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APIguide.qvw	1 Mb	6/17/2008 10:16:11 AM
Automation Interface Reference.pdf	1 Mb	7/10/2008 3:14:31 PM
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QlikView 8.50 Reference Manual DEU.pdf	14 Mb	6/16/2008 10:43:08 AM
QlikView 8.50 Reference Manual DUT.pdf	23 Mb	6/16/2008 2:24:00 PM
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QlikView
Server

Reference Manual

Version 8.5 for Microsoft Windows®

Second Edition, Lund, Sweden, October 2008

Authored by QlikTech International AB PJB/CEN

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CONTENT

1 INTRODUCTION 7
1.1 About this documentation 7
1.2 Documentation outline 8

2 VERSION HISTORY 9
2.1 What's new in version 8.0 9
2.2 What's new in version 8.01 12
2.3 What's new in version 8.2 13
2.4 What's New in version 8.5 16
2.5 Migration Considerations 18

3 QLIKVIEW SERVER - QVS 23
3.1 System Requirements 23
3.2 Upgrading the QlikView Server 26
3.3 Installing the QlikView Server 28
3.4 Completing the Installation 33
3.5 Register 34
3.6 Start Service 35
3.7 Set Default Security in MS IIS 35
3.8 Testing the QlikView Server Installation with the Sample pages 35

4 QVS LICENSING 43
4.1 Client Access Licenses (CALs) 43
4.2 Types of CALS 43
4.3 Combining different types of CALs 44
4.4 Borrowed CAL 44
4.5 Cluster Licensing 44
4.6 QlikView Server Small Business (SB) Edition 44

5 SERVER MANAGEMENT CONSOLE PARAMETERS 47
5.1 The QlikView Management Console 47

6 QLIKVIEW SERVER 8 SECURITY SET-UP 81
6.1 Communication encryption 81
6.2 File system security on server 81
6.3 File system security vs. QlikView Section Access security 85
6.4 Security Configurations 86

7 QLIKVIEW SERVER FUNCTIONAL ARCHITECTURE 93
7.1 QlikView Server – Client Communication 93

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

7.2 QlikView Server Tunnel 97

8 SERVER LOGGING 101

8.1 Logging from QlikView Server 101
8.2 The Session log 101
8.3 The Performance log 103
8.4 The Event log 105

9 QLIKVIEW SERVER BUILT-IN HTTP WEB SERVER 107

9.1 Starting the QVS built-in http web server 107
9.2 Displaying sample pages with the QVS built-in http web server 107

10 SERVER REPOSITORY FOR SHARED OBJECTS 111

10.1 Types of Objects Available for Sharing 111
10.2 Settings required for Collaboration 111

11 DOCUMENT METADATA SERVICE (DMS) 115

12 QLIKVIEW SERVER LOAD SHARING (CLUSTERING) 117

13 SUMMARY OF QLIKVIEW CLIENTS 121

14 ABOUT THE SAMPLE PAGES 123

14.1 Sample HTML Pages 123
14.2 QVS AccessPoint 125

15 QLIKVIEW JAVA CLIENT 127

15.1 Java Client 127
15.2 Display of application 127
15.3 Collaboration - Shared Objects 128
15.4 HTML Pages 128
15.5 Using custom HTML to invoke applet (Advanced) 128

16 QLIKVIEW JAVA OBJECTS CLIENT 131

16.1 Java Objects Client 131
16.2 QlikView Page Generator for Java Objects 132
16.3 Objects definition 133
16.4 Applying QlikView Java Objects to a web page 133
16.5 Language and bookmark settings 134

17 QLIKVIEW ANALYZER FOR INTERNET EXPLORER 137

17.1 Plug-in Client 137
17.2 Collaboration - Shared Objects 138
17.3 Deployment of QVA for IE 140
17.4 Customizing settings for QVA for IE 140

18 QLIKX - PUBLISHING SEPARATE SHEET OBJECTS FROM THE QVA FOR

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

IE PLUG-IN CLIENT 141
18.1 Technical description of the QlikX concept 141
18.2 Limitations 141
18.3 Getting it to work 141
18.4 QlikView Page Generator for QlikX 142
18.5 Capabilities, differences and limitations 145
18.6 Complete sample page 145

19 QLIKVIEW INSTALLED WINDOWS CLIENTS 149
19.1 Locally installed Windows Client 149
19.2 Open in Server 149

20 THE QLIKVIEW AJAX ZERO-FOOTPRINT CLIENT (ZFC) 153
20.1 General 153
20.2 QlikView Page Generator for AJAX ZFC 154
20.3 Collaboration - Shared Objects 156
20.4 Getting it to work 156
20.5 Web page design with QlikView AJAX ZFC 158
20.6 Using section access with QlikView AJAX ZFC 161
20.7 Capabilities, differences and limitations 166
20.8 ASP timeouts for very large QlikView documents 168

21 CONSIDERATIONS WHEN DEVELOPING DOCUMENTS FOR USE WITH QLIKVIEW SERVER 169
21.1 General 169
21.2 General limitations when working from clients 169
21.3 Limitations in Java clients layout functionality 169
21.4 Font Mapping in Java clients 170
21.5 Performance Considerations 170
21.6 Considerations when using macros in QV documents on the QlikView Server 171
21.7 Security and Access restriction 174

22 JAVA APPLET API 179
22.1 General provisions for the API 179
22.2 Documentation and examples 179

23 HTML PAGE SCRIPT API 181
23.1 General Specifications for the script API 181
23.2 General provisions 181
23.3 Error handling 181
23.4 Provisions for examples 181
23.5 QlikView Java / QlikView Java Objects script API function summary . 182

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23.6 Function descriptions 183

1 APPENDIX A - QLIKVIEW JAVA FAQ 201

2 APPENDIX B - QLIKVIEW PLUG-IN FAQ 203

3 APPENDIX C - MS WINDOWS INSTALLER - MSI PACKAGES 207

4 APPENDIX D - DEPLOYING MSI PACKAGES WITH GROUP POLICIES ... 215

5 APPENDIX E - QLIKVIEW SERVER SCRIPT API FOR DMS AND CALS . 223

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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PART I: QLIKVIEW SERVER

- **Introduction**
- **Version History**
- **System Requirements**
- **Installation**
- **Control Panels**
- **Security set-up**
- **Functional Architecture and Tunneling**
- **Server Repository**
- **Document Metadata Service (DMS)**
- **Load Sharing (Cluster environments)**

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6

1 INTRODUCTION

1.1 About this documentation

General

QlikView Server provides a platform for hosting, distributing, and sharing QlikView information over the Internet/Intranet. QlikView Server is tightly integrated with QlikView and QlikView Publisher to deliver a seamless suite of data analysis technology to end users. The server component of QlikView Server is the centerpiece of this technology, supplying a robust, centrally managed, QlikView document community, connecting multiple users, client types, documents, and objects within a secure and safe environment.

There are multiple client types available to connect to QlikView Server. There are the installed Windows clients - QlikView Developer, Professional, Analyzer+, and Analyzer. There is a Sun Java client that can be implemented as either a full or object based client (Java Client and Java Objects Client) for QlikView analysis in a standard web browser. There is also an ActiveX Internet Explorer plug-in client which can also be implemented as either a full or object based client (QlikView Analyzer for Internet Explorer Client – QVA for IE - and QlikX Objects Client) for analysis in an Internet Explorer browser. Finally, there is an AJAX Zero-Footprint Client (ZFC) that provides QlikView Objects support in a standard browser without requiring client side installation. Nothing apart from a standard web browser needs to be installed on the client machine.

With the installed QlikView (exe) clients and the QVA for IE ActiveX plug-in client, whole QlikView documents can be shown with complete sheet layout and more or less 100% fidelity to how the document would look if opened as a local qvw file in QlikView. These clients can be used to create and maintain new sheet objects that can be shared with other users of the document throught QlikView Server. As of version 8.5, the AJAX Client can also be used to create and maintain shared objects. QlikView user collaboration is a major theme starting with QlikView version 8, and will continue to be a focal point of development as QlikView Server continues to evolve.

The QlikView Objects Clients (Java Objects, QlikX, and AJAX) are based on the concept of placing individual sheet objects from a QlikView document in an HTML environment. This gives the web designer the freedom of placing single objects in arbitrary places on a web site and integrating them

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with text and other HTML code. As of QlikView version 8, the basic HTML code to display these objects in any of the object clients can be automatically generated through QlikView.

This documentation provides the necessary steps to complete the installation of the QlikView Server, test your installation, and share your QlikView documents. The documentation also describes how to configure and monitor QlikView Server through the Management Console, how to connect to QlikView Server and its documents through different clients, and how to access the data in QlikView documents via an API.

Programming languages

The examples in this documentation are written in HTML using JavaScript. For the server-side, Microsoft JScript is used and for the client-side standard JavaScript is used. This document is however not a manual for these scripting languages. The reader is expected to possess a basic knowledge of HTML, ASP and JavaScript programming.

Style coding

In this documentation all menu commands and dialog options are shown in **Arial bold**. All file names and paths are shown in **`Courier Bold`**. Sample code is shown in `Courier` and **`Courier Bold`**.

1.2 Documentation outline

Part I of this document describes the QlikView Server component, how to install it, configure it, start it and monitor it.

Part II describes the different client types. It also provides some examples of how to deploy QlikView documents.

Part III provides general API specifications for the QlikView Java and QlikView Java Objects clients for QlikView Server.

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2 VERSION HISTORY

2.1 What's new in version 8.0

One Product Suite

With the release of QlikView 8 we want to emphasize the merging of QlikView, QlikView Server and QlikView Publisher into one integrated product suite. All components now share the same version number. A number of features have been added to make the components feel as one integrated unit.

New QlikView Server Management Console from inside QlikView

By entering a URL in the Locations folder of User Preferences the QlikView Server administrator can have a shortcut to the new HTML based QlikView Server Management Console from the QlikView menu. The Management Console will appear as an HTML window inside QlikView.

Direct Access to QlikView Server Document Folders

Folder locations for QlikView Server documents can be defined in the **Locations** page of **User Preferences** in QlikView.

Page Generator for Object Based Clients

A page generator for the object based clients (AJAX zero-footprint, Java Objects and QlikX) has been integrated into QlikView. The wizard driven generator will take any QlikView document and produce a corresponding HTML page layout for each sheet in the document, customized for any of the client types listed above. The resulting page(s) can be previewed in an HTML window inside QlikView. The pages produced may be used directly or edited further in any HTML design tool.

QlikView Server and Clients

New features in QlikView Server extend the functionality of the server component and enhance the user experience for the clients.

Graceful document refresh

When using QlikView as a client to QlikView Server, it is now possible to refresh your session with new data (as the server document is updated) without loosing session or selection state. This is accomplished through a combination of settings in QlikView Server and in the QlikView Document.

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New Java clients

The QlikView Java clients have been completely re-written to make full use of the possibilities in Sun Java 1.5. The result is a client close to pixel-perfect in behavior compared to the IE plug-in client. New features include better font-handling, support for transparent objects, color gradients, and object borders with rounded corners. Additional compatibility is expected as version 8 matures. The following is a list of enhancements found in 8.0:

- Slider objects are supported
- Bookmark objects are supported
- Line/Arrow objects are supported in the QlikView Objects Java client
- Gauges and pictures in table cells are supported
- Transparent or semi-transparent backgrounds in charts are supported
- Rounded corners on sheet object borders are supported
- Borders are available in QlikView Java Objects
- Advanced sheet object borders are supported

Improved QlikView AJAX Zero-Footprint Client

The work continues to expand the functionality of the AJAX client and also to improve performance. Better perceived performance is expected mainly to asynchronous update of straight tables, table boxes and list boxes. Other new functionality includes support for line/arrow objects, transparent sheet objects (requires Internet Explorer 7) and improved search in list boxes. Finally, support has been added for sorting straight tables and table boxes by clicking in column headers.

New QlikView Server Management Console

The new QlikView server Management Console is fully HTML based. It communicates directly with QlikView Server via a new web service interface. In addition to most of the controls of the legacy exe control panel, it includes monitoring of various aspects of the QlikView Server, e.g. active users, active sessions, memory usage etc. This new control panel will provide the platform for future planned enhancements to the control and monitoring of QlikView Server.

Built-in http server

A basic (trimmed down to the specific needs of QlikView Server and QlikView Publisher) http server has been added to QlikView Server. When running QlikView Server on Windows XP/Windows Server 2003 or later, it will provide an alternative to MS IIS.

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Collaboration

One of the major design goals for QlikView 8 is to enhance user collaboration during the QlikView experience. QlikView Server will be the centerpiece of the shared infrastructure required to support this design goal.

Server bookmarks and shared server bookmarks

Bookmarks created when working with documents on QlikView Server can now be stored in a repository file, located in the same folder as the document on the server. Your personal server bookmarks will be available for roaming from any computer where you work as an authenticated user. These bookmarks can always be found in the My Server Bookmarks page of the More Bookmarks dialog. Furthermore, you may flag any of your personal server bookmarks as shared to other users. That means that they will appear on the Shared Server Bookmarks page of the More Bookmarks dialog. Other users' shared bookmarks will be available to you in the same manner. This functionality will be available to Enterprise, Professional and Analyzer users alike, but for now not from the Java and AJAX zero-footprint clients.

User objects and shared objects

It is now possible for an end-user to add sheet objects when working with a document on QlikView Server. Objects may be created in the usual manner but will be stored in a repository file, located in the same folder as the document on the server. Your personal sheet objects will be available for roaming from any computer where you work as an authenticated user. These objects can always be found in the My Server Objects page of the Server Objects dialog (Layout menu). Furthermore, you may flag any of your personal server objects as shared to other users. That means that they will appear on the Shared Server Objects page of the Server Objects dialog. Other users' shared objects will be available to you in the same manner. This functionality will be available to Enterprise and Professional users with exe or IE plug-in client only.

Shared reports

Similar to server sheet objects there will also be the possibility to define personal server reports and share those with other users. Again, this functionality will be available to Enterprise and Professional users with exe or IE plug-in client only.

Mail bookmark - click to invoke

When you find something worth sharing in a QlikView Server document, you may, with just a single command from the menu, send a snapshot to another user. A temporary server bookmark (including layout status informa-

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tion) will be created on the server. A mail with a qvp URL encoding the bookmark reference will be generated. You just need to enter recipient name and any text you like to go with the link. When the recipient clicks on the link, the QlikView Server document will be opened and your selections and layout status reapplied. This functionality, of course, relies on the recipient having access to the document on the server and access to relevant parts of data and layout based on security restrictions.

General features

Field level security in section access

The QlikView script section access has been amended with syntax to suppress one or more fields based on log-in identity. Suppressed fields in these documents are completely unavailable to the client.

2.2 What's new in version 8.01

Improved QlikView AJAX Zero-Footprint Client

The AJAX Zero-Footprint Client continues to be enhanced.

- Multi boxes and pivot tables have been optimized for asynchronous update, resulting in better performance characteristics.
- Table styles, such as cell colors, borders etc are now correctly rendered as they would appear in regular QlikView.
- Print and Send to Excel are now supported commands. These are accessed via caption icons.
- Support for caption icons in general has been expanded, and support has been added for almost all caption icons available in regular QlikView.

All these features are automatically supported by the AJAX ZFC page generator.

General optimizations

A number of performance optimizations have been added. Of special significance in this release is improved multi-threading of the internal memory manager. This should lead to significantly higher utilization of multiple processor cores in environments with many users and documents.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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2.3 What's new in version 8.2

Extended management options in QlikView Server

The new Document Metadata Service (DMS) in QlikView Server adds a whole new range of management options in the QVS Management Console. When using the DMS (optional) the QVS becomes aware of available documents in a whole new way. The new possibilities include:

- ability to have a document automatically loaded whenever the QVS service starts
- ability to schedule loading and unloading of a document
- ability to limit the number of sessions towards a document

Support for third-party (non-Windows) authentication

QlikView Server now contains provisions for accepting third-party authentication via a trusted web server. QlikView Server can accept and handle tickets from a web-server and thereby recognize an identity authenticated by that web server. The actual authentication is done completely outside the bounds of the QlikView software. The use of third-party authentication requires the use of extended authorization via the DMS (see below).

Extended (DMS) authorization mode

QlikView Server has traditionally relied on Windows NTFS file security for authorizing a user to access a QlikView document. Whereas this behavior remains the default, QlikView 8.2 also introduces an extended authorization mode, based on the new Document Metadata Service (DMS). This mode is compulsory, whenever using third-party authentication (see above). In this mode, the QlikView Server can make use of the Directory Service Connector (DSC) installed with QlikView Publisher (hence also a third-party Directory Service Provider) to resolve group memberships for authenticated users. With the use of extended authorization it also becomes possible to control access to a document for a specified user or user group to specified time intervals.

Improved support for clustered server environments

The support for several QlikView Servers has been improved. Provided that the QVSs share the same document location, there is now complete support for collaboration objects working seamlessly over all servers. The license model has also been extended, allowing several servers in a cluster to share the same CALs.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Session timeouts

Settings have been added to force the termination of server sessions after a specified timeout.

Borrow CAL from server

Users of the Windows QlikView Analyzer (non registered) client can use the credentials of a named CAL on a QlikView Server to open documents locally (Analyzer+ capability). This ability expires 14 days after the last connection to the QlikView server using the named CAL, but is renewed every time a server connection occurs.

Tighter integration between QVS and QV Publisher

The integration between QlikView Publisher and QlikView Server has been further strengthened. QlikView Publisher now recognizes a QlikView Server as a resource. QlikView Publisher also has been extended to communicate with the Document metadata Service (DMS) of the QlikView Server to support operation in conjunction with third-party authentication and extended authorization mode.

AJAX ZFC generation by QlikView Publisher

The new version of QlikView Publisher has the ability to automatically generate AJAX ZFC pages for distributed documents, thus making an AJAX ZFC alternative available via QlikView AccessPoint.

Improved AJAX Zero-Footprint Client

The AJAX Zero-Footprint Client has been further improved. New and improved features include:

- completely new multi box with the same look as in regular QlikView
- support for slider/calendar object
- support for bookmarks (for authenticated users)
- support for drill-down and cyclic groups
- support for cyclic expressions
- support for fast type-change in charts
- support for show conditions on sheets
- support for fixed number of lines in tables
- support for drop-down select in tables
- sort indicators in tables
- selection indicators (LEDs) in tables

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- Clear and lock icons in current selections object
- improved layout pixel fidelity to Windows client
- interactive search feedback
- support for Safari 3.0 browser
- support for dynamic label colors (using the caption settings in the document)
- For handcrafted pages, you may now disable inlinestyling

Improved Java Client

The Java Client has been further improved. New and improved features include:

- improved performance
- support for slider object
- tool tips in charts
- support for all relevant caption buttons in all sheet objects
- context menus on cycle and fast type-change buttons
- support for grid style multi box
- fast type change between bitmap charts and table charts
- improved handling of pop-up windows

Improved GUI for collaboration sheet objects

A new collaboration object pane has been added for better overview and easier handling of personal and shared server sheet objects. The pane features informative icons with hover tool tips, giving you information about the available objects. Objects can be dragged from the pane onto the sheet.

Convert user bookmarks to server bookmarks

A utility has been added to convert all old user bookmarks for a specific document to server bookmarks stored in the server repository. This action is recommended for easier maintenance of bookmarks.

Convert user reports to server reports

A utility has been added to convert all old user reports for a specific document to server reports stored in the server repository. This action is recommended for easier maintenance of reports.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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2.4 What's New in version 8.5

Improved performance and memory utilization

QlikView and QlikView server have been further optimized for better performance and better memory utilization in multi-user environments.

Scripting interface to DMS

Syntax has been added for scripted access to QlikView Server DMS. This will allow batch update of DMS and CAL data in QlikView Server. For more information, refer to the QlikView Server Script API in the appendix section of this manual.

Further Improvements to the AJAX Zero-Footprint Client

The AJAX Zero-Footprint Client continues to be improved. New and improved features include:

Collaboration object creation from AJAX client

Server settings permitting, it is now possible to create user charts and list boxes from the AJAX clients. This is the first step towards the goal of providing full collaboration object support in this environment.

Anonymous user bookmarks

Previously only authenticated users could create bookmarks via the AJAX client. With this release that capability is extended to all users, authenticated or anonymous.

Context menus

Right-click context menus have been added to the AJAX client. More or less all options found in the thicker client are now also available to the AJAX user.

Toolbar

It is now possible to add a toolbar with the most common commands to the AJAX client application. The option to include the toolbar is available in the Client Page Generator dialog.

Upgraded sheet object drawing

Major improvements have been made in the visual presentation of tables and Current Selection boxes. Support has been added for displaying bitmap buttons and aqua style buttons.

Upgraded sheet tabs

The drawing of sheet tabs has been improved. Support for selection beacons has been added.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Support for input fields

Input fields can now be edited via the AJAX client.

Full support for fast type change in charts

Fast type change now also works between bitmap charts and table charts.

Expression search

Support has been added for search in straight table expression columns.

Frequency in list boxes

Support has been added for the frequency column in list boxes.

Export to CSV

Export to csv has been added as an option for selected objects via their context menus.

Further Improvements to the Java Client

The Java Client continues to be improved. New and improved features include:

Java Beans integration

The Java client now consists of Java beans which can be used for server side and/or client side integration with other Java applications.

Stand-alone capabilities

The Java client can now be run as a stand-alone application outside the browser environment. For this to be useful, an open in server dialog has been added, so that the client can connect to a QlikView Server and open documents. Furthermore the client and QlikView Server 8.5 and later will have cross version compatibility just as the QlikView IE plug-in and the installed QlikView clients.

Graphical updates

A number of improvements have been made in the graphical presentation of the Java client, so that it now supports most features found in the thick clients. Features include an improved tab row, support for the new caption/border style, and support for rounded corners on sheet objects.

Improved tables

Tables in the Java client now support pivoting and moving of columns. Additionally, support has been added for displaying gauges in table cells.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Improved export option

Support for export to csv and copy to clipboard has been added.

Open files from info button

It is now possible to open files by means of an info button.

Simplified licensing

Several licensing changes have been introduced to simplify and expand the licensing options for QlikView Server.

Same price for 32- and 64-bit

The price difference between 32- and 64-bit QlikView and QlikView Server has been removed. All QlikView users now have the choice to use the full power of 64-bit QlikView without extra cost.

User object creation from QlikView Analyzer

The previous requirement for a QlikView Professional or QlikView Enterprise (Developer) license key in order to create personal and shared sheet objects in a QlikView server document has been removed. If you have a valid CAL and are an authenticated user, you may create and share your own sheet objects (server settings permitting).

QlikView Server Editions: Small Business Edition and Enterprise Edition

The QlikView Server Small Business (SB) Edition has been introduced as a new option for small businesses looking for a limited set of functionality in QlikView Server. For more information, refer to the section titled QVS Licensing. There will also be notations throughout this document denoting differences between the editions.

2.5 Migration Considerations

The following considerations apply when migrating QlikView Server from version 7.x to version 8.x, and within 8.x where applicable.

Converting AJAX ZFC 8.2 pages to 8.5

The general recommendation is to convert all pages to the new 8.5 syntax as soon as possible. Refer to the section Web page design with QlikView AJAX ZFC for more information.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

8.2:

```
<body onload="Avq.Start()" style="border: none;">
<span id="avq"
avqscriptpath="/QvAJAXZfc/htc/" avqremote="/
QvAJAXZfc/QvsViewClient.asp"
onavqmessage="alert(window.event.avqMessage)"
avqview="fruitcolor"
avqautoview="SH01"
        onavqupdatecomplete="SetNewSheet ();"
xmlns="">
</span>

avqSet (name, 'text', '', true);
```

8.5:

```
<script language="javascript" type="text/javascript">
      var qva = new Qva.PageBinding();
      qva.View = "fruitcolor";
      qva.Autoview = "SH01";
      qva.Trace = new Qva.Trace(qva);
      qva.Modal = new Qva.Modal(qva);
      //qva.JSON = true;
      qva.OnUpdateComplete = function () {qva.SetNewS-
      heet(); }
      new Qva.Collaboration(qva);
      new Qva.Scanner(qva);
</script>
<body onload="Qva.Start()" style="border: none;">
qva.Set (name, 'text', '', true);
```

Handcrafted AJAX Pages in 8.5

The QlikView Server installation process will copy several files to the folder Legacy Files\Ajax, where among other things you will find avq.js. For handcrafted pages, it is not recommended to move them to QvAjaxZfc\htc, but to copy them to a new folder instead and change the path in the page.

If the page uses stylesheets (default.css, tabcontent.css) shipped with QlikView Server, they may not appear correctly. If possible, use the stylesheets shipped with 8.2 and reference them instead of the 8.5 versions.

Generate AJAX Pages in 8.5

The AJAX client has undergone major restructuring and extension in version 8.5. AJAX pages generated with previous versions of QlikView should be re-generated with QlikView 8.5 before being used with QlikView Server 8.5.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Legacy Control Panel no longer supported in 8.5

The legacy QlikView Server Control Panel (QVSControl.exe) is no longer supported as of version 8.5. Configuration and communication with the QlikView Server service should be handled through the Management Console for QlikView Server.

New directory structure in 8.5

Some of the default installed paths for QlikView Server components have been changed in 8.5 to provide better Windows compatibility. Primarily, this affects the default QvsDocuments folder and the default sample web pages location.

New directory paths to QlikView AJAX ZFC

The default installed paths to the QlikView AJAX Zero-Footprint client have been changed to more accurately reflect the name of the client.

The default path to the client has changed from:

`C:\Program Files\QlikView\Server\QvClients\QvZfp`

To the path:

`C:\Program Files\QlikView\Server\QvClients\QvAJAXzfc`

The virtual directory name for this location is changed to **`QvAJAXZfc`** for both IIS and the new QVS http server. This requires that the document connector code in existing AJAX HTML must be updated to reflect the new path. Refer to the section titled “The QlikView AJAX Zero-Footprint Client (ZFC)” for more information.

The default path to the AJAX web pages has changed from:

`C:\Program Files\QlikView\Examples\QvWebpages\Zfp`

To the path (for QVS 8.0 – 8.2:

`C:\Program Files\QlikView\Examples\QvWebpages\AJAXzfc`

To the path (for QVS 8.5+):

`C:\Program Files\QlikView\Webpages\AJAXzfc`

Replacement of QlikView AJAX ZFC qvxmllayer (asp, dll)

Avq.htc in 8 has moved from Http-GET to Http-POST (for AJAX standard). This also means that **`qvlayer.dll`** and **`qvxmllayer.asp`** are replaced by **`QvsComRemote.dll`** (common for all http-calls to QlikView Server) and **`QvsViewClient.asp`** (dedicated to the ZFC protocol) . This change will affect existing coding for ZFC applications. See the section titled “The QlikView AJAX Zero-Footprint Client (ZFC)” for more information.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Single JAR file for Java

The Java archive files (*.jar) have been integrated into a single file (**`QlikView.jar`**) with multiple entry points to support the specific function required.

New Class ID for QlikX

The Class ID has been changed for version 8 of QlikX (plug-in objects).

The Class ID for the document connector for version 7.0 to 7.50 was:

`6E1BAAF6-ECB9-4505-86C1-5D04467B02CC`

The Class ID for the document connector for version 7.51 to 7.52 was:

`C966E50C-534E-44d2-84EE-52AA5C501F84`

For version 8, the Class ID for the document connector is:

`74DC8438-E36A-40a0-B750-4E2257FA2E41`

The Class ID for the object display for version 7.0 to 7.52 was:

`2B098AA4-1FBD-4d84-8AE3-E95A74371022`

For version 8, the Class ID for the object display is:

`54D93DE9-7DA5-4477-A3DA-869ADB41CBBB`

Refer to the section titled “QlikX - Publishing separate sheet objects from the QVA for IE plug-in client” for more information.

Cross-release compatibility

QlikView Server version 8 will work seamlessly with QlikView 6 or QlikView 7 clients, and QlikView Server 6/7 with QlikView 8 clients. Feature limitations based on version will, of course, apply.

QlikView Server version 8 is not compatible with QlikView 4 or QlikView 5 clients. QlikView Server (QlikWeb) version 4 and 5 are not compatible with QlikView 8 clients.

Control Panel settings in Registry

QlikView Server version 8 will inherit the same control panel settings from version 7, since it will use the same Windows Registry location:

[**`HKEY_LOCAL_MACHINE\SOFTWARE\QlikTech\QlikViewServer\Settings 7`**]

Support for native IA-64 (Itanium) dropped in version 8

QlikView Server version 8 does not ship in a native IA-64 (Itanium) version. The 32-bit version will run on Itanium based machines with Windows, but

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

performance can be expected to be poor. QlikView Server version 7 is recommended for native 64-bit Itanium support.

New Sample Pages in HTML

QlikView Server version 8 will include sample pages in HTML. The legacy ASP sample pages have been phased out as of 8.5.

QlikView Server Service automatically installed

The QlikView Server version 8 installation will automatically perform the Install Service function for the QlikView Server Windows service. It is recommended to set the proper Recovery option for the QlikView Server service so that the service will restart automatically if it encounters an error. See the Installation section of this document for further information.

Multiple QVS Installations sharing the same license are considered Clustered

If multiple QlikView Server installations share the same license, they will automatically be considered as clustered. Note that this configuration will affect Networks where unauthorized license sharing between test and production environments was configured.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 QLIKVIEW SERVER - QVS

3.1 System Requirements

In order to successfully install and run the QlikView Server, the following basic requirements must be met by the system:

Hardware and Software

You need a computer with

- 1 GHz (x86 processor) or 1.4 GHz (x64 processor). 2 GHz or faster, with several cores/processors recommended.
- graphics hardware supporting color XGA resolution or better. QlikView Server will use the color settings of the Windows server where it runs when sending charts and other graphics to the client. For best results, the color palette on the Windows server should be set to at least 65,536 colors (16 bit).
- a monitor with a resolution of at least 1024 x 768.
- a mouse or an equivalent pointing device supported by MS Windows.
- (optional) a DVD drive for DVD-based install media only.
- a hard disk with at least 250 MB of free disk space for installation off DVD, and at least 450 MB of free disk space for installation off a download file.
- enough primary memory (RAM). 512MB RAM minimum (1 GB RAM or more recommended on x86 systems, 4 GB or more on x64 systems). The server's capacity to publish QlikView documents and the number of users who concurrently can connect to it are strongly related to the amount of RAM available.
- An http server for providing QlikView Java, Java Objects Client and AJAX ZFC solutions to end users (e.g. MS Internet Information Server or the built-in QVS http server). Microsoft IIS or the built-in http server is required when using tunneling, external authentication or NT security with Java clients and whenever the AJAX Zero-Footprint client is used.
- TCP/IP Network.
- Microsoft .NET 2.0.
- Paging File Size defined as 4 GB or greater. For x64 systems, recommendation is 1.5 times the amount of RAM.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Actual requirements will vary, based on system configurations. It is recommended that you work with your local QlikView representative to configure an appropriate hardware platform for your QlikView Server requirements.

Operating System

You need one of the following operating systems:

- Microsoft® Windows 2000™; or
- Microsoft® Windows Server 2000 ™; or
- Microsoft® Windows Server 2003 ™; or
- Microsoft® Windows Server 2008 ™
  full support with QvsHttpServer, limited support* with Microsoft Internet Information Server 7; or
- Microsoft® Windows XP™
- Microsoft® Windows Vista™

Note that the built-in QVS http server requires Windows XP or Windows Server 2003 or later.

*Limited support includes:

- Windows Authentication must be enabled on the webpage level for the QvsManagement to function properly when accessing via the browser (no issues when access via shortcut)
- Listing folders/files with NFTS rights set, are not properly listed.
- Tunneling does not work.

Additional Requirements for QlikView Server x64

- Processor supporting the x64 architecture (includes AMD Athlon 64, AMD Opteron 64, Intel Xeon EM64T and Intel Pentium with x64 extension)
- Minimum 1 GB RAM. 4 GB RAM or more recommended.
- Microsoft® Windows XP Professional x64 Edition™; or
- Microsoft® Windows Server 2003 x64 Edition™
- Microsoft® Windows Vista x64 Edition™, or
- Microsoft® Windows Server 2008™, x64. See above for IIS 7 limitations.

Client requirements for installed exe clients

- See reference manual for QlikView

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Client requirements for plug-in (QVA for IE)

In addition to the server requirements above, the client must be running a compatible web browser. Client requirements are as follows:

- Microsoft Internet Explorer 6 or higher.

and

- Microsoft® Windows 2000™; or
- Microsoft® Windows Server 2000 ™; or
- Microsoft® Windows Server 2003 ™; or
- Microsoft® Windows Server 2008 ™; or
- Microsoft® Windows XP? ; or
- Microsoft® Windows Vista?

Client requirements for Java clients

In addition to the server requirements above, the client must be running a compatible web browser. Client requirements are as follows:

- The Java Runtime Environment (JRE) must be one of the following:
  - Sun Java 1.5 or later
  - Apple Java 1.5 or later
  - Java 1.5 or later (Sun Java compatible)
- Java and Java Script must be enabled in the web browser.

QlikView Java and QlikView Java Objects clients have been successfully tested with Java enabled versions of the following browsers:

- Under MS Windows:
  - Microsoft Internet Explorer 6 and 7 with Sun JRE.
  - Firefox 1.0.6 with Sun JRE
- Under MacOS X (tested on v. 10.4 "Tiger" only):
  - Firefox 1.0.6 or later

QlikView Java and QlikView Java Objects clients will most probably run on many other environments, including various UNIX versions but this has not been verified by QlikTech R&D. As the number of possible combinations of operating system versions, browser versions and JRE versions is very large, QlikTech cannot guarantee correct operation with all possible set-ups. If some specific combination would be found to suffer from problems, we encourage customers to report back, so that better coverage can be achieved in future releases of QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Client requirements for AJAX Zero-Footprint Clients

In addition to the server requirements above, the client must be running a compatible web browser.

Client requirements are as follows:

- Under MS Windows:
  - Microsoft Internet Explorer 6 or later
  - Firefox 1.0.6 or later
- Under Linux (tested on Ubuntu Linux only):
  - Netscape Navigator 7.2 or later
  - Firefox 1.0.6 or later
- Under MacOS X (tested on v. 10.4 "Tiger" only):
  - Netscape Navigator 7.2 or later
  - Firefox 1.0.6 or later

  Other Mozilla-based browsers should work and the QlikView AJAX ZFC will most probably run on many other environments, including various UNIX versions but this has not been verified by QlikTech R&D. As the number of possible combinations of operating system versions and browser versions is very large, QlikTech cannot guarantee correct operation with all possible set-ups. If some specific combination would be found to suffer from problems, we encourage customers to report back, so that better coverage can be achieved in future releases of QlikView.

3.2 Upgrading the QlikView Server

If you are installing QlikView Server for the first time on a server, you may skip this section, and proceed to “Installing the QlikView Server” for installation instruction. If you already have QlikView Server installed on a server, and would like to upgrade to a more current release, then follow the instructions in this section.

Whether you are upgrading QlikView Server to a new release or a new version, it is helpful to be aware of a few basic practices that will help to insure a successful transition to a new level.

- Utilize the sample HTML pages as examples to create your own code with your own naming conventions. Upgrading to a new release or version will typically overlay existing sample files with new ones. So, if you are not careful, you could lose your work.
- Always be sure to read the ReadMe documentation, if available, prior to installing an upgrade. This will have the most current information available to help you perform a successful migration.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- Be sure you have backup media of the current software, as well as your custom code for back out procedures, if necessary.
- QlikView Server must be stopped to perform an upgrade, so it is best to schedule this procedure for an off time.
- Registration (licensing) information and Settings will be saved by default when the QlikView Server program is removed. They will then be applied to any subsequent install of QlikView Server on that system.

TIP: Document folder information is not preserved, so if you have changed the default locations for document folders through the Management Console, you will have to reenter this information once the new version/release is installed.

Upgrading to a new release of QlikView Server will generally require an UNINSTALL of the old release and INSTALL of the new release.

For the uninstall of QlikView Server, be sure to perform the following steps prior to running a Windows Remove Program procedure:

1. Verify that backup media exists for the current release of QlikView Server and backup all current files associated with QlikView Server (HTML pages, QlikView documents, licensing file, QlikView Server version 8 .share files, etc.)
2. If you are already running version 8 of QlikView Server, use the QlikView Server Management Console **Users** tab to determine if there are any active users linked to QlikView Server. You may wish to send out a broadcast message to notify users that the service will be stopping.
3. Stop the QVS service through the QVS Management Console (or Windows Services dialog). If using the Server Management Console, on the **Install** page of the dialog, click on the **Stop** button.
4. Uninstall the QVS service through the Server Management Console. On the **Install** page of the dialog, click on the **Uninstall** button. Note that this only uninstalls the Windows Service.
5. Perform the Windows Remove Program procedure against QlikView Server from the Windows Control Panel.

For client program updates, if applicable, be sure the client computer has no open QlikView Server sessions before applying the update.

Now you are ready to install the new release of QlikView Server. Follow the instructions in the next section.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

3.3 Installing the QlikView Server

The QlikView Server installation can be performed off CD media or from a disk file. To install QlikView Server, insert the CD in a drive accessible from the target server hardware.

TIP: It is recommended to install QlikView Server after the web server software (e.g. MS IIS) has been installed and configured.

TIP: If the required Microsoft .NET 2.0 Framework is not installed, it will be included as part of the QlikView Server installation process.

TIP: It is recommended to not move folder locations after QVS installation is complete, since many settings are dependent on their initial file location. If you wish to change the location of QVS after it is installed, this should be done through an uninstall/install process.

If the DVD does not auto-run, or if you are installing from a different media, then execute **`d:\AvsX64SetupRedist.exe`**, where *d* is the logical drive or path for the target server installation media. Note that 32-bit version have a slightly different naming convention.

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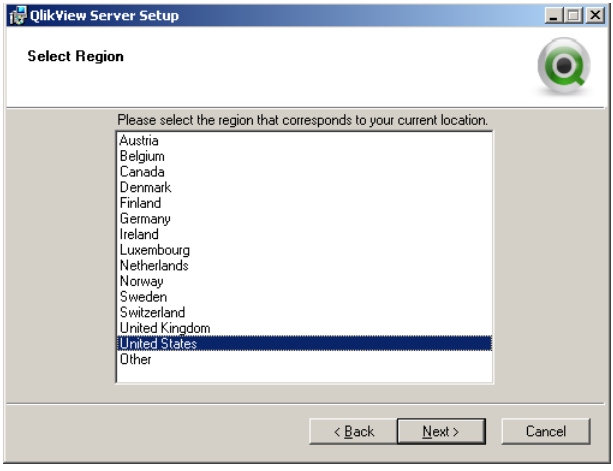
1 If the CD does not auto-run, or if you are installing from a different media, then execute **`d:\ QVS_SETUP.exe or d:\QvsSetupRedist.exe`** where d is the logical drive or path for the target server installation media. Note that x64 versions have a slightly different naming convention.



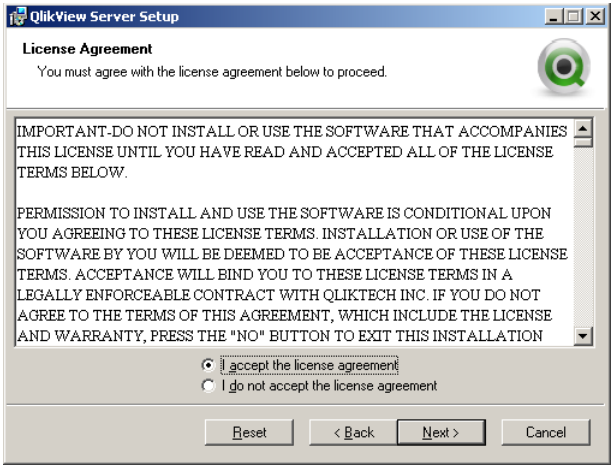


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2 Click **Next** to continue the QlikView Server setup.

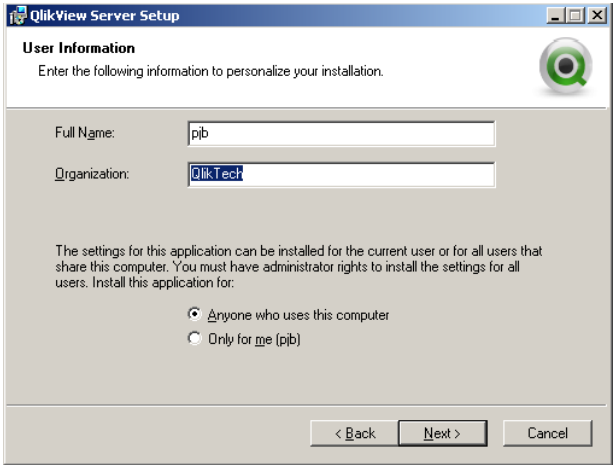


3 Select the region for the local location of the server.

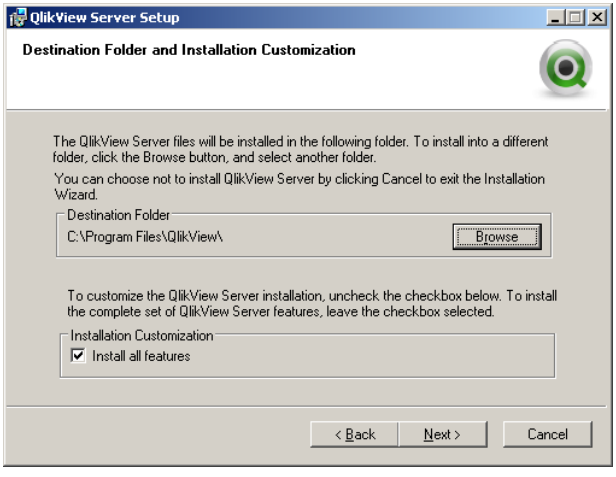


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4 Read the license agreement, and continue by selecting **I accept the license agreement**, and then click **Next**.



5 Enter the user information for QlikView Server.

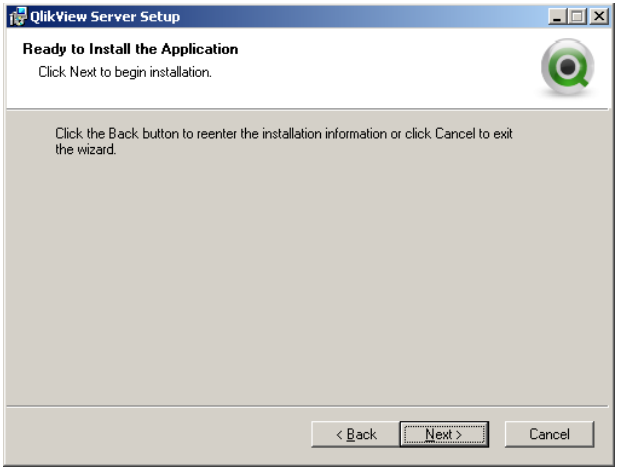


6 All files will be installed under the specified folder location. The QlikView Server executable (**`qvs.exe`**) file will be located in **`C:\Program Files\QlikView\Server`** by default. If you would like to change the root folder location of the installed files, click **Browse** to specify the preferred location.

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7 For full functionality, including the example web pages and documents, leave the **Install all features** checkbox selected. This will perform a complete installation (recommended) of the QlikView Server software. To control exactly what is installed, uncheck the checkbox. Continue by clicking **Next**.

TIP: It is recommended to install the QlikView Server example web pages and documents to use to test the installation for new environments.



8 Click **Next** to install the application.



9 Once the Installation is complete, click **Finish**.

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The QlikView Server is now installed on your computer. In order to activate it, you need to complete a few further steps.

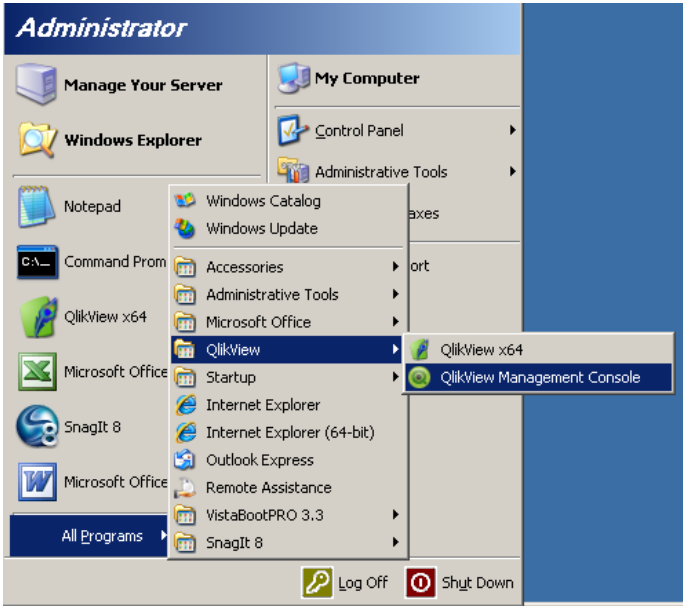
3.4 Completing the Installation

After successfully installing QlikView Server, you must complete the following steps to activate it:

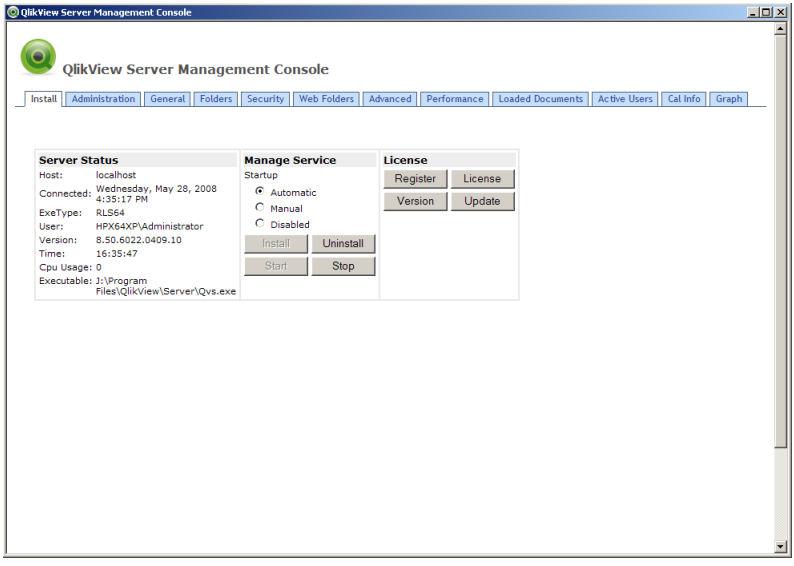
1 Register

2 Start Service

These steps must be completed after the installation using the QlikView Server Management Console (found under **Programs**, **QlikView** in the **Start** menu). The topics below explain how to use the Server Management Console.



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3.5 Register

Registration authenticates your copy of QlikView Server and allows it to run on your computer. In order to register, you must have a valid Serial Number and Control Number issued by your vendor. If you do not have both a Serial Number and a Control Number, contact your vendor.

TIP: Make sure you enter the serial and control number for QlikView Server. This will be a different license than, e.g., QlikView Developer.

In the QlikView Server Management Console (**Install** page), click on the **Register** button. Enter the Serial Number and Control Number assigned to your copy of the QlikView Server. You should also enter your name and company in the fields provided.

The License Enabler File (lef.txt) for QlikView Server will be automatically written to **`C:\Documents and Settings\All Users\Application Data\QlikTech`**. If for any reason, the LEF information cannot be accessed through the Internet from your server, you can obtain this information from your vendor, and copy the entire **`LEF.txt`** file to this location, or paste the LEF data using the **License button** on the **Management Console Install** page. Contact your vendor for specific instructions.

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3.6 Start Service

Once the QlikView Server has been registered and installed as a Windows service, it can be started. If the QlikView Server is set for automatic startup, rebooting the operating system will start the QlikView Server service. To manually start the service, either the Windows Services control panel or the QlikView Server Management Console can be used.

In the QlikView Server Management Console (**Install** page), click on the **Start** button to activate the QlikView Server service. The service will start and the **Stop** button will become enabled. No dialog will appear indicating successful startup of the service. The **Stop** button can be used to manually stop the QlikView Server service if necessary.

TIP: If the service does not start, and you receive the message "The service did not start in a timely manner" verify that you have a valid License Enabler File (lef.txt), and that the date contained in the LEF has not expired. If you need assistance with licensing, please contact your vendor.

3.7 Set Default Security in MS IIS

If you are using MS IIS as your web server in a Windows Server 2003 or greater environment, be sure to check the following default security settings to insure proper operation of the QlikView Server sample pages, as well as extended functions (e.g. QVS Tunnel).

- Enable ASP Pages
- Enable ASP.NET 2.0
- Add QVSTunnel.dll as a Web Service Extension if you wish to utilize the QVS Tunnel extension (see Chapter 7 for more information on the QVS Tunnel extension)

3.8 Testing the QlikView Server Installation with the Sample pages

When the above steps have been completed, the QlikView Server is installed and running. To test the installation to verify proper operation of the server, you can use the provided sample pages.

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If you performed a Complete installation or Custom, and included the QlikView Server example web pages and documents, several sample HTML pages were loaded onto your server during installation in order to allow you to verify proper operation. To access these web pages, the directory where the pages were loaded must be accessible to your web server.

The default folder location for the QlikView Server sample pages is:

`C:\Program Files\QlikView\Webpages`

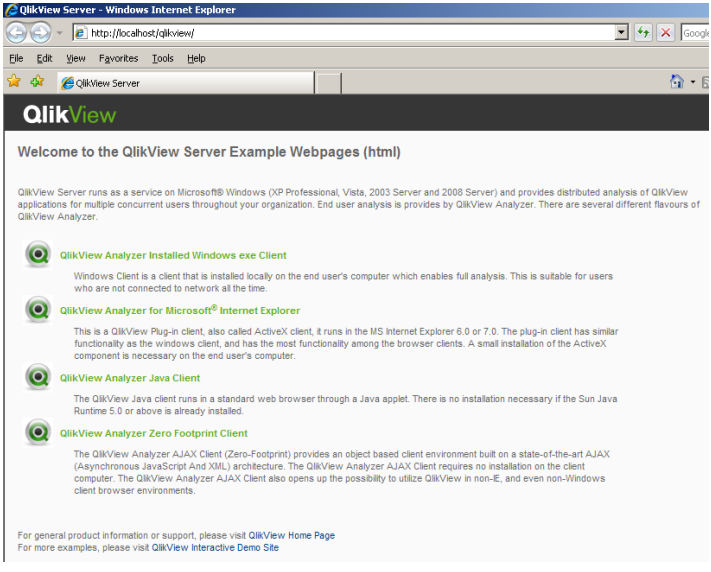
This location has a URL of **`http://<server>/QlikView/`**

If you cannot display the sample web pages, verify that there exists a virtual directory named **QlikView** defined in your web server, and pointing to the default folder location for the QlikView Server sample pages noted above.

If you installed to a different location or have chosen a different virtual directory name for your installation, then substitute your directory as described below.

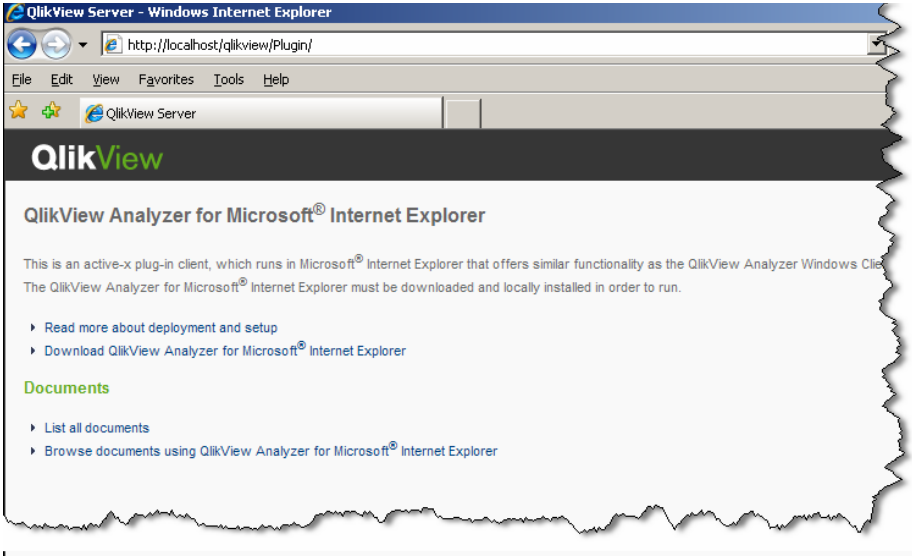
The following steps should be completed on the server where QlikView Server was installed:

1. Open your web browser.
2. Connect to the sample QlikView Server pages by entering the following URL: **`http://localhost/QlikView.`**

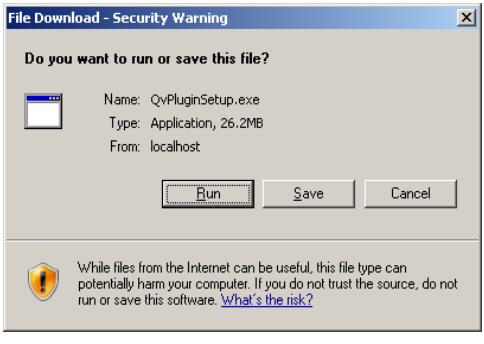


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3 Select **QlikView Analyzer for Microsoft® Internet Explorer.**

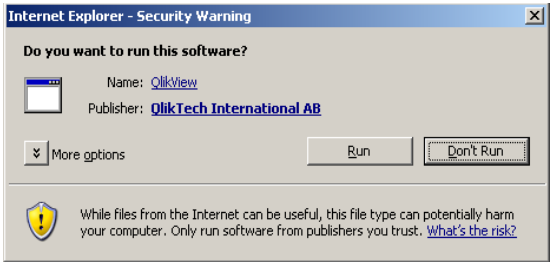


4 Select **Download QlikView Analyzer for Microsoft® Internet Explorer**.



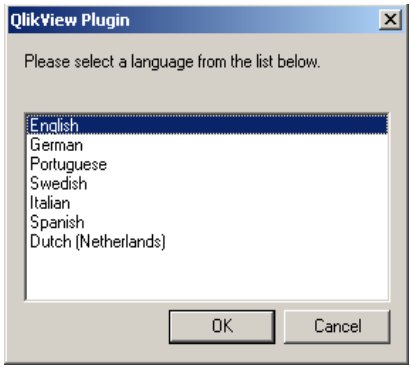
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5 Click **Run** to execute the **`QvPluginSetup.exe`** file.



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6 Click **Run** again.



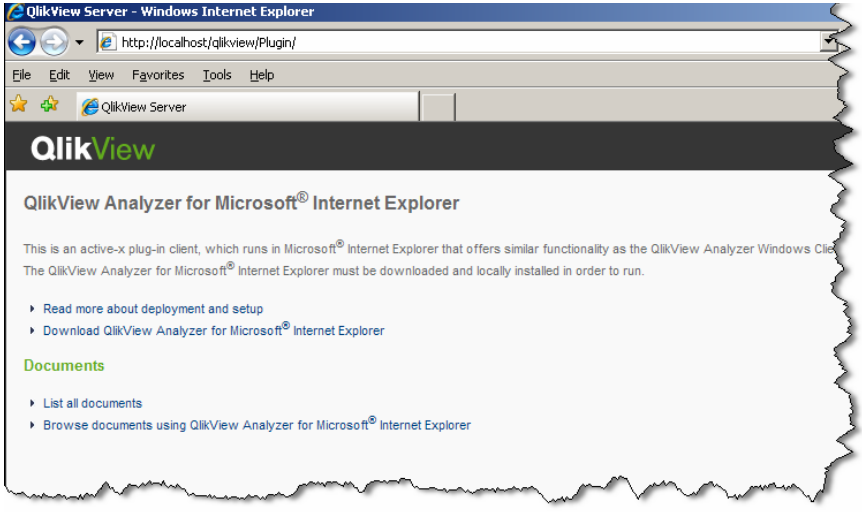
7 Select the appropriate language



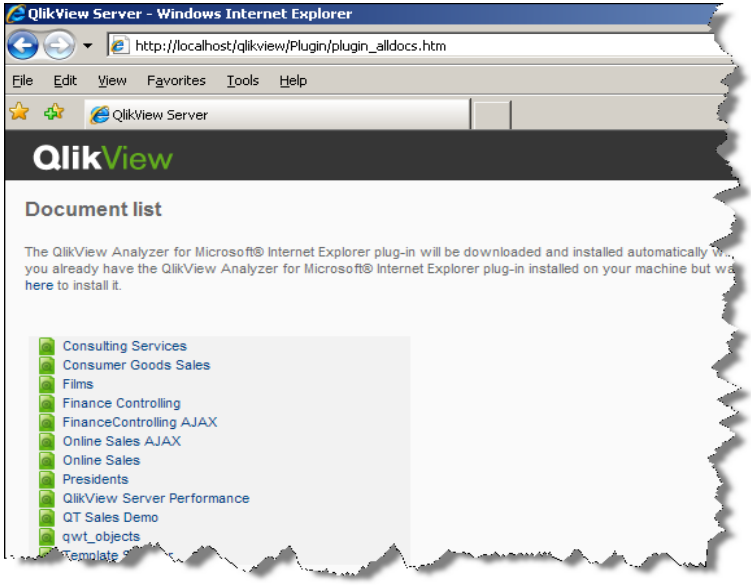
8 Install the QlikView Plugin. You will be asked to specify your location, accept the license agreement, and accept the default location.

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9 Once the **QlikView Analyzer for Microsoft® Internet Explorer** is installed, return to the **QlikView Analyzer for Microsoft® Internet Explorer** sample page.

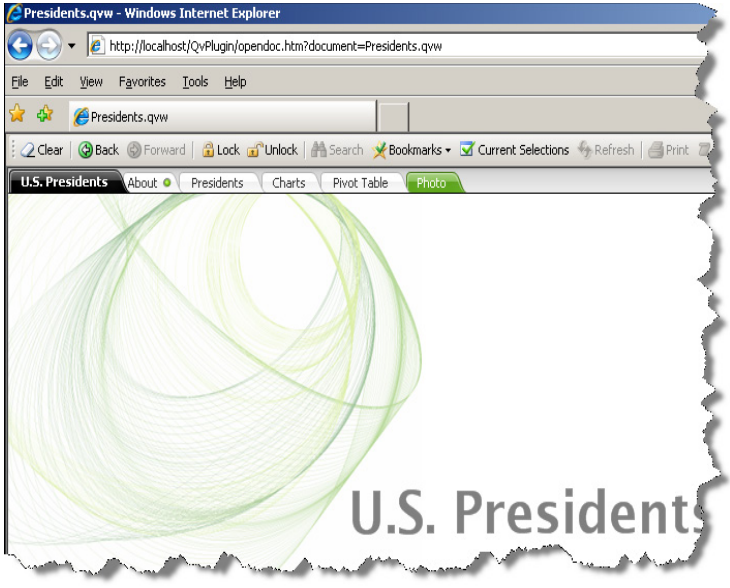


10 Select **List all documents** from the sample page.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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11 You will now see a list of links to sample QlikView documents. Click on one of the links.



12 The **QlikView Analyzer for Microsoft® Internet Explorer** client should open in your Internet Explorer web browser. Within a few seconds the toolbar, the tabbed sheets and other sheet objects should appear in the browser window.

TIP: If the QlikView document does not open after clicking on the link, the user may have to add the server/Fully Qualified Domain Name to the Trusted sites security zone in the browser settings.

13 If the application displays in your web browser, then you have successfully installed QlikView Server.

14 If you would like to test another client, simply select a different client choice on the default sample page. Note that the QlikView Analyzer Windows Client will also require a download and install. To use the Java or AJAX clients, you may have to modify some settings in your web server (e.g. IIS or the built-in QVS http server) to disallow anonymous access. See the section titled “QlikView Server 8 security setup” in this manual for more information.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4 QVS LICENSING

4.1 Client Access Licenses (CALs)

In order to connect to a QlikView Server each client needs a Client Access License (CAL). The CALs are purchased with QlikView Server and tied to the QlikView Server serial number. A CAL is never transferred to a client, but a client uses a CAL when connected to a specific QlikView Server. CALs are thus not transferable between different instances of QlikView Server. If a user is required to work with documents residing on several instances of QlikView Server, a separate CAL is needed at each of the QlikView Servers.

4.2 Types of CALS

There are three different types of CALs available:

- User CAL – Access is based on the user identity or machine identity. Any number of concurrent sessions from one user on one machine at a time is allowed. In order to utilize a user CAL, the client user must be identifiable either via user name (Windows or Novell) or with a unique machine ID. IP Address is not a valid form of identification for a User CAL. User name identification and machine name identification cannot be mixed on the same instance of QlikView Server. Note that user name identification requires Windows authentication on Java and Zero-Footprint clients, since machine name identification is not possible from these clients.
- Session CAL – Each Session CAL allows one user to access one QlikView document, i.e. to have one session at a time. Anonymous users are allowed, no identification of the client user is necessary.
- Usage CAL – Each Usage CAL gives the right to initiate one session (single document) per running 28-day period. The session may last a maximum of one hour. Any activity after the first hour has expired will count as a new session (albeit without visible interruption). No identification of the client user is necessary.

TIP: CALs are used for purposes of licensing only and they have nothing to do with user authentication for data access purposes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4.3 Combining different types of CALs

A given instance of QlikView Server can carry any combination of the CAL types listed above. When different CAL types are combined, the CAL options will be used as follows:

1. If there is a dedicated user CAL for the connecting client, that will be used.
2. If there is an available session CAL, that will be used.
3. If there is an available usage CAL, that will be used.
4. If none of the above, access will be denied.

4.4 Borrowed CAL

Astandalone Analyzer client, that does not have a registered license, is allowed to connect to a QlikView Server and "borrow" a User CAL for a disconnected 14 day use time period. After this time period has expired, the user may reconnect to "borrow" or activate another temporary disconnected usage license of QlikView. The Analyzer client must make an authenticated log on (not anonymous) in order to borrow a CAL. The Analyzer client needs to obtain a named User CAL (not a Session or Usage CAL) when connecting to the server in order to borrow a CAL.

4.5 Cluster Licensing

A special type of license is available to allow multiple QlikView Server installations to share the same license serial number, and support shared CALs. These servers are automatically considered as clustered. Note that this configuration will affect Networks where unauthorized license sharing between test and production environments has been configured.

4.6 QlikView Server Small Business (SB) Edition

QlikView Server Small Business (SB) Edition is available for customers looking for a QlikView Server specifically designed to support a smaller organization. While QlikView Server Enterprise Edition will contain all features and functionality of the full QlikView Server product, the SB Edition will be more focused in the features

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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that will be offered. Upgrade from SB to Enterprise will be controlled through licensing, so the migration process can be easily accomplished.

QlikView Server Enterprise Edition	QlikView Server Small Business Edition
Designed to support large numbers of users and integrate into enterprise environments	Designed for small numbers of users
End user QlikView UI development is allowed on the server	QlikView UI is read-only on the server
Integrates to 3rd party authentication for security and access control	Windows Active Directory only for security and access control
Users can be shared across servers for load-balancing, test environments, and fail-over	Single server deployments only
Named, session and usage CALs. Allows anonymous (typically external) users	Only named CALs. No anonymous users
AJAX client which makes it much easier to maintain large user communities	No AJAX client (Java, plug-in, stand-alone only)
No user limits	Limited to 25 users

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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5 SERVER MANAGEMENT CONSOLE PARAMETERS

5.1 The QlikView Management Console

The QlikView Server Management Console can be utilized to set and change all parameters controlling the QlikView Server operation. In addition, the QVS Management Console provides the ability to monitor key performance indicators, document usage and user connection status of the QlikView Server. You can open the QVS Management Console from the **Start menu**, under **Programs** … **QlikView.** The default location for the program is:

```
C:\Program Files\QlikView\MgmtConsole\QvsMC.hta
```

If you are managing multiple servers in a clustered environment, you may connect to individual servers by specifying a parameter on the shortcut command line as follows:

```
C:\Program Files\QlikView\MgmtConsole\QvsMC.hta <server>
```

This will allow you to monitor activity in a specific server. Note that any settings changed through the Management Console to a server in a clustered environment will change all other servers in the cluster as well. Any requirement to restart a server based on applying changes will restart all servers in the cluster.

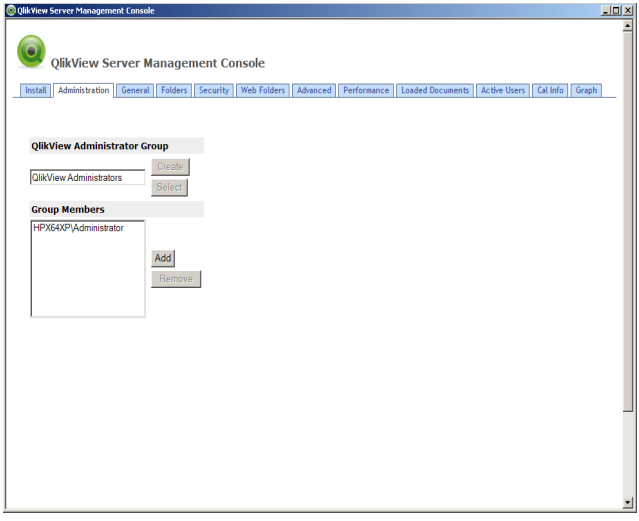
You can also open the QVS Management Console in either a standard web browser or in a local QlikView. If you open the QVS Management Console through the web or QlikView, you will not have access to the **Install** and **Graph** pages.

Prior to utilizing the functions in the QlikView Server Management Console, you must register as an authorized user in the QlikView Administrators group. You can do this either through the program shortcut or through the web dialog at the default address:

```
http://<server>/qvsmanagement/Default.htm
```

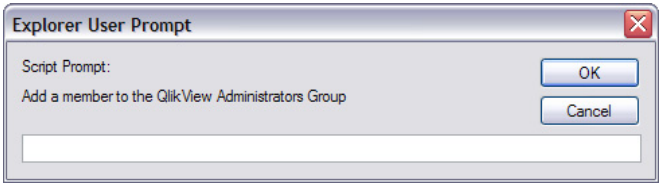

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Note that prior to adding an authorized user, only the Install page in the QVS Management Console will be available..



The Administration page of the QVS Management Console.

Add one or more authorized users that you wish to grant access rights to the QlikView Server management console. Click on the **Add** button.



You will be prompted for a user name. Enter the user name is the following format:

<Domain>\<user>

You may add as many authorized users as you wish.

TIP: The QlikView Administrators group and/or users in that group can also be added through standard Windows user management dialogs.

The QVS management virtual directory in IIS (**qvsmanagement**) should be set to disallow anonymous access, with integrated authentication set.

Once the users have been added, you may set the default location address for the QVS Management Console in QlikView for each of those users.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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To open in QlikView, set the URL for the QVS Management Console in **Settings** … **User Preferences** … **Locations**. Modify the location for Server Control Panel (URL).

The default URL of the QVS Management Console is:

`http://<server>/qvsmanagement/Default.htm`

Once set, this location will be referenced when selecting **Open QlikView Server Control Panel** off the **File** menu in QlikView.

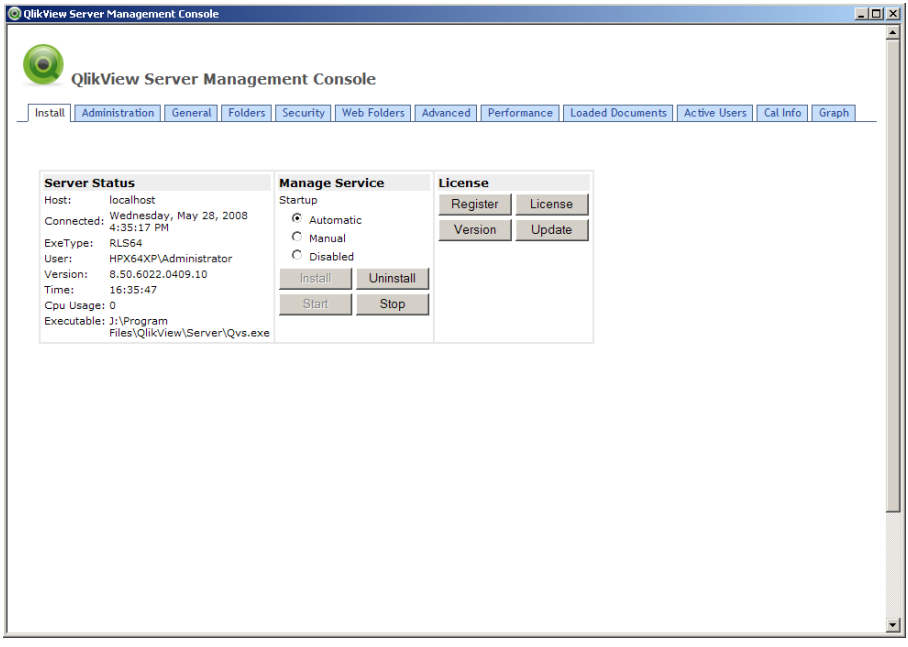
TIP: QlikView Publisher Enterprise will require communications with QlikView Server, e.g., for DMS data, so be sure to add the Publisher Administrator user to the QlikView Administrators Group.

Since the QVS Management Console communicates directly with QlikView Server, it is not possible to access the settings available on the Install tab of the Control Panel dialog, since they could affect the operation of the QlikView Server you are communicating with. For example, you must use the Server Control Panel to Register the QlikView Server, and Install and Uninstall the QlikView Server as a Windows service.

For explanations of the common individual settings available through the Server Control Panel and the QVS Management Console, please refer to the previous chapter.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Install page



The Install page allows direct control of the QlikView Server service. This page is only available through the Program shortcut (HTA).

Server Status

This area provides information about the current status of the QlikView Server as seen from the HTA

- **Host** is the QVS-machine that the HTA is connected to.
- **Connected** is the time when the HTA established the connection
- **ExeType** is the type of server (Release, Debug 32 or 64 bit)
- **User** is the user as seen by the server
- **Version** is the installed version of QlikView Server
- **Time** is current server time (also acts as a heartbeat)
- **Cpu Usage** is current server cpu usage (also acts as a heartbeat)
- **Executable** the actual path to the server (as seen from the HTA)

TIP: The Executable path must be valid for the operation of the Manage Service buttons.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Manage Service

Startup

Set the QlikView Server startup mode: **Automatic**, **Manual**, or **Disabled**.

Automatic startup mode instructs the QlikView Server to start each time the computer is restarted. Manual allows the administrator to manually start the QlikView Server when needed; it will not automatically start upon reboot. Disabled prevents the QlikView Server from be started even manually.

Install

The QlikView Server runs as a service on Windows Operating Systems. The default installation procedure will automatically install the QlikView Server service. If for any reason you need to install the service manually, you can use this button.

Uninstall

If at any time you wish to remove the QlikView Server service from Windows, click the **Stop** button, then click on the **Uninstall** button. This button does not remove any files from your system. Instead, it merely removes it from Windows's list of available services.

Start Once the QlikView Server has been registered and installed as a Windows service, it can be started. If the QlikView Server is set for Automatic startup, rebooting the computer will start the QlikView Server service. To manually start the service, either the Windows control panel or this button in the QVS Management Console can be used.

In the QVS Management Console , click on the **Start** button to activate the QlikView Server service. The service will start and the **Stop** button will become enabled. No dialog will appear indicating successful startup of the service.

Stop The Stop button can be used to manually stop the QlikView Server service if necessary.

License

Register

Registration authenticates your copy of QlikView Server and allows it to run on your computer. In order to register,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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you must have a valid Serial Number and Control Number issued by your vendor. If you do not have both a Serial Number and a Control Number for QlikView server, contact your vendor.

In the QVS Management Console , click on the **Register** button. Enter the Serial Number and Control Number assigned to your copy of QlikView Server. You should also enter your name and company name in the fields provided. Once you accept this dialog, a License Enabler File (LEF) will be obtained through the Internet. If for some reason this information cannot be accessed, registration will not be completed successfully. For manual validation procedures, contact your vendor.

License

Opens the License Enabler File Editor. License enabling information is normally downloaded automatically from QlikTech. Should this not work, e.g. because of lack of Internet access, the license enabling information may be entered here manually. For manual validation procedures, contact your vendor.

Version

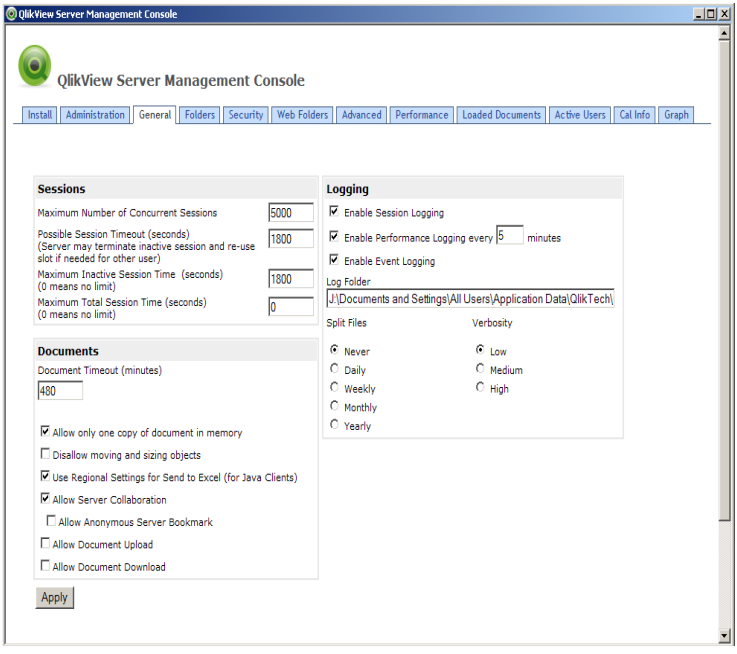
Shows the version and build number of the QlikView Server software.

Update

Launches QlikView Update to check the QlikTech web site for available patches to QlikView Server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General page



The General page of the QVS Management Console.

Maximum Number of Concurrent Sessions

The **Maximum Number of Concurrent Sessions** parameter specifies the maximum number of user sessions allowed to be connected to the QlikView Server at one time. A new user session is generated for each document that a user opens on the QlikView Server. This setting is unrelated to CAL specifications.

The value under **Maximum Number of Concurrent Sessions** works in connection with the **Possible Session Timeout** parameter discussed next.

When a user attempts to open any QlikView document, the QlikView Server will compare the number of active sessions against the **Maximum Number of Concurrent Sessions** limit. If the maximum number of sessions is already reached, the active sessions are checked to see if any of them have timed out. If a session has been inactive for the specified timeout period, it will close down and the new user session request will be granted. If the maximum number of

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sessions is reached and none have timed out, the new user session is refused.

This setting is provided as a way for the system administrator to prevent an excessive number of users on one server to cause general congestion and unacceptable response times. It has nothing to do with licensing restrictions.

Possible Session Timeout (seconds)

A session begins when a user opens a QlikView document with the server. When the session has had no activity for the specified number of seconds, it is eligible to be closed if a new user requests to start a session and the **Maximum Number of Concurrent Sessions** has been reached. Refer to the **Maximum Number of Concurrent Users** parameter described above for more information.

Maximum Inactive Session Time (seconds)

A session begins when a user opens a QlikView document with the server. If this setting is non-zero, and the session has had no activity for the specified number of seconds, it will automatically be terminated by QlikView Server. This setting is also available on a Document level. You can find it on the Server tab of the Document Properties dialog. If specified in both locations, the more restrictive setting will be used.

Maximum Total Session Time (seconds)

A session begins when a user opens a QlikView document with the server. If this setting is non-zero, all sessions will be limited to the maximum number of seconds as specified. Once the time limit is reached, the session will automatically be terminated by QlikView Server. This setting is also available on a Document level. You can find it on the Server tab of the Document Properties dialog. If specified in both locations, the more restrictive setting will be used.

Document Timeout (minutes)

A document is a QVW file opened by the QlikView Server. Open documents take up valuable system resources (i.e. RAM) and should not be allowed to remain open when not in use. However, if documents are closed too quickly, the user may see longer delay times when accessing the document while the server reopens it.

The **Document Timeout** value allows you to control for how long a document will be allowed to be unused before the QlikView Server closes the document and reclaims the resources.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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TIP: As of release 8.20, document loading and unloading can be controlled directly through settings in the Document Metadata Services (DMS) dialogs available on the Security tab of the QlikView Server Management Console.

Allow Only One Copy of a Document in Memory

If the status of a currently open document is changed due to a reload or changes in the layout, etc., QlikView Server will either open a new instance of the document or replace the currently opened instance. If the checkbox **Allow Only One Copy of a Document in Memory** is selected, the client session document will be forced to update whenever changes have been made in the original document on the QlikView Server. This setting will conserve memory resources on the server, but could cause forced session updates or disconnect sessions for connected users. This setting works in collaboration with the graceful document refresh settings **Refresh Mode when Document is Updated on Server** and **Client Refresh Initiation Mode**, both located on the Server tab in the QlikView Document Properties dialog. If this setting is checked, old data will not be kept on the server.

This setting replaces the **Forced Document Update** setting found in previous versions.

Disallow moving and sizing of objects (for Java clients)

This setting applies only to Java clients, and may be used to override object security settings in the QlikView document. Note that this setting will not affect the ability of Java client users to change certain column sizes in Multi Box and table/chart objects.

Use Regional Settings for Send to Excel (for Java clients)

If this setting is checked, the Regional Number Settings of the operating system will be used when exporting data from a QlikView object to an Excel file from the Java clients. If not checked the number formatting of the exported QlikView object will be used in the export.

Allow Server Collaboration

QlikView Server Collaboration for Bookmarks, Objects and Reports allows sharing of objects between users. Make sure this setting is checked if you want to allow sharing of objects. This setting works in association with the QlikView Server Collaboration settings **Allow Server Bookmarks**, **Allow Server Objects** and **Allow Server Reports** located on the **Server** tab in the **QlikView Document Properties** dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Allow Anonymous Server Bookmark

If this setting is checked, anonymous users will be allowed to create bookmarks. The machine ID of the client will be used for ownership. The client must allow persistent cookies to be created.

Allow Document Upload

If checked, the **Allow Document Upload** setting will allow new or updated documents to be uploaded to QlikView Server through the Publisher Access Point. QlikView Server must be defined as a resource in Publisher.

Allow Document Download

If checked, the **Allow Document Download** setting will allow documents to be downloaded through the Publisher Access Point.

Logging

This group contains settings for session, performance, and event logging.

Enable Session Logging

Mark this check box to enable detailed session logging from QlikView Server. The file will be called SessionStats.log.

Enable Performance Logging every n minutes

Mark this check box to enable performance logging from QlikView Server. The file will be called Performance.log. The logging interval can be set between one minute and 24 hours (1440 minutes).

Enable Event Logging

Mark this check box to enable mirroring to a log file of entries from QlikView Server to the Windows event log. The file will be called Events.log.

Log Folder

Here you may specify the folder in which QlikView server will create log files. The default is C:\Documents and Settings\All Users\Application Data\QlikTech\QVS.

Split Files

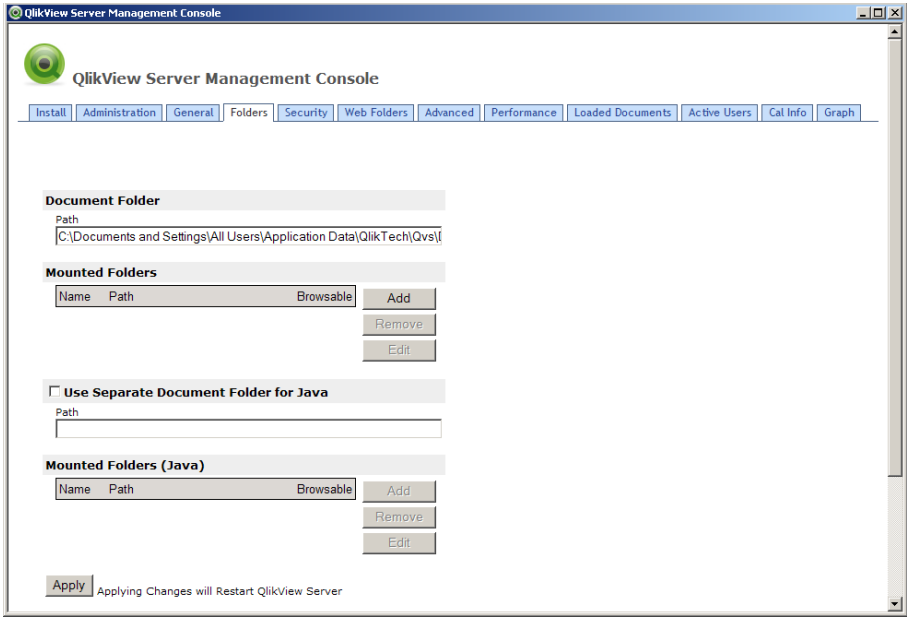
Here you can specify a time interval after which a new log file will be generated. Useful in order to avoid very large log files. Old files are not deleted. Log file names will have date information appended to them to identify intervals.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Verbosity

Use this setting to control how much information will be written to the log files.

Folders page



Document Folder

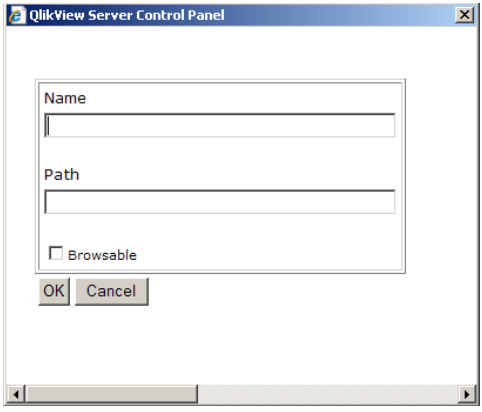
Specify where documents to be accessed from any QlikView client are located. This will typically reflect the default document location. Documents may also reside in subfolders to this folder. Windows file security applies for all access by a client to document folders and files, unless DMS Authorization mode is used. The default location of the Document folder will be different for Windows Server 2008 and Windows Vista operating systems. It will be located under the **`C:\ProgramData\QlikTech\QVS\Documents`** folder

Mounted Folders

Here you specify folders, physically located outside the QlikView Server document folder, which should functionally appear to QlikView Server as if they were located inside. A mounted folder may contain subfolders to any level.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Click Add to add a mounted folder.



Name Logical name of mounted folder as seen from QlikView Server.

Path Path to mounted folder.

Browsable

Mark this check box if the mounted folder and its contents should be browsable from the **Open in Server** dialog of QlikView.

TIP: To specify a document in a mounted folder location in web pages, make sure to use the folder name followed by a forward slash, then the document name.

(e.g. **`Pubdocs/Sales.qvw`**)

Select a mounted folder in the list and click on **Remove** to delete the mount (the physical folder and its contents are not affected). Select a mounted folder in the list and click on **Edit** to reopen the **Edit Mount** dialog and change properties of a mount.

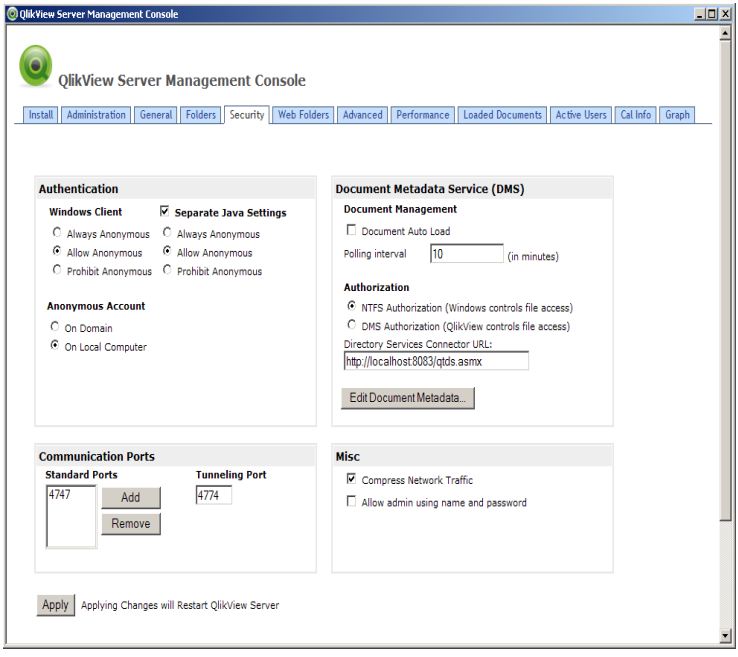
Windows file security applies for all access by a client to the contents of a mounted folder.

Use Separate Document Folder for Java

Mark this checkbox should you prefer to have a separate document folder for the Java clients. Specify the folder location in the edit box below. Mounted folders for Java client access can be specified under **Mounted Folders (Java)**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Security(Communication) page



Authentication

In this group you select whether the QlikView server should use Windows authentication when possible. It is possible to force anonymous communication (**Always Anonymous**), force authentication (**Prohibit Anonymous**) or to use authentication whenever possible (**Allow Anonymous**). **Allow Anonymous** is the default.

Make sure that this setting is consistent with any security settings that may be specified in the web server virtual directories (e.g. if IIS allows Anonymous, but QlikView Server does not, the client user will get an error message when trying to open the application through the virtual directory).

It is possible to use separate settings for Java clients by marking the **Separate Java Settings** check box to the right.

Communication Ports

The QlikView client communicates with the QlikView Server over one or more TCP ports. The default port is 4747, and this port should work for most environments. If you have a firewall, you can either open Port 4747 for QlikView sessions (e.g. for public Internet

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

use) or tunnel QlikView via http (typically Port 80) by using the QVSTunnel.dll that is installed in the Scripts virtual directory during installation.

Multiple ports can be specified. QlikView Server will try to initiate communication with the client over each port in the order they are listed until a working port is found. This is usually only required for Internet sessions where your users may be behind a firewall outside of your control. If the user's firewall has blocked communication over your default port, QlikView Server will continue with the other listed ports until an unblocked port is found.

For additional information on the QVS Tunnel extension, please refer to Chapter 7.

Tunneler port

Specifies the local server port used for tunneled communication.

Compress

Mark this check box if large packages should be compressed in communication between client and server. It is recommended to uncheck this setting in high bandwidth environments, since the compression routines could require more resource than sending large packages of data over a high bandwidth network.

Allow admin using name and password

This setting is used by Publisher if it is running in a separate Active Directory so that name and password can be used to connect to the QVS service.

Document Metadata Service (DMS)

Document Metadata Service (DMS) is a thread running in the QlikView Server service. There are two distinct and separate functions provided by DMS. The first function (**Document Management**) is used to control automated document loading and unloading. The second function (**Authorization**) is used to control the authorization mode that QlikView Server will run in. There are 2 choices for Server authorization mode. NTFS Authorization mode that QlikView Server has traditionally run in is the default selection. Alternatively, DMS Authorization mode can be used to enable third party (non-Windows) authenticated users to access documents through QlikView Server, as well as specification of specific access rights for individual or anonymous users, along with access days and times.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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TIP: Syntax has been added for scripted access to QlikView Server DMS. This will allow batch update of DMS and CAL data in QlikView Server. For more information, refer to the QlikView Server Script API in the appendix section of this manual.

Document Management

Document Auto Load

Check this box to enable automated document loading and unloading. Document settings are configured in the QlikView Server Document Metadata – Webpage Dialog. Refer to the description of this dialog below.

Polling interval (in minutes)

Specify the interval (in minutes) that QlikView Server will use to poll the DMS configuration for changes. The default setting is 10 minutes.

Authorization

Choose one of the options in this section to determine the authorization mode that QlikView Server will use when authorizing access to documents. Traditionally, QlikView Server has utilized **NTFS Authorization**, where the Windows Operating System controls access to files for users and groups through NTFS security settings. This is the default authorization mode for QlikView Server.

Alternately, choose **DMS Authorization** to utilize the QlikView Server DMS facility to authorize access to documents for users and groups. The QlikView Publisher Directory Services Connector (DSC) must be accessible in order to resolve Group membership. Document settings are configured in the QlikView Server Document Metadata – Webpage Dialog. Refer to the description of this dialog below.

Directory Services Connector URL:

Enter the URL address for the QlikView Publisher Directory Services Connector (DSC). This must contain a valid address for the active DSC in order to resolve Group membership when using DMS Authorization.

Edit Document Metadata

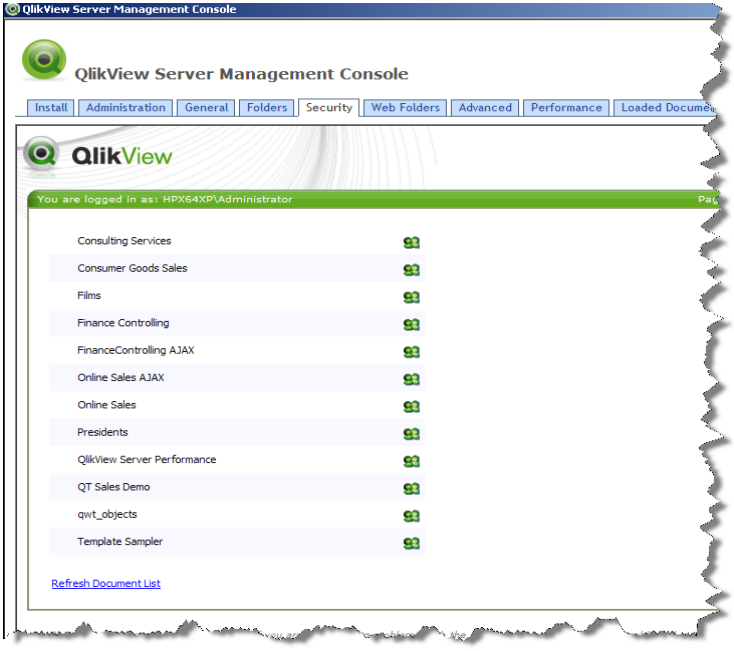
Click the **Edit Document Metadata** button to open the QlikView Server Document Metadata – Webpage Dialog in a new browser window. Here you can specify the docu-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



ment level settings for Document Management and DMS Authorization.

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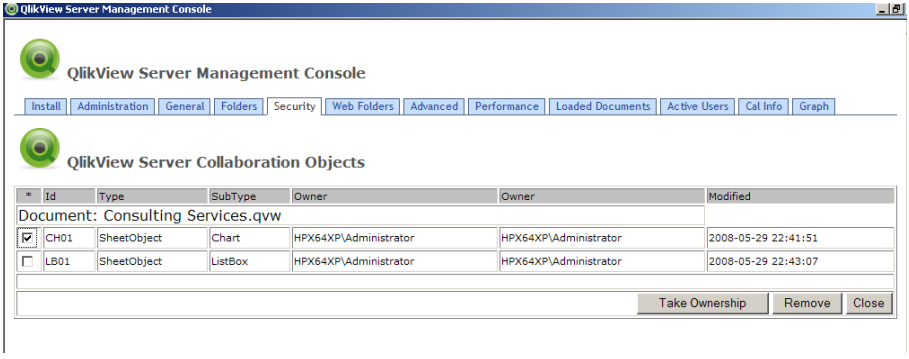


DMS Document Selection Page

This page displays the QlikView Server Accesspoint, allowing you to select the document you would like to configure for Document Management, DMS Authorization, and/or Accesspoint settings.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

From this page, you can also configure shared collaboration objects by clicking on the icon to the right of the document name.

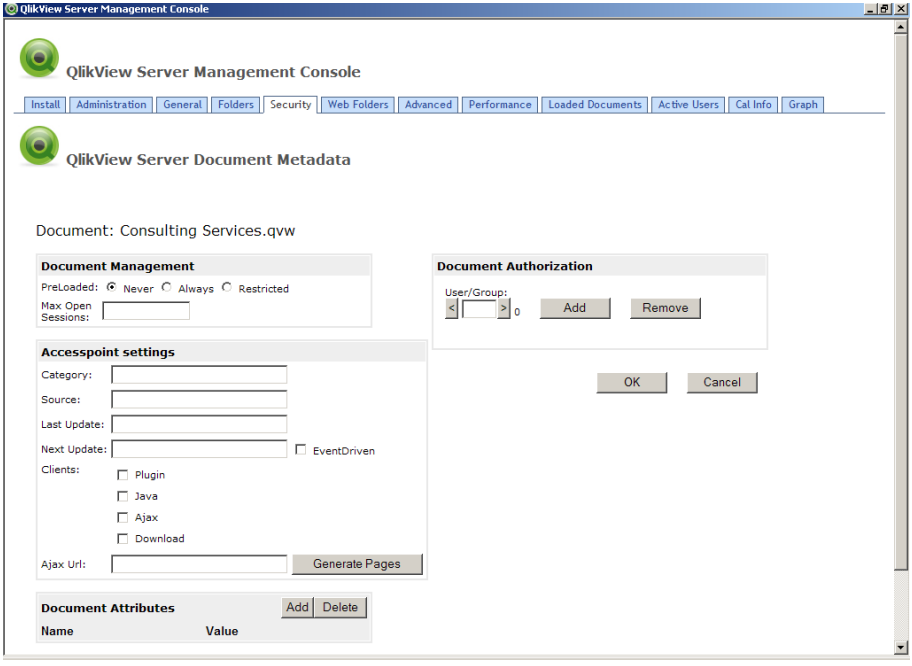


DMS Server Collaboration Objects Page

This page allows you to manage server collaboration objects by document. Click on the checkbox next to the **object ID** to select that object for management. The **Take Ownership** button may be used to take ownership of the object in order to view/change object properties. Access to object properties is through an appropriate client. Use this option with care, since ownership cannot be given back to the original owner of the object once this is initiated. Use the **Remove** button to delete the selected objects. The **Close** button may be used when the Management Console is opened in a web browser to close

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

the window. Program users may use the **Back** button, or simply click on another page tab.



Document Metadata – Webpage Dialog

This dialog provides the ability to configure Document Management, DMS Authorization, and Accesspoint settings for the selected document.

Document Management

This section is used to configure document management settings for the selected QlikView document. Choose one of the options for **PreLoaded** as follows:

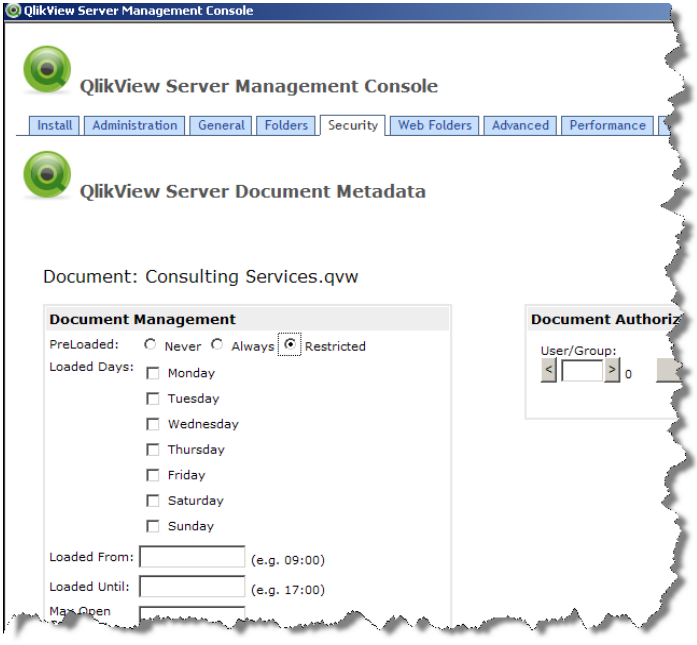
Never: The document will never be loaded automatically through DMS. Standard loading techniques, based on user requests and Document Timeout settings will apply.

Always: The document will always be loaded into Server memory.

Restricted: The document will be loaded automatically through DMS, based on specific day of the week and time restric-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

tions. If this option is selected, additional settings will become visible.



If **PreLoaded**: **Restricted** is selected, you may choose specific days of the week to automatically load the document and the times of the day to load and unload. All times are Server local times (in 24 hour format).

Use the **Max Open Sessions** parameter to limit the number of open sessions allowed at a time for this document.

Accesspoint settings

This section is used to configure the Accesspoint settings for the document.

Categoryis the Category grouping for this document.

Sourceis used to cluster documents with the same source document.

Last Updateis the Last Update timestamp for this document.

Next Update is the Next Update timestamp for this document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Clients is the list of client types for analysis available for this document. Use Download for offline analysis.

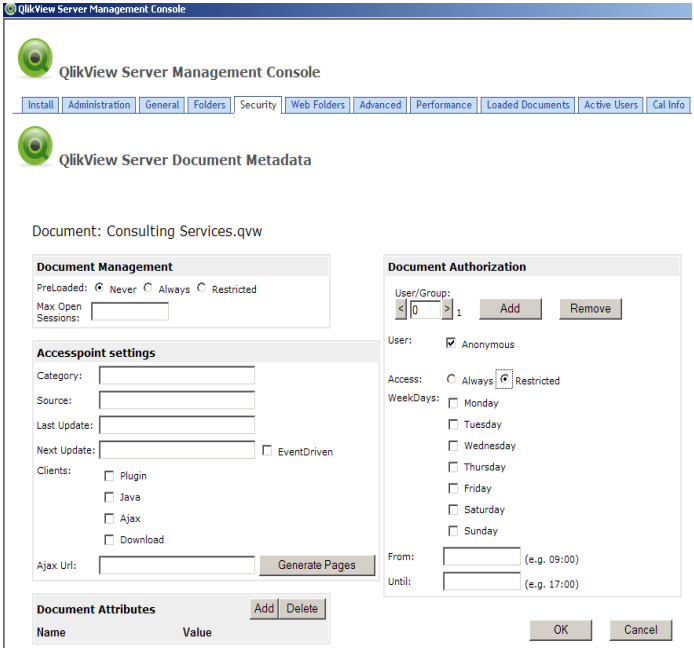
Ajax Url is the URL address of the default page for an existing AJAX ZFC client page for this document. The address is taken from the **Web Folders** page of the Management console. Use the **Generate Pages** button to generate the AJAX html pages to the specified location.

Document Attributes

Document Attributes are name value pairs that can be used for categorizing the document.

Document Authorization

This section is used to configure document authorization settings for the selected QlikView document. These settings will take effect once **DMS Authorization** is selected as the Authorization Method for this server. Only users specified in this configuration will be allowed access to the document once **DMS Authorization** is selected.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

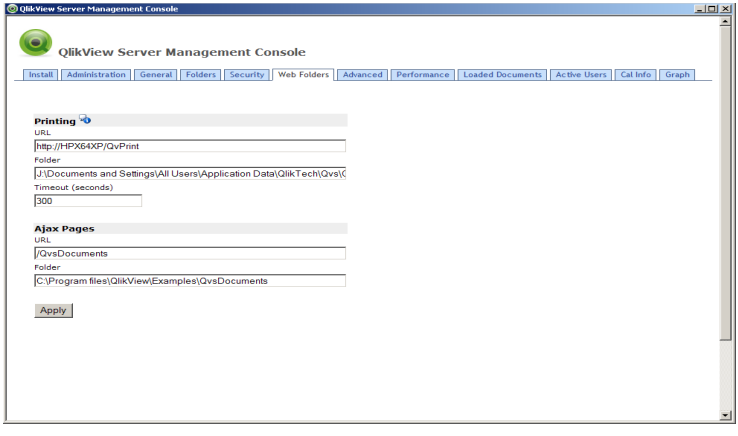
To add an authorized user/group, click on the **Add** button. To remove an existing authorized user/group, click on the **Remove** button.

The User/Group can be either Anonymous or named. Group names may be used, but access to the QlikView Publisher Directory Services Connector (DSC) will be required to resolve the Group.

Access can be granted as **Always** for no time restrictions, or **Restricted** to limit access to this document to specific days of the week as well as times. All times are Server local times (in 24 hour format).

QlikView Publisher Developer is the recommended method for maintaining the DMS Authorization Repository. Publisher will be granted priority for writing this information to DMS, so any entries entered manually through the QlikView Server Management Console dialogs will potentially be over-written if they also exist in the Publisher Repository.

Web Folders page (formerly Printing page)



The Web Folders page, formerly designated the Printing page, allows configuration to support printing and export of Java and AJAX Client chart objects. The locations on this page will direct chart and table object print and exports to a temporary HTML page, stored on the server that can be viewed and printed through the client's web browser. This page also can be used to specify the default location for generated AJAX pages.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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In order to create an HTML version of an object for printing in the Java client, simply right-click the object displayed in the client and choose **Export HTML for print** from the popup menu or click on the toolbar icons for Print or Export to Excel once the object has focus. QlikView Server will create an HTML version of the selected object and store the page under a unique name in a directory. QlikView Server will then open a new browser window and open the URL containing the newly created page.

In order for the **Export HTML for print** feature to be enabled in the Java client, the URL and Folder locations for the temporary print files must be specified in the Management Console.

The **Folder** and **URL** addresses should resolve to the same location.

URL

Use the **URL** field to specify the complete URL where exported HTML pages will be accessible to your users. QlikView server will create a temporary HTML page for the object exported, and automatically open a new browser window at the appropriate URL

For example, during installation, a virtual directory named **QvPrint** was created under the Default Web Site directory. The default Print folder would then be accessible as:

```
http://Myserver/QvPrint
```

Enter the complete URL where the folder specified in the Folder field can be accessed. If you specified a different folder in the Folder path, your URL may be different from that shown above.

TIP: The server address portion of the Printing URL may have to be changed for printing to function properly in certain configurations. For example, using an IP address or www.Myserver.com may be required for correct name resolution.

Folder

Use the **Folder** field to specify the complete path to a folder on the server where the temporary export HTML pages will be created. When a user requests the **Export HTML for print** feature, a uniquely named HTML page will be created in this folder. QlikView Server will automatically launch a new browser window and open the HTML page for the user. The path must be readable by all users.

For example, the default installation location for the Print folder will be the following directory on your system:

```
C:\Documents and Settings\All Users\Application
Data\QlikTech\Qvs\QvPrint\
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If you installed to a different location, you may need to substitute a different path to the Print folder. You may also choose a different folder if desired. Enter the complete path into the Folder field.

Timeout (seconds)

Use the **Timeout** field to specify a timeout value in seconds after which temporary HTML export files will be deleted from the server. Be sure to specify the timeout value high enough to enable temporary pages to transfer completely to the client's browser before the page is deleted.

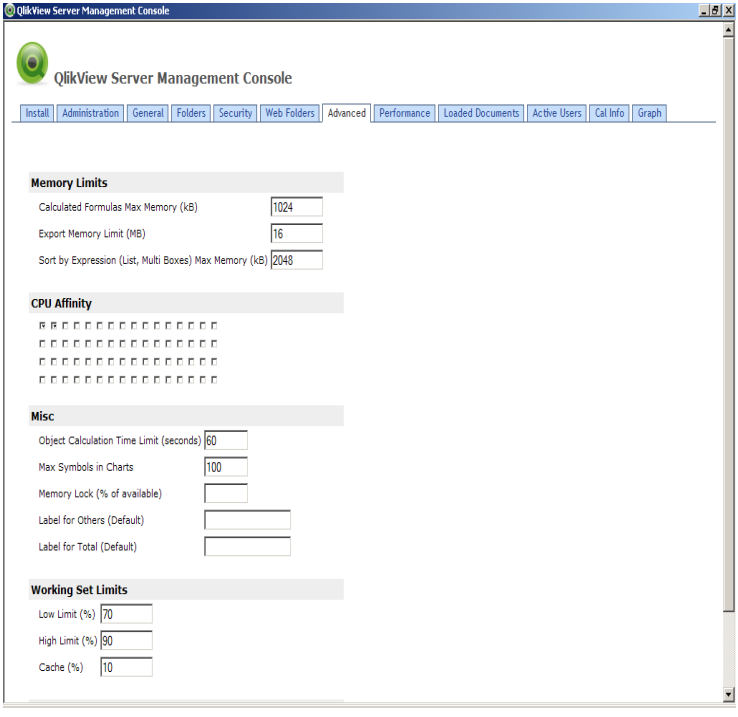
Ajax Pages

Here you may specify the URL and folder addresses to define the default location of generated AJAX pages, if using the **Generate Pages** button in the **DMS** dialog.

The **Apply** button will set any changes, but will not restart the QlikView Server service.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Advanced page



Calculated formulas

Note This setting is over-ridden by the automatic memory limiter settings since version 7.5x

The **Calculated Formulas** setting specifies the memory allocation for the evaluation of calculated formulas on the server.

Export Memory Limit

The **Export Memory Limit** setting specifies the memory allocation that QlikView server may temporarily use when exporting data. Setting this value too high may cause the server to run out of memory.

Sort by Expression (List, Multi Boxes)

Note This setting is over-ridden by the automatic memory limiter settings since version 7.5x

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **Sort by Expression** setting specifies the memory allocation for the calculation of sort expressions on the server.

CPU Affinity

In cases when QlikView Server is run on hardware with more processors than supported by your QVS license, you may deselect the use of specific processors. QlikView Server will normally automatically select the processors to use and this setting needs to be changed only when you wish to override that choice.

Max Symbols in Charts

Here you can specify a maximum number of symbols to plot in one chart.

Object Calculation Time Limit

The **Object Calculation Time Limit** setting specifies the maximum amount of time, in seconds, that QlikView Server will attempt to calculate a chart object.

Memory Lock (% of available)

Note This setting is only available on 64-bit systems

When working with very large documents (Gigabyte size) on certain 64-bit systems it may be necessary to lock an amount of the available physical RAM for use by QlikView Server. By doing this you may prevent sudden swapping of the document, which will cause the service to appear to freeze for up to several minutes. This setting should be used with care and never exceed 90. Make sure not to run other RAM-intensive applications (e.g. DBMS systems, QlikView Publisher or QlikView Developer) on the same machine when working with large documents on the QlikView Server.

Label for Others

Here you can specify a default label for Others in bar charts and pie charts.

Label for Total

Here you can specify a default label for Totals in bar charts, pivot tables and straight tables.

Working Set Limits

Use these settings to control the QlikView Server task (qvs.exe) memory working set size.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Low Limit (%)

The minimum working set size for the process. The virtual memory manager attempts to keep at least this much memory resident in the process whenever the process is active.

High Limit (%)

The maximum working set size for the process. The virtual memory manager attempts to keep no more than this much memory resident in the process whenever the process is active and available memory is low.

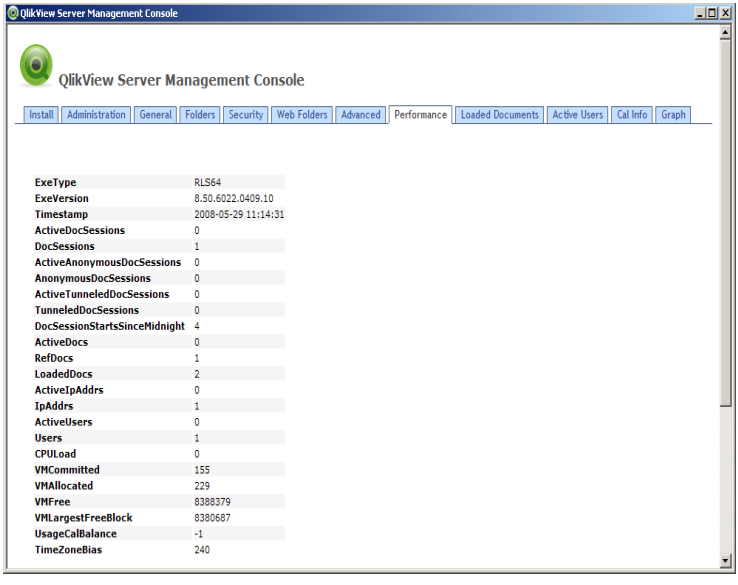
Cache (%)

Controls the MINIMUM allowed amount memory used for caching purposes.

Client licensing Info

Currently not used.

Performance page



All parameter settings on the Performance page of the QVS Management Console reflect current performance measures captured in QlikView Server. The interval for

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

performance measures is set on the Install tab of the Server Control Panel dialog. The default interval is 5 minutes.

Performance field	Explanation
Exe Type	Type of QlikView Server build. Example: 'RLS32'=32-bit release build.
Exe Version	Full version number of QlikView Server. Example: '8.50.6022.0409.10'
Timestamp	Date and Time of performance measures.
ActiveDocSessions	Number of document sessions* that have shown activity during the interval and still exist at the end of the interval.
ActiveAnonymousDocSessions	Number of document sessions* with anonymous user that have shown activity during the interval and still exist at the end of the interval.
AnonymousDocSessions	Total number of document sessions* with anonymous user that exist at the end of the interval.
ActiveTunneledDocSessions	Number of document sessions* with tunneled connection that have shown activity durin the interval and still exist at the end of the interval.
TunneledDocSessions	Total number of document sessions* with tunneled connection that exist at the end of the interval.
DocSessionStartsSinceMidnight	Number of document sessions* that have been initiated during the current day (as defined by the server).
ActiveDocs	Number of documents loaded at the end of the interval in which there has been user activity during the interval.
RefDocs	Number of documents loaded at the end of the interval for which there is a session at the end of the interval.
LoadedDocs	Total number of documents loaded at the end of the interval.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

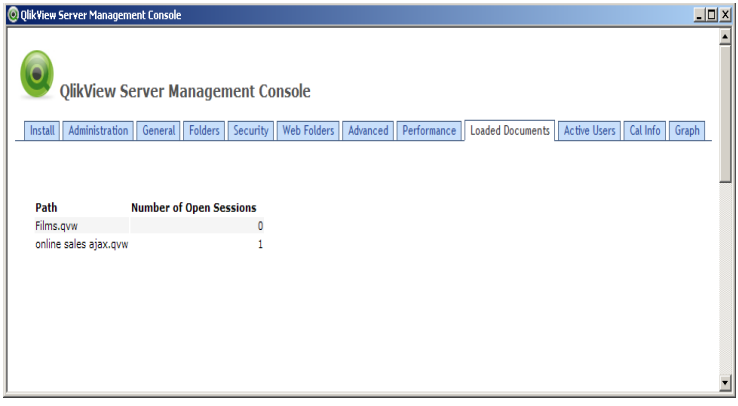
Performance field	Explanation
ActiveIpAddrs	Number of distinct IP-addresses that have been active during the interval and still exist at the end of the interval. Note that tunneled sessions and multible users originating from the same IP cannot be distinguished.
IpAddrs	Total number of distinct IP-addresses connected at the end of the interval. Note that tunneled sessions and multiple users originating from the same IP cannot be distinguished.
ActiveUsers	Number of distinct NT users that have been active during the interval and still exist at the end of the interval. Note that anonymous users cannot be distinguished here.
Users	Total number of distinct NT users connected at the end of the interval. Note that anonymous users cannot be distinguished here.
CPULoad	Average CPU load from QlikView Server during interval.
VMCommitted	Size in MB of virtual memory actually used by QlikView Server at the end of the interval. This number is part of VMAllocated(MB) and should not exceed the size of the physical memory in order to avoid unacceptable response times.
VMAllocated	Size in MB of virtual memory allocated by QlikView Server at the end of the interval**
VMFree	Size in MB of unallocated virtual memory available to QlikView Server**
VMLargestFreedBlock	Size in MB of the largest contiguous block of unallocated virtyal memory available to QlikView Server. This number is part of VMFREE(MB).
UsageCalBalance	Usage CALs remaining. ‘-1’ denotes no Usage CALs exist.
TimeZoneBias	Server time offset from GMT (in minutes)

* one user + one document = one document session.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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** VMAllocated(MB)+VMFree(MB)=total maximum virtual memory space available to the QlikView Server process.

Loaded Documents page



The Loaded Documents page of the QVS Management Console.

The Loaded Documents page of the QVS Management Console can be used to monitor current active document session activity in QlikView Server.

Path

The QlikView Server Folder path and document name of the active document(s). Loaded documents with no connected user sessions are not listed here. For example:

```
Additional Docs\Presidents.qvw
```

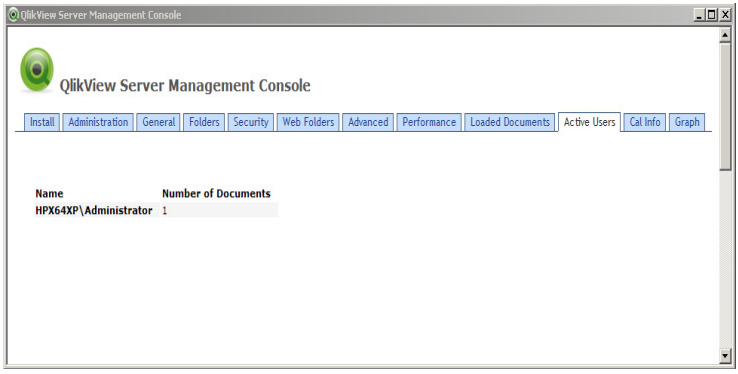
Number of Users

The number of user sessions connected to the active document.

TIP: You may have to refresh this page manually to view current activity.

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Active Users page



The Active Users page of the QVS Management Console can be used to monitor current user session activity in QlikView Server.

Name

The qualified user name with either machine name or domain and user name of the currently connected user(s). For anonymous users on a session or usage CAL, the anonymous user name for the domain or machine will be listed. For example:

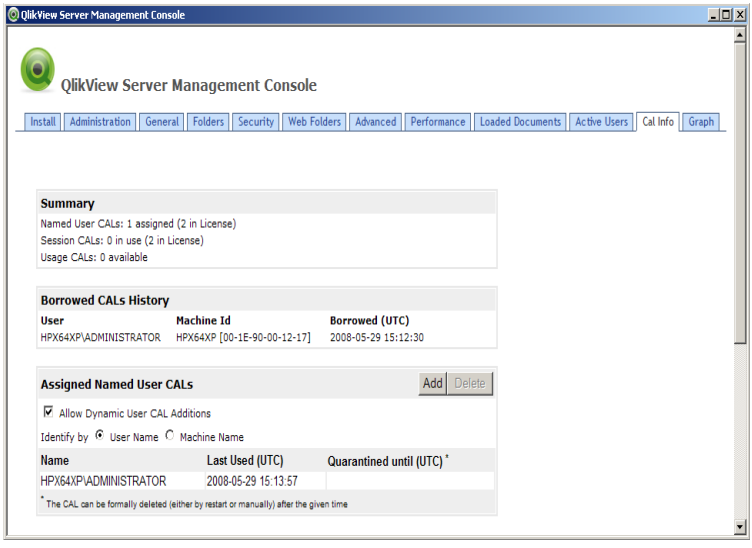
`<domain>\QVUser`

Number of Documents

The number of documents currently open in a user session for this user.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Cal Info page



The Cal Info page of the QVS Management Console can be used to display information about Client Access License (CAL) usage. This functionality replaces the Manage User CALs button, formerly available on the Install tab of the legacy Control Panel.

Summary

The usage by type of CAL and number of CALs defined in the LEF is displayed.

Borrowed CALs History

This section will list current information about Borrowed CAL activity. A Borrowed CAL is used by clients who connect to QlikView Server and may borrow a license to open the downloaded server document for 14 days.

Assigned Named User CALs

The current allocation of Named User CALs is displayed. Named User CALs can be either automatically allocated or manually added by clicking on the **Add** button, if there is a licensed Named User CAL slot available. Note that the allocation of Named User CALs does not imply security Authentication. Allocation of Named User CALs is for QlikView Server licensing, not operating system authentication.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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If the **Allow Dynamic User CAL Additions** is checked, new named user CALs will automatically be granted to users connecting to this QlikView Server for the first time, as long as there are available Named User CALs to assign.

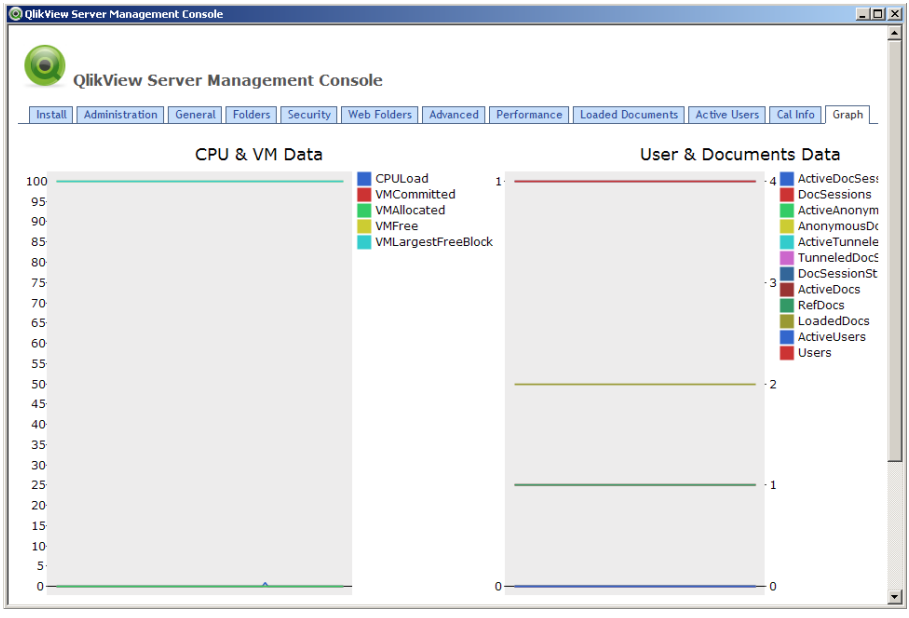
In the **Identify** by group you decide whether named users should be identified via identified **User Name** or via **Machine Name** (actually machine name + MAC address). It is possible to change this setting at any time but it is strongly recommended to use one mode consistently with a given QlikView Server. If changed during operation, the same user can take up two CALs, one based on user name and one on machine name.

To delete an allocated Named User CAL, highlight the entry, and click on the **Delete** button. If the CAL is not currently in use, it will be deleted immediately. If the CAL is currently being used, it will be marked for deletion, and not allow new sessions for user access through this CAL, but will still occupy an allocated spot for a 24 hour period. During this period, you may Undelete by highlighting the entry and clicking the **Undelete** button. After the 24 hour period, the entry will be deleted, and no longer available.

TIP: Maintenance of Named User CALs no longer requires a restart of the QlikView Server service.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Graph page



The Graph page displays graphical performance data for the connected QlikView Server. This page is only available through the Program shortcut.

This page will automatically refresh.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6 QLIKVIEW SERVER 8 SECURITY SET-UP

6.1 Communication encryption

All communication between QlikView Server and Windows based clients (QlikView Developer, Professional, Analyzer and plug-in) is encrypted. QlikView Server will attempt to establish 128-bit encryption based on the RSA algorithm when a client connects. The level of encryption may however be lowered if the operating system of the client computer does not support this strength of encryption (notably certain older Windows 98 installations).

Communication between QlikView Server and the Java based clients (QlikView Java client and QlikView Objects Java client) is scrambled but not encrypted. Encrypted communication can however be achieved by using the QlikView Server Tunnel and the https protocol.

Secure communication between QlikView Server and the AJAX client depends on http or https. Between the web browser and QVS, it depends on IIS or the QVS http server. Only the QVS http server can (and will by default) encrypt communication starting with version 8.5.

6.2 File system security on server

If the legacy NTFS Authorization mode is set on the Security page in the QlikView Server Management Console, QlikView Server will only make qvw documents available to a connecting client if the client has an identity with Operating System file access rights to that document. Each client must be given read permissions to both document folders and the documents themselves through a Windows security level. See below for details regarding anonymous clients.

Document and folder permissions are set on the **Security** page of the **Properties** dialog for documents and folders respectively. These settings are made entirely in the operating system and not from QlikView or QlikView Server.

TIP: Make sure to review the effective permissions after changing permission settings on a file or folder level. In complex environments it is not uncommon that conflicting permission settings cause access to be more or less restricted than intended.

For DMS Authorization mode information and settings, refer to the sections titled Document Metadata Service (DMS) and the Security page description for the QlikView Server Management Console.

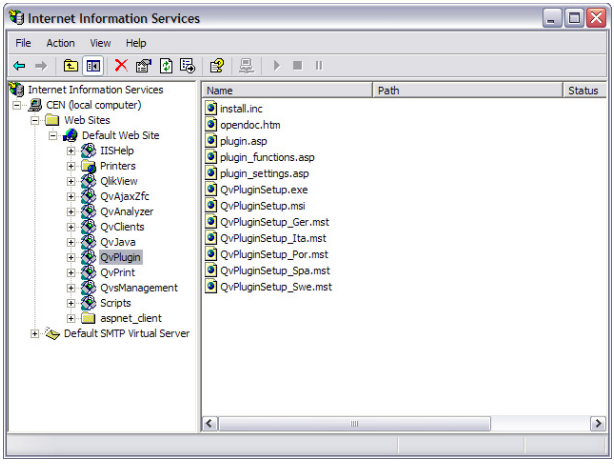
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Setting up IIS for Windows authentication with QVA for IE and QV AJAX ZFC

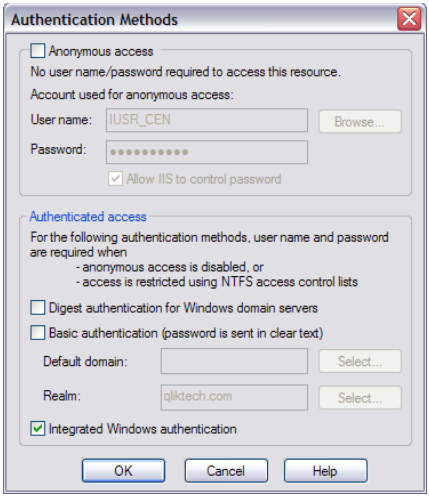
In order for the QVA for IE plug-in to be able to work with Windows authentication when the client computer is not on the same domain as the QVS, the following steps have to be performed:

1 Under **Administrative Tools** in the Windows Control Panel open **Internet Information Server**. Then expand your web site in the tree control.



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2 Right-click on **QVPlugin** and select **Properties**. Navigate to the **Directory Security** tab and click on **Edit**.



3 Make sure that **Anonymous Access** is deselected and that at least one of the check boxes under **Authenticated Access** is selected.

Setting up IIS for Windows authentication with QlikView AJAX ZFC

In order for the QlikView AJAX ZFC to be able to work with Windows authentication you must perform the same procedure as the one described for QVA for IE above, but set properties for **QvAjaxZfc** instead. This step is required if only named user CALs are licensed.

While it is not a requirement, you may also want to set the virtual directory subfolder **`QlikView\QvAjaxZfc`** to Windows authentication as well to set the access rights to the html pages.

Setting up IIS for Windows authentication with QlikView Java client

In order for the QlikView Java client to be able to work with Windows authentication you must perform the same procedure as the one described for QVA for IE above, but set properties for the subfolder QlikView/Java instead. This step is required if only named user CALs are licensed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The anonymous user account

When the QlikView Server is started for the first time on a machine an account will be created for anonymous users. The account will be named IQVS_name where name is the name of the machine in the local network.

If the machine in question is a domain server, the anonymous account will be created as a domain account or it will be a local machine account.

Each folder and file that should be available from anonymous clients must be given read privileges to the anonymous account.

Note It is important to start QlikView Server and thereby let it create the anonymous account before any attempt is made to grant privileges. You must not try to create the anonymous account yourself!

Connection pseudo-URLs

When connecting to QlikView Server from Windows clients, either via the **Open in Server** dialog or via link files, the identity to be used is specified via the pseudo-URL document address.

The syntax is:

```
qvp://[[username]@]servername [:(port | protocol)] /
[documentname.qvw][?paramname=paramvalue{&param-
name=paramvalue}]
```

where

username is a Windows user ID

servername is the name of a server running QlikView Server

documentname is the name of the QlikView document (excluding qvw extension)

port (e.g. 4749) can be used to specify a specific port used by the server

protocol (e.g. http) can be used to specify tunneling protocol

paramname := (USERID | XUSERID | PASSWORD | XPASSWORD | MACRO |

IIS_AUTHENTICATE)

USERID denotes a section access userID in clear text

XUSERID denotes a scrambled section access userID

PASSWORD denotes a section access password in clear text

XPASSWORD denotes a scrambled section access password

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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MACRO denotes the name of a macro to be run when the document is opened

(only one macro allowed)

IIS_AUTHENTICATE denotes a single-use key (40 hex characters) for IIS integrated authentication.

paramvalue is a valid value for each parameter.

@ without **username** denotes anonymous identity.

If user identity is omitted altogether, the logged in Windows identity is assumed.

Examples:

qvp://www.qliktech.com/AcmeStores.qvw

qvp://@www.qliktech.com/AcmeStores.qvw

qvp://john.doe@www.qliktech.com/AcmeStores.qvw

qvp://www.qliktech.com:http/AcmeStores.qvw

qvp://www.qliktech.com/AcmeStores.qvw?USERID=JOHN&PASSWORD=ABC123

qvp://www.qliktech.com/AcmeStores.qvw?MACRO=Mymacro

TIP: Internet Explorer 7 does not support @ or : in the URL in order to prevent spooling of URLs. To specify these characters in the URL, you need to URL-encode them.

Use %3A for: and %40 for @.

6.3 File system security vs. QlikView Section Access security

NTFS Authorization or DMS Authorization mode file system security only controls which documents a client is allowed to see in the file tree and attempt to open. The documents may of course contain a script section access which further prevents or limits the client's access to the content of the document once opened.

The QlikView Windows clients and Java clients will prompt the user for section access USERID and PASSWORD when required. When using section access with QlikView USERID and PASSWORD in connection with QlikView AJAX ZFC it is necessary to make your own provisions for entering them and then pass them to the QlikView AJAX ZFC by means of URL parameters (see special sub-section titled “Using section access with QlikView AJAX ZFC” for details).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6.4 Security Configurations

There are, of course, many configuration choices available for a QlikView Server implementation. As of release 8.2, however, many new options are possible. This section will attempt to describe some of those options as examples of possible configurations.

Authentication vs. Authorization

Authentication: ”Who is this user?”

The main way of authenticating a user should be

- an Operating System logon (Windows, Novell, etc), or
- any Web logon using a Directory Service.

Either way, it is made by non-QlikTech software.

An additional authentication can be made by QlikView through the fields USER, PASSWORD or SERIAL in a Section Access of the load script.

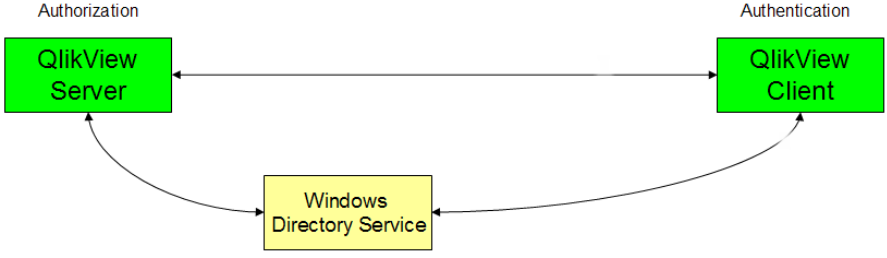
Authorization: ”What data is this user allowed to see?”

1. If the QlikView Server runs in **DMS Authorization** mode, the authorization is handled through the DMS thread on the QlikView Server.
2. If the QlikView Server runs in **NTFS Authorization** mode (legacy mode), the authorization is handled by the Windows NTFS file system. This requires that the authentication is made through Windows.
3. If a Custom User logon has been made, the authorization can be handled by the Publisher. This should be avoided, however, since the DMS Authorization mode above is safer.
4. In both modes, an additional access limitation can be defined in the Section Access of the script using e.g. NTNAME. This is handled by QlikView.

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Client Side Authentication

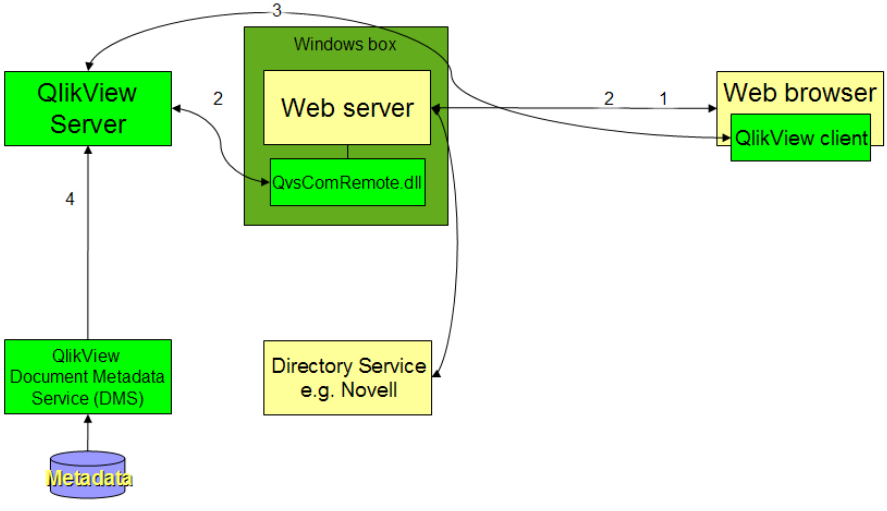
The QlikView Server is within the same Domain as the client, and a Windows Directory Service is available.



The user is already authenticated when the QlikView client is started. As the client clicks on a QlikView link, a request is sent to the QVS with the user credentials. The QlikView Server checks with the Domain Controller if the ticket is valid. The QlikView Server uses NTFS and Section Access to see if the user is allowed to see the document.

Server Side Authentication – Windows Web Server

The QlikView Server will issue a ticket for authenticating a user through QvsComRemote.dll. If the user presents a valid ticket when requesting a session, the access is granted based on the user's authorization to open a document.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1 The client makes a call to a web server. The web server must already have an authentication system in place. Either background authentication or a log-on screen.

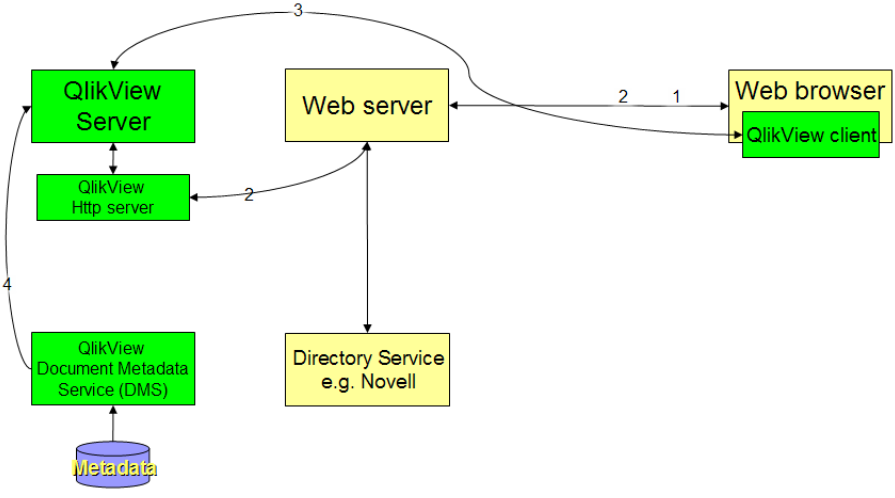
2 As the client clicks on a QlikView link, the web server uses **`QvsComRemote.dll`** to send a request to the QVS with the user name and gets a ticket in return.

3 The client launches a QlikView client that sends a request including the ticket to the QVS.

4 The QVS trusts the web server and thus ”knows” who the user is. QVS checks with the DMS if the user is allowed to see the document.

Server Side Authentication – Non Windows Web Server

The QlikView Server will issue a ticket for authenticating a user through the QVS http web server. If the user presents a valid ticket when requesting a session, the access is granted based on the user’s authorization to open a document.



1 The client makes a call to a web server. The web server must already have an authentication system in place. Either background authentication or a log-on screen.

2 As the client clicks on a QlikView link, the web server makes a web service call to the QlikView Http server with a request to the QVS with the user name and gets a ticket in return.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 The client launches a QlikView client that sends a request including the ticket to the QVS.

4 The QVS trusts the web server and thus ”knows” who the user is. QVS checks with the DMS if the user is allowed to see the document.

Server Side Authentication – Get Ticket Process

QlikView Server does not authenticate the user; it authenticates the process asking for a connection. There are two methods that can be used for authentication, Negotiated Authentication and Ticket Authentication. Once the connection is established QVS make no distinction between how the authentication was done.

Authenticated Names are required for any task where a user name is required, other than CAL assignments, which use a simple, best guess procedure.

Negotiated Authentication: This authentication will be used as the authenticated user if:

- The connection is marked as admin.

Or if all the below apply:

- The server is not set to ‘Always anonymous’
- The connection is not done by ticket
- The authenticated user isn’t considered as equal to anonymous (e.g. USR_...)

Negotiated Authentication will attempt to use Kerberos, but if that is unsuccessful, NTLM will be used.

Ticket Authentication: The alternate method to get an authenticated user is through ticket. See examples below for additional information.

- QVS is passed a username from a trusted source (in QVS Admin Group) and QVS trusts that authentication has happened elsewhere.
- Or, Tickets can also be obtained ‘For Me’ i.e. for the actual user of the asking process

Client Usage:

- The Windows client can use tickets (via QVP url) or negotiate authentication
- The Java client must pass the ticket in the applet-tag <param name=”username” value=”ticket” />

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- The AJAX client must use the userid parameter, e.g. **http://localhost/salesdemo/AJAXzfc/?userid=510EA55C2DB723DC04C16C6FB3CDAB24F3390792**

Get Ticket examples:

There are two ways of requesting a ticket from QlikView Server, to be used in different Single Sign On (SSO) scenarios:

GetTicketForMe This will require that you are an authenticated Windows user and will generate a ticket only valid for yourself. The function takes no parameters.

To try it out type the following in a web-browser:

```
http://webhost/qvajaxzfc/qvsviewclient.asp?cmd=<Global%20method='GetTicketForMe'%20/>
```

In programming (ASP/VBScript), use the following:

```
set ntsecurity = Server.CreateObject("QVSRemote.Client")
ntsecurity.AdminConnect "localhost"
ticket = ntsecurity.execute("<Global method='GetTicketForMe'/>
```

The response will be an XML-document in the following format:

```
<Global>
<_retval_>
40 char hex
</_retval_>
</Global>
```

GetTicket This function will generate a ticket for any UserId submitted to the function.

Note Only members of the local QlikView Administrators group can retrieve a ticket. If not part of the group the function will return **<Error />**. See below for other options

Note QVS must be running in DMS-mode to be able to manage **GetTicket**. If running in NTFS-mode, no ticket will be given (No error will be returned, only an empty _retval_)

In programming (ASP/VBScript), try the following:

```
set ntsecurity = CreateObject ("QVSRemote.Client")
ntsecurity.AdminConnect "localhost"
ticket = ntsecurity.Execute("<Global method='GetTicket'><UserId>User</UserId></Global>")
msgbox ticket
```

The UserID is retrieved from any other trusted authentication source.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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If QVS and IIS is installed on different machines, replace "local-host" with the IP/DNS name for the QlikView Server.

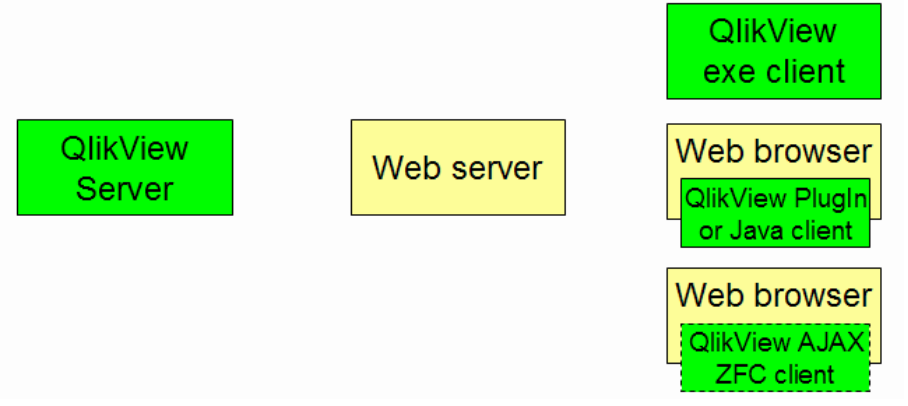
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OnlineNotary.net

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7 QLIKVIEW SERVER FUNCTIONAL ARCHITECTURE

7.1 QlikView Server – Client Communication

The QlikView Server – Client communication architecture requires three primary processes, which must be able to communicate with each other in a consistent and secure manner. This interaction can potentially involve multiple computers and multiple network connections, as well as other subordinate processes.



The three primary processes are:

1. The **QlikView Server (QVS)**, which provides QlikView functionality to the client. The machine that is hosting this service must be running in a Microsoft Windows Operating System (refer to System Requirements section at the beginning of this document).
2. The **Client**, running in a web browser or a QlikView shell that provides a container for the client code. The client communicates with QlikView Server either directly or through the Web Server to provide the QlikView interface and functionality to the end user.
3. The **Web Server** (or HTTP), running an HTTP server, which can be used to serve up the HTML web page to the client, assist with authentication of the user, and enable communication between the client and QlikView Server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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In the simplest scenario, all three processes can be running on a single machine, with a single user. The complexity of this relationship can increase quickly, however, as separate machines, Internet connections, multiple firewalls, and multiple Web Servers are introduced. Finally, multiple users who require security authentication and authorization from a myriad of Directory Services are added, and a QlikView Server – Client communication architecture can become quite involved.

There are, of course, a large number of possible network configurations that QlikView Server can participate in, but there are a few considerations to keep in mind regardless of the final configuration:

- QlikView Server runs as a Windows OS Service only
- At least one network communication path must exist between the QlikView Server and the Client
- The authentication of the Client user must be performed either through Windows Authentication, QlikView Authentication (section access), or any third party system that can authenticate the user.

QlikView Server Functional Description

There will be one QlikView Server process per logical computer, which must be running a Windows Operating System. QlikView Server can run as a 32-bit or 64-bit process (OS and hardware dependent). The QlikView Server process can be identified as qvs.exe.

Client Access License (CAL)

All client access to QlikView Server must be licensed. This is accomplished through the use of Client Access Licenses (CALs) linked to the specific instance of the QlikView Server through the LEF file. In this context, it is important to understand the definitions of anonymous user and authenticated user.

Anonymous user – an unidentified or unknown user (any user). There is no authentication for anonymous users, they can be anyone.

Authenticated user – an identified user whose identity can be verified.

Authenticated Windows OS user (e.g. NTNAME, NT User, NTDOMAINSID)

* Authenticated non-Windows user

Authenticated QlikView user (e.g. section access: USERID, PASSWORD)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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* Authenticated third party (build partner) user

* As of release 8.2+

The type of CAL will affect how users are allowed to connect to QlikView Server, based on the Client type and Authentication settings in the Web Server and/or QlikView Server.

A SESSION CAL allows any user – authenticated or anonymous – to connect to QlikView Server. There is no limit on the number of sessions over time, but only one session at any time is allowed per session CAL.

A USAGE CAL allows any user – authenticated or anonymous – to connect to QlikView Server. Each usage CAL is linked to a specific user – document session, and can only be initiated once per 28 day cycle.

A USER CAL allows only specific users (or machines) to connect to QlikView Server. The Java and AJAX Clients will not allow anonymous OS users or machine names as user CALs. Therefore, anonymous access should be disabled in the Web Server (or in QlikView Server if using the QVS http web server) when using these clients.

Client Functional Description

QlikView Server can support three categories of Clients:

1 **Windows Clients** – this includes the QlikView program variants of QlikView Analyzer, Analyzer+, Professional, and Developer. This category also includes the Internet Explorer plug-in ActiveX client running as a full window or object only (QlikX). All Windows Clients require installation with Administrator level rights. QlikView Analyzer+, Professional, and Developer require licensing on the Client machine in addition to the QlikView Server CAL.

2 **Java Clients** – this includes Sun/Apple Java running in a browser window, with either a full window or objects support. Java Clients require installation of the Java applet, although this installation is handled automatically through the Web Server, and does not require user intervention. No Client side licensing is required.

3 **AJAX (ZFC) Clients** – this includes the AJAX Client, which supports HTML objects only. No Client side installation or licensing is required.

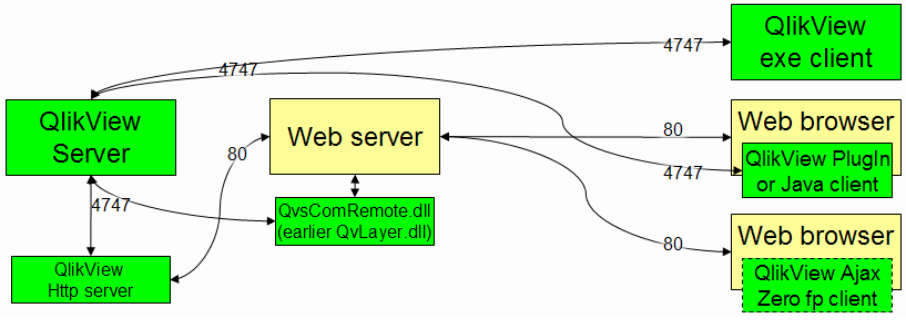
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Client Communication to QlikView Server

Windows Clients can communicate directly with QlikView Server, using QVP (QlikView Protocol) and, typically, port 4747. These clients do not require a Web Server to establish and maintain a connection with QlikView Server.

Java Clients can communicate directly with QlikView Server, typically, over port 4747, but they must first establish a connection with the Web Server (e.g. IIS or the QVS http web server) serving the page containing the Java applet, typically, over port 80 (http).

AJAX (ZFC) Clients can never communicate directly with QlikView Server. They must establish and maintain a connection through a Web Server (e.g. IIS or the QVS http web server). This is typically accomplished through port 80 (http).



Web Server Functional Description

Traditionally, the standard web server in a QlikView Server configuration has been Microsoft Internet Information Services (IIS). As of QlikView version 8, however, an alternative solution is offered, and is included with the QlikView Server installation. This is the QVS http web server. This web server can act as a stand alone service, but is not configured to handle asp pages.

Other web servers can be utilized in a QlikView Server environment, but there are some restrictions. If the other web server is able to direct traffic to the QVS http web server (running on the same machine as QlikView Server), the possibilities are many, including the configuration with the other web server running under a non-Windows OS. If the other web server must utilize a local QlikView Server dll (QvComRemote.dll) to communicate with QlikView Server (e.g. for tunneling), then the other web server must be running under a Windows OS.

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Web Server on Separate Machine from QlikView Server

If the IIS or QVS http web server is running on a separate machine from the QlikView Server, you will need to configure the location of the QlikView Server, and optionally, the port, to allow the web server to locate the QlikView Server. The configuration requirement will vary, based on which web server you are using.

IIS web server

Edit the file **`QvClients\settings.js`** to point to the QlikView Server, and optionally, the port. Change the vars **`QvsHost`** and **`QvsPort`** to match your environment, and remove the comments. The **`QvsViewClient.asp`** is configured to include the **`settings.js`** code, but you will need to remove the comment tags.

QVS http web server

Edit the file **`HttpServer\config.xml`** to point to the QlikView Server. Change the tags **`QvsHost`** and **`QvsTunnel`** to match your environment.

7.2 QlikView Server Tunnel

If the standard communication port to QlikView Server (4747) is blocked in any way (typically by a firewall limitation), the Windows and Java Clients will attempt to re-route their connection through port 80 (http). This connection path must then include the QvsComRemote.dll or the QVS http server so that the QlikView Tunnel communication can be established. All communication through the QVS Tunnel must include the secure communication packet, so this will significantly increase the network traffic (along with response times) required between the QlikView Server and the client. The infrastructure might also interfere, for example, if the traffic is routed through proxy servers. This is especially true if tunneling using HTTPS. It is recommended to set up rules to bypass proxy servers when tunneling using HTTPS.

The QlikView Tunnel is installed into the Web Server process and allows the QlikView Client to be tunneled over the HTTP protocol to the HTTP process and then forwarded onwards to the QVS process.

When there is a requirement for the HTTP process to run on a third machine (perhaps since it is not a Microsoft Windows server) but communication between the Client and the HTTP machine is restricted, then the setup is similar. The HTTP machine having a Tunnel installed to redirect the QlikView Client protocol on the QVS machine. Communications between the QVS and HTTP cannot be restricted in any way.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Finally, if the HTTP process must run on a third machine and communication between the Client and HTTP machine is not restricted in any way, then another process can come into play. This is a TCP/IP Redirector (or Redirect) that runs on the HTTP machine. It is required because (in the case of Java) the Client applet can only connect to the machine that served the web page containing the applet. The redirect process accepts the connection from the applet for the QlikView Client protocol and forwards it onto the actual QVS machine. The Redirect process may be a separate program, part of the Operating System of the HTTP machine or even a function of the firewall/proxy system in use between the HTTP machine and the Client machine. All that matters is that both the machine name and the IP address of the Redirect is the same as the HTTP machine.

For Tunneling on a Windows Server using IIS or the QVS built-in http server

If you have defined a path to the QVSTunnel.dll in the Control Panel, you have the possibility to tunnel the communication between the server and the client. The dll-file is by default copied to the following directory during installation:

C:\Program Files\QlikView\Server\QvTunnel

A virtual directory is set in IIS and the QVS built-in http server configuration as:

Scripts

If the client cannot connect via the default TCP connection, the client will by default try to connect via http (Port 80).

QVS HTTP:

Edit the Config.xml file to specify the location of the <QvsHost> and <QvsTunnel>. <QvsHost> is used in all non-tunnel-cases and <QvsTunnel> when tunnelling is requested. It is thus possible to have one Qvs handling all non-tunneling and another handling tunnelling. Note that if you omit <QvsTunnel> the HttpServer will NOT support QVS tunnel.

```
<?xml version="1.0" encoding="utf-8" ?>
     <Config>
      <QvsHost>HIC-HP</QvsHost>
      <QvsTunnel>HIC-HP</QvsTunnel>
      <Url>http://HIC-HP/</Url>
```

Microsoft IIS:

Two entries are required in the registry:

[**HKEY_LOCAL_MACHINE\SOFTWARE\QlikTech\QlikTunnel**]

"QVSPort"=dword:000012a6

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

"QVSServer"="QvsHost"

The QVSPort entry should already exist, but the QVSServer must be added manually.

Tunneling from Windows clients

Tunneling from Windows clients is achieved by adding :http as protocol in the pseudo-URL describing the server or document address.

QlikView Tunnel Test Procedure

You can test the QlikView Tunnel by entering the following URL from a Client browser window:

`http://Server/scripts/qvstunnel.dll?testtunnel`

Where

Server is the Web Server name or address

If the QlikView Tunnel is set up correctly, the webpage should return with:



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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8 SERVER LOGGING

8.1 Logging from QlikView Server

Alerts from QlikView Server will appear in the Windows event log.

More detailed logs for sessions can be found in the logging directory specified on the **General** page of the QlikView Server Management Console. The default location is **`C:\Documents and Settings\All Users\Application Data\Qlik-Tech\QVS`**.

Log files can be set to split (create new) daily, weekly, monthly, yearly or never. Performance log intervals can be set from 1 minute and higher.

A QlikView document designed to load data from the log files and support analysis is provided on the default installation of QlikView Server. This file is named **`QvServerPerformance.qvw`** and is located in the QvsDocuments folder.

8.2 The Session log

The session log is updated each time a session ends. A session is defined as a single user connected to a single document. The file name of the session log is **`Sessions*.log`**, where * reflects the server name and the split interval. Each entry of the session log will contain the following fields.

Session Log filed	Explanation
Exe Type	Type of QlikView Server build Example: 'RLS32' = 32-bit release build
Exe Version	Full version number of QlikView Server. Example: ‘8.0.4366.0409.10’
Timestamp	Date and Time when log entry was created
Document	QlikView document accessed
Document Timestamp	File timestamp of document accessed
QlikView User	QlikView section access UserID (if used)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Session Log filed	Explanation
Exit Reason	Reason for session termination: 'Socket closed'= client induced termination. 'LRU'=terminated as Least Recently Used in favor of new user 'Shutdown'=server induced termination for other causes Additional values exist, but should normally not occurr.
Session Start	Time when session was started
Session Duration	Duration of session in hours:minutes:seconds
CPU Spent (s)	CPU-seconds spent by session
Bytes Received	Bytes received by server during session
Bytes Sent	Bytes sent by server during session
Calls	Number of QlikView calls during session (bidirectional)
Selections	Number of QlikView selections made during session
Authenticated user	Authenticated Windows NT UserID (if it exists)
Identifying user	User identification for client
Client machine identification	Machine identification for client
Serial number	Serial number of QlikView client (QVA+, QVP or QVE installed client only)
Client Type	Type of client used 'Windows exe'=Windows client 'Java'=Java client
Secure Protocol	'On' when encrypted communication is used (typically Windows clients=. 'Off' when non-encrypted communication is used (typically Java clients)
Tunnel Protocol	'Tunnel' when QVS tunnel communication is used.
Server Port	Port used by server.
Client Address	Client IP number
Client Port	Client port

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Session Log filed	Explanation
Experienced Performance	A measure indicating how large portion of the CPU power that could theoretically be utilized by the session's needs that was actually available to it. The closer you get to the (theoretical and unachievable) maximum value of 100 the less the session had to wait for other sessions, server overhead etc. The value will vary between different types of documents. If you get consistent low readings in this column or if you get low readings for a specific document at certain times of the day, you should consider expanding server capacity.
Cal Type	Type of Client Access License used 'User'=User CAL 'Session'=Session CAL 'Usage'=Usage CAL
Cal Usage Count	Count of Usage CALs

8.3 The Performance log

The performance log is updated at an interval set on the **Install** page of the QlikView Server Control Panel . The default interval is 5 minutes. Additional entries are made whenever the server is started or stopped. The file name of the session log is **`Performance*.log`**, where * reflects the server name and the split interval. Each entry of the log will contain the following fields.

Performance Log field	Explanation
Exe Type	Type of QlikView Server build Example: 'RLS32' = 32-bit release build
Exe Version	Full version number of QlikView Server Example: '8.0.4366.0409.10'
Timestamp	Date and Time when log entry was created
EntryType	Type of entry. 'Server starting' denotes startup. 'Normal' denotes normal interval log entry. 'Server shutting down' denotes shutdown
ActiveDocSessions	Number of document sessions* that have shown activity during the interval and still exist at the end of the interval
DocSessions	Total number of document sessions* that exist at the end of the interval

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Performance Log field	Explanation
ActiveAnonymousDocSessions	Number of document sessions* with anonymous user that have shown activity during the interval and still exist at the end of the interval
AnonymousDocSessions	Total number of document sessions* with anonymous user that exist at the end of the interval
ActiveTunneledDocSessions	Number of document sessions* with tunneled connection that have shown activity during the interval and still exist at the end of the interval
TunneledDocSessions	Total number of document sessions* with tunneled connection that exist at the end of the interval
DocSessionStarts	Number of document sessions* that have been initiated during the interval
ActiveDocs	Number of documents loaded at the end of the interval in which there has been user activity during the interval
RefDocs	Number of documents loaded at the end of the interval for which there is a session at the end of the interval
LoadedDocs	Total number of documents loaded at the end of the interval
DocLoads	Number of new documents loaded during the interval
DocLoadFails	Number of documents that have failed to load during the interval
Calls	Total number of calls to QlikView Server during interval
Selections	Number of selection calls during interval
ActiveIpAddrs	Number of distinct IP-addresses that have been active during the interval and still exist at the end of the interval. Note that tunneled sessions and multiple users originating from the same IP cannot be distinguished
IpAddrs	Total number of distinct IP-addresses connected at the end of the interval. Note that tunneled sessions and multiple users originating from the same IP cannot be distinguished
ActiveUsers	Number of distinct NT users that have been active during the interval and still exist at the end of the interval. Note that anonymous users cannot be distinguished here

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Performance Log field	Explanation
Users	Total number of distinct NT users connected at the end of the interval. Note that anonymous users cannot be distinguished here
CPULoad	Average CPU load from QlikView Server during interval
VMAllocated(MB)	Size in MB of virtual memory allocated by QlikView Server at the end of the interval **
VMCommitted(MB)	Size in MB of virtual memory actually used by QlikView Server at the end of the interval. This number is part of VMAllocated(MB) and should not exceed the size of the physical memory in order to avoid unacceptable response times
VMFree(MB)	Size in MB of unallocated virtual memory available to QlikView Server **
VMLargestFreeBlock(MB)	Size in MB of the largest contiguous block of unallocated virtual memory available to QlikView Server. This number is part of VMFree(MB)
UsageCalBalance	'-1.00' denotes no Usage CALs exist

* one user + one document = one document session

**VMAllocated(MB)+ VMFree(MB) = total maximum virtual memory space available to the QlikView Server process.

8.4 The Event log

The event log is updated each time a log entry is made to the Windows event log from QlikView Server. The information stored is a mirror of the information written to the Windows event log. The file name of the event log is Events*.log, where * reflects the server name and the split interval. Each entry of the log will contain the following fields.

Event Log field	Explanation
Timestamp	Date and Time when log entry was created
SeverityID	Unique ID of severity level 1 = Error 2 = Warning 4 = Information
EventID	Unique ID for the type of event

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Event Log field	Explanation
Severity	Severity level of event Error | Information | Warning
Message	Description of the event

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

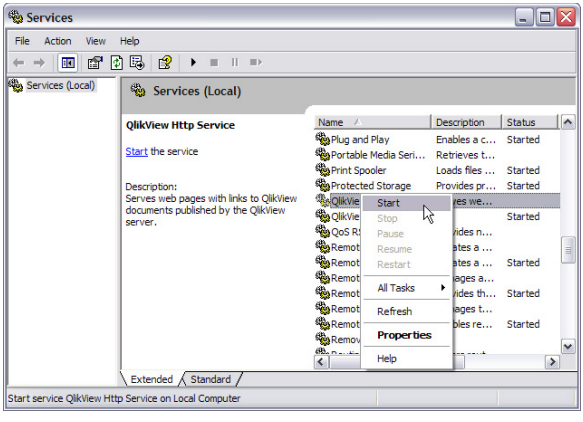
9 QLIKVIEW SERVER BUILT-IN HTTP WEB SERVER

An http web server is available with QlikView Server. When running QlikView Server on Windows XP/Windows Server 2003 or later, the built-in http web server can provide an alternative to MS IIS.

9.1 Starting the QVS built-in http web server

The built-in http web server is installed as a Windows service during a default Complete installation of QlikView Server. To start the server, use the Windows Services dialog. This is accessible from the Windows Control Panel … Administrative Tools, or from **Start** .. **Run** … **services.msc**

In the Services dialog, scroll down to find the **QlikView Http Service** entry and select it. You can either right-click, and select **Start**, or click on the S**tart the Service** link to the left.



Right-click on the service, and select **Start**.

9.2 Displaying sample pages with the QVS built-in http web server

The built-in web server supports the HTML sample pages distributed with QlikView Server, as well as tunneling, Windows Authentication and external authentication.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

This web server will not support .asp pages. It can be used in place of IIS ofr the operation of QlikView Server.

Configuring the QVS Http Service

You may configure the web server through a configuration file located in the following location:

C:\Program Files\QlikView\Server\HttpServer\config.xml

The QVS Http Service uses the QvsNetRemote.dll to support encryption and machine-id. This file is located in the same location as the config.xml file.

The **config.xml** file contains a commented out section to simplify the usage of common but non-default options.

As of 8.5, new configuration options are available:

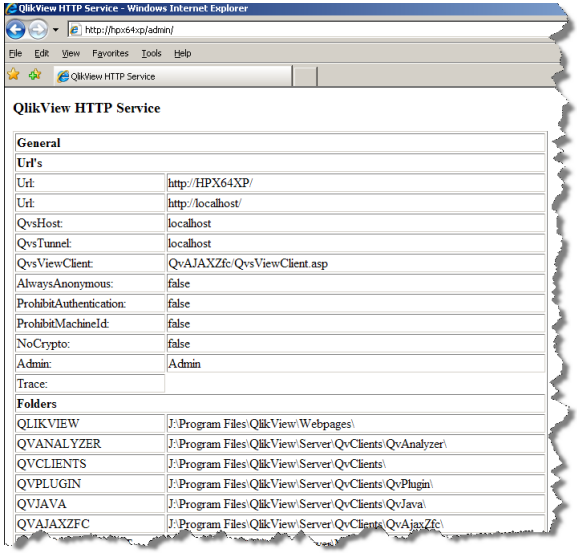
- Multiple **<Url>** tags to let the service listen to more than one Url. The default **config.xml** comes with two tags **<Url>http://localhost</Url>** is added
- A simplified syntax is possible for **QvsTunnel** and **AlwaysAnonymous<QvsTunnel/>** to allow tunneling to the same QVS as already specified in
<QvsHost>
<AlwaysAnonymous/>instead of
<AlwaysAnonymous>true</AlwaysAnonymous>

New (or previously undocumented) keywords are as follows. To utilize these functions, copy or move the tag to an uncommented section in the config.

- **<ProhibitMachineId/>** prohibit sending machineid. This will effectively exclude the usage of anonymous bookmark (a new collaboration feature in 8.5)
- **<ProhibitAuthentication/>** prohibit any authentication (including access to the Management Console) through the QVS Http Service
- **<NoCrypto/>** prohibit the use of encryption between the QVS Http Service and the QVS. This is useful when encryption, for some reason is not applicable.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- **`<Admin/>`** make it possible to see the current configuration through a web browser (e.g. **`http://localhost/Admin/`**) The URL will work only through the first **`<Url>`** tag present.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

10 SERVER REPOSITORY FOR SHARED OBJECTS

10.1 Types of Objects Available for Sharing

There are multiple objects available for user collaboration and sharing through QlikView Server.

- Bookmarks
- Sheet objects, including Charts
- Reports

Each of these objects may be defined as a user object, available to the authenticated user, regardless of access method or location, or a shared object, available to all users of the document through QlikView Server.

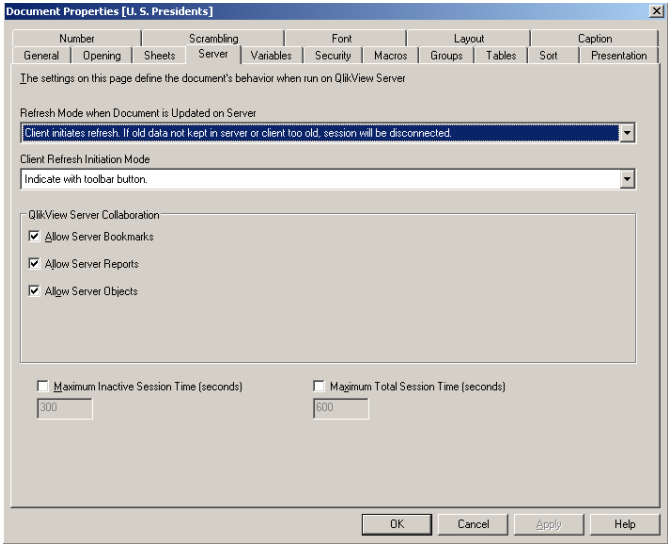
10.2 Settings required for Collaboration

Client based bookmark, object and report creation is limited as follows:

- Server and client are QlikView version 8 or later
- All clients except Java
- User authentication is required for Reports and Objects

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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In order for QlikView document objects to be enabled for sharing, the document must be set to allow Server Collaboration on each of the object types. This is the default setting for documents in QlikView 8.



The **Server** *page of the QlikView Document Properties dialog.*

Allow Server Bookmarks

This check box must be enabled, if remote clients are to be allowed to create and share bookmarks with this document on the QlikView Server.

Allow Server Objects

This check box must be enabled, if remote clients are to be allowed to create and share sheet objects with this document on the QlikView Server.

Allow Server Reports

This check box must be enabled, if remote clients are to be allowed to create and share reports with this document on the QlikView Server

TIP: For more information on Server Collaboration settings in QlikView, please consult the QlikView Reference Manual.

In addition, QlikView Server must be set to **Allow Server Collaboration**. Set this on the **General** page of the Server Management Console . If the Server is set to **disallow**, this setting will override the Document settings for all documents on that server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Once QlikView Server is enable for collaboration, and any of the QlikView Server Collaboration settings are checked, and the document is opened in QlikView Server, a special database file will be created and maintained in the same location as the QlikView document. The file will have the same name as the QlikView document, but will have a file extension of .Shared.

For example:

QlikView document: **`Presidents.qvw`**

QlikView Server share file: **`PRESIDENTS.QVW.Shared`**

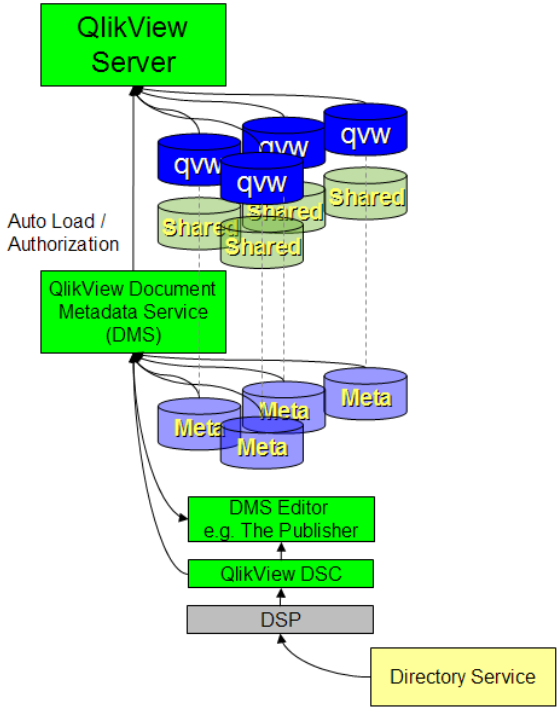
If the name of the QlikView document is changed for any reason, you will have to manually rename the .Shared file to match before opening the newly named QlikView document in QlikView Server. This will preserve the shared objects attached to the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

11 DOCUMENT METADATA SERVICE (DMS)

Document Metadata Service (DMS) is a thread running in the QlikView Server service. There are two distinct and separate functions provided by DMS. The first function is used to control automated document loading and unloading. The second function used to control the authorization mode that QlikView Server will run in. DMS Authorization mode can be used to enable third party (non-Windows) authenticated users to access documents through QlikView Server, as well as specification of specific access rights for individual or anonymous users, along with access days and times.



The DMS will utilize *.meta files stored alongside the QlikView documents to contain the automatic load and user/group authorization data. The *.meta files will have the same base filename of the QlikView document, with the .meta extension added, e.g. Presidents.qvw.Meta

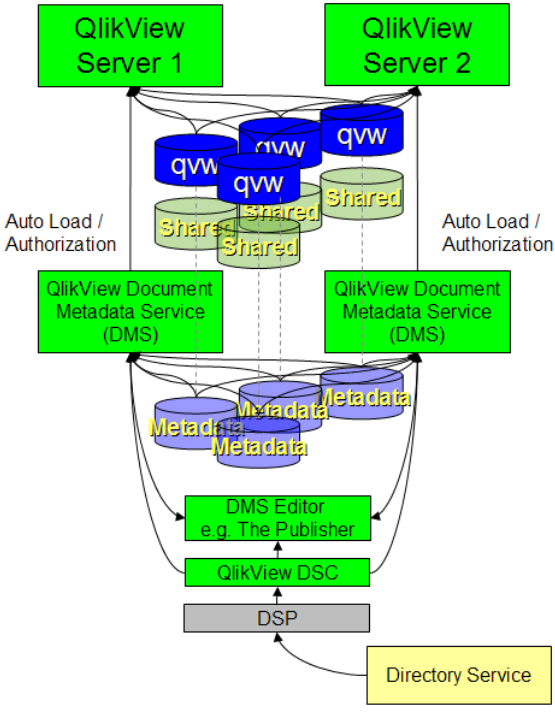
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The QlikView Server DMS will work in conjunction with the QlikView Publisher Enterprise Directory Services Connector (DSC) and Directory Services Provider (DSP) to populate, maintain, and enforce the document/user authorization configuration. Note that Groups can only be resolved through the use of the QlikView Publisher Enterprise DSC and DSP. The DMS Repository can also be maintained through the DMS dialogs available on the Security (Communication) page in the QlikView Server Management Console, as well as the Script API, which is documented in the Appendix Chapters. Note that the QlikView Publisher Enterprise DSC, if enabled, will have write priority over the DMS manual entry dialogs.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

12 QLIKVIEW SERVER LOAD SHARING (CLUSTERING)

QlikView Server will support load sharing of documents across multiple physical or logical computers. This sharing includes the ability to share in real time, information about collaboration objects, automated document loading and unloading (through DMS), and user license CALs. Special licensing is available to enable multiple server instances to share the same license number.



In order to utilize load sharing between multiple QlikView Servers, all document and support files must be shared between the servers. In other words, all servers should point to the same physical location for the files. In addition to the file types described in the diagram above, QlikView Server will create and maintain additional files to store load sharing data. These files will have a file type extension of .pgo (Persistent Group Object), and they will be located in the same folder as the QlikView documents.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Operating System Load Balance or Failover configurations are external to the QlikView Server load sharing configuration, and QlikView Server has no control over those systems.

Server configuration settings are shared between all clustered QVS, and can be maintained through the QlikView Server Management Console connected to any of the clustered QVS. Performance of a particular QVS system can be monitored through the Management Console by connecting to that system.

Since DMS data is shared among the QVS, any automated document load/unload procedures are performed on all QVS. DMS Authorization is, of course, also shared among all clustered QVS.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART II: CLIENTS

- **Client overview**
- **Sample HTML**
- **HTML pages**
- **QlikView Java Client**
- **QlikView Java Objects Client**
- **QlikView installed Windows Client**
- **QlikView Analyzer for Internet Explorer**
- **QlikView AJAX Zero-Footprint Client (ZFC)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

13 SUMMARY OF QLIKVIEW CLIENTS

A QlikView client is required for display and usage of an existing QlikView document (.qvw file). While the QlikView Server is responsible for opening, hosting, and calculating the document, the clients are required for user interaction and presenting the document and its objects.

The choice of which client or set of clients to use is entirely dependent on the customer's environment and preferences. Client choices range from a fully installed QlikView Developer to a (no installation required) AJAX Zero-Footprint Client (ZFC). Any combination of client types is allowed, as long as the proper licensing CALs are available (see Section QVS Licensing) on the server license. In general, any QlikView document may be displayed with any client, although additional HTML code must be created for the Object clients, including AJAX, to display and interact with the objects within a particular document. In addition, certain considerations must be taken into account when deploying a QlikView document with QlikView Server and its clients. See Section Considerations when developing documents for use with QlikView Server for information on limitations when using a QlikView client to interface with a QlikView document.

The following table provides a brief summary description of client choices.

QlikView Client	Description
Java Client	Full image client utilizing Sun Java in web browser. No installation or client side licensing required.
Java Objects Client	Object only client utilizing Sun Java in web browser. Requires web page design or QlikView Client Generator. No installation or client side licensing required.
Windows Installed Client	Full image desktop installed QlikView (Developer / Professional / Analyzer / Analyzer+). Installation and client (except for Analyzer) licensing required.
Analyzer for Internet Explorer	Full image ActiveX plug in for Internet Explorer web browser. Installation required. No client side licensing required.
QlikX Analyzer for Internet Explorer	Object only ActiveX plug in for Internet Explorer web browser. Requires web page design or QlikView Client Generator. Installation required. No client side licensing required.
AJAX Zero-Footprint Client (ZFC)	Object only Dynamic HTML client utilizing AJAX architecture in web browser. Requires web page design or QlikView Client Generator. No installation or client side licensing required.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The table below shows the different client varieties and some of their most important positioning properties.

Clients for publishing QlikView documents	Clients for building web applications with QlikView data and logic	Layout fidelity and functionality	Demands on client environment and install bandwidth
Installed EXE clients (QVE, QVP, QVA)	-	High	High
QVA for IE (plug-in)	QlikX:s (part of plug-in)		
QVA Java client	QVA Java Objects client		Medium
-	AJAX Zero Footprint Client (ZFC)	Low	Low

The leftmost column in the table contains client variants where entire QlikView documents with sheets and layout can be presented without the need for web page design.

The second column shows client variants which require web page design.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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14 ABOUT THE SAMPLE PAGES

14.1 Sample HTML Pages

If you selected **Complete** for Installation Type (default) or **Custom**, and included the QlikView Server example web pages and documents, several sample HTML pages were loaded onto your server during installation in order to allow you to verify proper operation. To access these web pages, the directory where the pages were loaded must be accessible to your web server.

The default folder location for the QlikView Server sample HTML pages is: **`C:\Program Files\QlikView\Webpages`**

This location has a URL of **`http://<server>/QlikView/`**

If you cannot display the sample web pages, verify that there exists a virtual directory named **QlikView** defined in your web server, and pointing to the default folder location for the QlikView Server sample HTML pages noted above.

The QlikView Server directory has a default start page that links to subdirectories for the different client alternatives:

- QlikView Analyzer Windows Client
- QlikView Analyzer for Microsoft Internet Explorer (plug-in) Client
- QlikView Analyzer Java Client
- QlikView Analyzer Java Objects Client
- QlikView Analyzer Zero Footprint client (AJAX)

From this start page the user will be guided through the different client alternatives that the QlikView Server installation provides.

These locations are also used as the default locations for pages created by the Object Client Page Generators.

TIP: If you modify any of the default pages that were installed by QlikView Server, be sure to either keep backups of the new pages, rename the new pages, or change the location of the new pages. Failure to do so could result in losing the modifications when upgrading or re-installing QlikView Server.

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showdocument.htm (Java clients only)

The HTML file named showdocument.asp can be used to show a QlikView document using the QlikView Java applet. This file utilizes JavaScript functions found in **`/QvJava/CodeLib/build_java.js`**

To choose a QlikView document and display sizes the page needs three parameters:

Document	- the QlikView file to show
Width	- the width of the applet in pixels
Height	- the height of the applet in pixels

There are also optional parameters for use in the query string for the client's network settings:

isapi	- Disable standard TCP connection and forces http tunneling
Port	Specify the communication port to QVS
Tunnelport	Specify the communication port between QVS and QVS tunnel

Example of calling showdocument.htm

```
<a href='showdocument.htm?width=1000&height=700&docu-
ment=Presidents.qvw'> Presidents</a>
```

Plugin_showdocument.htm (QVA for IE plug-in only)

The HTML file named **`plugin.asp`** can be used to initiate the Connect to Server dialog and show a QlikView document using the QlikView Analyzer for Internet Explorer.

alldocs.htm (Java clients only)

The **`alldocs.htm`** displays a list of all available QlikView documents available. This uses functions available in **`QvDocList.js`**, located in the scripts subdirectory of the Webpages location.

plugin_alldocs.htm (QVA for IE plug-in only)

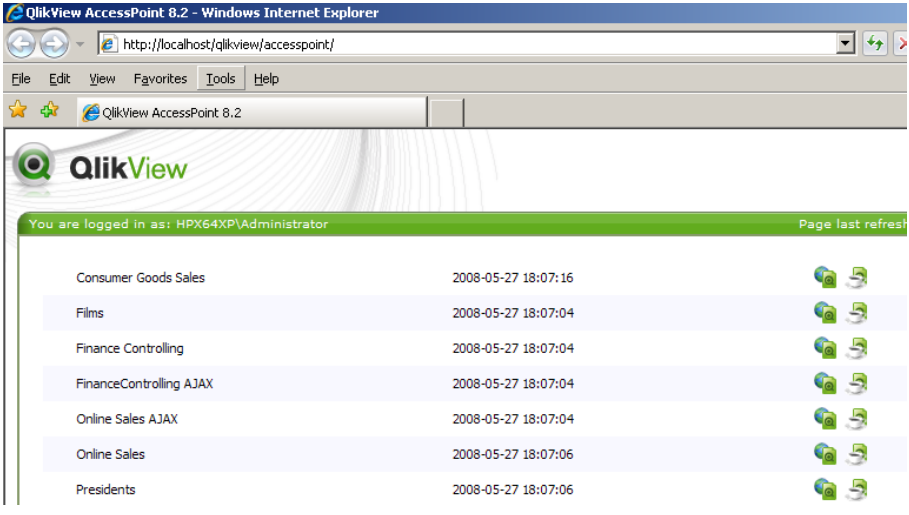
The **`alldocs.htm`** displays a list of all available QlikView documents available. This uses functions available in **`QvDocList.js`**, located in the scripts subdirectory of the Webpages location.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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14.2 QVS AccessPoint

If you selected **Complete** for Installation Type (default) or **Custom**, and included the QlikView Server example web pages and documents, a QlikView Server AccessPoint was set up under the default Webpages directory. Enter the following URL to open the AccessPoint:

`http://<server>/QlikView/AccessPoint`



From this page, the user may open documents with the choice of several different clients.

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15 QLIKVIEW JAVA CLIENT

15.1 Java Client

The QlikView Java client is a Java applet which appears as an integrated part of the browser window. The Java Client may also be initiated in a stand alone Java window, without the use of a browser. Refer to the Java sample pages for an example of this.

The QlikView menu bar is not available, but a standard toolbar is available. Sheet and sheet object context menus are available where applicable.



QlikView Java client in Internet Explorer.

15.2 Display of application

You may create your own custom applications and load them onto the QlikView Server. You must create the application using QlikView and save the application as a QVW file.

To display the application on the QlikView Server just copy the QlikView QVW file to the QlikView Server application directory.

The default location is:

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C:\Documents and Settings\All Users\Application Data\Qlik-Tech\QVS\Documents

You may have chosen a different directory during QlikView Server installation. Also, Java documents are allowed to have a separate dedicated folder.

Note The QVW file must be copied to the directory specified as **Document Folder** in the Management Console. This is not the same directory where the ASP pages are located. This directory should be secure from normal user access, and does not need to be readable by the web server (e.g. IIS.)

15.3 Collaboration - Shared Objects

Collaboration - shared objects - is not currently supported in the Java Client.

15.4 HTML Pages

You can customize the sample pages provided, or create your own. The web page can contain any normal HTML tag, but it must have room to display the Java applet window for the QlikView Java Client.

15.5 Using custom HTML to invoke applet (Advanced)

For those experienced in HTML programming there is an option to skip the sample pages altogether and write custom HTML to publish an application with the QlikView Java applet.

Basic example

A typical applet definition could look like :

```
<applet code='com.qt.qw.QlikApplet.class'
  archive='/QvJava/QlikView.jar' height=700 width=1000
  MAYSCRIPT>
       <param name='DOCUMENT' value='Presidents.qvw'>
       <param name='PORT' value='4747'>
       <param name='ISAPI' value='/scripts/QVSTun-
       nel.dll'>
       <param name='HEIGHT' value='700'>
       <param name='WIDTH' value='1000'>
       <param name='LANGUAGE' value='English'>
</applet>
```

On the applet tag, you can change the WIDTH and HEIGHT values to

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specify the size of the applet window that is drawn in the web browser. The parameters passed to the applet control various aspects of the application.

The DOCUMENT parameter value is the name of the QVW file that should be loaded in the applet window.

The PORT parameter value must match the port specified in the QVS Control Panel.

This is the TCP port that the client and server will communicate over.

The ISAPI parameter value specifies the location of the tunneler dll, if such is to be used.

The HEIGHT and WIDTH parameter values tell the QlikView Java client application the dimensions of the applet window available for use. Normally these values should match the values specified in the applet tag.

The LANGUAGE parameter value specifies the language of context menus in the client. Valid values are :

- “English”
- "Swedish" or "Svenska"

By adding an optional parameter <param name='HIDETOOLBAR' value=''> the client toolbar will be suppressed.

Example with Windows authentication

A minimal example with Windows authentication enabled could look like follows:

```
<%@ Language=JavaScript %>
<html>
	<%
	// Authenticate using QVSNTsecurity.dll
	var s = Server.CreateObject("QVSNTSecurity.QlikNTLia-
	son");
	var username_qlikweb = s.LogValidatedSes-
	sion(Request.ServerVariables("REMOTE_ADDR"));
	   %>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
        <applet code='QlikWeb.class' name='QlikDocument'
        id='QlikDocument' archive='/QvJava/QlikWeb.jar'
        height=700 width=1000 mayscript>
              <param name='DOCUMENT' value='presidents.qvw'>
              <param name='USERNAME' value='<% =
              username_qlikweb %>'>
              <param name='PORT' value='4747'>
              <param name='ISAPI' value='/scripts/QvsTun-
              nel.dll'>
              <param name='HEIGHT' value='700'>
              <param name='WIDTH' value='1000'>
              <param name='LANGUAGE' value='English'>
        </applet>
        <script language='javascript'></script>
</html>
```

On the applet tag, you can change the **WIDTH** and **HEIGHT** values to specify the size of the applet window that is drawn in the web browser. The parameters passed to the applet control various aspects of the application.

The **DOCUMENT** parameter value is the name of the QVW file that should beloaded in the applet window.

The **PORT** parameter value must match the port specified in the QVS Management Console.

This is the TCP port that the client and server will communicate over.

The **ISAPI** parameter value specifies the location of the tunneler dll, if such is to be used.

The **HEIGHT** and **WIDTH** parameter values tell the QlikView Java client application the dimensions of the applet window available for use. Normally these values should match the values specified in the applet tag.

The **LANGUAGE** parameter value specifies the language of context menus in the client. Valid values are :

- **English**
- **Swedish** or **Svenska**

By adding an optional parameter **<param name='HIDETOOLBAR' value=''>** the client toolbar will be suppressed.

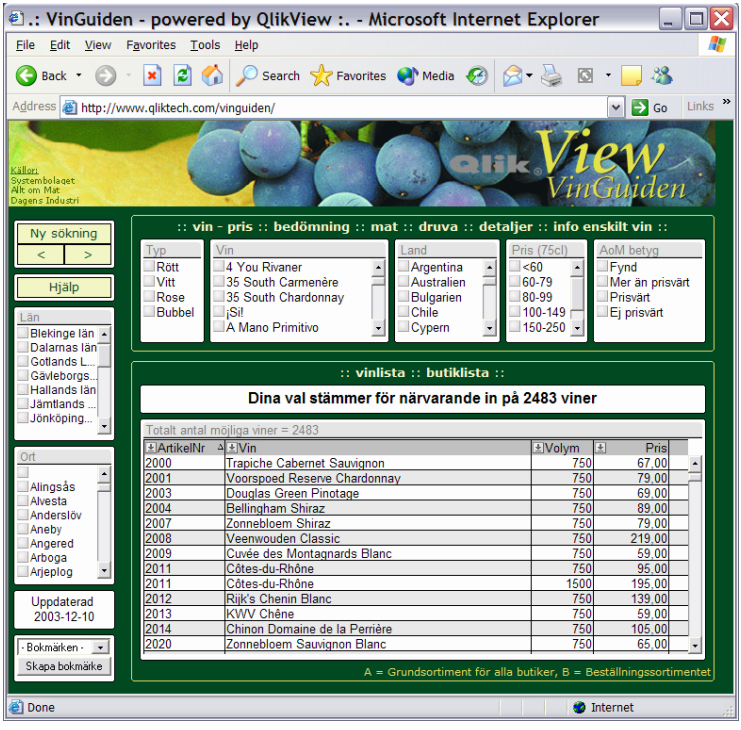
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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16 QLIKVIEW JAVA OBJECTS CLIENT

16.1 Java Objects Client

The QlikView Java Objects client consists of so called applets, one for each sheet object, which can be inserted at any position on an html page. Web pages containing Java Objects linked to a QlikView document may either be created through the QlikView **Objects Client Page Generator**, or manually created. This section describes the requirements and process for manual creation and/or maintenance of a Java Objects web page.

The QlikView menu bar and toolbars are not available in the Java Objects client. Sheet object context menus are however available where applicable.

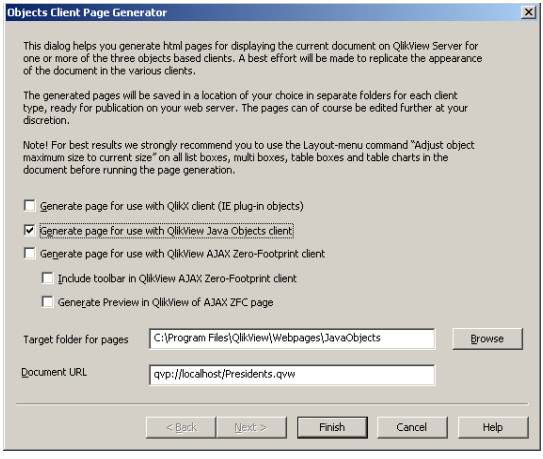


QlikView Java Objects client in Internet Explorer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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16.2 QlikView Page Generator for Java Objects

The Objects Client Page Generator tool in QlikView 8+, located off the Tools menu, can be used to generate QlikView Java Objects pages based on existing QlikView documents. This is the recommended way to quickly and easily develop the QlikView Java Objects pages for your documents. The following sections in this chapter can then be used to modify those pages for those wishing to further customize the presentation.



The **Objects Client Page Generator** *for Java Objects client.*

Target folder for pages

Specifies the folder where the generated pages will be saved. Each page variant (for different client types) will be saved in a separate sub-folder in the specified location. The target folder must exist for the **Finish** button to be enabled.

Document URL

Specifies the target document URL on the QlikView Server where the pages are to be run. This setting is necessary for the Java Objects and QlikX pages to work properly.

Adjust Object Maximum Size to Current Size

Some types of sheet objects, like list boxes, multi boxes and tables, may have a larger maximum size that what is currently utilized. This allows e.g. a table to expand on the sheet when more data is added. This operation resets the maximum object size to the currently used size for all selected objects on the active sheet. You may use CTRL+A to select all sheet objects on the sheet. it is recommended to always perform this operation on all list boxes, multi boxes, table boxes and table charts in the document before using the **Objects Client Page Generator wizard**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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16.3 Objects definition

General

The option to access QlikView files through Objects gives the web designer more freedom to use the space of the HTML page more efficiently.

The solution builds on having one applet communicating with the QVS and the specified QlikView file. In turn this "master applet" communicates with several applets representing each specific QlikView object you want to display.
The solution uses the unique object ID given to each object in a QlikView document. This ID can be found in QlikView, on the **General** page in the **Properties** dialog of the sheet object. Instead of displaying the whole file as described above, the web designer can choose where on the HTML page he wants to place the object. This object can be a listbox, a graph, a button etc.

Programming languages

The examples below are written in HTML and ASP using JavaScript. This documentation is however not a manual for these scripting languages. The reader is therefore supposed to have some knowledge of HTML and ASP programming.

16.4 Applying QlikView Java Objects to a web page

The setDocument function

In order to connect the client page to the right QlikView document (qvw file) on the server, the setDocument function has to be applied. Below you find an example on how to do this.

```
<% setDocument("qwt_objects.qvw") %>
```

The addObject function

In a QlikView application, every sheet object has a unique ID. You find the ObjectID on the General tab in the Properties dialog of the sheet object.

When you apply a sheet object to the page, you call the addObject function including parameters for QlikView Document Name, ObjectID and the height and width of the actual applets that are going to display the different QlikView sheet objects. Below you find an example of how to do this.

```
<% addObject("qwt_objects.qvw","LB01",140,80) %>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sample QlikView Java Objects code

Below you see the sample code for a complete working QlikView Java Objects page. The sheet objects are positioned on the page using a standard HTML table.

```
<!--#INCLUDE Virtual="/QvJava/Servers/QlikWebObjects/Qlik-
Web.asp"-->
<html>
<head>
      <title>.: QlikWeb Objects :.</title>
</head>
<body>
<% setDocument("qwt_objects.qvw") %>
<table border="0" cellspacing="0" cellpadding="0">
      <tr>
            <td>
                  <% addOb-
                  ject("qwt_objects.qvw","LB01",140,80) %>
            </td>
            <td>
                  <% addOb-
                  ject("qwt_objects.qvw","LB02",250,100) %>
            </td>
      </tr>
      <tr>
            <td>
                  <% addOb-
                  ject("qwt_objects.qvw","LB03",140,140) %>
            </td>
            <td>
                  <% addOb-
                  ject("qwt_objects.qvw","CH01",250,150) %>
            </td>
      </tr>
</table>
</body>
</html>
```

16.5 Language and bookmark settings

If you use the following functions before the setDocument function you will be able to either change the language of the session (menus and error messages) or set what bookmark that should be used as an initial selection. The functions are:

setLanguage(lang)

setStartBookmark(bookmarkname)

Possible languages are English and Swedish

The following example shows how these functions are used by the Java clients. By calling these functions the bookmark used at the start of the session will be “quarter1”. The session language will be set to Swedish.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
<% setStartBookmark ("quarter1"); %>
<% setLanguage ("swedish"); %>
<% setDocument("sales.qvw"); %>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

17 QLIKVIEW ANALYZER FOR INTERNET EXPLORER

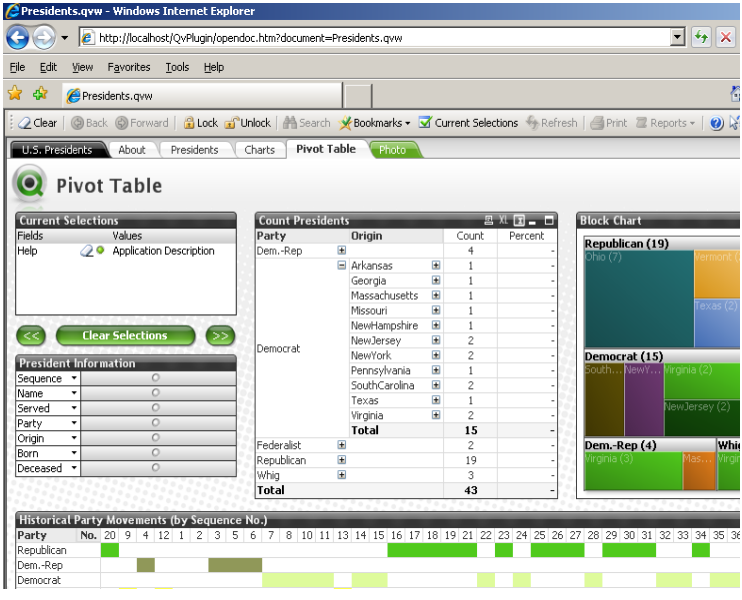
17.1 Plug-in Client

A plug-in is a program hosted by and running inside a web browser. Typically it consists of an ActiveX component with ocx as file extension. Acrobat Reader is a common example of a plug-in that computer users should be familiar with. QVA for IE installs and operates along exactly the same principles.

QlikView Analyzer for Internet Explorer is a freely downloadable program and can easily be distributed throughout the company via the sample HTML pages provided with the installation of QlikView Server.

The QVA for IE client appear as an integrated part of the MS Internet Explorer window. No QlikView menu bar is available, but most of the QlikView toolbar functions are available. Sheet and sheet object context menus are available where applicable.

The functionality of QVA for IE is otherwise identical to that of the unregistered version of QlikView Analyzer. Local files are not accessible from QVA for IE..

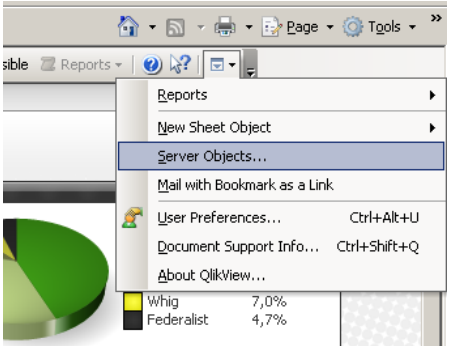


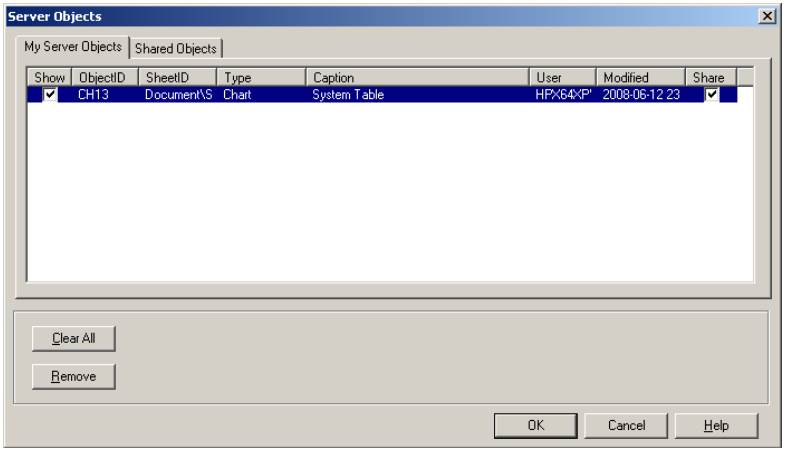
QlikView plug-in client in Internet Explorer.

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17.2 Collaboration - Shared Objects

Collaboration – shared objects – is supported in the Plugin Client for authenticated users. Sheet objects may be created, moved, and sized. Use the standard right-click menu and select **New Sheet Object**. Reports can be created and existing reports can be edited. New objects, reports and bookmarks may be shared with other users through the **Server Objects** dialog. Locate this option off the Menu Options toolbar icon.

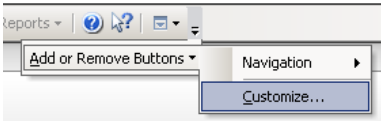


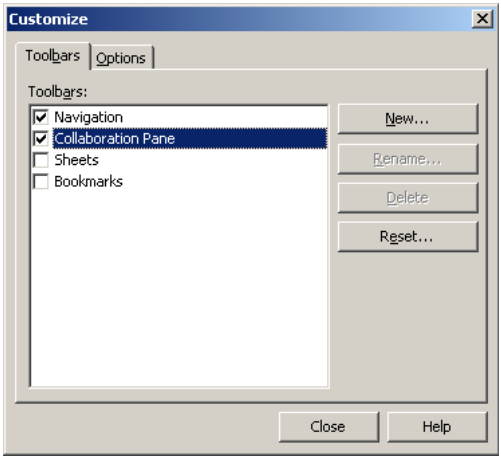


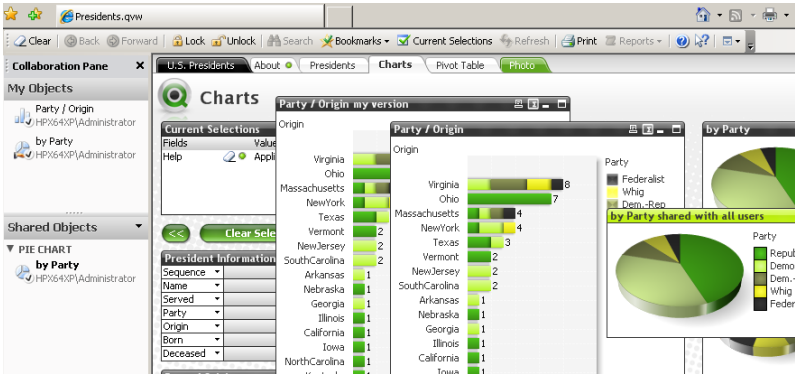
Use the **Share** option to share the selected objects with other server users. Access to the object through this dialog will move to the **Shared Objects** tab.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Shared Objects may also be controlled through the **Collaboration** menu. You can display the **Collaboration** menu from the **Add** or **Remove** buttons dialog off the main toolbar. Choose the **Collaboration Pane** from the **Toolbars** tab of the dialog.







The **Collaboration Pane** will list all objects that you have created, as well as any shared objects that are available.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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17.3 Deployment of QVA for IE

There are two basic ways to get the QVA for IE plug-in installed on a client computer:

Simple install link on web page

Clicking on a **download and install** link on a web page starts the installation. This is a very common approach used for many commercial plug-ins.

It is necessary that the user installing the plug-in has install privileges on their own machine in order for this approach to work.

Pushing out client via group policy

In organizations where individual users are not allowed to install new software on their computers, the system administrator may create a so called "group policy" and "shoot out" the QVA for IE clients to any set of computers in the directory.

17.4 Customizing settings for QVA for IE

The appearance and behavior of the QVA for IE client can be changed via a couple of special commands, as follows.

Selecting toolbars

The client comes with a predefined toolbar for Navigation, Collaboration, Sheets and Bookmarks. The toolbar may be customized by clicking on the **Toolbar Options** icon located to the right of the toolbar.

Setting User Preferences

Use the **Show Menu** toolbar icon to display the **User Preferences** selection. This will allow setting user preferences, such as language and printing preferences. For a detailed explanation of each of the available commands, please refer to the QlikView Reference Manual.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18 QLIKX - PUBLISHING SEPARATE SHEET OBJECTS FROM THE QVA FOR IE PLUG-IN CLIENT

18.1 Technical description of the QlikX concept

The QVA for IE plug-in has the ability to support the display of individual sheet objects on a web page, without the surrounding sheet environment. Sheet objects from different QVS documents can be displayed on the same page. Web pages that are to utilize this functionality may either be created through the QlikView **Objects Client Page Generator**, or manually created. This section describes the requirements and process for manual creation and/or maintenance of a QlikX web page.

18.2 Limitations

The following conditions must be met for the QlikXs to work:

- MS Internet Explorer version 6 or later must be installed on the client computer
- The QlikView Analyzer for Internet Explorer plug-in must be installed on the client computer

18.3 Getting it to work

This section provides an outline of the steps necessary to build a web page with QlikX objects. It is assumed that the reader possesses a general knowledge of HTML.

Infrastructure

Server environment

QlikView Server must be of version 7 or later.

Web page components

HTML web page

The basic HTML web page(s) defining the client typically reside in a directory somewhere under the web server's wwwroot, either directly, or indirectly through the QlikView virtual directory. The pages could contain any

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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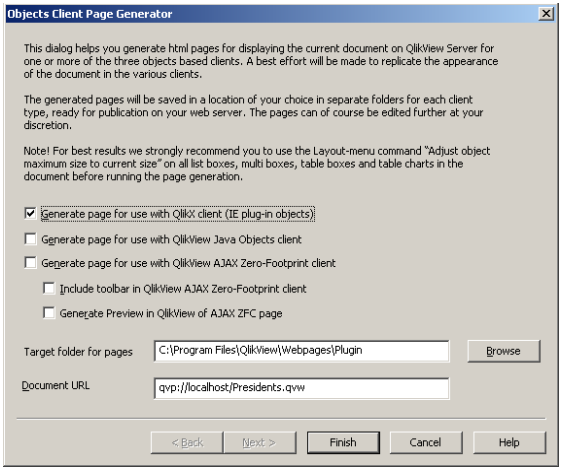
standard HTML code. The details of how to present QlikX sheet objects is described in the next chapter.

Plug-in

The QlikView Analyzer for Internet Explorer plug-in must be installed on the client computer.

18.4 QlikView Page Generator for QlikX

The Objects Client Page Generator tool in QlikView 8+, located off the Tools menu, can be used to generate QlikView QlikX pages based on existing QlikView documents. This is the recommended way to quickly and easily develop the QlikView QlikX object pages for your documents. The following sections in this chapter can then be used to modify those pages for those wishing to further customize the presentation.



The **Objects Client Page Generator** *for QlikX client.*

Target folder for pages

Specifies the folder where the generated pages will be saved. Each page variant (for different client types) will be saved in a separate sub-folder in the specified location. The target folder must exist for the **Finish** button to be enabled.

Document URL

Specifies the target document URL on the QlikView Server where the pages are to be run. This setting is necessary for the Java Objects and QlikX pages to work properly.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Adjust Object Maximum Size to Current Size

Some types of sheet objects, like list boxes, multi boxes and tables, may have a larger maximum size that what is currently utilized. This allows e.g. a table to expand on the sheet when more data is added. This operation resets the maximum object size to the currently used size for all selected objects on the active sheet. You may use CTRL+A to select all sheet objects on the sheet. it is recommended to always perform this operation on all list boxes, multi boxes, table boxes and table charts in the document before using the **Objects Client Page Generator wizard**.

Web page design with QlikX objects

This section describes the HTML code necessary to publish QlikView sheet objects as QlikXs.

Document connector code

The <body> tag of the html page must contain a chunk of code connecting the page to a QlikView document running on the QlikView Server. The code should look like follows:

```
<OBJECT
      id="QVPID1"
      height="1"
      width="1"
      classid="CLSID:74DC8438-E36A-40a0-B750-4E2257FA2E41">
      <PARAM
            NAME="SRC"
            VALUE="qvp://www.server.xyz/MyQvApp.qvw">
      <PARAM
            NAME="AutoScan"
            VALUE="-1">
</OBJECT>
```

The value of the VALUE property in the first parameter must be a complete qvp URL pointing at a QlikView document on a QlikView Server.

The value of the id property on the first line is the connection id of the document. You may have connections to multiple QlikView documents on a single HTML page, but the connection id must be unique for each new document. You may choose connection id at random, but we recommend following the convention laid out in this document (QVPIDn).

This connection code must reside in the HTML page before any references to sheet objects in the document in question (see below).

Incompatibility notice! The class IDs for the document connecter and object display in QlikX for QlikView version 8 has been

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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changed from previous versions. It is thus necessary to change all HTML and/or ASP pages when upgrading to plug-in version 8.0 or later. It is not possible to use the same web page for pre- and post 8.0 clients using QlikX objects. See the Migration section in this document for more information.

Sheet object display code

For each sheet object to be shown another chunk of code must be added. The code should look as follows:

```
<OBJECT
	id="Qlix1"
	height="133"
	width="100"
	classid="CLSID:54D93DE9-7DA5-4477-A3DA-869ADB41CBBB" >
	<PARAM NAME="ObjectID" VALUE="LB38">
	<PARAM NAME="QvPluginID" VALUE="QVPID1">
</OBJECT>
```

The value of the VALUE property in the second parameter is the connection id of the document.

The value of the VALUE property in the first parameter is the id of the sheet object you want to show. The sheet object must reside on the opening sheet of the source document.

The value of the height property is the height in pixels of the rectangle containing the sheet object in the HTML page.

The value of the width property is the height in pixels of the rectangle containing the sheet object in the HTML page.

Automation access to QlikX objects

The <head> tag of the HTML page could contain scripting code referencing a specific QlikView document, identified by its connector id. The code could look as follows:

```
<head>
	<script type="text/javascript">
	function ClearAll()
	{
		QVPID1.ActiveDocument.ClearAll();
	}
	</script>
</head>
```

The QVPID1.ActiveDocument gives you an Automation handle to the connected QlikView document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18.5 Capabilities, differences and limitations

This section describes some of the technical differences and limitations with QlikX in relation to other QlikView clients.

Sheet Objects supported

All sheet objects apart from Custom Objects are supported

QlikView entities with partial support

The following QlikView entities currently have partial support:

- Sheets (there is no direct connection available to the sheets in the QVW document, but it is very easy to create the same functionality using HTML frames and tabs).

The following QlikView entities currently have no counterpart in the QlikX environment but may appear in some form in future versions:

- Alerts
- Reports

Navigational differences

There are a few differences in the GUI facing users of QlikX compared to users of other types of QlikView clients.

- There is no menu bar
- There is no toolbar

Print/Export

Print and export work exactly as in normal QlikView. Right-click on the object and select Print...

18.6 Complete sample page

Below is a complete HTML page for displaying one list box and one chart with QlikX. Minimum HTML formatting applied.

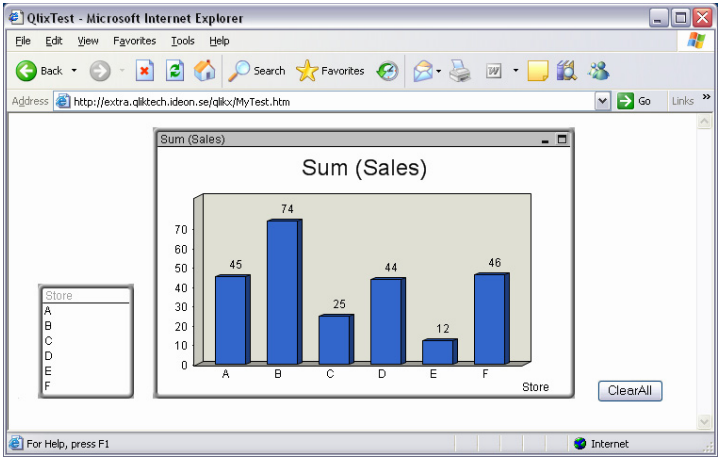
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
<html>
	<head>
		<title>QlixTest</title>
		<meta name="vs_targetSchema"
		content="http://schemas.microsoft.com/intel-
		lisense/ie5">
		<script type="text/javascript">
		function ClearAll()
		{
			QVPID1.ActiveDocument.ClearAll();
		}
		</script>
	</head>
<body>
	<OBJECT id="QVPID1"
		height="1"
		width="1"
		classid="CLSID:74DC8438-E36A-40a0-B750-
		4E2257FA2E41">
		<PARAM
			NAME="SRC"
			VALUE="qvp://extra.qliktech.ideon.se/
			MyQvApp.qvw">
		<PARAM
			NAME="AutoScan"
			VALUE="-1">
	</OBJECT>
	     
	<OBJECT
		id="Qlix1"
		height="122"
		width="102"
		classid="CLSID:54D93DE9-7DA5-4477-A3DA-
		869ADB41CBBB" >
		<PARAM NAME="ObjectID" VALUE="LB01">
		<PARAM NAME="QvPluginID" VALUE="QVPID1">
	</OBJECT>
	     
	<OBJECT
		id="Qlix2"
		height="288"
		width="448"
		classid="CLSID:54D93DE9-7DA5-4477-A3DA-
		869ADB41CBBB" >
		<PARAM NAME="ObjectID" VALUE="CH01">
		<PARAM NAME="QvPluginID" VALUE="QVPID1">
	</OBJECT>
	     
	<input
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
            type="button"
            value="ClearAll"
            onclick="ClearAll()"
            id=button2
            name=button2>
      </body>
</html>
```

The result of the HTML code above can be seen below:



The QlikX example in Microsoft Internet Explorer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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OnlineNotary.net

19 QLIKVIEW INSTALLED WINDOWS CLIENTS

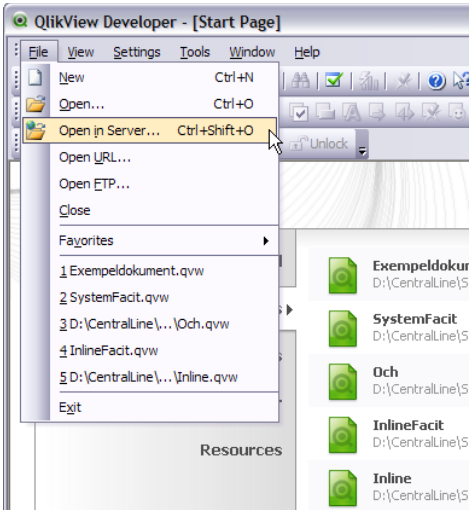
19.1 Locally installed Windows Client

With QlikView Analyzer, Professional or Developer installed on your machine, you may open any application on QlikView Server which you have access rights to.

QlikView Analyzer is a freely downloadable program and can easily be distributed throughout the company via the sample html pages provided with the installation of QlikView Server.

19.2 Open in Server

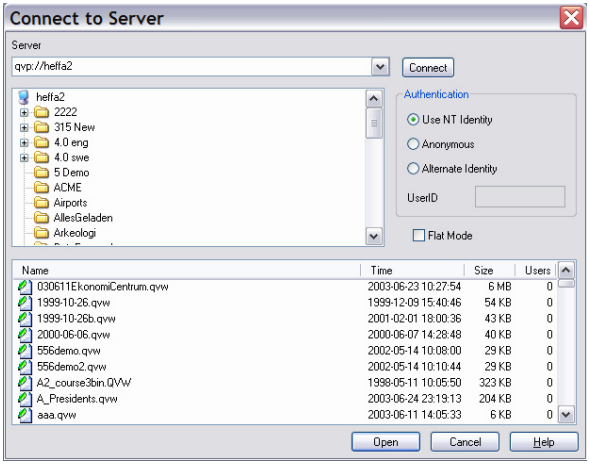
Once QlikView has been installed, the end user can choose to open QlikView documents through the **Open in Server** command in the **File** menu.



The Open in Server menu item.

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This command will provide the end user with all the possible QlikView documents provided and which QlikView Servers are available. By clicking in the **Connect to Server** dialog the application will open and the analysis session can begin.



The Connect to Server dialog in QlikView.

Connection pseudo-URLs

When connecting to QlikView Server from Windows clients, either via the Open in Server dialog or via link files, the identity to be used is specified via the pseudo-URL document address. The syntax is:

`qvp://[[username]@]servername [:(port | protocol)] / [documentname.qvw][?paramname=paramvalue{&paramname=paramvalue}]`

where

`username` is a Windows user ID

`servername` is the name of a server running QlikView Server

`documentname` is the name of the QlikView document (excluding qvw extension)

`port` (e.g. 4749) can be used to specify a specific port used by the server

`protocol` (e.g. http) can be used to specify tunneling protocol

`paramname` := (USERID | XUSERID | PASSWORD | XPASSWORD | MACRO | IIS_AUTHENTICATE)

`USERID` denotes a section access userID in clear text. This parameter is also utilized to pass a **`Ticket`** value during the **`Get Ticket`** process.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

XUSERID denotes a scrambled section access userID

PASSWORD denotes a section access password in clear text

XPASSWORD denotes a scrambled section access password

MACRO denotes the name of a macro to be run when the document is opened

(only one macro allowed)

IIS_AUTHENTICATE denotes a single-use key (40 hex characters) for IIS integrated authentication.

paramvalue is a valid value for each parameter.

@ without username denotes anonymous identity.

If user identity is omitted altogether, the logged in Windows identity is assumed.

Examples:

qvp://www.qliktech.com/AcmeStores.qvw

qvp://@www.qliktech.com/AcmeStores.qvw

qvp://john.doe@www.qliktech.com/AcmeStores.qvw

qvp://www.qliktech.com:http/AcmeStores.qvw

qvp://www.qliktech.com/AcmeStores.qvw?USERID=JOHN&PASSWORD=ABC123

qvp://www.qliktech.com/AcmeStores.qvw?MACRO=Mymacro

TIP: Internet Explorer 7 does not support @ or : in the URL in order to prevent spooling of URLs. To specify these characters in the URL, you need to URL-encode them.

Use %3A for: and %40 for @.

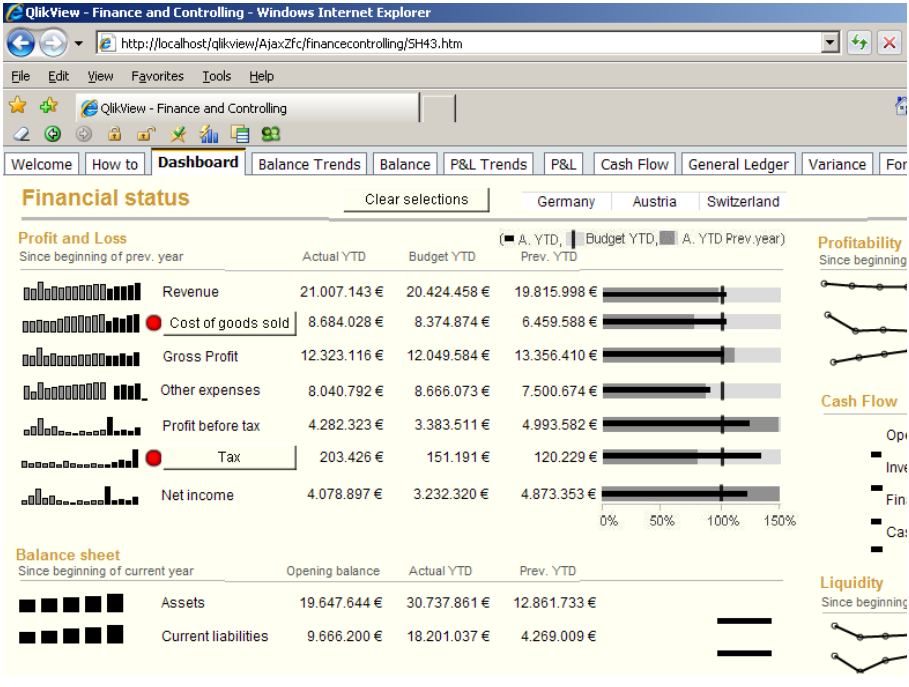
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

20 THE QLIKVIEW AJAX ZERO-FOOTPRINT CLIENT (ZFC)

20.1 General

The QlikView AJAX Zero-Footprint Client (ZFC) provides an object based client environment built on a state-of-the-art AJAX (Asynchronous JavaScript And XML) architecture. The QlikView AJAX ZFC requires no installation on the client computer, but some HTML/ASP development is required to display and interact with objects from a QlikView document hosted by QlikView Server. The QlikView AJAX ZFC also opens up the possibility to utilize QlikView in non-IE, and even non-Windows client browser environments.



QlikView AJAX client with the toolbar option

Basic description of the QlikView AJAX ZFC

One of the main advantages of the AJAX architecture is the inherent asynchronous update capability to provide quick, incremental updates to the user

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

interface, without requiring a browser page refresh. The QlikView AJAX ZFC provides the environment for the QlikView Server to produce and send Dynamic HTML (DHTML) pages and XML data to the browser running on the client computer and also receive feedback from the user clicking in those pages. DHTML is basically HTML with scripting. Nothing is installed on the client computer.

QlikView AJAX ZFC is based on the component AVQ.HTC, which is part of Winsider AB's "Visual Value"™ framework. The "Visual Value"™ framework is a data modeling and presentation framework that allows location independent presentation and manipulation of data with advanced business logic rules and constraints. QlikTech has licensed this component for use with QlikView Server.

Limitations (short version)

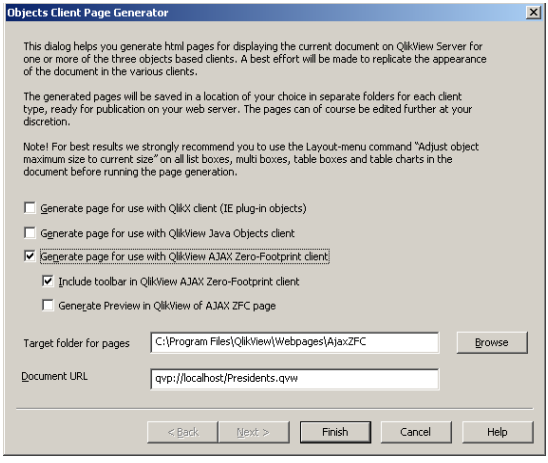
- The client requires one of the following browser types:
  - MS Internet Explorer version 6 or later
  - Browsers based on the Mozilla engine version 1.0.6 or later (e.g. Firefox)
- Different browsers may render the same page slightly differently.
- This is a way to build web pages featuring one or more QlikView sheet objects. The standard QlikView Sheet Tab is not supported, but separate QlikView sheets may be emulated through the use of multiple HTML pages. Selection state in the source QlikView document will hold throughout the same browser session.
- A few basic asp examples and style sheets are provided with a Complete installation of QlikView Server. The default location of these resources is **`C:\Program Files\QlikView\Webpages\Ajaxzfc`**.
- Most, but not all types of QlikView sheet objects are supported. See the end of this chapter for details.
- The looks of the QlikView sheet objects will in many cases be slightly different from standard QlikView, as e.g. all grid objects (list boxes, tables etc) are generated in HTML.

20.2 QlikView Page Generator for AJAX ZFC

The Objects Client Page Generator tool in QlikView 8+, located off the Tools menu, can be used to generate QlikView AJAX ZFC pages based on existing QlikView documents. This is the recommended way to quickly and easily develop the QlikView AJAX ZFC pages for your documents. The following sections in this chapter can

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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then be used to modify those pages for those wishing to further customize the presentation.



The Objects Client Page Generator for AJAX Zero-Footprint client.

Target folder for pages

Specifies the folder where the generated pages will be saved. Each page variant (for different client types) will be saved in a separate sub-folder in the specified location. The target folder must exist for the **Finish** button to be enabled.

Document URL

Specifies the target document URL on the QlikView Server where the pages are to be run. This setting is necessary for the Java Objects, QlikX and AJAX pages to work properly.

Include toolbar in QlikView AJAX Zero-Footprint Client

This option is checked by default, and will include a basic navigation toolbar in the generated pages.

You can optionally choose to view a preview of the generated pages in this instance of QlikView. Check the box for **Generate Preview in QlikView of AJAX ZFC page**.

Adjust Object Maximum Size to Current Size

Some types of sheet objects, like list boxes, multi boxes and tables, may have a larger maximum size that what is currently utilized. This allows e.g. a table to expand on the sheet when more data is added. This operation resets the maximum object size to the currently used size for all selected objects on the active sheet. You may use CTRL+A to select all sheet objects on the

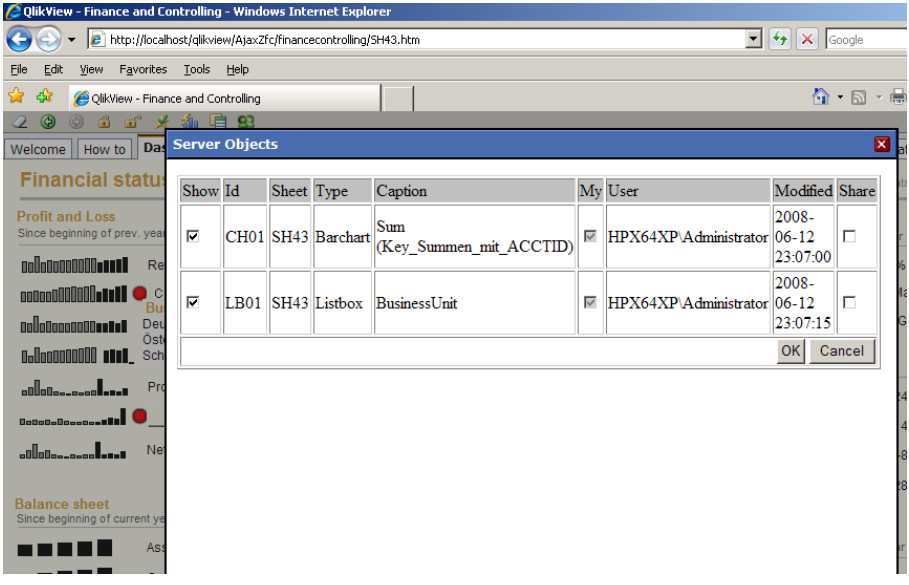
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

sheet. it is recommended to always perform this operation on all list boxes, multi boxes, table boxes and table charts in the document before using the **Objects Client Page Generator wizard**.

20.3 Collaboration - Shared Objects

Collaboration – shared objects – is supported in the AJAX Client for authenticated users. Charts and listboxes may be created, moved, and sized. Use the toolbar provided through the AJAX page generator to allow these options for users. New charts and listboxes may be shared with other users through the **Server Objects** dialog. Locate this option on the toolbar.

Bookmarks may be added, but not deleted. Remember to add a Bookmark sheet object in your source document prior to using the page generator, since there is no ability to implement a bookmark from the toolbar.



Use the **Share** option to share the selected objects with other server users.

20.4 Getting it to work

This section provides an outline of the steps necessary to build a web page with QlikView AJAX ZFC. All files reside or are referenced from the QlikView Server. No client side file installation or maintenance is required.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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It is expected that the reader has at least a general knowledge of HTML coding.

Infrastructure

Summary table for file locations

QlikView AJAX ZFC Required File	Default location on QlikView Server
default.htm*	C:\Program Files\QlikView\Webpages\AjaxZfc\basic
QvsComRemote.dll	C:\Program Files\QlikView\Server
QvsViewClient.htm	C:\Program Files\QlikView\Server\QvClients\QvAjaxZfc
Style sheets JavaScript Support files	C:\Program Files\QlikView\Server\QvClients\QvAjaxZfc\htc

* required only as an example

Server environment

The current version of QlikView AJAX ZFC requires a Microsoft Internet Information Services (MS IIS) web server, version 6 or later, or the QVS built-in http web server.

If the web server does not reside on the same physical machine as the QlikView Server, this must be specified in the QvsViewClient.asp page. Update the code:

```
var host = 'localhost';
```

to:

```
var host = '<name of server to use>'
```

QlikView Server must be version 7 or later.

Required dll

The dll file **`QvsComRemote.dll`** must reside in the same directory as QlikView Server and be registered. This is normally taken care of by the QlikView Server Installation program.

Web page components

HTML web page

The basic HTML web page(s) utilized by the ZFC client reside in a default location under the standard QlikView virtual directory (path = **`C:\Program Files\QlikView\Examples\QvsHtmlWebpages\AjaxZfc`** – for HTML, or **`C:\Program Files\QlikView\Examples\QvWebpages\AjaxZfc`** –

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

for ASP). The pages contain standard HTML code, along with ZFC specific references to QlikView documents and objects. If you perform a Complete Installation of QlikView server, a few examples are provided, including a basic example (**default.htm**).

ASP page

The file **QvsViewClient.asp** must reside in the QvAjaxZfc virtual directory (path = **C:\Program Files\QlikView\Server\QvClients\QvAjaxZfc**).

20.5 Web page design with QlikView AJAX ZFC

This section describes the HTML code necessary to publish QlikView sheet objects with QlikView AJAX ZFC.

The Qva and the qva

In every AJAX page there needs to be a set of jscript code that sets up the communication with QlikView Server and the framework. This is equivalent to the avq span used prior to 8.5.

By default, it looks something like the example:

```
<script language="javascript" type="text/javascript">
	var qva = new Qva.PageBinding();
	qva.View = "fruitcolor";
	qva.Autoview = "SH01";
	qva.Trace = new Qva.Trace(qva);
	qva.Modal = new Qva.Modal(qva);
	//qva.JSON = true;
	qva.OnUpdateComplete = function () { qva.SetNewS-
	heet(); }
	new Qva.Collaboration(qva);
	new Qva.Scanner(qva);
</script>
```

Default setup:

- **Qva** (uppercase Q) is a global namespace responsible for, among other things, communicating with QlikView Server.
- **qva** is an application specific object. There can be more than one on a page.
- **qva.View** should be the relative (to the root document folder) application name on the server. Do not include the .qvw extension.
- **qva.Autoview** is an optimization that reduces the response to only contain data for objects located on the current page.
- **qva.Trace** enables a trace feature (ctrl shift d).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- **qva.Modal** enables modal dialogs (e.g. quick chart wizard).
- **qva.OnUpdateComplete** is used for custom action triggers after each update.
- **Qva.Collaboration** enables collaboration objects and sheet context menus.
- **Qva.Scanner** scans html for avq attributes.

TIP: If you are running under the Internet Explorer browser, you may want to consider using a third-party tool for trace instead of qva.Trace.

Possible customizations:

- qva.Remote = '/QvAJAXZfc/QvsViewClient.asp';
- qva.ShowMessage – by default a popup.

Example:

```
qva.ShowMessage = function (msg) { window.status = msg; }
```

- qva.OnSessionLost – by default confirm a reconnect.

Example:

```
qva.OnSessionLost = function (msg) { document.location =
document.location; }
```

Included files and their purpose

StyleSheets

- The style sheets **`tabcontent.css`** and **`default.css`** are not necessary for handcrafted pages.
- The style sheet **`avq.css`** contains classes for state and context menus.

Subfolders

- **`Calendar`** is only used for the calendar object.
- **`Modal`** is used to show dialogs (new bookmark, create listbox, etc.)

Scripts

There are dependencies between the included files. To avoid problems, always include QvAjax.js first. The general order of subsequent script files should be followed as below:

- **`QvAjax.js`** contains general functionality – the framework.
- **`QvAjaxtrace.js`** is used for the trace feature (ctrl-shift-d) mentioned above.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- **QvAjaxBaseMgr.js** includes a number of general functions and behaviors (show, hide, label, link, inputcheckbox, inputradio, inputtext, edit, text, step, action, select, binary, binaryaction, caption, restore, bind, frame, menu and toolbar).
- **QvAjaxTableMgr.js** is the implementation for all tables.
- **QvAjaxScan.js** contains functions for scanning the page for avq attributes (objects).
- **QvAjaxModal.js** is necessary to show dialogs.
- **QvAjaxGraphics.js** contains general graphic functions used by slider and graph.
- **QvAjaxSlider.js** contains the implementation of the slider.
- **QvAjaxGraph.js** contains a prototype for client-side rendering of graphs.
- **QvAjaxCollaboration.js** is necessary to show collaboration objects.

Behaviors

Show / Hide

Used to show or hide an html element dependent on a value.

Example:

```
<div avq="show:.TX1650.Content@text:" style="left:
795.12pt; top: 100pt; width: 100pt; height: 50pt; back-
ground-color:Red; position:absolute;">
      <span>The respons for TX1650 now contains an empty
      'text' attribute</span>
</div>

<div avq="hide:.TX1650.Content@text:" style="left:
795.12pt; top: 200pt; width: 100pt; height: 50pt; back-
ground-color:Green; position:absolute;">
      <span>The respons for TX1650 now contains an non
      empty 'text' attribute</span>
</div>
```

If the text object isn't displayed in its generated form ".Content" can be omitted.

Label

Used to hide or show an html element dependent on if the object is visible in QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
<div avq="label:.TX1650" style="left: 795.12pt; top:
200pt; width: 100pt; height: 50pt; background-
color:Green; position:absolute;">
      <span>If TX1650 is hidden by qlikview this element
      will be hidden as well</span>
</div>
```

Link

Used to create links by combining text from QlikView objects and static text.

After the first colon there is a non mandatory object that is only used to show or hide the element.

Everything in between a $ pair is replaced by the object's text.

Example:

```
<button avq="link:.TX1650:http://$.TX1650.Content$/
$.TX1651.Content$" style="left: 795.12pt; top: 100pt;
width: 43pt; height: 27.16pt;position:absolute; text-dec-
oration:underline;">link
      </button>
```

20.6 Using section access with QlikView AJAX ZFC

This section describes how to use section access with QlikView USERID and PASSWORD together with QlikView AJAX ZFC. This functionality requires the use of QlikView Server 7.52 or later.

URL parameters for section access

The QlikView AJAX ZFC has no provisions for displaying log-in dialogs for QlikView section access USERID and PASSWORD. It is possible, however, to send section access USERID and/or PASSWORD as URL parameters. The syntax is:

```
   http:// pagename [?paramname=paramvalue{&param-
name=paramvalue}]
```

where

pagename is a URL pointing at the HTML page defining the QlikView AJAX ZFC document.

paramname := (USERID | XUSERID | PASSWORD | XPASSWORD)

USERID denotes a section access USERID in clear text

XUSERID denotes a scrambled section access USERID

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PASSWORD denotes a section access password in clear text

XPASSWORD denotes a scrambled section access password

paramvalue is a valid value for each parameter.

Example:

```
http://www.santa.gov/QVpresentplanner.htm?USE-
RID=Santa&PASSWORD=dec25
```

Note There is a known bug in QlikView Server 7.52 that requires the XUSERID and XPASSWORD parameter names to be specified as lower case (as xuserid and xpassword). This has been corrected in version 8 to be case insensitive.

Scrambling passwords with QvScrambler.dll

In order to convert unscrambled user IDs and passwords into the scrambled versions XUSERID and XPASSWORD, the QvScrambler.dll is provided by the QlikView Server installation. An example using the QvScrambler.dll follows:

```
<html>
 <head>
  <title>Extended Security Demo</title>
 </head>
 <body bgcolor="#eaeaea" >
<%
 QVSName = Request.ServerVariables ("SERVER_NAME")
 userid = Request("userid")
if userid="" then userid = "ADMIN" end if
password = ""
if userid="ADMIN" then password = "ADMIN" end if
if userid="HAKAN" then password = "WOLGE" end if
if userid="LARS" then password = "ANDERSSON" end if
if Request("client_type")<>"" then
     redirect_url = ""
    if Request("client_type")="plugin" then redirect_url =
"qvp://" & QVSName & "/StationsAndLines.qvw?IIS_AUTHENTICATE="
  if Request("client_type")="zfp" then redirect_url = "Station-
sAndLines.html?userid="
    if Request("client_type")="java" then redirect_url = "Sta-
tionsAndLines.java.asp?userid="
set ntsecurity = Server.CreateObject ("QVSNTSecurity.QlikNTLia-
son")
    token = ntsecurity.LogCustomValidatedSession
(Request.ServerVariables ("REMOTE_ADDR"), userid)
Response.Redirect (redirect_url & token)
end if
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
set scrambler = Server.CreateObject ("QvScrambler.ScrambleUn-
scramble")
xuserid = scrambler.Scramble (userid)
 xpassword = ""
if not password="" then xpassword = scrambler.Scramble (pass-
word) end if
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
%>
  <form name="input" action="StationsAndLines.asp"
method="get">
   Username:
   <select name="userid" onchange="input.submit()"
   value="<%=userid%>">
    <option value="ADMIN" <%if userid="ADMIN" then
Response.Write("selected") end if%> >ADMIN</option>
    <option value="HAKAN" <%if userid="HAKAN" then
Response.Write("selected") end if%> >HAKAN</option>
    <option value="LARS" <%if userid="LARS" then
Response.Write("selected") end if%> >LARS</option>
    <option value="BAKERLOO" <%if userid="BAKERLOO" then
Response.Write("selected") end if%> >BAKERLOO</option>
    <option value="CENTRAL" <%if userid="CENTRAL" then
Response.Write("selected") end if%> >CENTRAL</option>
    <option value="CIRCLE" <%if userid="CIRCLE" then
Response.Write("selected") end if%> >CIRCLE</option>
    <option value="DISTRICT" <%if userid="DISTRICT" then
Response.Write("selected") end if%> >DISTRICT</option>
    <option value="EAST" <%if userid="EAST" then
Response.Write("selected") end if%> >EAST</option>
    <option value="HAMMERSMITH" <%if userid="HAMMERSMITH" then
Response.Write("selected") end if%> >HAMMERSMITH</option>
    <option value="JUBILEE" <%if userid="JUBILEE" then
Response.Write("selected") end if%> >JUBILEE</option>
    <option value="METROPOLITAN" <%if userid="METROPOLITAN"
then Response.Write("selected") end if%> >METROPOLITAN</option>
    <option value="NORTHERN" <%if userid="NORTHERN" then
Response.Write("selected") end if%> >NORTHERN</option>
    <option value="PICCADILLY" <%if userid="PICCADILLY" then
Response.Write("selected") end if%> >PICCADILLY</option>
    <option value="VICTORIA" <%if userid="VICTORIA" then
Response.Write("selected") end if%> >VICTORIA</option>
    <option value="WATERLOO" <%if userid="WATERLOO" then
Response.Write("selected") end if%> >WATERLOO</option>
   </select>
  </form>
  <p>
   <a href="qvp://<%=QVSName%>/StationsAndLines.qvw?use-
rid=<%=userid%><%if password<>"" then Response.Write("&pass-
word=" & password) end if%>">
    Open plug-in with userid <%=userid%><%if password<>"" then
Response.Write(" and password " & password) end if%>
   </a>
  </p>
  <p>
   <a href="qvp://<%=QVSName%>/StationsAndLines.qvw?xuse-
rid=<%=xuserid%><%if xpassword<>"" then Response.Write("&xpass-
word=" & xpassword) end if%>">
  Open plug-in with xuserid <%=xuserid%><%if xpassword<>"" then
Response.Write(" and xpassword " & xpassword) end if%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.asp?userid=<%=use-
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
rid%>&client_type=plugin">
    Open plug-in using "QVSNTSecurity.QlikNTLiason" with userid
<%=userid%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.java.asp?userid=<%=userid%><%if
password<>"" then Response.Write("&password=" & password) end
if%>">
    Open QlikWeb with userid <%=userid%><%if password<>"" then
Response.Write(" and password " & password) end if%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.java.asp?xuserid=<%=xuserid%><%if
xpassword<>"" then Response.Write("&xpassword=" & xpassword)
end if%>">
    Open QlikWeb with xuserid <%=xuserid%><%if xpassword<>""
then Response.Write(" and xpassword " & xpassword) end if%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.asp?userid=<%=use-
rid%>&client_type=java">
    Open QlikWeb using "QVSNTSecurity.QlikNTLiason" with userid
<%=userid%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.html?userid=<%=userid%><%if pass-
word<>"" then Response.Write("&password=" & password) end
if%>">
    Open ZFP with userid <%=userid%><%if password<>"" then
Response.Write(" and password " & password) end if%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.html?xuserid=<%=xuserid%><%if
xpassword<>"" then Response.Write("&xpassword=" & xpassword)
end if%>">
    Open ZFP with xuserid <%=xuserid%><%if xpassword<>"" then
Response.Write(" and xpassword " & xpassword) end if%>
   </a>
  </p>
  <p>
   <a href="StationsAndLines.asp?userid=<%=use-
rid%>&token_type=userid_token&client_type=zfp">
    Open ZFP using "QVSNTSecurity.QlikNTLiason" with userid
<%=userid%>
   </a>
  </p>
 </body>
</html>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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20.7 Capabilities, differences and limitations

This section describes some of the technical differences and limitations with QlikView AJAX ZFC in relation to other QlikView Server clients.

Sheet Objects supported

The following types of sheet objects are currently supported to a smaller or larger extent in the QlikView AJAX ZFC:

- List box
- Multi box
- Table Box
- Straight Table
- Pivot Table
- Bitmap charts
- Bookmark Object
- Current Selections Box
- Input Box
- Button
- Text Object
- Line/arrow Object
- Statistics box
- Slider/Calendar object

The following types of sheet objects are not supported in the QlikView AJAX ZFC and are very unlikely to ever be supported:

- Custom Object

QlikView entities with partial support

The following QlikView entities currently have partial support in the QlikView AJAX ZFC environment:

- Sheets (there is no direct connection available to the sheets in the QVW document, but it is very easy to create the same functionality using HTML frames and tabs). User selection state is maintained throughout a single browser session.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Other QlikView entities not supported

The following QlikView entities currently have no counterpart in the QlikView AJAX ZFC environment but may appear in some form in future versions:

- Alerts
- Reports

Navigational differences

There are a few differences in the GUI facing users of QlikView AJAX ZFC compared to users of other types of QlikView clients. Primarily, this is reflected in the fact that there is no menu bar, as in the exe clients.

Print/Export

The following general comments can be made with regard to print and export of objects and data when using the QlikView AJAX ZFC

Functionality supported includes:

- The HTML page can be printed by using the Print command in MS Internet Explorer. The usual rules and limitations regarding MS IE printing apply.
- Chart images can be copied to clipboard or saved as any other pieces of graphics on a web page.
- Button-driven server-side export providing results in a new MS Internet Explorer window. Same functionality as can be found in the existing QlikView Java clients.

Caption icons can be utilized in object captions for additional functionality.

APIs and integration

QlikView AJAX ZFC builds on HTML. This implies certain limitations with regard to programmatic access and integration

- Automation APIs cannot be used
- No real client side APIs are available. It may be possible in the future to access data stored client-side in QlikView AJAX ZFC elements via scripting.
- Note however that
- Server side macros can be executed via buttons

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- The HTML elements of QlikView AJAX ZFC can co-exist with all other types of web page components on a common HTML page. That includes other QlikView clients (e.g. QVA for IE plug-in, including QlikX components) and all types of ActiveX controls. Interaction between QlikView AJAX ZFC and the other components will however be limited.

20.8 ASP timeouts for very large QlikView documents

When using the QlikView AJAX ZFC with large QlikView documents, the asp code might sometimes require that you increase the asp timeout. This can be made in two ways, either programmatically or by customizing the IIS.

- By setting the Server.ScriptTimeout property in your code, such as: <%Server.ScriptTimeout = 180 %>, where the numeric value is the number of seconds that the current script will be executed.
- To set the timeout in the IIS, open the **IIS Management Console**, open **Properties** for the folder containing the asp code, go to the **Directory** or **Virtual Directory** page (depends on what type of folder you use), press the **Configuration** button to open the **Application Configuration** dialog, go to the **Options** page where you find the edit box for the **ASP Script Timeout**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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21 CONSIDERATIONS WHEN DEVELOPING DOCUMENTS FOR USE WITH QLIKVIEW SERVER

21.1 General

The QlikView Server will read all qvw files created by QlikView 6.0 and later. Files with older file formats must be converted to a newer before used with the QlikView Server.

21.2 General limitations when working from clients

Regardless which client you use there are some things you cannot do when working with a document opened through QlikView server:

- You cannot create new documents
- You cannot access or execute the script
- You cannot add sheets.
- You cannot access sheet or sheet object properties of non-shared objects
- You cannot access or change the macro module
- You cannot save changes to the document, beyond shared objects

21.3 Limitations in Java clients layout functionality

Some features in QlikView 8 are not supported in the Java Clients. Apart the limitations mentioned above there are a number of layout features currently not supported in the Java clients:

- Chart animations not supported
- Custom objects are not supported
- Pictures in list box cells are not supported
- Dynamic (calculated) text on sheet tabs not available

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- Dynamic (calculated) color on sheet tabs not available
- It is not possible to Copy or Paste sheet objects
- It is not possible to access the QlikView sheet objects via ODBC
- No Scroll control for predefined values in input box
- Multi line text wrapping cannot be used in multi boxes
- Launch/Export buttons have no function
- Info returning other items than text and URL's are not supported
- Use of VBScript is restricted. (See 9.5).

21.4 Font Mapping in Java clients

Font mapping in the Java Clients has improved dramatically over previous version, but there may still exist minor differences in the way sheet objects are presented on the screen in standard QlikView and in the Java client. This is mainly due to the fact that the rendering of the screen objects are not handled by Windows in the Java environment. Windows and Java may handle font sizes slightly differently in terms of actual size on screen and when the size has to be rounded.

TIP: It is strongly recommended that you always test any application in the QlikView Server together with the browser(s) that you intend to use, before commissioning.

21.5 Performance Considerations

Response time and memory usage both on the server and on the client can depend heavily on how your application is designed. Below are a few tips to bear in mind when building your application:

1. Each open chart and table will require extra memory in the server for each user connected. Minimized charts/tables as well as charts/tables not on the active sheet do not require extra memory. Each open chart/table must also be recalculated on the server after each change in the logical state, which could prolong response times. Therefore avoid opening charts and tables when it is not necessary, or try to spread them over several sheets.
2. Large bitmap pictures in sheet backgrounds or text objects may cause delays, as they have to be transferred from the server to the client. The bitmaps are compressed during transfer and are only transferred once per session, but nevertheless can cause substantial amount of data to be moved. Consider using colored sheet back-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ground and text objects with opaque background for better performance. If you have to use bitmap sheet backgrounds, it is more efficient to apply one background on application level than assigning the same background to each sheet.

3 Very small (e.g. 1x1 pixel) tiled background bitmaps can greatly reduce performance on the client, as they have to be rendered repeatedly by the Java Virtual Machine. Rather use medium size (e.g. 20x20 pixel) tiles or colored sheet background.

21.6 Considerations when using macros in QV documents on the QlikView Server

Macros on QlikView Server

QlikView Server can execute macros in QlikView documents. Due to client-server environment some considerations must be taken when using macros.

Macro trigger limitations

Macro triggers may or may not work with the various client types. The table below summarizes the situation.

 Trigger will work as usual.

 Trigger is not to be used as they lack meaning or may cause unexpected results.

 Trigger lacks meaning with this type of client.

Trigger	Windows clients	Java client	Java Objects client
Document.OnAnySelect			
Document.OnClose			
Document.OnOpen			
Document.OnPostReduceData			
Document.OnPostReload			

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Trigger	Windows clients	Java client	Java Objects client
Document.OnToolbarMacro1			
Document.OnToolbarMacro2			
Document.OnToolbarMacro3			
Field.OnSelect			
Field.OnChange			
Field.OnLock			
Field.OnUnlock			
Sheet.OnActivateSheet			
Sheet.OnLeaveSheet			
SheetObject.OnActivate			
SheetObject.OnDeActivate			
Variable.OnChange			
Variable.OnInput			

Macro functionality limitations

The type of functionalities that will normally work well in macros in the QlikView Server environment are summarized in the table below:

 Will work as usual.

 Will not work.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

 May work.

Type of macro operation	Windows clients	Java client	Java Objects client
Logical operations such as Clear Selections or selections of field values.			
Operations changing variable values			
Layout operations acting on the properties of sheets and sheet objects, including minimization/ restoration of sheet objects.			
Operations changing document or user settings			
Creation of sheets or sheet objects			
All operations related to the script, including Reload			
Data reduction operations, e.g. ReduceData			
Operations such as Save and Open document			

VBScript functions

VBScript functions defined in the module of a QlikView document will generally work well on QlikView Server. General functionality limitations as defined in the previous section apply.

Server-side export

It is possible to export the content of any chart to a text file on the server through the use of macro automation. This feature has to be added in the QlikView document and then the Macro can be executed from the QlikView Server directly in the web browser.

Below you will find a sample of VB Script code used in the Edit Module in QlikView for making the export possible. The macro is then connected to a trigger, for example, a button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
Sub ServerExport
  Set st = ActiveDocument.GetSheetObject("CH20")
  st.ServerSideExport "C:\Program
Files\QlikView\Server\CH20export.skv" , ";" ,0
End Sub
```

As the button is clicked, the contents of the Straight Table CH20 can be exported as a text file to the specified directory on the QlikView Server machine.

21.7 Security and Access restriction

It is important that information is distributed only to those with access rights to it. Since QlikView makes the previously cumbersome process of retrieving information a very simple task, it is obvious that an access restriction mechanism is necessary. This can be done when creating the application. For more information on this, see the QlikView reference manual.

When a QlikView document is published on a QlikView Server, it is just as important to protect confidential data and prevent unauthorized access as it is when running the standard QlikView. QlikView Server therefore supports all security features built into QlikView. In addition, it is possible to use the Windows NT file security or DMS authorization to control access to specific documents. This can be done also without using any of the QlikView built-in security features.

QlikView File Security

QlikView and QlikView server can be instructed to test for a number of user properties before letting the user open a document. (For more information on this, see the QlikView reference manual.) Possible fields are:

USERID: A field that should contain a valid user ID. The client will open a dialog asking for user ID.

PASSWORD: A field that should contain a valid password. The client will open a dialog asking for Password.

SERIAL: A field that should contain a number corresponding to the QlikView serial number. The server will check the Server Serial Number and compare that to the valid ones listed in the QlikView document. In other words, the Serial Number check is a very blunt security instrument for documents that are to be published: Any client will be allowed to open a document on the valid server.

NTNAME: A field that should contain a string corresponding to a Windows NT Domain user name or group name. The server will ask the operating sys-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

tem if the user named in the QlikView document corresponds to the user logged on, or to a group to which the logged on user belongs.

NTDOMAINSID: A field that should contain a string corresponding to a Windows NT Domain SID. The server will ask the operating system if the Windows NT Domain named in the QlikView document corresponds to the Domain to which the logged on user belongs.

NTSID: A field that should contain a Windows NT SID. The server will ask the operating system if the NT SID named in the QlikView document corresponds to the NT SID of the user logged on, or to a group to which the logged on user belongs.

Only if all the required tests are passed, will the user be able to open the document.

The Windows File security described above and the three last tests are of course very similar. The difference is that for the former, the security information is fetched from the file system, whereas for the latter, it is fetched from within the QlikView file. Both are, however, compared to the logon information from the operating system.

Dynamic Data reduction

QlikView Web Server supports a feature that can hide some part of the data (field values) in a document from the user based on the login information. Only the information that the user has the right to see will be shown.

The selection of values to be shown is controlled by means of having one or more fields with common names in the data and in the access restriction data. Only the field values logically connected to the user logged on will be shown.

This is a very efficient way to hide information to which the user does not have access.

For more information on how to build such an application, see the QlikView reference manual.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART III: JAVA CLIENT APIS

- **Java applet API**
- **HTML page script API**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

22 JAVA APPLET API

22.1 General provisions for the API

General

The Java applet API exposes a large sub-set of the functionality of the QlikView Automation API for access from other Java applets on a web page. Compared to the script API (see next chapter below) this API offers considerably richer functionality and better performance.

Disclaimer

The Java applet API was introduced with version 7.51 of QlikView Server. Not all parts have tested in detail. It is likely that some classes will be added to and deleted from the API in future releases.

22.2 Documentation and examples

- An HTML documentation of all available classes and methods can be found in the folder **`C:\Program files\QlikView\Documentation\Java API`** after installing QlikView Server 7.51 or later.
- A small Java code example accessing the API can be found in the same folder.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23 HTML PAGE SCRIPT API

23.1 General Specifications for the script API

General

This part of the documentation provides a systematic description of the API (Application Programming Interface) of the full document Java applet (QlikView Java Client) and of the object Java applet (QlikView Java Objects Client).

Programming languages

The examples in this documentation are written in ASP, HTML and JavaScript. This documentation is, however, not a manual for these scripting languages. The reader is expected to possess a basic knowledge of ASP, HTML and JavaScript programming.

Style coding

In this documentation all menu commands and dialog options are shown in **Arial bold**. All file names and paths are shown in **`Courier Bold`**. Sample code is shown in **`Courier Bold`**.

23.2 General provisions

- All functions block until the operation has been performed.
- All parameters must be strings in order to guarantee proper results in all browsers. This means that e.g. a column index 3 should be stated as "3".

23.3 Error handling

On any error the Int functions return –1 (minus one) and the string functions return the zero length String "" (which is often translated into null by JavaScript).

23.4 Provisions for examples

All examples under the function descriptions below assume the following:

- The current document contains a QlikView Java Objects master applet named QlikDocument.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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23.5 QlikView Java / QlikView Java Objects script API function summary

Member	Comment
clearAll	Clears all the selections for this application.
clickButton	Activates a button.
getCaption	Returns the caption of any specified object.
getCellValue	Returns the contents of a specified cell in a table.
getColCount	Returns the number of columns for table boxes and straight tables and the number of data columns for pivot tables.
getColLabel	Returns the label for a specified column in a table box or straight table.
getLabel	Returns the label for a specified column in a table box or straight table and for a specified column and row in a pivot table.
getLabelColCount	Returns the number of label columns to the left of the data columns in a pivot table.
getLabelRowCount	Returns the number of label rows above the data rows in a pivot table.
getListState	Returns the state of a specific row in a list box or multi box field.
getListValue	Returns the value from a specific row in a list box or multi box field.
getOptionalCount	Returns the number of optional values in a list box or multi box field.
getRowCount	Returns the number of data rows for table boxes, straight tables and pivot tables.
getSelectedCount	Returns the number of selected values in a list box or multi box field.
getStateCount	Returns the number of values that match the given state in a list box or multi box field.
getStateValues	Returns the values that match the given state in a list box or multi box field.
getTextValue	Returns the current text from a text object.
Redo	Reapplies a previously undone selection action.
runMacro	Executes a macro on the QlikView document at the server.
searchSelect	Makes a selection in a list box or multi box field based on a search string.
searchToggle	Toggles a selection in a list box or multi box field based on a search string.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Member	Comment
Undo	Undoes the last selection action.

23.6 Function descriptions

clearAll

Clears all the selections for this application

ParameterNo	Parameter	Type	Direction	Comment
return value	-	-	-	No return value
1	locked	String	in	If non-zero, all locked selections will be cleared too

Example of use :

```
<FORM id=DocFrm name=DocFrm>
      <INPUT type=button id=ClearAllBtn name=ClearAllBtn
      value=ClearAll onclick="doClearAll()">
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doClearAll()
      {
      document.QlikDocument.clearAll("0");
      }
</SCRIPT>
```

clickButton

Activates a button.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	string	-	URL to load if the button's activation should result in the loading of a new URL
1	buttonId	string	in	QlikView Object ID of button

Example of use :

```
<FORM id=ButtonFrm name=ButtonFrm>
      <INPUT type=button id=ButtonBtn name=ButtonBtn value=But-
      ton onclick="doButton ()">
      <INPUT type=text size=20 maxlength=20 id=ButtonCell
      name=ButtonCell readonly>
      </FORM>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
<SCRIPT LANGUAGE=JavaScript>
function doButton()
	{
	var frm = document.ButtonFrm;
	frm.ButtonCell.value = document.QlikDocument.clickBut-
	ton("BU01");
	}
</SCRIPT>
```

getCaption

Returns the caption of any specified object.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	string	-	Value of caption returned
1	objID	string	in	QlikView Object ID

Example of use :

```
<FORM id=frm name=frm>
<input type=button value="get caption" onClick="getCap()">
	<input type=text name=result>
</FORM>
<SCRIPT language=javascript>
function getCap()
	{
	frm.result.value = document.QlikDocument.getCap-
	tion("LB01");
	}
</SCRIPT>
```

getCellValue

Returns the contents of a specified data cell in a table.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	string	-	Text contents of data cell returned
1	gridID	string	in	QlikView Object ID of table box, straight table or pivot table
2	col	string	in	A number indicating column index (0 based)
3	row	string	in	A number indicating row index (0 based)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example of use :

```
<FORM id=TableFrm name=TableFrm>
      Column: <INPUT type=text size=5 maxlength=5 id=TableCell-
      Col name=TableCellCol value=1>
      Row: <INPUT type=text size=5 maxlength=5 id=TableCellRow
      name=TableCellRow value=1>
      <INPUT type=button id=TableCellBtn name=TableCellBtn
      value=Cell onclick="doTableCell()">
      <INPUT type=text size=20 maxlength=20 id=TableCell
      name=TableCell readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doTableCell()
      {
      var frm = document.TableFrm;
      frm.TableCell.value = document.QlikDocument.getCell-
      Value("TB01",
      frm.TableCellCol.value, frm.TableCellRow.value);
      }
</SCRIPT>
```

getColCount

Returns the number of columns for table boxes and straight tables and the number of data columns for pivot tables.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of data columns returned
1	gridID	string	in	QlikView Object ID of table box, straight table or pivot table

Example of use :

```
<FORM id=TableFrm name=TableFrm>
      <INPUT type=button id=TableRowBtn name=TableColBtn
      value=Cols onclick="doTableCols()">
      <INPUT type=text size=5 maxlength=5 id=TableCols
      name=TableCols readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doTableCols()
      {
      document.TableFrm.TableCols.value = document.QlikDocu-
      ment.getColCount("TB01");
      }
</SCRIPT>
```

getColLabel

Returns the label for a specified column in a table box or straight table.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	string	-	Column label returned

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ParameterNo	Parameter	Type	Direction	Comment
1	tableID	string	in	QlikView Object ID of table box, straight table or pivot table
2	col	string	in	A number indicating column index (0 based)

Example of use :

```
<FORM id=StraightFrm name=StraightFrm>
      Column: <INPUT type=text size=5 maxlength=5 id=Straight-
      LabelCol name=StraightLabelCol value=1>
      <INPUT type=button id=StraightLabelBtn name=StraightLa-
      belBtn value=Label onclick="doStraightLabel()">
      <INPUT type=text size=20 maxlength=20 id=StraightLabel
            name=StraightLabel readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doStraightLabel()
      {
      var frm = document.StraightFrm;
      frm.StraightLabel.value =
      document.QlikDocument.getColLabel("CH01", frm.Straight-
      LabelCol.value);
      }
</SCRIPT>
```

getLabel

Returns the label for a specified column in a table box or straight table and for a specified column and row in a pivot table.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	string	-	Column label returned
1	tableID	string	in	QlikView Object ID of table box, straight table or pivot table
2	col	string	in	A number indicating column index (0 based)
3	row	string	in	A number indicating row index (0 based)

Example of use :

```
<FORM id=PivotFrm name=PivotFrm>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
      Column: <INPUT type=text size=5 maxlength=5 id=PivotLa-
      belCol
            name=PivotLabelCol value=0>
      Row: <INPUT type=text size=5 maxlength=5 id=PivotLabelRow
            name= PivotLabelRow value=0>
      <INPUT type=button id=PivotLabelBtn name=PivotLabelBtn
            value=Label onclick="doPivotLabel()">
      <INPUT type=text size=20 maxlength=20 id=PivotLabel
            name=PivotLabel readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doPivotLabel() {
      var frm = document.PivotFrm;
      frm.PivotLabel.value =
      document.QlikDocument.getLabel("CH01", frm.PivotLabel-
      Col.value, frm.PivotLabelRow.value);
      }
</SCRIPT>
```

getLabelColCount

Returns the number of label columns to the left of the data columns in a pivot table. If used on a straight table or table box always returns 0.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of label columns returned
1	gridID	string		QlikView Object ID of table box, straight table or pivot table

Example of use :

```
<FORM id=PivotFrm name=PivotFrm>
      <INPUT type=button id=PivotLabelColBtn name=PivotLabel-
      ColBtn
            value=Label onclick="doPivotLabelColCount()">
      <INPUT type=text size=20 maxlength=20 id=LabelColCount
            name=LabelColCount readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doPivotLabelColCount()
      {
      var frm = document.PivotFrm;
      frm.LabelColCount.value =
      document.QlikDocument.getLabelColCount("CH01");
      }
</SCRIPT>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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getLabelRowCount

Returns the number of label rows above the data rows in a pivot table. If used on a straight table or table box always returns 1.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of data rows returned
1	gridID	string		QlikView Object ID of table box, straight table or pivot table

Example of use :

```
<FORM id=PivotFrm name=PivotFrm>
      <INPUT type=button id=PivotLabelRowBtn name=PivotLabel-
      RowBtn
            value=Label onclick="doPivotLabelRowCount()">
      <INPUT type=text size=20 maxlength=20 id=LabelRowCount
            name=LabelRowCount readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doPivotLabelRowCount()
      {
      var frm = document.PivotFrm;
      frm.LabelRowCount.value =
      document.QlikDocument.getLabelRowCount("CH01");
      }
</SCRIPT>
```

getListState

Returns the state of a specific row in a list box or multi box field.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	int	-	Field state returned
1	listID	string	in	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)
2	index	string	in	Number indicating the index (0 based) of the requested field value in the field shown in the list box

Example of use :

```
<FORM id=ListFrm name=ListFrm>
```


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```
      State: <INPUT type=text size=5 maxlength=1 id=GetNState
            name=GetNState value=1>
      <INPUT type=button id=GetStateBtn name=GetStateBtn
      value=Get onclick="doGetNthState()">
      <INPUT type=text size=20 maxlength=20 id=GetNthState
      name=GetNthState readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetNthState()
      {
      var frm = document.ListFrm;
      frm.GetNthState.value = document.QlikDocument.getList-
      State("LB05",
      frm.GetNState.value);
      }
</SCRIPT>
```

getListValue

Returns the field value from a specific row in a list box or multi box field.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	string	-	Field value returned
1	listID	string	in	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)
2	index	string	in	Number indicating the index (0 based) of the requested field value in the field shown in the list box

Example of use :

```
<FORM id=ListFrm name=ListFrm>
      Row: <INPUT type=text size=5 maxlength=5 id=GetN
      name=GetN value=1>
```


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```
      <INPUT type=button id=GetBtn name=GetBtn value=Get
            onclick="doGetNth()">
      <INPUT type=text size=20 maxlength=20 id=GetNth name=Get-
      Nth readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetNth()
      {
      var frm = document.ListFrm;
      frm.GetNth.value = document.QlikDocument.getList-
      Value("LB05", frm.GetN.value);
      }
</SCRIPT>
```

getOptionalCount

Returns the number of optional values in a list box or multi box field.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of optional field values returned
1	listID	string	in	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)

Example of use :

```
<FORM id=ListFrm name=ListFrm>
      <INPUT type=button id=OptionalBtn name=OptionalBtn
      value=Optional onclick="doGetOptional()">
      <INPUT type=text size=5 maxlength=5 id=GetCount name=Get-
      Count readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetOptional()
      {
      document.ListFrm.GetCount.value = document.QlikDocu-
      ment.getOptionalCount("LB05");
      }
</SCRIPT>
```


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getRowCount

Returns the number of field values for a field in a list box or multi box and the number of data rows for a table box, straight table and pivot tables.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of data rows in table returned
1	objectID	string	in	Either the QlikView Object ID of a list box , table box, straight table or pivot table (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)

Examples of use :

```
<FORM id=ListFrm name=ListFrm>
      <INPUT type=button id=CardinalBtn name=CardinalBtn
      value=Cardinal onclick="doGetCardinal()">
      <INPUT type=text size=5 maxlength=5 id=GetCount name=Get-
      Count readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetCardinal()
      {
      document.ListFrm.GetCount.value = document.QlikDocu-
      ment.getRowCount("LB05");
      }
</SCRIPT>
<FORM id=StraightFrm name=StraightFrm>
      <INPUT type=button id=StraightRowsBtn name=StraightRows-
      Btn value=Label onclick="doStraightRows()">
      <INPUT type=text size=20 maxlength=20 id=StraightRows
            name=StraightRows readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doStraightRows()
      {
      document.StraightFrm.StraightRows.value = document.Qlik-
      Document.getRowCount("CH01");
      }
</SCRIPT>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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getSelectedCount

Returns the number of selected values in a list box or multi box field.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of selected field values returned
1	ListID	string	in	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)

Example of use :

```
<FORM id=ListFrm name=ListFrm>
      <INPUT type=button id=SelectedBtn name=SelectedBtn
      value=Selected onclick="doGetSelected()">
      <INPUT type=text size=5 maxlength=5 id=GetCount name=Get-
      Count readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetSelected()
      {
      document.ListFrm.GetCount.value = document.QlikDocu-
      ment.getSelectedCount("LB05");
      }
</SCRIPT>
```

getStateCount

Returns the number of values with the given state in a list box or multi box field.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	integer	-	Number of field values with this state returned
1	ListID	string	in	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)
2	state	String	in	A number representing the state to be counted

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example of use :

```
<FORM id=ListFrm name=ListFrm>
      State: <INPUT type=text size=5 maxlength=1 id=GetCount-
      State
            name=GetCountState value=1>
      <INPUT type=button id=StateCountBtn name=StateCountBtn
      value=Count onclick="doGetStateCount()">
      <INPUT type=text size=5 maxlength=5 id=GetStateCount
            name=GetStateCount readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetStateCount()
      {
      var frm = document.ListFrm;
      frm.GetStateCount.value = document.QlikDocument.get-
      StateCount("LB05",
      frm.GetCountState.value);
      }
</SCRIPT>
```

getStateValues

Returns the number of values with the given state in a list box or multi box field.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	String	-	String containing all the values that have this state value. They are separated by a pipe (“|”) character.
1	ListID	string	In	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)
2	state	String	In	A number representing the state to be counted

Example of use :

```
<FORM id=ListFrm name=ListFrm>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
      State: <INPUT type=text size=5 maxlength=1 id=GetVal-
      uesState
            name=GetValuesState value=1>
      <INPUT type=button id=StateValuesBtn name=StateValuesBtn
            value=Values onclick="doGetStateValues()">
      <INPUT type=text size=5 maxlength=5 id=Values name=Values
            readonly>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doGetStateValues()
      {
      var frm = document.ListFrm;
      frm.Values.value = document.QlikDocument.getStateVal-
      ues("LB05",
      frm.GetValuesState.value);
      }
</SCRIPT>
```

getTextValue

Returns the current text from a text object.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	String	-	Text in text object returned
1	textID	String	in	The QlikView Object ID of a text object
(e.g. “TX01”)				

Example of use :

```
<FORM id=ListFrm name=ListFrm>
      <INPUT type=text size=10 maxlength=10 id=MyTxt name=MyTxt
      value="">
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function getText()
      {
      document.ListFrm.MyTxt.value = document.QlikDocu-
      ment.getTextValue("TX02");
      }
</SCRIPT>
```

redo

Reapplies a previously undone selection action.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	-	-	No return value

Example of use :

```
<FORM id=ListFrm name=ListFrm>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
	<INPUT type=button id=RedoBtn name=RedoBtn value=Redo
		onclick=″doRedo()″>
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doRedo()
	{
	document.QlikDocument.redo();
	}
</SCRIPT>
```

runMacro

Executes a macro defined in the QlikView document macro module.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	-	-	No return value
1	MacroName	string	in	QlikView macro name

Example of use :

```
<FORM id=ListFrm name=ListFrm>
	<INPUT type=button id=MacroBtn name=MacroBtn
	value=MyMacro onclick="doMacro()">
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doMacro()
	{
	document.QlikDocument.runMacro("MyMacro");
	}
</SCRIPT>
```

searchSelect

Makes a selection in a list box or multi box field based on a search string.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	-	-	No return value
1	listID	String	in	Either the QlikView Object ID of a list box (e.g. “LB01”) or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. “MB01,1”)
2	pattern	String	in	A text matching pattern (e.g. “*t*”)

Example of use :

```
<FORM id=ListFrm name=ListFrm>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
	<INPUT type=text size=10 maxlength=10 id=SearchTxt
	name=SearchTxt value="*t*">
	<INPUT type=button id=SelectBtn name=SelectBtn
	value=Select onclick="doSelect()">
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doSelect()
	{
	document.QlikDocument.searchSelect("LB05",
	document.ListFrm.SearchTxt.value);
	}
</SCRIPT>
```

searchToggle

Toggles a selection in a list box or multi box field based on a search string.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	-	-	No return value
1	listID	string	in	Either the QlikView Object ID of a list box (e.g. "LB01") or the QlikView Object ID of a multi box followed by a comma and a numeric index (zero-based) indicating a specific field row in the multi box (e.g. "MB01,1")
2	pattern	string	in	A text matching pattern (e.g. "*t*")

Example of use :

```
<FORM id=ListFrm name=ListFrm>
	<INPUT type=text size=10 maxlength=10 id=SearchTxt
	name=SearchTxt value="*t*">
	<INPUT type=button id=ToggleBtn name=ToggleBtn value=Tog-
	gle onclick="doToggle()">
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doToggle()
	{
	document.QlikDocument.searchToggle("LB05",
	document.ListFrm.SearchTxt.value);
	}
</SCRIPT>
```

undo

Undoes the last selection action.

ParameterNo	Parameter	Type	Direction	Comment
return value	-	-	-	No return value

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example of use :

```
<FORM id=ListFrm name=ListFrm>
      <INPUT type=button id=UndoBtn name=UndoBtn value=Undo
            onclick="doUndo()">
</FORM>
<SCRIPT LANGUAGE=JavaScript>
function doUndo()
      {
      document.QlikDocument.undo();
      }
</SCRIPT>
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

198

APPENDICES

- **QlikView Java FAQ**
- **QlikView plug-in FAQ**
- **MS Windows Installer - MSI Packages**
- **Deploying MSI Packages with Group Policies**
- **QlikView Server Script API**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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200

1 APPENDIX A - QLIKVIEW JAVA FAQ

This appendix attempts to answer some of the most common questions with regard to the QlikView Java client solutions.

Java basics

Q: Is all Java the same?

A: No, apart from different versions of Java (1.5, 1.6 etc) there are several different uses of the Java language. One should at least differentiate between:

- JavaScript which is a scripting language for web pages etc
- Java applets (e.g. QlikView Java clients) which are programs run inside a Java

  Runtime Environment in a browser.
- Java programs which are self-contained applications written

  in Java as opposed to e.g. VB or VC++.

Q: What is a Java Runtime Environment (JRE)?

A: The JRE is a plug-in to an internet browser which creates a "sandbox" for running applets written in Java inside the browser. The applets have no access to the machine on which they are running outside the JRE.

Java versions

Q: Which Java versions are compatible with QlikView Java clients?

A: Sun Java 1.5 or 1.6

QlikTech Java support

Q: Will all new features in QlikView be implemented in the QlikView Java clients?

A: Some will and some will not, depending on technical considerations.

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Q: What does QlikTech recommend users who for some reasons do not want to deploy or continue using the QlikView Java client solutions?

A: QlikView Analyzer or QlikView Analyzer for IE (plug-in) or QlikView AJAX ZFC

Common technical issues

Q: Sometimes when using the QlikView Java clients I get scrollbars where I should not have them. Why does a layout created in QlikView not look exactly the same in a QlikView Java client,?

A: The JVM is a separate entity from the hosting computer. It has its own graphics library and its own fonts, which differ from those used under Windows. Slight differences in font sizes and rounding errors can make a scrollbar to go on or off compared to how it looks under Windows.

Q: Isn't the behavior described in the previous question a bug which could be fixed by changing the program code?

A: Unfortunately not.

Q: Why can I not print/export directly from the QlikView Java client but have to go via an intermediate html page?

A: The JVM is a "sand-box" which for security reasons has no contact with the resources of the host computer. Therefore local printers and disks are not reachable from the Java applet.

Q: Is communication between QlikView Server and QlikView Java clients encrypted?

A: Not currently, unless you use https tunneling.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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2 APPENDIX B - QLIKVIEW PLUG-IN FAQ

This appendix attempts to answer some of the most common questions with regard to the QlikView plug-in client, QlikView Analyzer for Internet Explorer.

Plug-in basics

Q: What is a plug-in?

A: A program hosted by and running inside a web browser. Typically-can ActiveX component with ocx as file extension.

QlikView Plug-in specifics

Q: What version of QlikView is provided as plug-in?

A: Professional level functionality.

Q: Does QlikView Analyzer for IE require a serial number?

A: No.

Q: Can QlikView Analyzer for IE be registered with a serial number?

A: No.

Q: Can QlikView Analyzer for IE open local files?

A: No.

Q: What can I do with QlikView Analyzer for IE?

A: Almost everything you can do with QlikView Professional except edit script and open local files.

Q: Will the QV plug-in work with other browsers than MS IE?

A: No.

Q: Are their plans to make the QV plug-in work with e.g. Netscape?

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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A: No, not at the moment.

Q: Is the plug-in and the standard QV OCX the same thing?

A: Kind of but not quite. The actual OCX is the same, but the shell each program is run under differs.

Q: Will QVA for IE work under MacOS?

A: No, this is Windows only!

Q: Will QVA for IE work under Linux?

A: No, this is Windows only!

Q: Will QVA for IE work under Windows 98?

A: No, Windows 2000 is the minimum requirement.

Installation and deployment issues

Q: How and when is the QVA for IE plug-in installed?

A: There are two basic ways/cases :

1 Clicking on a "download and install" link on a web page.

2 In organizations where individual users are not allowed to install new software on their computers, the sysadmin may create a so called "group policy" and "shoot out" the QVA for IE client to any set of computers in the directory.

Q: I get a message saying only administrators may install. What is wrong?

A: You do not have the necessary permissions to install new software on your computer (see case 3 above). Contact your sysadmin.

Q: What is written to disk when I install?

A: The following:

1 **`QlikOCX.ocx`** under **`\Program Files\Qlikview\QlikOcx\`**

This is the plug-in OCX control.

2 **`*.chm`** under **`\Program Files\Qlikview\QlikOcx\`**

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These are the QlikView html help files in different languages.

3 **qvp.dll** under **\Program Files\Qlikview\QvProtocol**

This is the definition of the qvp protocol

4 **QvRes*.dll** under **\Program Files\Qlikview\QlikOcx**

These are the QlikView support files in different languages.

Q: How much hard disk space is taken up by the QVA for IE client?

A: Approximately 30 MB when installed. MS Installer may need twice as much for caching during installation

Q: What is the size of the download when installing?

A: Approximately 30 MB depending on msi package used.

Q: Is any part of the QVW documents accessed from QVA for IE saved on disk?

A: No, not unless you make an export of data.

Common technical issues

Q: Does the layout look exactly the same when opened in QVA for IE as when opened in a standard installed QV?

A: YES!

Q: Are all layout goodies available in standard QV available in QVA for IE?

A: YES!

Q: Can I print from QVA for IE directly to my local printer?

A: YES!

Q: Can I export and send to Excel directly from QVA for IE?

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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A: YES!

Q: Is communication between QVA for IE and QVS encrypted?

A: YES! All communication is encrypted with a 128 bit key.

Q: How is the performance of QVA for IE compared to QlikView Java clients?

A: Faster!

Q: Is the QVW document data transferred to the client computer RAM when using QVA for IE?

A: No, just as with the QlikView Java clients the data mainly stays on the server. Only what is needed to draw the screen is transferred. However, when you print and export data locally, more data will of course need to be transferred.

Q: Is the client computer's CPU used for the AQL logic and chart calculations when using QVA for IE?

A: No, the client machine just takes care of rendering all sheets and sheet objects and of course receiving the user's mouse clicks.

Q: Is the load on the QVS different when using QVA for IE compared to when using QlikView Java clients?

A: Yes, it will be slightly lower as QVA for IE (as well as the installed exe Windows clients) render all charts by itself.

Advanced technical issues

Q: Can I have multiple instances of QVA for IE running on a single client machine?

A: Yes

Q: Can I achieve the same "single object per window" design that is possible with QlikView Java Objects when using QVA for IE?

A: This client is referred to as QVA for IE plug-in - QlikX

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3 APPENDIX C - MS WINDOWS INSTALLER - MSI PACKAGES

General description

When Microsoft deployed the Office 2000 in 1999 they used the first version of the MSI packaging technique. The development team behind Office 2000 is also the team behind the MSI technique. They wanted to create a safer and more reliable installation technique than the one they used for Office 97.

Microsoft discovered early that this technique was not only applicable to Office 2000, but to many other software products.

MS Windows installer consists of two parts:

1 The Windows Installer service, this is a service running on the operating system. This service consists of the following five files: **MSIEXEC.EXE**, **MSI.DLL**, **MSIHND.DLL**, **MSIMSG.DLL**, and **MSI-SIP.DLL**. They are located in the system32 folder.

2 The MSI package (*.msi file), this is the file that the software vendor distributes. It consists of a database describing the installation and one or several *.CAB files containing the files to be installed.

What makes the msi packages so much better than the old exe packages?

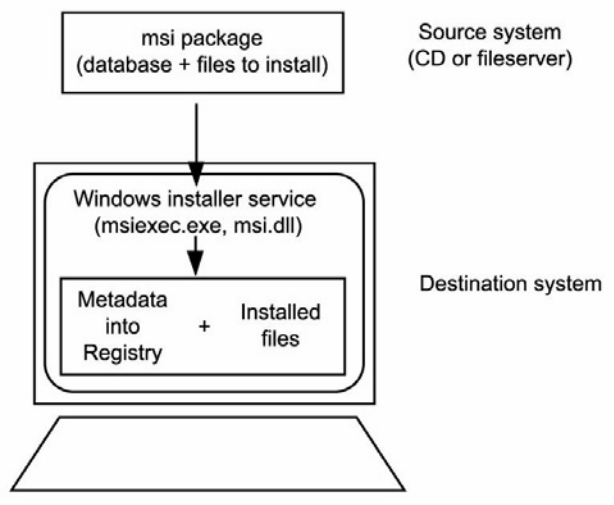
- It is a standardized procedure that all msi packages work according to the msi rules
- Extended possibility to repair and support installed applications
- Runtime files e.g. ms dll files. The runtime files are packaged and installed by so called merge modules and developed by the vendor
- Administrative installation, specially adapted to installations in a locked down environment
- Built-in rules for overwriting files
- If an installation is aborted, the rollback functionality restores the computer to the exact same state it had before the installation was executed.

The MSI installation package

An MSI file is a combination of a database and a package with the files to be installed. The database holds all the information the MS Windows Installer service needs to know about how to install, configure and uninstall an application.

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During the installation process metadata about what was installed, where it was installed and from where it was installed, is saved onto the destination system. This metadata is saved in the registry and in the folder <windows>\Installer and is used to administer self-repair, configuring of features, uninstall etc. Fig 1 below illustrates the relationship between the service on the destination system and the msi package.



How Windows installer works

When the Windows Installer service executes the msi package directly, i.e. from a CD, its starts by copying the msi file onto the destination systems <temp> folder from where the installation starts.

In the opening phase, the Acquisition-phase, all necessary system information is gathered, the database tables analyzed and a script that describes the following installation steps is generated. Next is the Execution-phase, it copies the files onto the system, rollback (if activated) cashes its files in the hidden folder config.msi and finally all metadata is saved into the registry and to the msi file in <windows>\Installer.

When changing profile, repair and uninstall, this metadata is used. Every time an msi package is executed, Windows installer investigates what rights it shall execute with. Normally you can’t install an msi package from an account with guest or user rights; it is however possible for a system administrator to give either the Windows Installer service or the msi package itself specific rights on a locked down account.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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MSI packages in a locked down environment

Most computers today are configured with user accounts without rights to place files into certain folders or to edit the registry information. A common problem is therefore to run an installation that needs to add information to the registry and/or place files into locked down folders. The Windows Installer service does very thorough controls on the account that is to install a specific package. It is however possible for a system administrator to give either the whole Windows Installer service or a specific installation package rights to execute with administrator rights on a locked down account. This is called installing with elevated privileges.

Giving all MSI packages elevated privileges

On Windows NT4, 2000 and XP it is possible for a system administrator to specify a number of local policies for the Windows Installer service. These policies specify what the system is allowed to do with any Msi installations.

The policies are written in the registry on the following locations:

- Machine policies: **HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows\Installer**
- User policies: **HKEY_CURRENT_USER\Software\Policies\Microsoft\Windows\Installer**

There are several different policies that the system administrator can specify; this document will only handle the policy for giving the Windows Installer service elevated privileges. For more information about policies, see Microsoft developer network homepage, msdn.microsoft.com.

The policy that handles the privileges for Windows installer is called: AllwaysInstallElevated.

Below you find an excerpt from the Microsoft documentation about this policy:

AlwaysInstallElevated

On Microsoft® Windows NT® 4.0 or Microsoft Windows® 2000, an administrator can set the AlwaysInstallElevated policy for both per-user and per-machine installations. Note that this method can open the computer to a security risk because when this policy has been set a non-administrator user might run installations with elevated privileges and access secure locations on the computer, such as the SystemFolder or HKLM registry key. If the application is installed per-machine while the AlwaysInstallElevated policy is set, the product is treated as managed. In this case, the application can still perform a repair with elevated privileges if the policy is

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removed. If the application is installed per-user while the AlwaysInstallElevated policy is set, the application is unable to perform a repair if the policy is removed.

To always install a package with elevated (system) privileges, set the AlwaysInstallElevated value to "1" under both of the following registry keys.

HKEY_CURRENT_USER\Software\Policies\Microsoft\Windows\Installer

HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows\Installer

If the AlwaysInstallElevated value is not set to "1" under both of the previous registry keys, the installer uses elevated privileges to install managed applications and uses the current user's privilege level for non-managed applications.

Giving a specific MSI package elevated privileges

It is possible for a system administrator to assign elevated privileges to a specific msi package (the package becomes “managed”), either by advertising the package or by installing it with the property ALLUSERS set to 1.

The Windows Installer service then gets special privileges for that specific msi package to install to locked down folders and writing to the registry.

Note It is not possible for a user with non-administrative rights to give an msi package elevated privileges, a system administrator must initially do this.

There are three different ways to give an msi package elevated privileges on the destination computer.

1 The system administrator advertises or installs the package for the ALL_USERS profile.

- Advertising the package means that the non-administrator user can execute the msi package as a normal installation when the administrator has advertised the package. To advertise a package the system administrator must execute the msi package accordingly to the command line below:
msiexe /jm “myinstallation.msi”
- Installing with the property ALLUSERS=1, means that the installed application becomes available for any user on the computer; each user is able to perform repair and/or modifications to the installed package. To install an msi package to the ALL_USER profile the system administrator must execute the package with the following command line:
msiexec /i “myinstallation.msi” ALLUSERS=1 /qb

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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2 It is possible to programmatically advertise an installation per user and at the same time define to be executed with elevated privileges. This is however a very unusual way to assign an installation with elevated privileges and it will not be described any further in this document.

3 The administrator defines an installation package with Group Policies Objects and then assigns the package to the user via Active Directory. Clients that run Windows 2000 or XP and are logged on to a Windows Server 2000/2003 domain can then run the installation with elevated privileges. An NT4 client can be complemented to support some parts of the Active Directory-technique.

Windows file protection

The information below is retrieved directly from the Windows installer SDK.

Windows File Protection on Windows 2000 and Windows XP

Windows Installer adheres to Windows File Protection (WFP) when installing essential system files on Microsoft Windows 2000. If a protected system file is modified by an unattended installation of an application, WFP restores the file to the verified file version. For more information, see Windows File Protection in the Platform SDK.

Windows Installer never attempts to install or replace a protected file. When the InstallFiles action or any other action scheduled before InstallFiles attempts to install a file protected on Windows 2000, the installer calls WFP with a request to install or replace the protected file. The installer requests the file installation from WFP immediately after executing the InstallFiles action. Windows File Protection installs or replaces the file on the user's system with a cached version of the protected file. Note that this does not guarantee that the version of the file installed from the cache is the version required by the application. After WFP has installed the file, the installer determines whether this version matches the version in the package. If the file version in the package is greater than the installed version, the installer informs the user that it cannot update the system and that an update of the operating system may be required for the application.

If any action sequenced after InstallFiles attempts to install or replace a protected file not already installed on the system, the installer cannot call WFP to install the file. In this case, the installer

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informs the user that it cannot update the system and that an update of the operating system may be required for the application.

The installer also checks with Windows File Protection when removing files and never attempts to remove protected system files.

Component Key Files Protected by Windows File Protection

When the installer attempts to install a component's key file on Windows 2000, it first calls Windows File Protection to determine if the key file is protected. When the key file of a component is protected by WFP, and that key file is already installed, the installer updates the component only if the version of the key file in the package is greater than the installed version. If the installation package specifies that a component be installed, and the key file of the component is not currently installed, then regardless of whether the key file is protected the installer installs the component. Once any component having a key file protected by WFP is installed, it is permanently installed, and the installer never removes or replaces the component.

Note that if a Windows Installer component contains a WFP file, this file must be specified as the key path for the component.

Installation of Assemblies

Windows File Protection (WFP) for assemblies differs from Windows File Protection for Windows 2000 and Windows XP system files.

WFP protects Windows 2000 and Windows XP system files by detecting attempts to replace protected system files. This protection is triggered after WFP receives a directory change notification for a file in a protected directory. When WFP receives this notification, it determines which file has changed. If the file is protected, WFP looks up the file signature in a static catalog file to determine if the new file is the correct version. If the file version is not correct, the system replaces the file with the correct version from either the cache or distribution media.

In contrast, WFP of assemblies is dynamic. WFP is extended to files as they are added to the shared side-by-

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side assembly cache. If an assembly becomes corrupted, WFP will request that the installer replace the file. Windows Installer may or may not be able to replace the file depending on whether the source package is accessible. If the source package is inaccessible, WFP will put up a dialog box stating that it is unable to restore the file.

Note that Windows File Protection protects unmanaged shared side-by-side assemblies, installed in % windir%\winsxs. Unmanaged private assemblies, installed in the application directory, are not protected by WFP. Managed global assemblies installed in the application directory or %windir%\assembly\gac are not protected by WFP.

Windows File Protection on Windows Millennium Edition

Support for Windows File Protection on Microsoft® Windows® Millennium Edition (Windows Me) is provided with Windows Installer version 1.2. Windows Me implements its own version of system file protection using catalogs that describe protected files. To completely protect a file on Windows Me, the file must be listed by Windows File Protection and there must be a catalog with version information. To install a protected file, update the version information for the file with a catalog. Windows File Protection catalogs are provided to developers to enable their applications to update system components.

Note that if a Windows Installer component contains a WFP file, this file must be specified as the KeyPath for the component.

The InstallSFPCatalogFile action queries the Component table, File table, FileSFPCatalog table, and SFPCatalog table for catalogs and files. Each protected file in a catalog that can be installed separately should be put into a separate component. A catalog is associated with a protected file and is installed only if the component controlling the file is set for local installation or is already locally installed and is being repaired. The msidbComponentAttributesPermanent bit flag must be included for the component in the Attributes column of the Component Table. This prevents the removal of the catalog and protected file if the component is subsequently removed. The entry in the KeyPath column of the Component Table must exactly match the path specified by the provider of the Windows File Protection catalog. If the paths do not match, the file is not protected.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The InstallSFPCatalogFile action, FileSFPCatalog table, and SFP-Catalog table are not available with Windows Installer versions 1.0 or 1.1.

Useful links

Additional information can be found at:

msdn.microsoft.com/library (General Microsoft and Windows information)

www.desktopengineer.com (Questions&Answers, click MSI4Admins)

www.appdeploy.com (General information about application deployment)

www.wise.com (The author of the development tool:"Wise for windows installer")

Sources for this appendix

-"Microsoft developer network"

-Course documentation "Wise för programutvecklare"

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4 APPENDIX D - DEPLOYING MSI PACKAGES WITH GROUP POLICIES

General

A common issue today is how to deploy applications in a network environment where the users have limited rights and how to deploy applications to a specific group of users. This document will shortly describe how to deploy Microsoft's Windows Installer (.msi) packages with group policies in an Active Directory environment.

Note Deploying software with group policies is only supported by workstations running Windows 2000, XP Professional or 2003 Server.

The QlikView .msi packages also require version 2.0 or higher of the Windows Installer service to be installed on the destination workstations.

Deploying the MSI Package

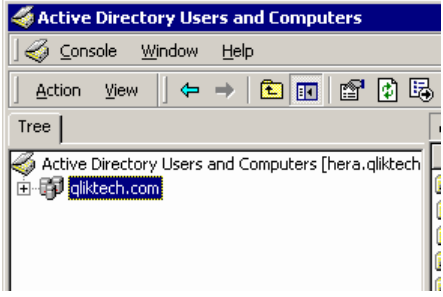
When you have obtained your .msi file it must be placed in a folder shared on the network. Make sure that all users and/or computers, that will install the application, have read access to that folder. When the package is made accessible to these users and/or computers you are ready to create the Group policy object that will advertise the installation package. See section 1.3 for further information about advertising.

The package can be advertised for each user or each computer. Use the "User Configuration/Software Settings" container to advertise per user. Use the "Computer Configuration/Software Settings" container to advertise it per computer. Both containers are located in the Group Policy Object editor.

If the package is advertised per user, you can either assign or publish it. A package that is advertised per computer can only be published.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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To publish a package per user means that it is listed (advertised) in the “Add programs from your network”-list in the “Add/Remove programs” dialog, see figure below.



Each user must then click the **Add** button to complete the installation.

To publish a package per computer means that the package is installed and accessible for all users on that computer the next time the computer is rebooted.

An advertised package that is assigned is also listed in the “Add programs from your network” list and can be added from there. This option also offers a few more ways to activate the installation package:

- Shortcuts, if the installation package adds any shortcuts, to desktop and/or start menu, these are added and the installation package can be executed by clicking on any of these.
- File association, the installation program is executed when the user tries to open a file that is associated with the advertised application.
- There are a few more ways to execute the installation when it is advertised as assigned but they are not applicable to any QlikView installations and therefore fall out of the scope for this documentation.

Note Executing the installation from shortcuts or via a file association is not applicable to the “QlikView Analyzer for Internet Explorer”-installation package, since is doesn’t add any shortcuts or file associations. Therefore it is not recommended to advertise QlikView installation packages with the assign option.

Advertising

To advertise means that the administrator gives the installation package permission to execute on an account with locked down permissions.

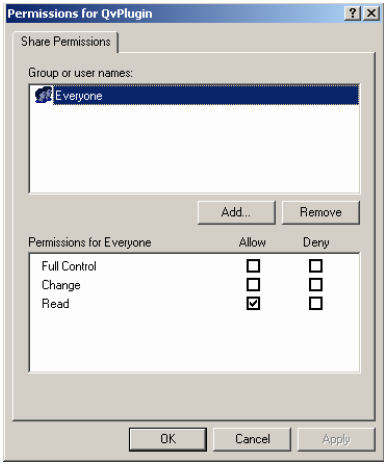
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When the package is advertised, there are so called “entry points” loaded onto the destination system. Entry points are typically shortcuts, file associations, listing in the Add/Remove programs dialog etc.

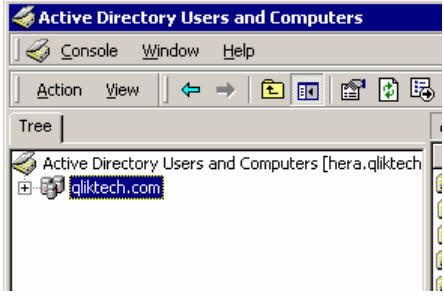
Step-by-step guide

This section provides a brief step-by-step guide for creating a group policy for the advertising of QlikView Analyzer for Internet Explorer .msi package on a number of machines in the Active Directory.

For more details on creating group policies we refer to the wealth of published literature in this field.

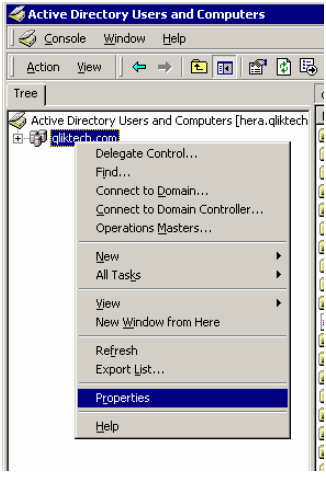


1 Browse to the folder containing the .msi package. Share the folder to the network users with permission to install the package.

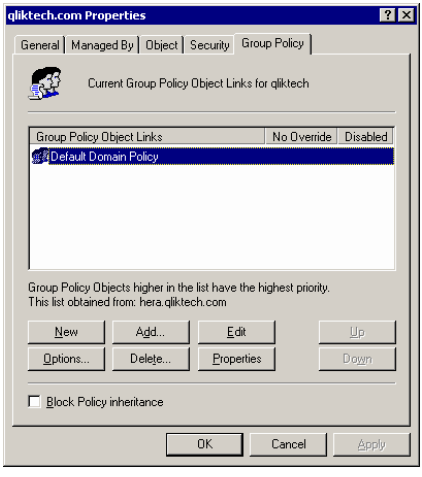


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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2 Open **Active Directory Users and Computers** and highlight the **Organizational Unit (OU)** where you want to deploy the package.

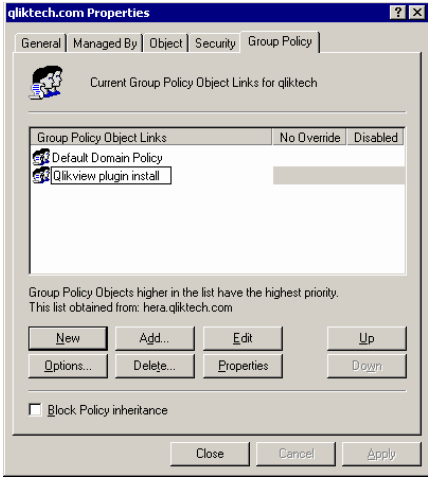


3 Right-click and choose **Properties**.

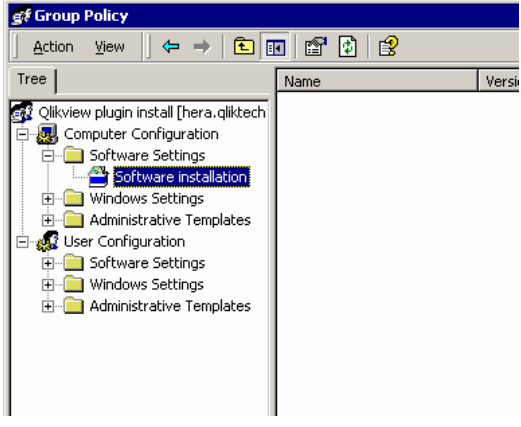


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4 Go to the **Group Policy** tab, click **New** and give it an appropriate name.

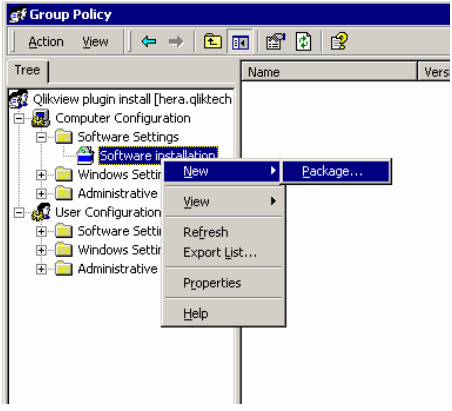


5 Highlight the new group policy object and press **Edit**.

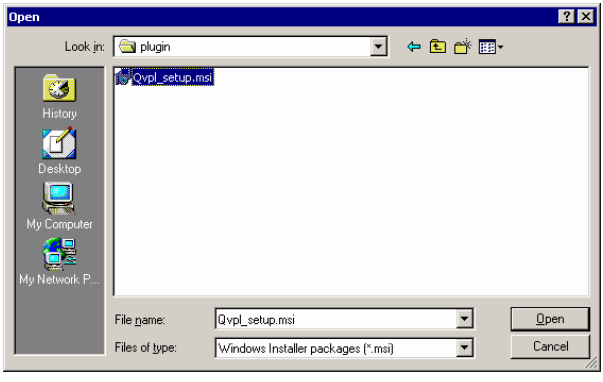


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6 Expand to **Computer Configuration/Software Settings** or **User Configuration/Software Settings** depending on how you want to deploy the package. We select **Computer Configuration** and then highlight **Software installation**.

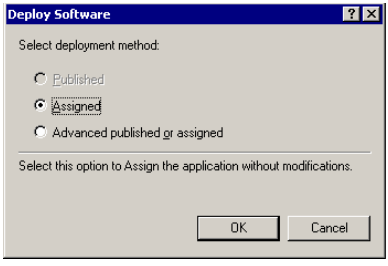


7 Right-click **Software installation** and choose **New** -> **Package**. A pop-up window is shown asking where to locate the installation package.

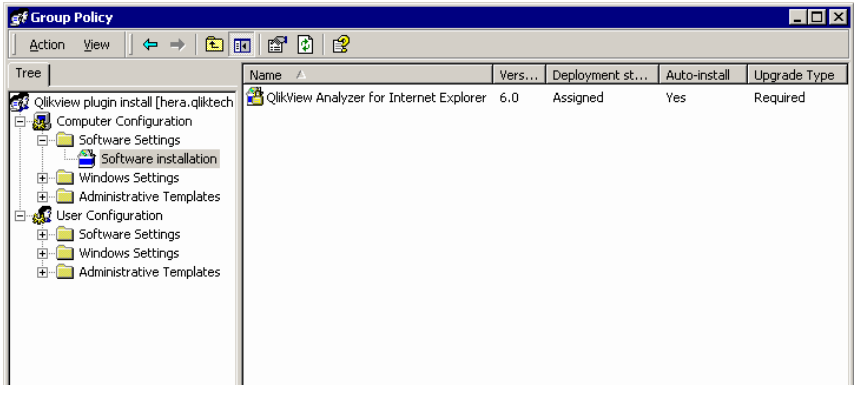


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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8 Find the installation package, select it and press **Open** (in this case **`Qvpl_setup.msi`**).



9 Select the deployment method **Assigned** and press the **OK** button. Since we selected to apply the installation to the **Computer configuration** in item #6, it is only possible to use the **Assigned** deployment method, see section 1.2 for further information.



10 The deployment rule is now ready for use. All the machines in this Operational Unit (OU) get this deployment automatically. What actually happens is that when a computer is rebooted the installation program is executed so that any user who logs on to a computer in that OU, will be able to run the installed program. The rule can be applied to many different OU's.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

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OnlineNotary.net

5 APPENDIX E - QLIKVIEW SERVER SCRIPT API FOR DMS AND CALS

The Document Metadata and the CAL data in QlikView Server can be administered through an AJAX interface. This section describes the xml needed to perform these tasks. It also describes the JavaScript library **QvcLibrary.js** and how to communicate with QVS directly from a .NET language.

The XML Syntax

The first command must be:

```
<update mark="" view="" level="0" stamp="" kind="TTT_obj"
ident="new:AAA" />
```

TTT should be replaced by **MetaServiceData** or **CalInfoTab**. AAA is empty for **CalInfoTab** and the document path for MetaServiceData.

The answer should look like:

```
<result>
      <object name=″TTT″ ident=″III″ stamp=″MMM″ session=″SSS″
      ...>
            ...
      </object>
      <message text=″″/>
</result>
```

Start to check that the text attribute of the message-tag is empty (or missing). If not, it contains the error text. Also validate that the name-attribute of the object tag is equal to the MMM you supplied. If not, the operation failed. If ok, save the ident (III), the stamp (MMM) and the session (SSS) . These are needed in the next calls.

The following commands look like:

```
<update mark="" view="" level="0" stamp="MMM" kind="TTT_obj"
ident="III" session=″SSS″>
      <set name="NNN" ... />
      ...
</update>
```

In most cases one call is enough. To check that all went ok look in the result that the text attribute of the message-tag is empty (or missing) and that the session attribute hasn't changed.

In the case of **MetaServiceData** the last set must be:

```
<set name=".CreateFromActiveObject" action=""/>
```

In case of **CalInfoTab** the commands take effect immediately.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The most interesting commands for **CalInfoTab** are:

```
<set name="CalInfoTab.AddNamedCal" text="Domain\User"/>
<set name="CalInfoTab.DeleteNamedCal" text="Domain\User"/>
```

Among the most interesting commands for MetaServiceData are related to authorisation:

```
<set name="MetaServiceData.AccessList.RemoveAll"
action=""/>
<set name="MetaServiceData.AccessList.Append"
action=""/>
<set name="MetaServiceData.AccessList.Selected.User"
text="Domain\User"/>
<set name="MetaServiceData.AccessList.Selected.Allow"
text="Restricted"/>
<set name="MetaServiceData.AccessList.Selected.Days"
count=" Monday"/>
<set name="MetaServiceData.AccessList.Selected.From"
text="9.00"/>
<set name="MetaServiceData.AccessList.Selected.Until"
text="17.00"/>
```

The JavaScript Library

The file **QvcLibrary.js** contains the class **QvcObject**. All errors are issued as exceptions.

CalInfoTab example (add ten new users):

```
var calinfo = new QvcObject("CalInfoTab", true, true);
      calinfo.Connect("");
      for(var ix = 0; ix < 10; ++ix) {
          calinfo.SetText("AddNamedCal", "User_" + ix);
      }
      calinfo.Commit();
```

MetaServiceData example (Set access right for two users of a document)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
var dms = new QvcObject("MetaServiceData", true);
            dms.Connect("", "xmas.qvw");
            dms.RemoveAll("AccessList");
            dms.Append("AccessList");
            dms.SetText("AccessList.Selected.User",
"XMas\\Santa");
            dms.Append("AccessList");
            dms.SetText("AccessList.Selected.User",
"XMas\\Brownie");
            dms.SetText("AccessList.Selected.Allow",
"Restricted");
            dms.Include("AccessList.Selected.Restricted.Days",
"Monday");
            dms.SetText("AccessList.Selected.Restricted.From",
"9");
           dms.SetText("AccessList.Selected.Restricted.Until",
"17");
            dms.Commit();
```

Communicate with QVS from a .NET Language

The component to use is **QvsPureRemote.dll**. The class is **QvClient** in the namespace **QlikTech.NetClient**. To connect use the following call:

```
QvClient client = new QvClient("localhost",
QvClient.Mode.Admin);
```

Replace localhost with server where the QVS resides.

Construct the XML as a string (here named 'request').

Make the call:

```
string data = client.Execute(request);
```

Parse the XML-text (here contained in **data**);

As always the calling process must be running as (or impersonate) a user existing in the "QlikView Administrators" group on the QVS machine.

The CalInfoTab Reference

AddNamedCal

```
<set name="CalInfoTab.AddNamedCal"
text="Domain\User"/>
```

DeleteNamedCal

```
<set name="CalInfoTab.DeleteNamedCal"
text="Domain\User"/>
```

UndeleteNamedCal

```
<set name="CalInfoTab.UndeleteNamedCal"
text="Domain\User"/>
```

AllowDynamicNamedCals (0=false, 1=true)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

<set name="CalInfoTab.AllowDynamicNamedCals" value="1"/>

NamedCalMode (0=User Name, 1=Machine Id)

<set name="CalInfoTab.DeleteNamedCal" text="0"/>

The MetaServiceData Reference

The following controls loading of document

AutoLoadMode (Never, Always, Restricted)

```
<set name="MetaServiceData.AutoLoadMode"
text="Never"/>
```

AutoLoadRestricted.From (timeofday in format 17:45)

```
<set name="MetaServiceData.AccessList.Selected.From"
text="9.00"/>
```

AutoLoadRestricted.Until (timeofday in format 17:45)

```
<set name="MetaServiceData.AccessList.Selected.Until"
text="17.00"/>
```

AutoLoadRestricted.Days (Monday, Thuesday, Wednesday, Thursday, Friday, Saturday, Sunday) prefix space to add minus (-) to remove

```
<set name="MetaServiceData.AccessList.Selected.Days"
count=" Monday"/>
<set name="MetaServiceData.AccessList.Selected.Days"
count="-Sunday"/>
```

MaxOpenSessions (>= 0, empty string means not limitations)

```
<set name="MetaServiceData.MaxOpenSessions" text="3"/
>
```

The following are used by e.g. accesspoint

Category (any text)

```
<set name="MetaServiceData.Category" text="Sales
Document"/>
```

LastUpdate (empty or time in format 2008-12-24 13:56:00)

```
<set name="MetaServiceData.LastUpdate" text="2008-12-
24 13:56:00"/>
```

NextUpdate (empty or time in format 2008-12-24 13:56:00)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
<set name="MetaServiceData.NextUpdate" text="2008-12-
24 13:56:00"/>
```

EventDriven (0=false, 1=true)

```
<set name="MetaServiceData.EventDriven" value="1"/>
```

SourceName (any text)

```
<set name="MetaServiceData.SourceName"
text="lastyear2.qvw"/>
```

Clients (set of Plugin, Java, Ajax, Download) prefix space to add minus (-) to remove

```
<set name="MetaServiceData.Clients" count=" Ajax"/>
```

AjaxUrl (an url, or empty)" mode="enabled" value="/QvsDocuments/Sörens Filer/test1_ajax" text="/QvsDocuments/Sörens Filer/test1_ajax"/>

```
<set name="MetaServiceData.AjaxUrl" text="/QvsDocs/
Sales/lastyear_ajax"/>
```

The following are the access data (used when access control is set to DMS mode)

AccessList (the list of control records)

AccessList.RemoveAll

```
<set name="MetaServiceData.AccessList.RemoveAll"
action=""/>
```

AccessList.Current (the zero based index of the selected reocrd (to be manipulated through AccessList.Selected)

```
<set name="MetaServiceData.AccessList.Current"
text="1"/>
```

AccessList.Remove (remove the current record)

```
<set name="MetaServiceData.AccessList.Remove"
action=""/>
```

AccessList.Append (append a new record at the end and make it current)

```
<set name="MetaServiceData.AccessList.Append"
action=""/>
```

AccessList.Selected.Anonymous (0=false, 1=true)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
<set
name="MetaServiceData.AccessList.Selected.Anonymous"
value="1"/>
```

AccessList.Selected.User

```
<set name="MetaServiceData.AccessList.Selected.User"
text="Acme\Bob"/>
```

AccessList.Selected.Allow (Always, Restricted)

```
<set name="MetaServiceData.AccessList.Selected.Allow"
text="Restricted"/>
```

AccessList.Selected.Restricted (see Auto-LoadRestricted)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

INDEX

A

addObject function 133
AJAX Zero-Footprint Client (ZFC) 153
alldocs.asp 124
Authentication vs. Authorization 86

B

Built-in http Web Server 107

C

clearAll 183
clickButton 183
Client Access Licenses (CALs) 43
Client Side Authentication 87
Cluster Licensing 44
Clustering 117
Communication encryption 81

D

Document Metadata Service (DMS) ...115
Dynamic Data reduction 175

E

Event log 105

F

File Security 174
File system security on server 81
Functional Architecture 93
functions.asp 127

G

getCaption 184
getCellValue 184
getColCount 185
getColLabel 185
getLabel 186
getLabelColCount 187
getLabelRowCount 188
getListState 188
getListValue 189
getOptionalCount 190
getRowCount 191
getSelectedCount 192
getStateCount 192
getStateValues 193
getTextValue 194

H

HTML page script API 181

J

Java applet API 179
Java Client 127
Java Objects Client 131

L

Licensing 43

M

Macro functionality limitations 172
Macro trigger limitations 171
Macros on QlikView Server 171

P

Page Generator for AJAX ZFC 154
Page Generator for Java Objects 132
Page Generator for QlikX 142
Performance log 103
Plug-in Client 137
plugin_alldocs.asp 124
plugin_functions.asp 127
Plugin.asp 124

Q

QlikView clients 121
QlikView Management Console 47
QlikView Server Load Sharing 117
QlikX 141

R

redo 194

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

runMacro 195

S

Sample Pages 123
Script API for DMS and CAL 223
searchSelect 195
searchToggle 196
Security Configurations 86
Server logging 101
Server Side Authentication – Get Ticket Process 89
Server Side Authentication – Non Windows Web Server 88
Server Side Authentication – Windows Web Server 87
Server Tunnel 97
session log 101
setDocument function 133
showdocument.asp 124
Small Business (SB) Edition 44
System Requirements 23

U

undo 196

V

VBScript functions 173

W

Windows clients 149

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

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QlikView

Reference Manual

Book I: Installation and Script

Version 8.5 for Microsoft Windows®

First Edition, Lund, Sweden, June 2008

Authored by QlikTech International AB /HIC/KHN/JNN/MSJ/CEN

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OnlineNotary.net

OVERVIEW BOOK I

INTRODUCTION I

INSTALLATION II

GENERAL III

SCRIPT VI

4

CONTENT

PART I: INTRODUCTION

1 BEFORE YOU BEGIN 13
1.1 About This Book 14
1.2 Conventions 15
1.3 Flavors of QlikView 16
1.4 QlikTech Support Services 17

2 WHAT'S NEW IN QLIKVIEW 8? 19
2.1 Product Integration 19
2.2 Other QlikView Server Related Features 20
2.3 Collaboration 21
2.4 Input Fields 23
2.5 General Features 23
2.6 Script, Data Retrieval and Data Interpretation 24
2.7 Script and Layout Functions 25
2.8 Chart Features 26
2.9 Layout Features 26
2.10 Printing and Exporting from QlikView 27
2.11 Automation and Macros 28

3 WHAT'S NEW IN QLIKVIEW 8.01? 29

4 WHAT'S NEW IN QLIKVIEW 8.2 33
4.1 QlikView Server 33
4.2 QlikView Publisher 34
4.3 QlikView Clients 35
4.4 General QlikView 37

5 WHAT'S NEW IN QLIKVIEW 8.5 39
5.1 Chart features 39
5.2 Layout features 40
5.3 New Script and Layout Functions 41
5.4 General Features 41
5.5 Script Features 42
5.6 AJAX Client Capabilities 43
5.7 Java Client Capabilities 44
5.8 QlikView OCX features 44

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

5.9 Simplified licensing 45

6 COMPATIBILITY ISSUES FOR EARLIER VERSIONS OF QLIKVIEW 47
6.1 File Format Compatibility 47
6.2 Mixed Client/Server Environments 48
6.3 Issues when Migrating from QlikView 6.0x 48
6.4 Automation Change Patterns 49
6.5 Issues when Migrating from QlikView 5.0x 51

PART II: INSTALLATION

7 INSTALLING QLIKVIEW 55
7.1 Starting the Installation Program 55
7.2 When the Installation Program Is Running 55
7.3 Serialization 56
7.4 Network distribution of QlikView 57
7.5 License Enabler File Editor 58

8 OLE DB AND ODBC 61
8.1 OLE DB 61
8.2 When Is the ODBC Interface Needed? 61
8.3 Creating ODBC Data Sources 63

PART III: GENERAL

9 STARTING QLIKVIEW 67
9.1 Command Line Syntax 67
9.2 The Start Page 68
9.3 Batch Execution 70

10 QLIKVIEW DOCUMENTS 73
10.1 File Compatibility 73

11 MENU COMMANDS 75
11.1 File Menu 75
11.2 Edit Menu 80
11.3 View Menu 82
11.4 Selections Menu 83

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

11.5 Layout Menu 84
11.6 Settings Menu 87
11.7 Bookmarks Menu 88
11.8 Reports Menu 89
11.9 Tools Menu 90
11.10 Object Menu 90
11.11 Window Menu 91
11.12 Help Menu 92

12 THE TOOLBARS AND THE STATUS BAR 95
12.1 The Toolbars 95
12.2 The Standard Toolbar 95
12.3 The Navigation Toolbar 98
12.4 The Design Toolbar 99
12.5 The Sheet Toolbar 101
12.6 The Bookmark Toolbar 101
12.7 Configuration of the Toolbars 102
12.8 The Status Bar 106

13 USER PREFERENCES 107
13.1 General 107
13.2 Save 113
13.3 Editor 115
13.4 Design 119
13.5 Objects 121
13.6 Font 125
13.7 Export 126
13.8 Printing 131
13.9 Mail 133
13.10 Locations 135
13.11 Security 137
13.12 License 138

14 CALCULATION MEMORY SETTINGS 141

15 LOGIC AND SELECTIONS 145
15.1 Single Field Value Selection 145
15.2 Multiple Selection within a Field 146
15.3 Search 146
15.4 The Advanced Search Dialog 149
15.5 Moving the Selection 151
15.6 Logical And Mode 152
15.7 Locking Selected Field Values 153
15.8 Selections in Charts and Tables 154

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

15.9 Current Selections 155
15.10 Selection Styles 157
15.11 Loosely Coupled Tables 159

16 BOOKMARKS 165
16.1 About bookmarks 165
16.2 Creating bookmarks 165
16.3 Applying bookmarks 168
16.4 Maintaining bookmarks 168
16.5 Bookmarks dialog 169
16.6 Export Bookmark(s) dialog 172
16.7 Import Bookmark(s) dialog 173

17 REPORTS 175
17.1 About Reports 175
17.2 The Reports Menu 176
17.3 The Report Editor Dialog 176

18 ALERTS 195
18.1 About alerts 195
18.2 Creating alerts 195
18.3 Using alerts 195
18.4 The Alerts dialog 197
18.5 The Alert Wizard 201

19 VARIABLE OVERVIEW DIALOG 211

20 EXPRESSION OVERVIEW DIALOG 213
20.1 The Find/Replace Dialog 215
20.2 Quick Chart Wizard 216

21 INTERNAL FILES 217
21.1 File references in the QlikView layout 217
21.2 Internal files in QlikView documents 217
21.3 Internal files in the QlikView program file 217
21.4 Bundled Sounds 220

PART IV: SCRIPT

22 VARIABLES AND FIELDS 225
22.1 Fields 225
22.2 Input Fields 225

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

22.3 Variables 226
22.4 Other Entities in QlikView 226

23 SCRIPT DIALOG BOXES 229
23.1 Edit Script 229
23.2 Hidden Script 238
23.3 Table Viewer 239
23.4 Data Link Properties 242
23.5 Create Select Statement 244
23.6 Open QlikView File 248
23.7 Open Local Files 249
23.8 Open Internet Files 250
23.9 Connect to Server 252
23.10 Inline Data Wizard 255
23.11 Access Restriction Table Wizard 258
23.12 Table File Wizard 259
23.13 The XML File Wizard 287

24 SCRIPT SYNTAX 293
24.1 Statements and Keywords 293
24.2 Script Keywords and Statements in Alphabetical Order 293
24.3 Table Names 354
24.4 Script Variables 355
24.5 Dollar-Sign Expansions 362
24.6 Quotation Marks 364

25 SCRIPT EXPRESSIONS 367
25.1 Expression Syntax 367
25.2 Operators 368
25.3 Aggregation Functions 370
25.4 Other Functions 395

26 DATA STRUCTURES 469
26.1 Data Loading Statements 469
26.2 System Fields 469
26.3 Logical Tables 470
26.4 Associations between Logical Tables 471
26.5 Renaming Fields 474
26.6 Concatenating Several Tables into One 475
26.7 Join and Keep 476

27 EVALUATING THE LOADED DATA 483
27.1 Generic Databases 483
27.2 Cross Tables 484

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

27.3 Matching Intervals to Discrete Data 485
27.4 Using the Extended IntervalMatch Syntax to Resolve Slowly Changing Dimension Problems. 487
27.5 Hierarchies 489
27.6 Semantic Links 491
27.7 Linking Information to Field Values 495
27.8 Data Cleansing 496
27.9 Wild Cards in the Data 499
27.10 NULL Value Handling in QlikView 500
27.11 Character Sets 503

28 QVD FILES 505
28.1 About QVD Files 505
28.2 The QVD file Format 505
28.3 What are QVD files good for? 505
28.4 How Fast Is It? 506
28.5 Creation of QVD Files 506
28.6 Reading data from QVD files 508
28.7 Using QVD files for incremental load 509
28.8 Reading Data from QVD files 512

29 LIMITED SCRIPTING IN QLIKVIEW PROFESSIONAL 515

30 SECURITY 517
30.1 Authentication and Authorization 517
30.2 Security using the QlikView Publisher 517
30.3 Security using the Section Access in the QlikView script 518
30.4 Sections in the Script 518
30.5 Access Levels in Section Access 518
30.6 Section Access system fields 519
30.7 Restrictions on QlikView functionality 521
30.8 Dynamic Data Reduction 522
30.9 Inherited Access Restrictions 523
30.10 Encryption 523

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART I: INTRODUCTION

- **About QlikView**
- **About This Book**
- **What's New in QlikView 8?**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

12

1 BEFORE YOU BEGIN

Welcome to QlikView - the data access solution that enables you to analyze and use information from different data sources.

With QlikView, it is easy to grasp the overall picture and spot the connections, even when working with large and complex data sets. You can integrate information from different sources and the information can quickly be made available through the network. The right information gets to the right person. The associative technology allows you to create a unique interface for interactive presentation and analysis of any kind of information.

QlikView manages information in a way that resembles and supports the way the human brain works. Just like the human brain, it gradually makes associative connections in the information being processed. You - not the database - decide which questions to ask. Just click on the item you want to know more about.

Conventional information search systems often require a top-down approach, while QlikView allows you to get started with any piece of data regardless of its location in the data structure.

The retrieval of data in conventional systems is often a complex task requiring extensive knowledge of the structure of the databases and of the syntax of the query language. The user is frequently limited to predefined search routines. QlikView revolutionizes this by making it possible to select freely from data displayed on the screen with a click of the mouse.

QlikView has many areas of application. You are the one to decide how the program is to be used. QlikView helps you acquire a unified and coherent overview of the data in different databases - your own or someone else's, central or local. QlikView can be used with virtually any database.

With QlikView you can

- create a flexible end user interface to an information warehouse
- get snapshots of data relations
- make presentations based on your data
- create dynamic graphical charts and tables
- perform statistical analysis
- link descriptions and multimedia to your data
- build your own expert systems
- create new tables, merging information from several sources

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- build your own business intelligence system

Some examples of QlikView applications being used today are financial systems, human resources administration, market analysis, customer support, project administration, production control, stock inventories and purchasing. You can even mix the different applications to gain entirely new information overviews.

1.1 About This Book

This Reference Manual consists of three books: *Installation and Script*; *Layout, Number Formats and Macros*; and *Charts*. Book I contains four parts: *Introduction*, *Installation*, *General* and *Script*. Book II consists of the parts *Sheets and Sheet Objects*, *Number Formats* and *Macros and Automation*. Book III consists of the part *Charts*, as well as of a *Glossary* and an *Appendix*.

In addition, we provide a separate *Tutorial*, guiding you step by step through the main features of QlikView.

The *Introduction* part, which you are currently reading, contains general information on the program and on our support services.

The *Installation* part shows how to install QlikView and other components needed to run the program.

The *General* part shows how to start QlikView, introduces the QlikView menu bar and toolbars, and describes how selections are made.

The *Script* part contains all the information you need to load data into QlikView. This part explains the dialog boxes involved in the creation of scripts, and provides a detailed syntax description. Access restriction is also handled here.

The interpretation and formatting of date, time and number formats is treated in a separate part, *Number Formats*. Here you will find explanations of the number format dialogs, as well as general information on how different formats are handled by QlikView.

The *Macros and Automation* part provides a brief description of the Automation interface, as well as of the use and creation of macros.

The *Sheets and Sheet objects* part provides information on how to create and modify the layout. This part ends with a chapter on exporting and printing sheet objects.

Since there is a great number of different chart types, these are treated in a separate part, *Charts*. Besides the variety of settings used for creating and modifying charts, this part also provides detailed information on chart expressions.

The *Glossary* explains some of the terminology used in the manual.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Finally, the *Appendix* contains chapters on issues such as data security, sharing QlikView documents in workgroups, etc.

A Help file is installed together with the program. You can open this file from many places in the program, and it will assist you in solving most of the problems encountered.

1.2 Conventions

Before you start using QlikView, it is important to understand the terms and notational conventions used in the documentation. In this section some of the terms will be explained.

General Conventions

- The word "choose" is used for carrying out a menu command in the toolbar or in a dialog.
- The word "select" is used for highlighting an object in a list or on a sheet that you want your next action to affect. It is also used for highlighting field values, thereby making logical selections within the data.
- Numbered lists (e.g. 1, 2, 3, ...) indicate procedures with two or more sequential steps.
- Bulleted lists, such as this one, provide information, and do not indicate procedural steps.

Mouse Conventions

- The descriptions in this manual assume that you have configured the left mouse button as the primary mouse button and the right mouse button as the secondary mouse button (This is default in Windows).
- "Point at..." means move the mouse and thus the cursor until the tip of the cursor points at the referred object.
- "Click..." means point at the referred object, then press and immediately release the mouse button without moving the mouse.
- "Double-click..." means click the mouse button twice in rapid succession.
- "Right-click" means click with the right mouse button.

Keyboard Conventions

- Key names appear in small capital letters, e.g. "Press ENTER".
- The RETURN key and the ENTER key perform the same action in QlikView.

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- A plus sign "+" used between two key names indicates that you must press both keys at the same time. E.g., CTRL+S means that you should press the CTRL-key while pressing S.
- A comma sign "," used between two key names indicates that you must press the keys sequentially.

1.3 Flavors of QlikView

QlikView comes in three flavors called QlikView Developer, QlikView Professional and QlikView Analyzer.

QlikView Developer is the full version intended for development of QlikView documents. This is the only version which gives you full access to the script. When working with documents on QlikView Server, this version allows you to create personal sheet objects and share them with other users.



QlikView Professional is intended for the average user who needs to work with existing QlikView documents. This version contains full capabilities for manipulating layout. It is possible to reload data, but normally only with the existing script. Limited scripting capabilities are provided for use with local file data sources. When working with documents on QlikView Server, this version allows you to create personal sheet objects and share them with other users.



QlikView Analyzer is the low-end client. It comes either as an installed Windows client, as a plug-in to Internet Explorer, as a Java applet client or as an AJAX Zero Footprint client. It can be used to access QlikView documents on a QlikView Server. The user may navigate the layout, make selections and view results. However, no modification of the layout is possible. The installed version can, with an optional registration, also access local QlikView documents, but only with the same limited functionality.

Different parts of this reference manual apply differently to the different versions. Each main chapter is therefore marked with one or more of the icons shown above, indicating that the chapter in whole or partly is relevant to the respective version.

Inside a chapter individual sections or paragraphs may be marked with a subset of the icons for the chapter, indicating that the text is relevant only for the product versions indicated.

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1.4 QlikTech Support Services

Contact us if you need product support, additional training or consultation concerning application development. Please consult our homepage for current information on how to get in touch with our support services. You will find us at:

http://www.qlikview.com.

QlikTech International Headquarters

QlikTech International
150 N. Radnor Chester Road
Suite E220
Radnor, PA 19087
USA

Phone: +1 (888)-828-9768
Fax: 610-975-5987

For other locations please visit our www home page (see above).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18

2 WHAT'S NEW IN QLIKVIEW 8?

The QlikView development team has again listened to the ideas and suggestions of users, customers and partners. As a result of our development and your comments, QlikView 8 is considerably more powerful for data analysis while being even easier to use than before. A large number of improvements have been made since version 7.5, some of them truly ground-breaking.

We believe that there will be something for everyone to enjoy. Most of the new features are presented more in detail below.

2.1 Product Integration

Two major themes when making the specification of QlikView 8 were to strengthen QlikView's ability to serve really large numbers of users and to handle really large numbers of documents. The key to these goals, we believe, lies with the QlikView Server and the QlikView Publisher. Making those components part of the default QlikView configuration is thus a must. With a number of developments we have tried to make them more integrated, more accessible and easier to utilize.

One Product Suite

With the release of QlikView 8 we want to emphasize the merging of QlikView, QlikView Server and QlikView Publisher into one integrated product suite. All components now share the same version number. A number of features have been added to make the components feel as one integrated unit.

QVS and Publisher Control Panels from inside QlikView

By configuring URLs in the **Locations** folder of **User Preferences** the QlikView administrator can have direct shortcuts to the QlikView Publisher control panel and the new html based QlikView Server control panel from the QlikView menu. The control panels will of course appear as html windows inside QlikView. Read more about the **Locations** folder on page 135.

QlikView AccessPoint from inside QlikView

Another configurable URL in the **Locations** folder gives the end-user direct shortcuts to QlikView AccessPoint from the QlikView menu. The AccessPoint will of course appear as an html window inside QlikView. Read more about the **Locations** folder on page 135.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Direct Access to QVS and Publisher Document Folders

Folder locations for QlikView Server documents and QlikView Publisher source documents can be defined in the **Locations** page of **User Preferences**. When this is done, icons for direct access to these folders will appear in the **Open** and **Save** dialogs (requires Windows XP or later). Read more about the **Locations** folder on page 135

Page Generator for Object Based Clients

A page generator for the object based clients (AJAX zero-footprint, Java Objects and QlikX) has been integrated into QlikView. The wizard driven generator will take any QlikView document and produce a corresponding html page layout for any of the client types listed above. The html page can be previewed in an html window inside QlikView. The pages produced may be used directly or edited further in any html design tool. See page 271ff in Book II.

2.2 Other QlikView Server Related Features

The following developments are mainly QlikView Server related and with the exception of the graceful document refresh may rather belong in the **What's New** section of the QlikView Server Reference Manual.

For reasons stated above we still chose to list them here as well.

Graceful Document Refresh

When using QlikView as a client to QlikView Server it is now possible to refresh your session with new data (as the server document is updated) without losing session or selection state.

New Java Clients

The QlikView Java clients have been completely re-written to make full use of the possibilities in Sun Java 1.5. The result is a client close to pixel-perfect in behavior compared to the IE plug-in client. New features include better font handling, support for transparent objects, color gradients, improved object borders and captions etc. It is our ambition that the Java clients will gradually be expanded to cover basically all functionality supported in the IE plug-in client.

Improved AJAX Zero-Footprint Client

The work continues to expand the functionality of the AJAX client and also to improve performance. Better perceived performance is expected, mainly due to asonchrynous update of straight tables, table boxes and list boxes.

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Other new functionality includes support for line/arrow objects, transparent sheet objects (requires Internet Explorer 7) and improved search in list boxes. Finally, support has been added for sorting straight tables and table boxes by clicking in column headers.

New QlikView Server Control Panel

The new QlikView Server Control Panel is fully html based. It communicates not with the registry but rather directly with QlikView Server via a new web service interface. In addition to the controls of the old exe control panel it includes monitoring of various aspects of the QlikView Server, e.g. preloading of documents, scheduled loading/unloading, user exemption etc.

Built-in http Server

A basic (trimmed down to the specific needs of QlikView Server and QlikView Publisher) http server has been added to QlikView Server. When running QlikView Server on Windows XP or later it will provide an alternative Microsoft IIS. It is expected that the use of the built-in http server will be expanded in QlikView versions to come.

2.3 Collaboration

The third major design goal for QlikView 8 has been to break the so far somewhat solitary nature of the QlikView experience. Great analysis can only get better if we provide good means of sharing findings and results with our fellow users. Again, the key is QlikView Server.

Server Bookmarks and Shared Server Bookmarks

Bookmarks created when working with documents on QlikView Server can now be stored in a repository along with the document on the server. Your personal bookmarks will be available for roaming from any computer where you work as an authenticated user. Your personal server bookmarks can always be found in the **My Server Bookmarks** page of the **More Bookmarks** dialog. Furthermore, you may flag any of your personal server bookmarks as shared to other users. That means that they will appear on the **Shared Server Bookmarks** page of the **More Bookmarks** dialog. Other users' shared bookmarks will be available to you in the same manner. This functionality will be available to Developer, Professional and Analyzer users alike, but for now not from the Java and AJAX zero-footprint clients. Read more about **Server Bookmarks** on page 165ff.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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User Objects and Shared Objects

It has never before been possible for an end-user to add sheet objects when working with a document on QlikView Server. Now it is! Objects may be created in the usual manner but will be stored in a repository along with the document on the server. Your personal sheet objects will be available for from any computer where you work as an authenticated user. Your personal server objects can always be found in the **My Server Objects** page of the **Server Objects** dialog (**Layout** menu). Furthermore, you may flag any of your personal server objects as shared to other users. That means that they will appear on the **Shared Server Objects** page of the **Server Objects** dialog. Other users' shared objects will be available to you in the same manner. This functionality will be available to Developer and Professional users with exe or IE plug-in client. Find more information about the definition of **User Objects** and **Shared Objects** on page 91 and the **My Server Objects** dialog on page 90 ff in Book II.

Shared Reports

In analogy with server sheet objects there will also be the possibility to define personal server reports and share those with other users. Again, this functionality will be available to Developer and Professional users with Windows or IE plug-in client.

Mail Bookmark - Click to Invoke

When you find something worth sharing in a QlikView Server document, you may with just a single command from the menu send a snapshot to another user. A temporary server bookmark (including layout status information) will be created on the server. A mail with a qvp URL encoding the bookmark reference will be generated. You just need to enter a recipient name and any text you like to go with the link. With the link the recipient may open the QlikView Server and have your selections and layout status reapplied. This functionality obviously relies on the recipient having access to the document on the server and access to relevant parts of data and layout therein. Read more on page 77.

Mail QlikView Document as Attachment

The local qvw file counterpart of the above item. Creates an e-mail with the qvw document as attachment. No QlikView Server required or involved. Read more on page 77.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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2.4 Input Fields

The fourth and final major theme of QlikView 8 is the introduction of the possibility to change certain field values without running the script. Whereas interactive and programmatic input of values in variables has been possible for a long time, the extension of theses capabilities to fields is a true paradigm shift in QlikView. It opens up QlikView to applications such as budgeting, planning, forecasting and what-if analysis. Finally the programmatic entry of input field data may be used to achieve near-real-time data display in QlikView.

Input Fields

An input field is just like any other field in QlikView, with the difference that its values, as read in the script, can later be changed without running the script again. In put fields can be used like any other fields in all types of sheet objects.

The script creates placeholders for each field value, which can later be edited to contain new data. Any field can be turned into an input field by listing it in an **inputfield** statement in the script before it appears in a **load** or **select** statement.

Values of an input field can be changed in list box cells, table box cells and in table chart expression cells. Only list boxes and table columns which contain input fields are editable. By hovering over an editable cell you will see an input icon. Clicking the icon sets the cell in input edit mode. It is possible to use up/down arrow keys to move between cells while staying in input edit mode. The entire QlikView document will automatically recalculate whenever new values are entered.

A table chart expression cell may contain the aggregation **inputsum(inputfield)** and still be open for input. The change will then be distributed back to the underlying field values, based on predefined algorithms, such as e.g. “spread equally“ or “spread proportionally“.

There are also Automation APIs for extracting and setting values programmatically.

You can read about input fields on page 23 and page 223.

2.5 General Features

Windows Vista Compliance

QlikView is now fully compatible with Windows Vista.

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Advanced Search

If you start a text search with an equal sign =, you may now enter an advanced search expression involving search criteria for associated fields and full boolean logic. After the equal sign you may type any valid QlikView layout expression. The expression will be evaluated for each field value in the search field. All values for which the search expression returns a non-zero value will be selected. This feature adds new dimensions to QlikView search.

In order to facilitate the entry of complex search expressions, an expanded search dialog has been added. It can be opened via the Advanced Search menu item in the Edit menu and list box object menu. It can also be invoked via the via the CTRL+SHIFT+F shortcut. See page 148 for a description of the dialog.

Alert Wizard

The new alert wizard simplifies the task of defining alerts. Find out more about the **Alert Wizard** on page 201ff.

Field Level Security in Section Access

The QlikView script section access has been amended with syntax to suppress one or more fields based on log-in identity. Suppressed fields are completely unavailable in the layout and cannot be referenced via Automation.

Scrambling Page in Document Properties

With the help of the new scrambling page it is possible to perform a random scrambling of the data in one or more fields. Numbers are scrambled to numbers and text to text (spaces are kept). Once scrambled, the data cannot be recreated in its original form by QlikTech or anyone else. See page 57 in Book II.

2.6 Script, Data Retrieval and Data Interpretation

Office 2007 Compatibility

QlikView 8 can read Excel files saved in the new Office 2007 format. See page 262.

Multiple Tabs in Hidden Script

It is now possible to have multiple tabs in the hidden part of the script.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Optimization of Where Clauses with QVD Files

It is now possible to use certain types of where clauses when reading qvd files and still maintain the high speed optimized load. The where clauses supported with high speed processing are exists and not exists on a single field name present in the table read. This feature can produce considerable performance gains for many types of incremental loads.

Optimization of join and keep statements

The join and keep statements are now executed with greater speed and lower peak memory usage. The difference can be rather dramatic when joining large tables.

2.7 Script and Layout Functions

Workday Functions

The new functions **networkdays**, **firstworkday** and **lastworkday** have been added to simplify calculations involving work days. See page 455.

Like Operator

The **like** operator has been added for string matching with wildcards. See page 366.

Hash Functions in Script

The two new script functions **hash128** and **autonumberhash128** can be used to build complex keys with better performance. See page 413 and page 420.

Other New Functions

The **age** function (page 455) returns the age in completed years at a certain time. The **substringcount** function (page 420) returns the number of times the string **substring** appears within the string text.

Optimization of count distinct

The count distinct function has been greatly optimized. Whereas it was previously a rather expensive operation, it is now in most cases just as sage from performance perspective as regular count.

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2.8 Chart Features

Funnel Chart

The funnel chart is a new chart type in QlikView, typically used for showing data in flows and processes. From a display point it is related to the pie chart. See page 162 in Book III.

Improved 3D Pie Chart

The pie chart has been amended with a new improved 3D look with true perspective. See page 153 in Book III.

Search/Select in Straight Table Expression Column

It is now possible to add a search icon in expression columns in straight tables. Clicking the  icon will open a search box. You may then type a search criteria (e.g. >100000). When hitting ENTER all table rows with an expression value matching the search criteria will be selected. See page 225 in Book III.

ALL Qualifier with Modifying Dimensions

The **ALL** qualifier functionality in QlikView chart expressions has been extended to match that of the **TOTAL** qualifier. This means that the **ALL** qualifier can be used with more aggregation functions and that it may be modified with one or more chart dimensions.

2.9 Layout Features

Animated GIF Support

Animated GIF images are now supported in QlikView text objects and buttons.

Text Object Stretch/Align Settings

There are now full stretch settings for both background and foreground images in text objects.

Eraser Icon on Each Line in Current Selections Box

Options have been added for displaying clear and lock/unlock icons on each row in the **Current Selections Box**. Clicking the icons has the same effect as the previously available **Clear** and **Lock/Unlock** commands in the current selections box context menu.

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Expanded Layer Control GUI for Objects

A custom setting has been added in the layer control for sheet objects. Whereas the previous GUI has only allowed the use of three layers, there is now access to the full underlying 255 layers. With design grid turned on the object menus of all sheet objects have been amended with an **Order** cascade menu for easy control of layers.

Detailed Control of Minimized Sheet Object Size/Position

On the **Advanced Captions Settings** dialog (**Layout** page of sheet object properties) it is now also possible to set minimized sheet object size and position to exact pixel values.

Object ID Renumber Command

A command has been added for a complete renumbering of all sheet, sheet object, bookmark, alert and report IDs in a document. Please use with caution, as e.g. macros referencing objects via ID will be rendered useless.

2.10 Printing and Exporting from QlikView

Report Editor Enhancements

The report editor has undergone extensive work to make building of reports easier. New functionality includes a zoom control, a design grid, alignment tools and the ability to navigate to any object in the report using the tab key. Furthermore it is now possible to drag and drop multiple sheet objects from the layout to the report in one operation. Drag and drop capabilities within the report editor have also been expanded, including the possibility to move the border between the different sections of a multi-paper page interactively.

Configurable Section Spacing in Report

The distance between the different sections of a multi-paper page can now be configured as a percentage of the total paper height.

Show Condition on Reports

Just as it has been possible before to attach a show condition on sheets and sheet objects, it is now also possible to do the same on reports. This allows for the conditional display of reports depending on selections made or user identity.

Calculated Report Names

The name of a report may now be expressed as a calculated formula.

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Print Code Enhancements

The general print code of QlikView has been revised for better performance and better page number calculation.

2.11 Automation and Macros

Automation Interface

The QlikView Automation interface has been extended with a number of new members in order to facilitate better control of QlikView.

Since many parts of QlikView have been extensively changed, macros from earlier versions of QlikView may have to be revised in order to work in QlikView 8. This is especially true for all macros referencing sheet object properties.

Below a few much requested highlights have been singled out. See the QlikView 8.0 API guide for details on all new Automation members.

Improved Export Method

A new method ExportEx has been added. This method gives you options for exporting QlikView sheet object data content to any supported file format, including QVD.

Field Level Security - Option in Automation Reduce Method

The **Document.ReduceData** method has been amended with the option of dropping individual fields as part of the reduction.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 WHAT'S NEW IN QLIKVIEW 8.01?

Custom Formatting In Tables

A dialog has been added for applying custom cell formats to table cells. Editing is done by dimension and/or expression for table charts and per field in table boxes. Editable properties include colors, borders and font adjustments. Read more about the **Custom Cell Format** dialog on page 158 in Book II.

New Copy Options In Sheet Objects

All text based sheet objects have been amended with a new option to copy the contents of the cell upon which you click to invoke the object's object menu.

In order to make the object menus less crowded, all **Copy To Clipboard** options have been moved out in a cascade menu for all sheet object types.

The command for copying the entire sheet object, previously only accessible via CTRL+C, has been added to the copy cascade.

You can read more about the **Copy to Clipboard** options under the different objects' object menus (e.g. for list boxes on page 96 in Book II).

Favorites in Start Page

A new tab has been added in the start page, displaying your collection of **Favorites** documents. Read more on page 68.

New Input Field Aggregation Function

The new aggregation function **inputavg** provides the average equivalent of the **inputsum** function. Apart from displaying aggregated average instead of sum, this function retains all the properties of the inputsum function. Read more on page 325 in Book III.

Expression Copy/paste

It is now possible to copy all data and settings associated with a chart expression (including label) as a piece of xml. The expression may then be pasted back into the same chart or into any other QlikView chart in the same or another document. If you use the command on an attribute expression, only the attribute expression definition will be copied. An attribute expression may then be pasted onto any main expression in the same or another chart.

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Improved AJAX Zero-Footprint Client

The AJAX Zero-Footprint Client has been further improved. Multi boxes and pivot tables have been optimized for asynchronous update and thereby drastically better performance.

Table styles, such as cell colors, borders etc are now correctly rendered as they would appear in regular QlikView.

Support for minimized charts and auto-minimize has been added.

Print and **Send to Excel** are now supported commands. These are accessed via caption icons. Support for caption icons in general has been expanded and

Support has been added for almost all caption icons available in regular QlikView.

Of course all these features are automatically supported by the AJAX ZFC page generator.

Options For Caption Icons On New Objects

Options have been added under **User Preferences** to control whether certain selected caption icons are to appear by default in newly created sheet objects. The use of these caption icons (**Search** in list boxes and **Print/XL** for charts and tables) is highly recommended for better usability in general and especially if the document is to be published for the QlikView AJAX ZFC client. See page 123.

Default Font

A default font can now be set as a user preference. This will be used as document default when new documents are created. Further, the font sheet under **Document Properties** now defines the document default font instead of chaning the acutal font of all objects.

Option To Re-open Script Dialog After Script Execution

An option has been added under **User Preferences** to make the **Edit Script** dialog to be re-opened after script execution, if the script execution has been started from inside the dialog. Read more on page 109.

New Calculation Logic for Complex Expressions

When an expression contains fields from only one table, QlikView will calculate the aggregation on the set of possible records in this table. Conversely, if the expression contains fields from several tables, QlikView will calculate the aggregation on the set of possible combinations of records from the used tables. With QlikView 8.01, fields that only exist in the first parameter of an

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if function will be excluded from the generation combinations. This means that the if function now can be used as a filter without affecting the multiplicity in the calculation set.

General Optimizations

As always, a number of further performance optimizations have been added. Of special significance in this release is improved multi threading of the internal memory manager. This should lead to significantly higher utilization of multiple processor cores in environments with many users and documents.

New Default for the Today() Function

A call of the **Today()** function will now return the day when the document was opened. As before, it is still possible to call **Today()** with parameters to control the mode used. The mode "1" (real time) should still be used with caution, since it will cause QlikView to poll the system once a second, which could influence the general QlikView performance.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4 WHAT'S NEW IN QLIKVIEW 8.2

4.1 QlikView Server

For more information about the new features in QlikView Server, please refer to the QlikView Server manual.

Extended Management Options in QlikView Server

The new Document Metadata Service (DMS) in QlikView adds a whole new range of management options in the QVS Control Panel. When using the DMS (optional) the QVS becomes aware of available documents in a whole new way. The new possibilities include:

- ability to have a document automatically loaded whenever the QVS service starts
- ability to schedule loading and unloading of a document
- ability to limit the number of sessions towards a document

Support for Third-Party (Non-Windows) Authentication

QlikView Server now contains provisions for accepting third-party authentication via a trusted web server. QlikView Server can accept and handle tickets from a web server and thereby recognize an identity authenticated by that web server. The actual authentication is done completely outside the bounds of the QlikView software. The use of third-party authtentication requires the use of extended authorization via the DMS (see below).

Extended (DMS) Authorization Mode

QlikView Server has traditionally relied on Windows NTFS file security for authorizing a user to access a QlikView document. Whereas this behavior remains the default, QlikView 8.2 also introduces an extended authorization mode, based on the new Document Metadata Service (DMS). This mode is compulsory, whenever using third-party authentication (see DSC) installed with QlikView Publisher (hence also a third-party Directory Service Provider) to resolve group memberships for authenticated users. with the use of extended authorization it also becomes possible to control access to a document for a specified user or user group to specified time intervals.

Improved Support for Clustered Server Environments

The support for several QlikView Servers has been improved. Provided that the QVSs share the same document location, there is now complete support for collaboration objects working seamlessly over all servers. The license

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model has also been extended, allowing several servers in a cluster to share the same CALs.

Session Time-outs

Settings have been added to force the termination of server sessions after a specified time-out.

Borrow CAL from Server

Users of the Windows QlikView Analyzer (non registered) client can use the credentials of a named CAL on a QlikView Server to open documents locally (Analyzer+ capability). This ability expires 14 days after the last connection to the QlikView server using the named CAL, but is renewed every time a server connection occurs.

4.2 QlikView Publisher

Tighter Integration between QVS and QV Publisher

The integration between QlikView Publisher and QlikView Server has been further strengthened. QlikView Publisher now recognizes a QlikView Server as a resource and automatically licenses itself towards any QlikView Server on the same computer, leading to a fast time to value and minimal configuration. QlikView Publisher also has been extended to communicate with the Document Metadata Service (DMS) of the QlikView Server to support operation in conjunction with third-party authentication and extended authorization mode. The QlikView Publisher now automatically licenses itself towards any QlikView Server on the same computer leading to a fast time to value and minimal configuration.

Directory Service Connector

The Directory Service Connector (DSC) acts as the interface to any directory. The DSC is delivered with providers for Microsoft Active Directory, Windows NT, Windows Users and Groups and QlikView Publisher Custom Users and Groups. The API lets developers create their own providers to suit their organizations.

AJAX Zero-Footprint Client Generation by QlikView Publisher

The new version of QlikView Publisher has the ability to automatically generate AJAX ZFC pages for distributed documents, thus making an AJAX ZFC alternative available via QlikView AccessPoint for the end user.

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QlikView Publisher Improvements

A number of general GUI and performance improvements have ben made in the QlikView Publisher components. Among these are; past and present events are viewable in real-time, information about Tasks, Jobs and Resources can be acted upon from one single location making maintenance even easier.

Command Center converted to a Windows service

The virtual folder in Internet Information Service has been converted to a Windows service.

Massive performance improvements

The speed of the user interface has greatly improved with the use of AJAX and improved work processes in QlikView Publisher.

Task retry

A Task can be configured to retry its execution with a certain delay.

Improved availability of web service call for Event Driven Execution

The Event Driven Execution (EDX) will be more available through a web page that allows the entering of the name of a Job to start the execution of the Job.

For details see the QlikView Publisher 8.2 Reference Manual.

4.3 QlikView Clients

Improved AJAX Zero-Footprint Client

The AJAX Zero-Footprint Client has been further improved. New and improved features include:

- completely new multi box with the same look as in regular QlikView
- support for slider/calendar object
- support for bookmarks (for authenticated users)
- support for drill-down and cyclic groups
- support for cyclic expressions
- support for fast type-change in charts
- support for fixed number of lines in tables
- support for drop-down select in tables

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- sort indicators in tables
- selection indicators (LEDs) in tables
- CLEAR and LOCK icons in current selections object
- improved layout pixel fidelity to Windows client
- interactive search feedback
- support for Safari 3.0 browser

Improved Java Client

The Java Client has been further improved. New and improved features include:

- improved performance
- support for slider object
- tool tips in charts
- support for all relevant caption buttons in all sheet objects
- context menus on cycle and fast type-change buttons
- support for grid style multi box
- fast type change between bitmap charts and table charts
- improved handling of pop-up windows

Improved GUI for Collaboration Sheet Objects

A new collaboration object pane has been added for better overview and easier handling of personal and shared server sheet objects. The pane features informative icons with hover tool tips, giving you information about the available objects. Objects can be dragged from the pane onto the sheet. For more information see chapter 17 in Book II.

Convert User Bookmarks to Server Bookmarks

A utility has been added to convert all old user bookmarks for a specific document to server bookmarks stored in the server repository. This action is recommended for easier maintenance of bookmarks. Read more on page 172.

Convert User Reports to Server Reports

A utility has been added to convert all old user reports for a specific document to server reports stored in the server repository. This action is recommended for easier maintenance of reports. Read more on page 178.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4.4 General QlikView

Numbers and Values Next to Slices in Pie Charts

It is now possible to display numbers and text adjacent to the slices of a pie chart. Read more on page 152 in Book III.

Improved Sorting in Pivot Tables

The sorting on y-values in pivot tables has been improved so that correct sort order is applied also in the inner dimensions. Read more on page 152 in Book III.

Custom Formatting in Tables

The dialog for custom cell formatting in tables has been improved. New features include a table context preview, ability to change an active cell from inside the dialog and undo/redo of changes within the dialog.

Expression Export/Import

It is now possible to export all data settings associated with a chart expression (including label) to an xml file. The expression may then be imported back into the same chart or into any other QlikView chart in the same or another document.

Color Mix Wizard

A new wizard has been added to simplify the task of defining color gradient expressions. Read more on page 234 in Book III.

Improved Properties GUI for Caption Settings

Many users have argued that the settings of the so called **Advanced Caption** dialog are quite frequently used and should therefore be more easily accessible. We acknowledge this fact and have now moved the caption settings to a new **Properties** tab of their own. This new **Caption** tab is described on page 65 (under **Document Properties**), and page 114 (under **List Box Properties**) in Book II. You will also find it described on page 79 in Book III (under **Chart Properties**).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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5 WHAT'S NEW IN QLIKVIEW 8.5

5.1 Chart features

Set Analysis

This is arguably the most important new feature of this release. QlikView has always been good at calculating aggregates for the current selection of data. However, when you wanted to compare results for different selections in the same chart, you needed to either prepare data in the script or resort to rather complicated expressions with if clauses. Set analysis changes all that, by making it possible to modify any aggregation function with an arbitrary selection set. The set may be defined as a bookmark, as an on-the-fly selection in one or more fields, as a function of current selections, the inverse of current selections, previous selections, all data etc etc. The possibilities are endless and yet the syntax is fairly simple and straightforward. Read more on page 327 in Book III.

New Formatting Styles

Pie charts, bar charts and gauge charts have been given new formatting styles providing a visible upgrade in graphics.

New Plot Area Background Style

The shadowed plot area background previously found in certain bar charts is now available for all bitmap charts with plot area background.

Numbers in Bar Segments

In bar charts there is now an option to have numbers plotted inside the bar segments rather than on top of them.

New Mode for Dimensionless Bar Charts

In dimensionless bar charts it is now possible to have the expression labels plotted on the x-axis instead of in a separate legend.

Symbol Plot Options

This option makes it possible to select a specific plot symbol for a given expression. Read more on page 36 in Book III.

Plateau Line Mode

This new plot option for line charts draws horizontal lines between data points and vertical lines at the points. Read more on page 36 in Book III.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Select Others in Block chart

It is now possible to select the Others segment in a block chart by clicking on it.

5.2 Layout features

Improved Bookmarks

Bookmarks containing layout information now cover much more of the relevant layout state. Cycle group status and pivot table expand/collapse information will be remembered and re-applied when recalling the bookmark. There is also an option to include scroll positions in tables and charts with x-axis scroll. The scroll position will be re-applied on a best effort basis. Finally, it is now possible to make a pure layout bookmark, excluding the selection state altogether. Read more on page 167.

Preservation of Scroll Positions after Selection

QlikView now has the option to preserve scroll positions in tables and charts with x-axis scroll over a selection. The post-selection scroll positions are applied on a best effort basis.

Sheet Object Drag and Drop to Microsoft Office

Sheet objects in QlikView can now be dragged and dropped straight into Microsoft Word, Excel and PowerPoint documents. This feature works for local and server QlikView documents and from installed QlikView and QlikView IE plug-in alike.

Styling Mode

A new sheet object caption/border style adds a whole new look to the QlikView sheet. Sheet objects are drawn with a background shadow, providing a cleaner and more modern look. Read more on page 20 in Book II.

Upgraded Multi Box

The multi box has been given an alternative cleaner formatting style. The traditional style has also received an upgrade. The multi box can now also display calculated fields. Read more on page 135 in Book II.

More Formatting Options in Input Box

More formatting options have been added to the input box. These include alignment settings and an option to omit the equal sign in the middle column. Read more on page 179 in Book II.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Calculated Fields in Slider/Calendar Objects

The slider/calendar object is now able to connect to calculated fields. Read more on page 219

Copy Image as Caption Icon

The copy image command can now be configured as a caption icon.

More Window Sizes

The resize window command now has more screen resolutions to choose from, notably widescreen sizes.

5.3 New Script and Layout Functions

Document Info Functions

Script macro functions accessing ActiveDocument are no longer permitted, as of QlikView 8.20. As there is sometimes information needed during script execution that was only available via macros containing ActiveDocument, we have added a set of standard QlikView functions to replace those macros. The new functions are NoOfTables, TableName, TableNumber, ReportName, NoOfReports, ReportId, ReportNumber and ReportComment. The table functions are only available from the script whereas the report functions work both in the script and in the layout.

Day Number Functions

The functions DayNumberOfYear and DayNumberOfQuarter have been introduced. They return the day number within the year and the quarter, respectively.

5.4 General Features

Improved Performance and Memory Utilization

QlikView and QlikView Server have been further optimized for better performance and better memory utilization in multi-user environments.

Password for Module

It is now possible to protect the macro module with a password. Read more on page 45 in Book II.

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Initial Selection Based on Section Access

This new feature allows you to apply an initial selection based on section access when a document is opened. It works basically just like the old initial data reduction, but without applying the reduction.

On-the-fly Variables

When using $() macro expansion in QlikView expressions, you may now skip the extra step of creating a variable for the expansion. If the string between the brackets starts with an equal sign, the following content will be expanded as if it were contained in a variable. Read more on page 360.

Command Line Switch -nodata

A new command line switch, -nodata has been added, making it possible to open QlikView documents without their data. This may be handy, e.g. when opening a very large document on a developer computer with too little RAM to accommodate all data. Read more on page 67.

Scripting Interface to DMS

Syntax has been added for scripted access to QVS DMS.

5.5 Script Features

Hierarchy Resolution

The new script keywords Hierarchy and HierarchyBelongsTo drastically simplify the creation of scripts reading hierarchical data. Read more on page 309 and page 310.

Read Pictures from ODBC Databases

Support has been added to read images stored in ODBC databases. Read more on page 312.

Image Size Transformation

When reading images for inclusion in the QlikView document, script syntax has been added for resizing of the images. This makes it possible to e.g. read thumbnail images via the bundle syntax. Read more on page 312.

More Keyboard Shortcuts in Script Editor

A number of new keyboard shortcuts have been added throughout the script editor.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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5.6 AJAX Client Capabilities

Collaboration Object Creation from AJAX Client

Server settings permitting, it is now possible to create user charts and list boxes from the AJAX clients. This is the first step towards the goal of providing full collaboration object support in this environment.

Anonymous User Bookmarks

Previously only authenticated users could create bookmarks via the AJAX client. With this release that capability is extended to all users, authenticated or anonymous.

Context Menus

Right-click context menus have been added to the AJAX client. More or less all options found in the thicker client are now also available to the AJAX user.

Toolbar

It is now possible to add a toolbar with the most common commands to the AJAX client application. The option to include the toolbar is available in the Client Page Generator dialog.

Upgraded Sheet Object Drawing

Major improvements have been made in the visual presentation of tables and current selection boxes. Support has been added for displaying bitmap buttons and aqua style buttons.

Upgraded Sheet Tabs

The drawing of sheet tabs has been improved. Support for selection beacons has been added.

Support for Input Fields

Input fields can now be edited via the AJAX client.

Full Support for Fast Type Change in Charts

Fast type change now also works between bitmap charts and table charts.

Expression Search

Support has been added for search in straight table expression columns.

Frequency in List Boxes

Support has been added for the frequency column in list boxes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Export to CSV

Export to csv has been added as an option for selected objects via their context menus.

5.7 Java Client Capabilities

JavaBeans Integration

The Java client now consists of JavaBeans, which can be used for server side and/or client side integration with other Java applications.

Stand-alone Capabilities

The Java client can now be run as a stand-alone application outside the browser environment. For this to be useful, an open in server dialog has been added, so that the client can connect to a QlikView Server and open documents. Furthermore, the client and QlikView Server 8.5 and later will have cross version compatibility just as the QlikView IE plug-in and the installed QlikView clients.

Graphical Updates

A number of improvements have been made in the graphical presentation of the Java client, so that it now supports most features found in the thick clients. Features include an improved tab row, support for the new caption/border style and support for rounded corners on sheet objects.

Improved Tables

Tables in the Java client now support pivoting and moving of columns. Additionally support has been added for displaying gauges in table cells.

Improved Export Option

Support for export to csv and copy to clipboard has been added.

Open Files from Info Button

It is now possible to open files by means of an info button.

5.8 QlikView OCX features

Registration-free Deployment of QlikView OCX

It is now possible to use the QlikView OCX component for integration with other applications without actually registering it on the target system. This

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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makes it possible to deploy several different host applications using different versions of the QlikView OCX component on the same computer.

OnReloadFailed Event

This new event makes it possible to catch failed script execution from a host application.

5.9 Simplified licensing

QlikView Enterprise becomes QlikView Developer

QlikView Enterprise has been renamed QlikView Developer in order to better reflect its intended use and target audience. Functionally it is the same good stuff though.

Same Price for 32- and 64-bit

The product distinction between 32- and 64-bit QlikView and QlikView Server has been removed. All QlikView users now have the choice to use the full power of 64-bit QlikView.

User Object Creation from QlikView Analyzer

The previous requirement for a QlikView Professional or QlikView Enterprise license key in order to create personal and shared sheet objects in a QlikView Server document has been removed. If you have a valid CAL and are an authenticated user, you may create and share your own sheet objects (server settings permitting).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6 COMPATIBILITY ISSUES FOR EARLIER VERSIONS OF QLIKVIEW



The development team has done absolutely everything we could to make the migration from QlikView 8 from earlier versions as smooth as possible. We believe that we have succeeded and think that the migration from QlikView 6 and QlikView 7 has the potential of being very smooth indeed. This document lists some areas of concern.

6.1 File Format Compatibility

File Format Compatibility in QlikView 6, 7 and 8

QlikView 6, QlikView 7 and QlikView 8 share the same file format. You may work in these versions in parallel virtually without thinking about it. New QlikView 8 document features will of course not work in QlikView 6 or QlikView 7 but will be retained even if the document is opened and edited in the earlier version. The whole thing works very much like Microsoft Office files have been working for some time now.

File Format Read Compatibility with Earlier Versions

QlikView 8 will open all QlikView files created in QlikView 6.0x. Should you need to open files from QlikView 1.x, 2.xx, 3.xx, 4.xx or 5.xx, you need to go via QlikView 6. Contact your QlikView vendor for a free copy.

The development team always strives to make the appearance of a document in the new version as similar as is ever possible to how it looked in the older version. However, sometimes added functionality must come with the price of changes in the look of old documents.

Saving in Earlier File Formats from QlikView 8

QlikView 8 cannot save documents in any file format usable in versions prior to QlikView 6.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6.2 Mixed Client/Server Environments

QlikView 8 <-> QlikView 6/7

QlikView Server 6/7 will work seamlessly with QlikView 8 clients as will QlikView Server 8 with QlikView 6/7 clients. Of course, in order to make use of QlikView 8 specific functionality you need to have both server and client of version 8.

Earlier Versions

QlikView Server 8 is not compatible with QlikView 4 and QlikView 5 clients. Nor are QlikView Server 4 and QlikView Server 5 compatible with QlikView 8 clients.

6.3 Issues when Migrating from QlikView 6.0x

Toolbar Settings in Document

With the new customizable toolbars in place, the by industry standards rather odd behavior of QlikView to store toolbar settings in the document became impossible to maintain. Toolbar settings are now, as with most other software products, a user setting. Customers depending on a certain subset of toolbars being shown or hidden with a specific document will have to achieve that by means of Automation programming. Simple methods for this will be provided.

User Bookmarks

User bookmarks are now stored in one file per document rather than in one file per user as in QlikView 6. This means that user bookmarks created in QlikView 6 are not accessible from QlikView 7 and vice versa.

Case Sensitive Script

Unlike earlier versions of QlikView script table names are now case sensitive.

Automation: Chart Expressions

QlikView versions later than 6 store chart expressions in a completely new way as compared to QlikView 6. The change has been made to bring order and scalability to expression structures with main expressions, sub-expressions and attribute expressions. The old structure had reached a dead-end. All macros and host program code performing direct manipulation of chart expressions will have to be adjusted to work in QlikView 8. See the next section of this document for instructions on necessary changes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Automation: Other Issues

It is very likely that some other minor compatibility issues will be identified with regard to the Automation API. These issues will be published as we find them.

Sheet Object Memory Limits

With the introduction of asynchronous sheet object update in QlikView 6 much of the meaning of the sheet object memory limits became obsolete. As for the time limit, it even became meaningless, as asynchronicity and parallelism take away any clear definition of the timing involved. For QlikView 7 we have therefore instated two changes. Firstly the time limit has been scrapped altogether. Remember that the calculation of each sheet object can now be aborted (and restarted) interactively at any time the user chooses, something unheard of back when time limit was introduced. Secondly all new sheet objects are created with practically unlimited settings for memory and cells. Old limits will of course not be changed and you may still set the limits for any sheet object, new or old.

6.4 Automation Change Patterns

This section contains patterns for changes necessary when using Automaton code written for QlikView 6 in QlikView 8.

GraphProperties.ExpressionDatas

All references to the Automation API GraphProperties.ExpressionDatas must be changed according to the pattern shown in the example below:

QV6 code

```
set chart =
ActiveDocument.Sheets("Main").CreateComboChart
chart.AddDimension "ProductType"
chart.AddExpression "sum(Amount)"
chart.AddExpression "count(Customer)"
set p = chart.GetProperties
p.ExpressionDatas.Item(1).Accumulate = 1
chart.SetProperties p
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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QV8 code

```
set chart =
ActiveDocument.Sheets("Main").CreateComboChart
chart.AddDimension "ProductType"
chart.AddExpression "sum(Amount)"
chart.AddExpression "count(Customer)"
set p = chart.GetProperties
p.Expressions.Item(1).Item(0).Data.ExpressionData.Acc
umulate = 1
chart.SetProperties p
```

GraphProperties.ExpressionVisuals

All references to the Automation API GraphProperties.ExpressionVisuals must be changed according to the pattern shown in the example below:

QV6 code

```
set chart =
ActiveDocument.ActiveSheet.CreateComboChart
chart.AddDimension "ProductType"
chart.AddExpression "count(Customer)"
set p = chart.GetProperties
set expr = p.ExpressionVisuals.Item(0)
expr.ShowAsBar = false
expr.ShowAsLine = true
expr.ShowAsSymbol = true
chart.SetProperties p
```

QV8 code

```
set chart =
ActiveDocument.ActiveSheet.CreateComboChart
chart.AddDimension "ProductType"
chart.AddExpression "count(Customer)"
set p = chart.GetProperties
set expr =
p.Expressions.Item(0).Item(0).Data.ExpressionVisual
expr.ShowAsBar = false
```

ChartProperties.DataAxes

All references to the Automation API ChartProperties.DataAxes must be changed according to the pattern shown in the examples below:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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QV6 code

```
set chart =
ActiveDocument.Sheets("Main").CreateLineChart
chart.AddDimension "ProductType"
chart.AddExpression "sum(Amount)"
set p = chart.GetProperties
p.ChartProperties.DataAxes(0).Logscale = true
chart.SetProperties p

set chart = ActiveDocument.GetSheetObject("CH01")
set p = chart.GetProperties
for i = 0 to p.ChartProperties.DataAxes.Count - 1
    p.ChartProperties.DataAxes.Item(i).Grid = true
next
chart.SetProperties p
```

QV8 code

```
set chart =
ActiveDocument.Sheets("Main").CreateLineChart
chart.AddDimension "ProductType"
chart.AddExpression "sum(Amount)"
set p = chart.GetProperties
p.Expressions.Item(0).Item(0).Data.AxisData.Logscale
= true
chart.SetProperties p

set chart = ActiveDocument.GetSheetObject("CH01")
set p = chart.GetProperties
for i = 0 to p.ChartProperties.DataAxes.Count - 1
   p.Expressions.Item(i).Item(0).Data.AxisData.Grid =
true
next
chart.SetProperties p
```

6.5 Issues when Migrating from QlikView 5.0x

Text objects with OCX replacement objects

The role of the QlikView 5 text object for hosting OCX replacement controls has from QlikView 6 been taken over by the new Custom object. Text objects hosting OCX replacements imported from QlikView 5 will remain unchanged and display the OCX replacement control correctly. It is however no longer possible to create text objects with an OCX replacement control. Neither can the OCX replacement controls in a text object be changed under

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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QlikView 8. It is recommended to substitute text objects carrying OCX replacement controls with custom object.

Calculated Color in Charts

An expression for calculated color in a chart is in QlikView 8 converted to a color attribute linked to the first expression in the chart.

Changes in the Automation Interface

Fairly large changes have been made in certain parts of the Automation interface since version 5. Mostly a large number of new properties have been added, but a few have disappeared. One important change is that fields must now always be referenced by name. The internal field number available in earlier versions may no longer be used. Macros and external applications calling QlikView through the Automation interface may need to be updated in order to work properly.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART II: INSTALLATION

- **Installing QlikView**
- **OLE DB and ODBC**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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7 INSTALLING QLIKVIEW



In your QlikView package you will find a DVD, a note with a serial number and a control number, and a license agreement. To install QlikView you will need the QlikView DVD, the serial number and the control number.

QlikView is designed to run on an IBM PC compatible computer with Windows NT 4 Service Pack 6, Windows 2000, Windows 2003, Windows XP or Vista. For detailed information on the system requirements, see page 459 in Book III.

7.1 Starting the Installation Program

Do the following:

1. Insert the DVD into the DVD drive.
2. The setup program usually starts by itself: if it does not, open the Windows Explorer, find the DVD drive and double-click *Start.exe*.

The installation program should now have started.

7.2 When the Installation Program Is Running

1. In the first dialog that opens, choose your product type and click **OK.**
2. In the second dialog that opens, choose your language and click **OK**.
3. The third dialog that appears is just a “Welcome” dialog in the language that you selected in the previous dialog. Click **Next** to continue the installation.
4. You now get to the software license agreement. Read it, and click “I accept the license agreement” (if this is the case), then click **Next**.
5. In the **User Information** dialog you specify for whom the installation will be personalized. On Windows NT based operating systems, you must specify if the installation settings will be valid for the current account or if the settings are the same for any account that uses the computer (an account with administrator rights is required, if you choose the last alternative mentioned). Specify your choice and click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6 The installation program suggests a destination directory for the QlikView files. If you prefer to install to another folder, click **Browse** and choose another folder. To continue, click **Next**.

7 The installation type dialog appears. If you choose **Typical**, the following features will be installed: The QlikView program and its Help file, the Reference Manual (in PDF-format, Acrobat Reader is required to view it), the API Guide and Examples of Custom objects. If you choose **Complete**, the previous files mentioned will be installed plus the QlikView Tutorial and examples of QlikView functionality and features. If you choose **Custom**, a dialog where you can specify the features to install will appear when you click **Next**. Make your selections and click **Next**.

8 If you selected **Typical** or **Complete** installation, you are now ready to start the installation, click **Next** to start. Otherwise you have to customize your installation before you are ready to install it.

9 In the last dialog you click **Finish** to complete the installation process.

Note You always have to enter the QlikView license on the account that installed it; otherwise it might not function properly.

7.3 Serialization

If you are using QlikView Developer or QlikView Professional the next step is to serialize your copy of QlikView. Start QlikView from the **Start** menu. The **Serialization** dialog box should now appear. This is where you enter your serial number, your control number, your organization and your user name. If this is not done correctly, the initialization of QlikView will fail.

Note The serialization process requires network access or optionally phone activation!

If you are using QlikView Analyzer no serialization is necessary. It is however possible to acquire a serial number for this product and enter it on the **Registration** page of the **User Preferences** dialog (see page 138). A registered QlikView Analyzer will give you access to local files. Contact your QlikView vendor for details.

Once you have installed and serialized your copy of QlikView, you can start using the program.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

7.4 Network distribution of QlikView

This type of installation is useful if you have many licenses and want to make sure that all users run the same version of QlikView. Each user still needs a separate license number.

To distribute a QlikView installation, you need the installation DVD. Serial numbers and control numbers are not necessary until you start your first QlikView session on the client computer.

On earlier QlikView installation CDs (QlikView 5 and earlier), a specific server installation program was provided. QlikView 8 uses the Microsoft Windows Installer technique (MSI packaging) and a specific server installation program is no longer needed. The Microsoft Windows Installer technique has built-in support for this type of installations.

To find out more about the ways to install an MSI-package please visit the Microsoft homepage for Windows installer:

- http://msdn.microsoft.com/library/default.asp?url=/library/en-us/msi/setup/windows_installer_start_page.asp

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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7.5 License Enabler File Editor

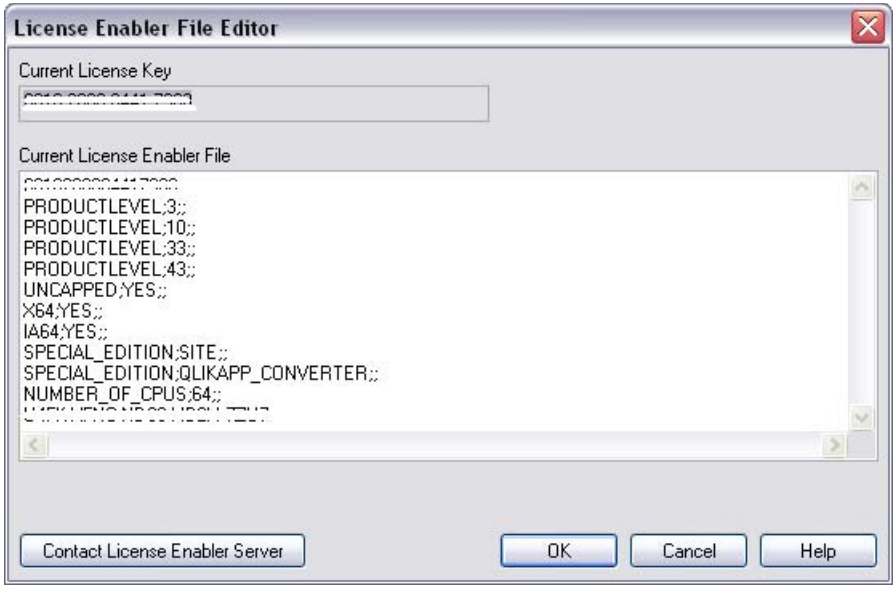


Figure 1. License Enabler File Editor

In this dialog the user can review or edit the License Enabler File.

Current License Key

The license key of the QlikView license that is normally entered when the original program is installed. It may also be entered or edited at a later time via the **Registration** dialog that is opened via the **Registration** page of the **User Preferences** dialog.

Current License Enabler File

A text file containing information relevant to the installed license that is required in order to activate (enable) the license.

Contact License Enabler Server

Click this button if the text edit box **Current License Enabler File** above is empty in order to contact the **License Enabler Server**.

Troubleshooting the License Enabler File

A License Enabler File (LEF file) is required in order to verify the validity of every QlikView license (with the exception of QlikView Analyzer) at the time of the installation. During the initialization of the license the QlikTech LEF Server is contacted via the Internet. Provided that the license information given checks out, a LEF file is automatically transferred to your com-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

puter. Under normal circumstances the LEF procedure is barely noticeable as it is done in the background. There are however instances when the procedure fails, either because you are unable to contact the LEF server or because a firewall prevents the transfer of the LEF file. When this happens the **License Failure** dialog will be displayed to inform you about the problem.

Should you be unable to obtain a valid LEF file through the normal procedure and you feel that you are entitled to one, you might instead obtain it directly from QlikTech Support. When you copy the text file directly into the LEF editor you must make sure that there are no trailing empty spaces in the text.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

60

8 OLE DB AND ODBC



8.1 OLE DB

QlikView supports the OLE DB interface for connection to external data sources. You can access a great number of external databases via the Microsoft OLE DB Provider for ODBC Drivers.

8.2 When Is the ODBC Interface Needed?

It is necessary to have the ODBC (Open DataBase Connectivity) interface installed if you want to access a general database. The alternative is to export data from the database into a file that is readable to QlikView.

Normally some ODBC drivers are installed with the operating system. Additional drivers can be bought from software retailers, found on the Internet or delivered from your DBMS manufacturer. Some drivers are redistributed freely.

The ODBC interface described here is the interface on the client computer. If you plan to use ODBC to access a multi-user relational database on a network server, you might need additional DBMS software that allows a client to access the database on the server. Contact your DBMS supplier for more information on the software needed.

QlikView works with both 32-bit and 64-bit ODBC drivers. It is however very important to use the corresponding versions of the ODBC drivers and the program version, i.e. the 32-bit version of QlikView will only work with the 32-bit ODBC drivers and 64-bit QlikView will only work with the 64-bit ODBC drivers.

Is the Correct ODBC Driver Installed?

On a 64-bit platform it is possible to use both 32-bit and 64-bit applications. It is also possible to run both 32-bit and 64-bit ODBC drivers.

When using the 64-bit versions of ODBC and QlikView, the **ODBC Data Source Administrator** is found in the **Control Panel**, **Administrative Tools**.

When using the 32-bit versions of ODBC and QlikView, you must start the 32-bit administrator via the executable file, odbcad32.exe, that is located in the SysWOW64 folder, usually c:\windows\SysWOW64.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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According to Microsoft, in the 64-bit versions of the operating systems, the system32 folder, usually c:\windows\system32, contains only 64-bit files. If there is also a 32-bit version of the file, it resides in the syswow64 folder. See http://technet.microsoft.com for more information.

On a 32-bit operating system the configuration is very straightforward since all files and drivers are 32-bit.

There should be an **ODBC Data Source Administrator** installed on your system.(Classic view of the **Control Panel** is assumed):

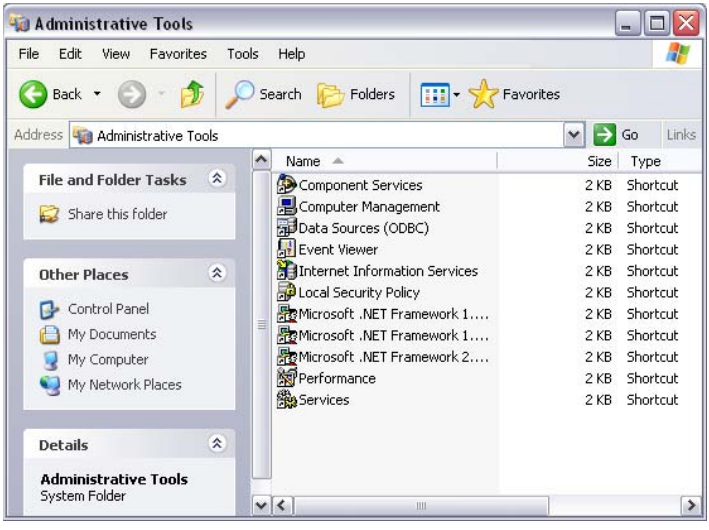


Figure 2. The Administrative Tools in the Windows XP Control Panel

1 Click the **Start** button on the task bar, choose **Control Panel**, then **Administrative Tools**.

2 Double-click the ODBC icon to find out what data sources you have defined. (For 32-bit ODBC on a 64-bit operating system, start C:\windows\SysWOW64\odbcad32.exe).

3 Go to the **ODBC Drivers** tab to find out what drivers are installed.

If the driver you need is not found on the ODBC Drivers dialog page, contact your software supplier to get the correct driver.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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8.3 Creating ODBC Data Sources

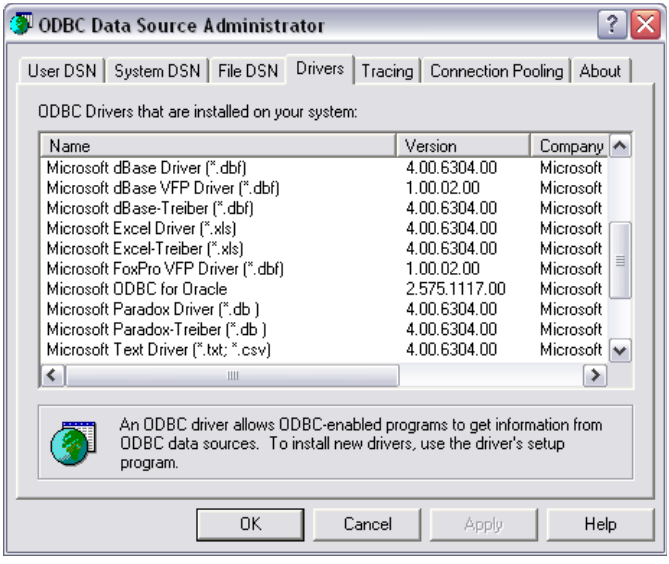


Figure 3. The ODBC Data Source Administrator dialog box, Drivers page

You must create an ODBC data source for the database you wish to access. This can be done during the ODBC installation or at a later stage.

Before you start creating data sources, you must decide whether they should be user or system data sources. User data sources cannot be reached unless you have logged on with the correct user id. If you want to share your data sources with other users, you must create system data sources.

1. Open the **ODBC Data Source Administrator** dialog box again.
2. Go to the tab **User DSN** if you want to create user data sources, or to the tab **System DSN** if you want to create system data sources.
3. Click the **Add** button. The **Add Data Source** dialog box should appear, showing a list of the ODBC drivers installed.
4. If the correct ODBC driver is listed, select it and click the **OK** button. A dialog box specific to the selected database driver will appear. Name your data source and set the necessary parameters. Click the **OK** button when ready.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

64

PART III: GENERAL

- **Menu Commands**
- **Toolbars and Status Bar**
- **User Preferences**
- **Logic and Selections**
- **Bookmarks**
- **Reports**
- **Alerts**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

66

9 STARTING QLIKVIEW

D P A

You start QlikView by double-clicking the QlikView icon or by choosing **Programs**, then **QlikView** from the **Start** menu. 

If you wish to start QlikView from the command line, you can use the parameters described in the following section.

9.1 Command Line Syntax

The QlikView command line invocation can be described by the following syntax (for a description of the syntax notation used, see page 493 in Book III):

[path] **Qv.exe** *[{ switch } documentfile]*

The *path* is the path to the file, either absolute, or relative to the current directory. There is only one single program file for all three levels of QlikView. Your serial number will be used to determine whether you will be running QlikView Developer, QlikView Professional or QlikView Analyzer.

documentfile::= [path] documentfilename
documentfilename is the name of your document file.
switch is used to mark different options:

D P **/r** Reload switch. The document will be opened and the script reloaded. Thereafter the document will be saved, and QlikView will close itself.

D P **/rp** The same as above, but with a partial reload.

D P **/l** Load new data. The document will be opened and the script reloaded. The document will not be saved and QlikView will remain open.

D P **/p** The same as above, but with a partial reload.

D P **/v** If this switch is immediately followed by a macro variable name and an assignment, the macro variable will obtain the assigned value before the script execution starts.

/nodata Opens the document without variables, table and field data. This feature is also available for previously opened documents on the Start Page, see page 69.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

/NoSecurity

Overrides QlikView security measures against hostile macros and scripts embedded in QlikView documents. No warning dialogs prompting the user to accept potentially harmful code will be shown. Use this switch with caution and only with well-known documents.

Example:

qv.exe /r */vMyvar=123 abc.qvw*

Note In order to avoid error messages to appear when executing scripts in batch mode, always set the script variable errormode to 0 in the script (see page 358)

9.2 The Start Page

Once you have started QlikView according to the previous section, you will see the QlikView start page.

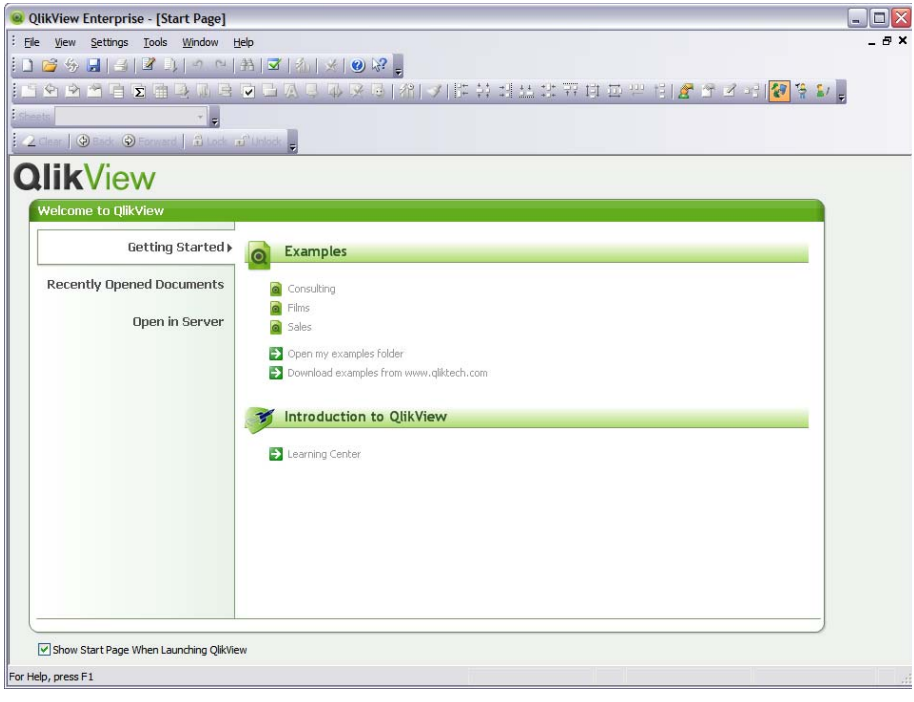


Figure 4. The Getting Started page of the QlikView start page

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The QlikView start page contains several tabs. The number of pages and the contents on some of them may vary over time as they contain web content. The following pages will exist at all times:

The **Getting Started** tab contains information and links that can help you explore the wealth of possibilities in QlikView. This includes direct links to selected demo examples, a link to the QlikView demo example folder on your local computer and links to selected resources at www.qliktech.com.

The **Recently Opened Documents** tab contains a list of recently opened documents and web pages. Just click on one of them to re-open. By right-clicking on a document you gain access to a menu with the following useful commands:

Open "document" Without Data
: Opens the document but skips variables, table and field data. What you get is a layout with all sheets and sheet objects in place but empty. This feature can be useful e.g. for opening corrupted documents or for avoiding long waits when opening very large documents for a small change in the layout (of course you need to re-run the script to re-populate the document after the changes). This can be done through the command line switch **nodata** as well, see page 67.

Open "document" and Reload Data
: Opens the document and performs an immediate reload.

Browse Documents in Folder
: Opens the folder containing the document in the list.

Add "Document" to Favorites
: Adds the document or web page to your Favorites list.

Remove "Document" From This List
: Removes the document from the list of recently used documents. The actual document file remains unchanged where it resides.

The **Favorites** tab contains a list of the documents and web pages previously added to your favorites list. Unlike the list of recently used documents the favorites list remains unchanged until you yourself explicitly add or delete entries. Just click on a favorite document or page to re-open. By right-clicking on a document you gain access to a menu with the following useful commands:

Open "Document" Without Data
: Opens the document but skips table and field data. What you get is a layout with all sheets and sheet objects in place but empty. This fea¬ture can be useful e.g. for opening corrupted documents or for avoiding long waits when opening very large documents for a small

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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change in the layout (of course you need to re-run the script to re-populate the document after the changes).

Open "Document" and Reload Data
Opens the document and performs an immediate reload.

Browse Documents in Folder
Opens the folder containing the document in the list.

Remove "Document" From Favorites
removes the document from the Favorites list. The actual document file remains unchanged where it resides.

The **Open in Server** tab contains a list of recently used QlikView Servers and an easy-to-use interface for connecting to any other QlikView Server. Once you have selected a QlikView Server, QlikView will connect to it and show a list of available documents, which can then be opened with a single click. You may click on **Show Options >** for advanced authentication options. See the documentation of the **Connect to Server** dialog (page 250) for details on these commands.

QlikView will remember which tab you last used and open the start page on that tab next time you start QlikView. If you don't want the start page to appear when you start the program, deselect the **Show Start Page When Launching QlikView** check box.

The start page can be left open and will then be found as **Start Page** on the **Windows** menu. If you close the start page, it can be re-opened at any time by choosing **Show Start Page** from the **Help** menu.

9.3 Batch Execution



If the QlikView document should be updated regularly, e.g. every night, this can be done by executing QlikView in *batch mode*. To do this you need a scheduling program, e.g. the at command under Windows NT or the System Agent under Windows 98 (included in the Plus! package).

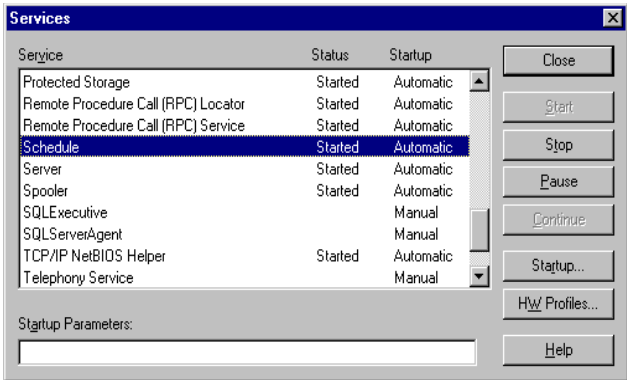
The QlikView command line should be

qv.exe /r *[path] datafile.qvw*

Such a command will start QlikView, open the data file, reexecute the script, save the file and finally close QlikView. This way the QlikView files can be updated automatically and the end users will be able to look at new data every morning.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Scheduling Programs



Windows NT 4.0 offers either the **Schedule** or the **Task Scheduler** service. Windows 2000 offers the **Task Scheduler** service. The services are controlled from the Services applet in the Control Panel. Make sure that **Status** is set to **Started** (and **Startup** to **Automatic** for the service to automatically start after a reboot) for the relevant service.

The easiest way to submit a batch job is usually to create a batch file with the relevant commands. The file, named e.g. *MyBatch.cmd*, could e.g. contain the following commands:

```
C:\qlikview\qv.exe /r C:\qlikview\example\file.qvw
```

The Schedule Service

The schedule service normally runs under the system account and thus has some limitations. If you need to access network resources, reconfigure the service to run under a different account. Since the QlikView license is stored in the account-specific part of the registry, you will have to make sure that it is correctly registered for the account to be used. To do this you may submit an interactive job:

```
C:\>AT 11:00 /interactive "C:\Program
Files\QlikView\qv.exe"
```

This will cause the **License Registration** dialog to appear. Here you can register the license also for the correct account.

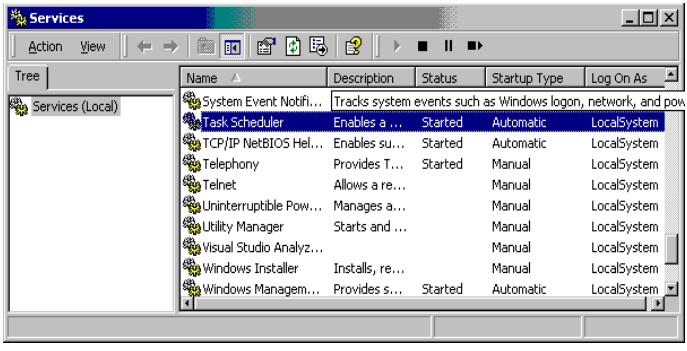
The batch file (see the previous page) can be submitted in e.g. the following way:

```
C:\>AT 11:00 /every:m,t,w,th,f,sa,su
C:\MyBatch.cmd
```

This will cause the batch file to be executed every day at 11 AM.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The Task Scheduler Service



Start the **Add Scheduled Task** wizard found in the Control Panel, **Scheduled Tasks**, or directly under My Computer. Specify the name of your batch file (see page 71), when you want to run the file and under which account you want it to run.

Section Access

Serial	User	Password	Access
CREATOR			Admin
4600 9999 9999 9999	Joe	ppp789	Admin
*	Joe	qqq456	User
*	User	rrr123	User

To reexecute a QlikView file containing a **section access**, make sure that the license serial number that is installed on the machine doing the batch execution is allowed to run the script without entering a user name or a password. See the example above:

ODBC

If ODBC is used, please make sure that the DSN definition is available from the account doing the reexecution. The easiest way to assure this is probably to define the DSN as a System DSN in the ODBC Control Panel.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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10 QLIKVIEW DOCUMENTS



A QlikView document is a file containing everything you need to analyze the data:

- the data itself
- the script needed to update the QlikView file with new data from the data source
- layout information, including all the sheets, list boxes, charts, etc.
- document alerts, document bookmarks and document reports
- access restriction information
- macro module

It is thus very easy to distribute information using QlikView files. The analysis can be made independently of the location of the original data or network conditions. The files can e.g. be attached to electronic mail and sent to other persons that for technical reasons are not able to log on to the database.

10.1 File Compatibility

QlikView 6, 7 and 8 share the same file format. This means that documents can be opened and saved by the three versions without the need to bother about file formats.

Documents created with QlikView 6.0 and later can be opened with QlikView 8. In order to open files from earlier versions you must first install QlikView 6.0x, open the document and save it in the 6.0x format.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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OnlineNotary.net

11 MENU COMMANDS

D P A

11.1 File Menu

The **File** menu is a drop-down menu at the top of the screen, containing the following commands (most of which can also be configured as buttons in the toolbar):

D P **New** Opens a new, empty document.This command can also be invoked via the keyboard shortcut CTRL+N.



Open... Opens an existing file, either a QlikView file or a text file. If you open a text file, you will automatically get to the file wizard, which analyzes its contents and helps you to create a script. This command can also be invoked via the keyboard shortcut CTRL+O.



Open in Server...

Opens the **Connect to Server** dialog. In this dialog you may connect to a QlikView Server and browse for a document to open in client mode. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+O.



Note When opening documents as a client to QlikView Server you will be restricted in what you can do with the document compared to when opening local documents. As a client you may not be able to add or delete sheets and sheet objects, depending on the client license used and whether or not the document supports collaboration. Sheets cannot be added or deleted. Furthermore you cannot most access properties dialogs, change macros, access the script, reload data or save the document.

Refresh Document

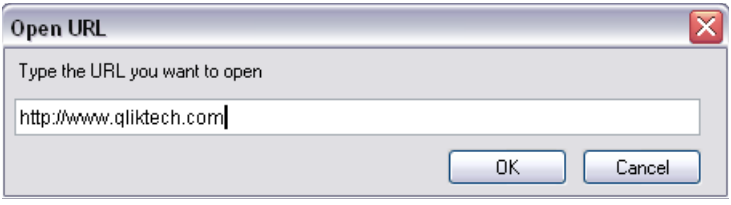
This command is only available with documents opened on QlikView Server and when there is a newer version of the document available on the server. When invoking a refresh, you will get access to the latest data while maintaining your session including selections and layout state.



III

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Open URL...



Opens the **Open URL** dialog. In this dialog you type a valid URL to any web page. The web page will be opened in a separate window inside QlikView. This functionality may be used e.g. for the QlikView Publisher Accesspoint or for pages displaying QlikView Server documents via the Java or Zero-Footprint clients. Opened web pages can be accessed via the **Windows** menu just as with standard QlikView document windows.

Open Ftp...

Opens a file from an ftp server of your choice. See Figure 58 on page 248.

The **Open** and **Open FTP** commands are only available in QlikView Analyzer when the program has been registered with a serial number (QlikView Analyzer +).

Close Closes the active document. If changes have been made, you are asked whether you want to save it as a file.

Favorites

This cascade menu allows you to create and maintain a list of favorite documents (local or on servers) for fast access independently of the **Recent Files** list (see below).

Add to Favorites

Opens the **Add to Favorites** dialog which lets you add the currently active document to the **Favorites** list. This option is only available when a document is open.



Organize Favorites

Opens the **Organize Favorites** dialog which lets you delete and rename entries in the Favorites list.

List of Documents

A list of favorite documents. Choosing one in the list is equivalent to opening the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Save

Saves the active document in a file. Data, script and layout are saved. This command can also be invoked via the keyboard shortcut CTRL+S.



Save As...

Saves the active document in a new document file under a new name. It is possible to save the QlikView file in a previous file format. The default file format is set in the **User Preferences** dialog, **Save** page (Figure 7 on page 71). This command can also be invoked via the keyboard shortcut F12.

Save Link...

Saves a link to a document opened on a QlikView Server as a text file on the local machine. The file will have the qvw extension but will not contain any data or layout. When opening such a link document QlikView will attempt to reconnect to the server and open the document on the QlikView Server. This command is not available for local documents.



Mail as Attachment

Only available when working with a local document. Creates an e-mail with a copy of the current qvw document attached. The mail recipient will be able to open the qvw document provided he has access to QlikView and access rights to the document (if section access security is used). You have to have an e-mail client configured for this command to work.

Mail with Bookmark as Link...

Only available when working with a QlikView Server document. Creates an e-mail with a URL link to the current server document. A temporary server bookmark will be created (including layout state) and encoded in the URL. The mail recipient will be able to use the URL link to open the server document and see what you see, provided that he has access rights to the document and its data. You need to have aan e-mail client configured for this command to work. The QlikView Server must be configured to allow server bookmarks.

Print... Opens the standard **Print** dialog box (see page 247 in Book III), allowing you to print the current sheet object. This command is not available for list boxes. To print the contents of a list box, use the command **Print Possible**. This command can also be invoked via the keyboard shortcut CTRL+P.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Print as PDF...



Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+P.

Print Possible...



Opens the standard **Print** dialog box (see page 247 in Book II), allowing you to print the possible (selected and optional) values of the current list box. This command is only available for list boxes.

Print Possible as PDF...



Opens the **Print** dialog with the QlikViewPDF printer preselected, allowing you to print the possible (selected and optional) values of the current list box. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package. This command is only available for list boxes. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+P.

Print Sheet...

Opens the **Print** dialog, allowing you to print the current sheet or all the sheets of the document. See further on page 255 in Book II.

Print Preview...



Opens a dialog showing a print preview of the active object (if printable). See further on page 255 in Book II.

Export

This cascade menu has two options:

Export Contents...

This option is only available when an exportable sheet object is active. It then performs the export operation found on the sheet object's **Object** menu.

Export Sheet Image...

Opens a dialog for saving an image of the current sheet to file. The image can be saved as bmp, jpeg, gif or png.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Edit Script...

Opens the **Edit Script** dialog box (Figure 51 on page 227). Here you can generate and execute scripts that open one or several databases in text files, and fetch data from them. This command can also be invoked via the keyboard shortcut CTRL+E.



Reload

Executes the current load script and reloads data to the active QlikView document. This needs to be done if the contents of the database have been changed since the last time a reload was made. This command can also be invoked via the keyboard shortcut CTRL+R.



Partial Reload

Executes only **load** and **select** statements preceded by a **replace** (see page 336) or an **add** (page 294) prefix. Data tables that are not affected by this kind of **load** or **select** statements will not be affected by the partial reload. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+R.



Reduce Data

Opens a cascade menu containing the two following commands:

Keep Possible Values

Reduces the QlikView database by removing all excluded values.



Remove All Values

Creates a template by removing all the values from the QlikView database, but keeping the database structure and the layout.

Table viewer...

Opens the **Table Viewer** dialog where the structure of the loaded data can be studied in a graphical view of tables, fields and associations. This command can also be invoked via the keyboard shortcut CTRL+T. Read more about the **Table Viewer** on page 237.



Recent Documents

A listing of the last documents opens. The number of documents to be shown can be set in the **User Preferences** dialog. The default number is 8. Choosing one in the list is equivalent to opening the document.

Exit Closes the open documents and exits QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

11.2 Edit Menu

The **Edit** menu is a drop-down menu, containing the following commands (most of which can also be configured as buttons in the toolbar):

Undo Layout Change



Undoes the last layout action. Changes that can be undone includes all moving, sizing and removing of sheet objects as well as changes to sheet object properties. Removing sheets, changes to sheet properties and changes to document properties can also be undone. The **Undo** command can be repeated. Certain operations, e.g. **Reload** and **Reduce Data** will empty the Undo/Redo buffer. This command can also be invoked via the keyboard shortcut CTRL+Z.

Redo Layout Change



Redoes the latest undone layout action. The Redo command can be repeated for as long as there are undone actions to redo. Certain operations, e.g. **Reload** and **Reduce Data** will empty the Undo/Redo buffer. This command can also be invoked via the keyboard shortcut CTRL+Y.

(D) (P) **Cut**



Removes the selected sheet object(s) from the sheet and puts it(them) on the clipboard for pasting elsewhere in the QlikView document. If only one sheet object is active, the image of this object will also be put on the clipboard. This command can also be invoked via the keyboard shortcut CTRL+X.

Copy



Copies the selected sheet object(s) to the clipboard for pasting elsewhere in the QlikView document. If only one sheet object is active, the image of this object will also be put on the clipboard. This command can also be invoked via the keyboard shortcut CTRL+C.

(D) (P) **Paste**



Pastes a sheet object or several sheet objects which have previously been put on the clipboard via the **Cut** or **Copy** commands within the QlikView document. This command can also be invoked via the keyboard shortcut CTRL+V.

Format Painter



This button makes it possible to copy formatting from one sheet objects to one or many other sheet objects. In order to copy formatting to a single object, first click on the source object, then single-click on the format painter button and then click on the target object. In order to copy formatting to multiple objects, first click on the source object, then double-click on the format

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

painter button and then click on each of the target objects. You stop the copying by clicking the button again or pressing ESC. When you copy formatting between sheet objects of different types or when you click on the caption of the target object(s), only border/caption properties will be copied. When you copy between sheet objects of the same type, additional object type specific properties will be copied.

Remove

Removes selected sheet object(s). This command can also be invoked via the keyboard shortcut DEL.

Activate All

Activates all the sheet objects on the active sheet. This command can also be invoked via the keyboard shortcut CTRL+A.

Search



Opens the text search window if a list box or opened multi box is active. The search window will contain two wildcard characters (**) with the cursor placed in-between. As you type all values which have an exact match with the search text will be shown in the list. If you hit ENTER all matching values in the list will be selected. Use an equal sign (=) to search using an expression. This command can also be invoked via the keyboard short CTRL+F.

Fuzzy Search



Opens the text search window in fuzzy search mode provided that a list box or opened multi box is active. The search window will contain a tilde ~ with the cursor placed after it. As you type all values will be sorted by the degree of resemblance to the search string with the best matches at the top of the list. If you hit ENTER the first value in the list will be selected.

Advanced Search

Opens the Advanced Search dialog, provided that a list box or opened multi box is active. The dialog makes it possible to enter advanced search expressions. This command can also be invoked via the keyboard shortcut SHIFT+CTRL+F.

Copy Mode



Switches from logic mode to copy mode. Values clicked while in copy mode are copied to the Clipboard without changing the logical state of the QlikView document.

III

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

11.3 View Menu

The **View** menu is a drop-down menu, containing the following commands (many of which can also be configured as buttons in the toolbar):

Sheets Opens a cascade menu with all the sheets currently visible in the document. The active sheet is checked. Select a sheet to activate it.

Toolbars

Opens a cascade menu with the different toolbars currently available. It is possible to design your own toolbars, but the following five are supplied as standard:

Standard

Toggles the main toolbar on or off.

Navigation

Toggles the navigation toolbar on or off.

Design

Toggles the design toolbar on or off.

Sheet

Toggles the sheet toolbar on or off.

Bookmark

Toggles the bookmark toolbar on or off.

Customize...

Opens the **Customize** dialog, which helps you customize your toolbars.

Zoom Opens a cascade menu containing a number of zoom factors from 25% to 400%. The zoom factor is applied on the current sheet only. Zoom factors other than those listed can be applied in the **General** page of the **Sheet Properties** dialog.

Statusbar

Shows a statusbar at the bottom of the QlikView application windows. The text in the bar contains the date and time the application was last saved.

Collaboration Pane

Toggles the **Collaboration Pane** on and off. See chapter 17.1 in book II for further information on **Collaboration Pane**.

Resize Window

This command offers a cascade menu for resizing of the QlikView application window to one of several common screen resolutions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Fit Zoom to Window

Adjusts the zoom factor of the current sheet to fit all sheet objects into the current window frame.

Apply Zoom to All Sheets

Applies the zoom factor of the current sheet to all sheets in the document.

Design Grid

Opens a cascade menu with the following three options for display of layout design grid:

None Turns off the design grid, sheet object placeholders for active object(s) and snap-to-grid for sizing and moving objects in the layout. This command can also be invoked via the keyboard shortcut CTRL+G when white design grid is shown.

Black Grid

Turns on the design grid and sheet object placeholders for active object(s) in black color. Turns on snap-to-grid for sizing and moving objects in the layout. This command can also be invoked via the keyboard shortcut CTRL+G when no design grid is shown.

White Grid

Turns on the design grid and sheet object placeholders for active object(s) in white color. Turns on snap-to-grid for sizing and moving objects in the layout. This command can also be invoked via the keyboard shortcut CTRL+G when black design grid is shown.

Current Selections

Toggles the **Current Selections** dialog on or off. This command can also be invoked via the keyboard shortcut CTRL+Q.



11.4 Selections Menu

The **Selections** menu is a drop-down menu, containing the following commands (most of which can also be configured as buttons in the toolbar):

Back QlikView remembers the last 100 selections. By clicking this button, you go one step back in the list of selections. This command can also be invoked via the keyboard shortcut SHIFT+LEFT ARROW.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Forward

By clicking **Forward**, you go one step forward in the list of selections (equivalent to cancelling the last **Back** command). See **Back** above.This command can also be invoked via the keyboard shortcut SHIFT+RIGHT ARROW.



Lock Locks all the selected cells. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+L.



Unlock Unlocks all the locked cells. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+U.



Clear Clears all the current selections except the ones that are locked. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+D.



Unlock and Clear

Clears all the current selections, including the ones that are locked.



11.5 Layout Menu



The **Layout** menu is a drop-down menu which contains the following commands (most of which can also be configured as buttons in the toolbar):

Add Sheet

Adds a tabbed sheet in which you can display a new set of sheet objects.



Promote Sheet

Moves the active tab one step to the left.



Demote Sheet

Moves the active tab one step to the right.



Remove Sheet

Removes the active sheet.



Select Fields...

Opens the **Fields** page in the **Sheet Properties** dialog box. Here you can select the fields to be displayed on the current sheet. This command is not available when working with documents on QlikView Server.



Server Objects

Opens the **Server Objects** dialog box. Here you can manage personal and share server objects. This menu option is only available

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

when working with a document on QlikView Server and only if the server and the server document have been configured to allow server objects.

New Sheet Object

Opens a cascade menu in which you can choose to create one of the different sheet objects. When created you will be presented with the corresponding **Properties** dialog for configuring the new object.

Provided that both client and server are QlikView version 8 or later it may be possible to add this new sheet object to the layout even if working with a document on QlikView Server. This requires a) that you have a Professional or Developer license, b) that the server document has been configured to allow server objects and c) that the QlikView Server is configured to allow server objects.

Quick Chart Wizard...

Opens the **Quick Chart** dialog where you can create bar, line and pie charts with only very basic settings.



Time Chart Wizard...

The time chart wizard helps you to build charts where a given measure (expression) should be qualified and often compared by different time periods, e.g. current year, last year, year-to-date etc.



Statistics Chart Wizard...

The statistics chart wizard provides guidance for those who want to apply common statistical tests on data in QlikView.

Rearrange Sheet Objects

Automatically arranges the sheet objects on the active sheet.



Adjust Object Maximum Size to Current Size

Some types of sheet objects, like list boxes, multi boxes and tables, may have a larger maximum size that what is currently utilized. This allows e.g. a table to expand on the sheet when more data is added. This operation resets the maximum object size to the currently used size for all selected objects on the active sheet. You may use CTRL+A to select all sheet objects on the sheet. it is recommended to always perform this operation on all list boxes, multi boxes, table boxes and table charts in the document before using the **Objects Client Page Generator wizard**.



Adjust Off-Screen Objects

Moves all sheet objects with a position outside the current QlikView window to a temporary position inside the visible



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

area. Unless the objects are explicitly moved from their temporary positions, the original positions will be maintained when the document is saved.

Align/Distribute

Under this cascade menu you will find a number of commands for aligning and distributing sheet objects in the layout.

Left Align

Aligns the active sheet objects along their left border.



Center Horizontally

Aligns the active sheet objects along their centers on the horizontal axis.



Right Align

Aligns the active sheet objects along their right border.



Bottom Align

Aligns the active sheet objects along their bottom border.



Center Vertically

Aligns the active sheet objects along their centers on the vertical axis.



Top Align

Aligns the active sheet objects along their top border



Space Horizontally

Distributes the active sheet objects on the horizontal axis with equal spaces between them.



Space Vertically

Distributes the active sheet objects on the vertical axis with equal spaces between them.



Adjust Top

Arranges the active sheet objects from the horizontal top edge of the topmost object and downwards with minimal spaces between them.



Adjust Left

Arranges the active sheet objects from the vertical edge of the leftmost object and to the right with minimal spaces between them.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Theme Maker Wizard

Invokes the **Theme Maker Wizard** for creation of a new theme or editing an existing theme. See chapter 19 in Book II for details on QlikView layout themes.

11.6 Settings Menu

The **Settings** menu is a drop-down menu which contains the following commands:

User Preferences...

Opens the **User Preferences** dialog, which contains settings that the user normally does not change when switching to another document. This command can also be invoked via the keyboard shortcut CTRL+ALT+U.



Document Properties...

Opens the **Document Properties** dialog, which contains settings concerning the entire document. Some common properties for the sheet objects in the document can also be set in this dialog. This command can also be invoked via the keyboard shortcut CTRL+ALT+D



Sheet Properties...

Opens the **Sheet Properties** dialog, which contains settings concerning the current sheet. Some common properties for the sheet objects on the sheet can also be set in this dialog. This command can also be invoked via the keyboard shortcut CTRL+ALT+S



Variable Overview...

Opens the **Variable Overview** dialog where all non-hidden variables and their values are shown in a single list. See further description on page 237. This command can also be invoked via the keyboard shortcut CTRL+ALT+V



Expression Overview...

Opens the **Expression Overview** dialog where all document, sheet and sheet object expressions can be shown and centrally maintained in a single list. See further description on page 237. This command can also be invoked via the keyboard shortcut CTRL+ALT+E.

Alerts...

Opens the **Alerts** dialog where alerts can be defined and edited. See further description on page 195.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Alert Wizard...

The alert wizard helps you with the task of defining an alert. See further description on page 201.

Level This command offers a cascade menu for temporary masquerading as a lower level of QlikView user. This feature is meant to facilitate for application designers to see how their applications work under lower levels, without actually starting another QlikView version. The current level is checked.

Analyzer

Sets all menus to QlikView Analyzer level. In QlikView Developer a number of menu items are grayed out.



Professional

Sets all menus to QlikView Professional level. In QlikView Developer a number of menu items will be grayed out.



Developer

Sets all levels to QlikView Developer level.



11.7 Bookmarks Menu

The current state of selections can be saved as bookmarks for later use. Bookmarks may be document bookmarks, stored with the document or personal bookmarks, stored separately on the user's computer. The **Bookmarks** menu contains the following commands:

Document Bookmarks

A list of the first ten available document bookmarks in the active document. Click on a bookmark name to apply it.

My Bookmarks

A list of the first ten available personal bookmarks linked to the active document. Click on a bookmark name to apply it.



Add Bookmark

Opens the **Add Bookmark** dialog for saving the current set of selections as a bookmark. The default name can be changed in the **Create Bookmark** dialog that opens automatically. This command can also be invoked via the keyboard shortcut CTRL+B.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Replace Bookmark

Opens a cascade menu with the ten first document bookmarks currently defined in the document, followed by the ten first personal bookmarks for the document. By choosing one of these, the contents of that bookmark will be replaced with the current state of selections and variable values.

Remove Bookmark

Opens a cascade menu with the ten first document bookmarks currently defined in the document, followed by the ten first user bookmarks for the document. By choosing one of these, that bookmark will be deleted.

More... Opens the **Bookmarks** dialog containing detailed information about all the saved bookmarks. From this dialog you can also delete and select bookmarks, set their internal display order and view additional information. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+B



(D) (P) **Import...**

Opens the **Import Bookmark(s)** dialog for importing bookmarks from a QlikView bookmark file.

(D) (P) **Export...**

Opens the **Export Bookmark(s)** dialog for exporting bookmarks to a QlikView bookmark file.

For more information about bookmarks, see page 165.

11.8 Reports Menu

The **Reports** menu is a drop-down menu listing all available existing reports for immediate selection. Reports may be document reports, stored with the document or personal reports, stored separately on the user's computer. The **Reports** menu contains the following commands:

Document Reports

A list of all document reports in the active document. Clicking one of the report names opens the **Print** dialog for printing of the report.

My Reports

A list of all user reports in the active document. Clicking one of the report names opens the **Print** dialog for printing of the report.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Edit Reports...

Opens the **Edit Reports** dialog for creating new or edit existing reports. From this dialog you can also delete and select reports, design their layout, add addtional pages and images etc. For more information on the **Edit Reports** dialog, see page 176ff.



11.9 Tools Menu

The **Tools** menu is a drop-down menu which contains the following commands:

Edit Module...

Opens the **Edit Module** dialog where you can create macros (see page 299). This command can also be invoked via the keyboard shortcut CTRL+M.



Open QlikView AccessPoint

Opens the QlikView AccessPoint in a html window inside QlikView. This command is only available if you have configured a URL for QlikView AccessPoint on the **Locations** page of the **User Preferences** dialog.

Open QlikView Server Control Panel

Opens the QlikView Server Control Panel in a html window inside QlikView. This command is only available if you have configured a URL for QlikView Server Control Panel on the **Locations** page of the **User Preferences** dialog.

Open QlikView Publisher Control Panel

Opens the QlikView Publisher Control Panel in a html window inside QlikView. This command is only available if you have configured a URL for QlikView Publisher Control Panel on the **Locations** page of the **User Preferences** dialog.

Objects Clients Page Generator

Opens a dialog that helps you generate html pages for displaying the current document on QlikView Server for one or more of the three object based clients. See page 271 in Book II.

11.10Object Menu

The **Object** menu is an object menu for the sheet object that is currently active. It can be opened by choosing **Object** on the menu bar, or by clicking with the right mouse button on the sheet object. For a description of the different object menus, see the section on the specific object.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

11.11Window Menu

The **Window** menu is a drop-down menu which contains the following commands:

Cascade

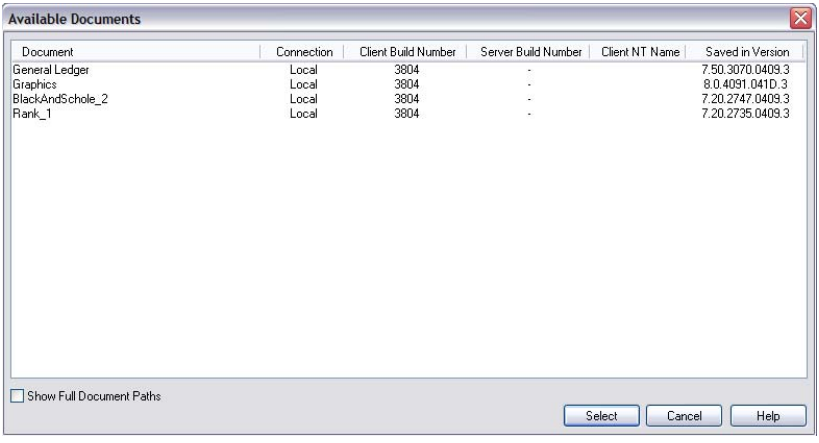
Arranges windows in a cascade so that they overlap.

Tile Arranges windows as non-overlapping tiles.

Arrange Icons

Arranges icons at the bottom of the window.

Available Documents...



Opens the **Available Documents** dialog. This dialog can be used for selecting the active document when you have more than ten documents open at the same time. Select a document in the list and click on **Select** to make that document the active Window. Clicking on **Cancel** closes the dialog without changing the active window.

Document

Name of the qvw document. If the check box Show Full Document Paths at the bottom of the dialog is marked the document name will be given with its full file path.

Connection

Local (document opened on local computer) or Remote (document opened on QlikView Server).

Client Build Number

Build number of QlikView client.

Server Build Number

Build number of QlikView Server for remote documents.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Client NT Name

Windows NT authenticated identity of client user when connection is made with NT authentication.

Saved in Version

Full information about the QlikView version that last saved the document (available for local documents only).

Also, an alphabetic listing of the ten first open document windows is displayed for quick selection. Selecting a document from the list makes it the active window.

11.12Help Menu

The **Help** menu is a drop-down menu which contains the following commands:

Contents

Opens the QlikView help file.



Using Help

Displays instructions on how to use the help file.

Show Start Page

Shows the start page each time you start QlikView. If you don't want the start page to appear when you start the program, deselect the **Show Start Page When Launching QlikView** check box in the left lower corner of the start page.

QlikTech on the Web

Opens a cascade menu containing the following commands:

Support

If your computer is connected to the Internet, this command will take you directly to the Support section of the QlikTech home page. From here you can access the FAQ (Frequently Asked Questions) section. If you are in need of further support, this page also lets you contact QlikTech via e-mail.

What's New

If your computer is connected to the Internet, this command will take you directly to the What's New section of the QlikTech home page.

QlikTech Home Page

If your computer is connected to the Internet, this command will take you directly to the QlikTech home page.

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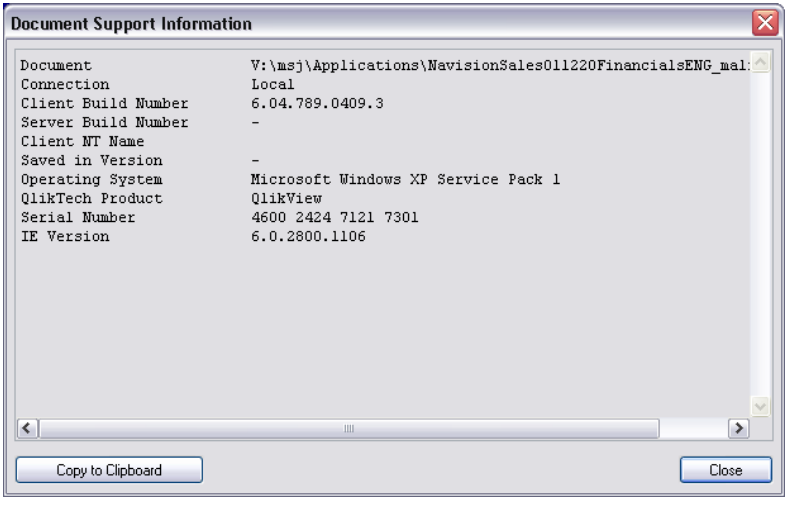
QlikView Update...

Opens the **QlikView Update** dialog from which you can make QlikView contact the QlikView update server to see if any program updates are available. You can also specify automatic checks for updates every *n* days. In order to use this feature you must be connected to the Internet. As part of the procedure your QlikView registration information as well as information about installed QlikView version and operating system version will be sent to the QlikView update server. This feature may be permanently disabled by the system administrator in certain environments.

License Update...

Opens the **License Enabler File Editor** dialog from which you can make QlikView contact the QlikView license server to download license registration info. This is normally done automatically, but in some cases it may be necessary to do it manually. If you have no connection to the Internet you will receive your License Enabling File via mail. In this case this is where you can paste the data into QlikView.

Document Support Info...



Opens the **Document Support Information** dialog. This dialog shows a list of support data for the active document. The information can and should be used whenever contacting QlikTech support and when reporting bugs or problems in relation to QlikView documents. Note that some rows are only relevant for local documents

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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while some refer only to remote documents. This dialog can also be invoked via the keyboard shortcut CTRL+SHIFT+Q.

About QlikView...

Opens the **About** dialog box which displays the QlikView version, the serial number and the name of the owner.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

12 THE TOOLBARS AND THE STATUS BAR

12.1 The Toolbars

QlikView has five standard toolbars and one menubar. The standard toolbar normally contains buttons for tasks that you perform while using QlikView documents, whereas the design toolbar normally contains buttons for tasks you perform when creating or changing the layout of a document. The navigation toolbar contains the most frequently used commands for logical operations in a document. The sheet toolbar offers an alternative method for navigating different sheets whereas the bookmark toolbar offers an alternative way of accessing bookmarks.

Each of the toolbars can be individually turned on and off. All toolbars are completely customizable and may contain any of the available command buttons.

All toolbars can be moved around by pointing at them on the dotted line to their far left. Hold down the left mouse button and drag to any position you like. The toolbars can be docked to any side of the QlikView application window.

12.2 The Standard Toolbar

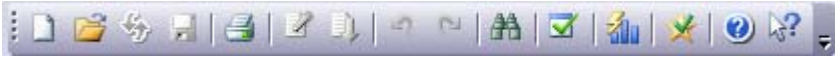


Figure 5. The standard toolbar

The QlikView standard toolbar (see above) contains buttons for the most frequently needed functions.To toggle the standard toolbar on or off choose **Standard Toolbar** under **Toolbars** on the **View** menu. The figure above and the text below refer to the default contents of the standard toolbar.

New Creates a new document. When pressed, it opens an empty QlikView screen. This command can also be invoked via the keyboard shortcut CTRL+N.



In QlikView Professional the **Open QlikView File** dialog will be displayed. After selecting a qvw file the new document will be created with a script containing a **binary** statement pointing at the selected file

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Open Opens an existing document file, either a QlikView file or a text file. If you open a text file, you will automatically get to the Table file wizard, which analyzes its contents and helps you create a script. This command can also be invoked via the keyboard shortcut CTRL+O.

(A) The **Open** and **Open FTP...** commands are only available in QlikView Analyzer when the program has been registered with a serial number (QlikView Analyzer +).

Refresh

This command is only available with documents opened on QlikView Server and when there is a newer version of the document available on the server. When invoking a refresh, you will get access to the latest data while maintaining your session including selections and layout state.



(D) (P) **Save** Saves the active document as a file. It is possible to save the QlikView file in an earlier file format. The default file format is set in the **User Preferences** dialog, **Save** page (Figure 12 on page 113).This command can also be invoked via the keyboard shortcut CTRL+S.



Print Prints the active chart or table box. This command can also be invoked via the keyboard shortcut CTRL+P



Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This button is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.



(D) **Edit Script**

Opens the **Edit Script** dialog (Table 17 on page 123). This command can also be invoked via the keyboard shortcut CTRL+E.



(D) (P) **Reload**

Reloads data to the QlikView document by executing the load script. This command can also be invoked via the keyboard shortcut CTRL+R



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Undo Layout Change

Undoes the last layout action. Changes that can be undone include all moving, sizing and removing of sheet objects, as well as changes to sheet object properties. Removing sheets, changes to sheet properties and changes to document properties can also be undone. The **Undo** command can be repeated. Certain operations, e.g. **Reload** and **Reduce Data,** will empty the Undo/Redo buffer. This command can also be invoked via the keyboard shortcut CTRL+Z



Redo Layout

Redoes the last layout action. The **Redo** command can be repeated for as long as there are undone actions to redo. Certain operations, e.g. **Reload** and **Reduce Data,** will empty the Undo/Redo buffer. This command can also be invoked via the keyboard shortcut CTRL+Y



Search

Opens the text search window if a list box or opened multi box is active. The action is equal to that of just start typing in an opened list box or multi box. This command can also be invoked via the keyboard shortcut CTRL+F.



Quick Chart

Opens the **Quick Chart** dialog, where you can create a bar chart, line chart or pie chart using only the most basic settings.



Current Selections

Opens the **Current Selections** dialog in which it is possible to see the selections that are active. This command can also be invoked via the keyboard shortcut CTRL+Q



Add Bookmark

Saves the current set of selections as a bookmark. In the **Create Bookmark** dialog that opens, you can specify a name for the bookmark. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+B.



Help Topics

Opens the QlikView help program.



Context Help

Displays specific help concerning the chosen object, e.g. a menu command. After clicking this button, simply move the question mark to the object on which you need help.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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12.3 The Navigation Toolbar



Figure 6. The Navigation toolbar

The QlikView navigation toolbar (see above) contains buttons for the most frequently needed functions when using QlikView for analyzing data. To toggle the navigation toolbar on or off choose **Navigation Toolbar** under **Toolbars** on the **View** menu. The figure above and the text below refer to the default contents of the **Navigation Toolbar**.

Back QlikView remembers the last 100 selections. By clicking this button, you go one step back in the list of selections. This command can also be invoked via the keyboard shortcut SHIFT+LEFT ARROW.

Forward

By clicking **Forward**, you go one step forward in the list of selections (equivalent to cancelling the last **Back** command). See **Back** above. This command can also be invoked via the keyboard shortcut SHIFT+RIGHT ARROW.

Clear Selections

Clears selections, excluding the locked ones. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+D.

Lock Selections

Prevents selections from being cleared by mistake.This com¬mand can also be invoked via the keyboard shortcut CTRL+SHIFT+L.

Unlock Selections

Takes away the lock described above. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+U.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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12.4 The Design Toolbar



Figure 7. The design toolbar

The QlikView design toolbar (see above) contains buttons for tasks you perform when creating or changing the layout of a document. By default, this toolbar is not displayed. To toggle the design toolbar on or off choose **Design Toolbar** under **Toolbars** on the **View** menu. The figure above and the text below refer to the default contents of the design toolbar.

Add Sheet
Adds a new sheet to the document.

Promote Sheet
Moves the active sheet one step further to the left.

Demote Sheet
Moves the active sheet one step further to the right.

Sheet Properties
Opens the **Sheet Properties** dialog, from which you can modify the active sheet.

Create List Box
Creates a list box to display the field of your choice from the database table.

Create Statistics Box
Creates a statistics box, which calculates statistical entities based on the possible values of a field.

Create Multi Box
Creates a multi box, suitable for showing different attributes.

Create Table Box
Creates a table box, suitable for showing record-oriented information.

Create Chart
Creates a chart that can be made to display fields and calculated dimensions.

Create Input Box
Creates an input box, suitable for displaying and entering data into QlikView variables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Create Current Selections Box

Creates a current selections box, suitable for displaying the current selections directly in the layout.



Create Button

Creates a button object that performs actions in QlikView, e.g. shortcut, export etc.



Create Text Object

Creates an object for displaying text information or images.



Create Line/Arrow Object

Creates a line/arrow object, suitable for drawing a line or an arrow in the layout.



Create Time Chart

The time chart wizard helps you to build charts where a given measure (expression) should be qualified and often compared by different time periods, e.g. current year, last year, year-to-date etc.



Format Painter

Copies visual properties between different sheet objects.



Align Left

Aligns the active sheet objects along their left border.



Center Horizontally

Aligns the active sheet objects along their center on the horizontal axis.



Align Right

Aligns the active sheet objects along their right border.



Align Bottom

Aligns the active sheet objects along their bottom border.



Center Vertically

Aligns the active sheet objects along their center on the vertical axis.



Align Top

Aligns the active sheet objects along their top border.



Space Horizontally

Distributes the active sheet objects on the horizontal axis with equal spaces between them.



Space Vertically

Distributes the active sheet objects on the vertical axis with equal spaces between them.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Adjust Left

Arranges the active sheet objects from the vertical edge of the left-most object and to the right with minimal spaces between them.



Adjust Top

Arranges the active sheet objects from the horizontal top edge of the topmost object and downwards with minimal spaces between them.



Document Properties

Opens the **Document Properties** dialog, from which you can modify the settings of the current document.



User Preferences

Opens the **User Preferences** dialog, where you can modify settings concerning the way the user works.



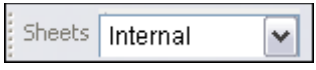
Edit Module

Opens the **Edit Module** dialog where macros and custom defined functions can be written in VBScript or JScript.



III

12.5 The Sheet Toolbar



The sheet toolbar contains a drop-down list of all sheets in the document and offers an alternative way of changing sheets. The name of the active sheet is always shown in the drop-down box. To toggle the **Sheet** toolbar on or off choose **Sheet Toolbar** under **Toolbars** on the **View** menu.

12.6 The Bookmark Toolbar



The bookmark toolbar contains a drop-down list of all bookmarks in the document and offers an alternative way of changing bookmarks. After selecting a bookmark, the name of the bookmark will be shown in the drop-down box until selections or variable values are changed. To toggle the **Bookmark** toolbar on or off choose **Bookmark Toolbar** under **Toolbars** on the **View** menu.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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12.7 Configuration of the Toolbars

All toolbars are customizable, which means that you can configure them to display the buttons you use the most. Select Customize... under Toolbars in the View menu to open the **Customize** dialog. The dialog has three pages.

Note Customization of toolbars can be locked by means of registry entries.

Toolbars

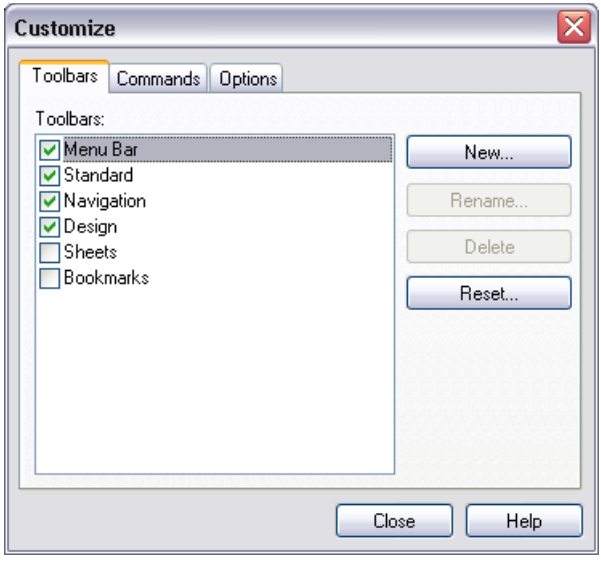


Figure 8. The Toolbars page of the Customize dialog

This page contains a list of all available toolbars and the menu bar. You can turn toolbars on or off by selecting/deselecting them in the list.

New... Click this button to create your own new toolbar.

Rename...
Click this button to rename the selected toolbar. The command is not available for the five default toolbars.

Delete Click this button to delete the selected toolbar. The command is not available for the five default toolbars.

Reset...
Click this button to Reset the configuration of the selected toolbar to default.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Commands

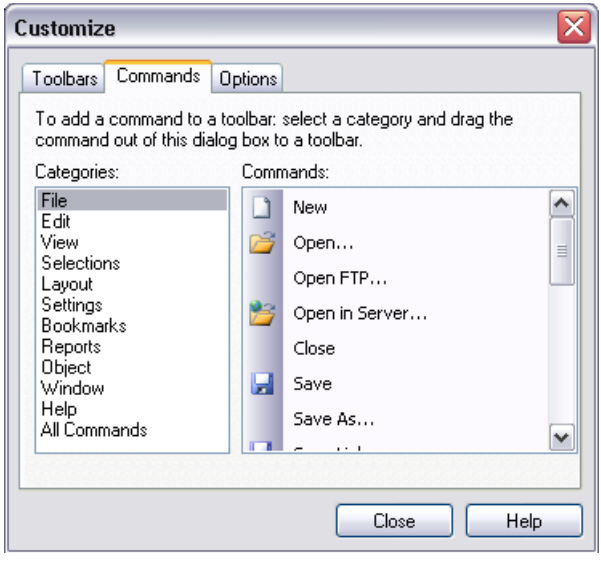


Figure 9. The Commands page of the Customize dialog

This page contains a list of all available commands. You may filter the list by choosing a category in the left column. Point at a command and drag it onto any toolbar in any position you choose.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Options

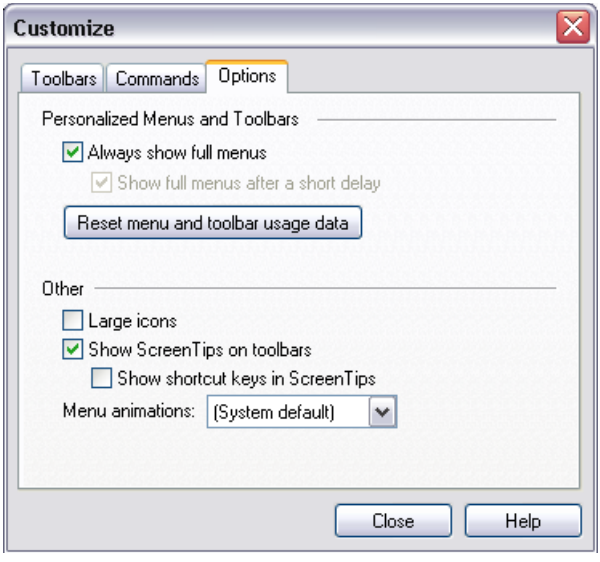


Figure 10. The Options page of the Customize dialog

This page contains additional options for toolbars.

The **Personalized Menus and Toolbars** section allows you to use shorter menus with only the most common commands.

Always show full menus

Deselect this check box to use shorter menus with only the most common commands.

Show full menus after short delay

When short menus are used, mark this check boxcheck box to have the full menus appear after hovering over the menu for some time.

Reset menu and toolbar usage data

This command deletes the records of the commands used in an application and restores the default set of visible commands to the menus and toolbars. It does not undo any explicit customizations.

The **Other** section contains the following settings:

Large icons

Mark this check box to get large icons in all toolbars.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Show ScreenTips on toolbars

Mark this check box to display tool tips when hovering over toolbar buttons.

Show shortcut keys in ScreenTips

Mark this check box to include keyboard shortcuts (where available) in the tool tips.

Menu animations

This drop-down offers a choice of menu animation schemes.

Customizing QlikView Toolbars in Large Deployments

Enabling and disabling interactive toolbar customization

QlikView 7 introduces fully customizable toolbars and menus. The interactive customization can be turned on/off by means of the two registry keys:

HKEY_CURRENT_USER\Software\QlikTech\QlikView\Settings 7\AllowCustomizeToolbars

and

HKEY_CURRENT_USER\Software\QlikTech\QlikView\Settings 7\AllowCustomizeMenubar

For the QlikView Analyzer for Internet Explorer plug-in client the corresponding registry key is

HKEY_CURRENT_USER\Software\QlikTech\QlikViewPlugin\Settings 7\AllowCustomizeToolbars

Setting the value to 1 enables interactive customization whereas the value 0 prevents it.

Enforcing toolbar settings on large numbers of computers

If you want to duplicate the toolbar settings between computers, do as follows:

1 Customize the toolbars on one computer

2 Export the following registry keys from Regedit

Ordinary QlikView:
HKEY_CURRENT_USER\Software\QlikTech\QlikView\Toolbar 7

Plug-in:
HKEY_CURRENT_USER\Software\QlikTech\QlikViewPlugin

3 Run the resulting reg files on target computers

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If already running, QlikView has to be restarted on the target computer for the changes to take effect.

Note The QlikView versions of the source and target computers should be the same in order to guarantee 100% functionality.

12.8 The Status Bar

Below the sheet, the status bar is found. Some interesting information is displayed here:

On the left side of the status bar, several things can be shown: the text **Ready** may be shown when QlikView is ready for selections; if the cursor is moved over a graphical chart, the coordinates are shown.

It is also possible to obtain help to the left on the status bar. When clicking a command or a button without releasing the mouse button, help is displayed. If the mouse cursor is moved outside the command or the button before the mouse button is released, the command will not be executed.

In the middle of the status bar a time stamp is displayed. It shows when the last reload of data was performed.

An **AND-**indicator is shown if the active object is in **and** mode.

On the right side of the status bar, the number of distinct optional (or selected) values over the total number of distinct values in the active list box is presented, preceded by a D.

Further to the right, preceded by an F, the frequency of the active field is presented, showing the number of records in the table where the field first occurs over the total number of records.

Finally a selection indicator is shown on the status bar. It will be green if selections are made that cannot be seen on the current sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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13 USER PREFERENCES



User preferences are settings that concern the way the user works and that are stored on the computer, not in the document file.

The **User Preferences** dialog is opened from the **Settings** menu. When the preferences are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

13.1 General

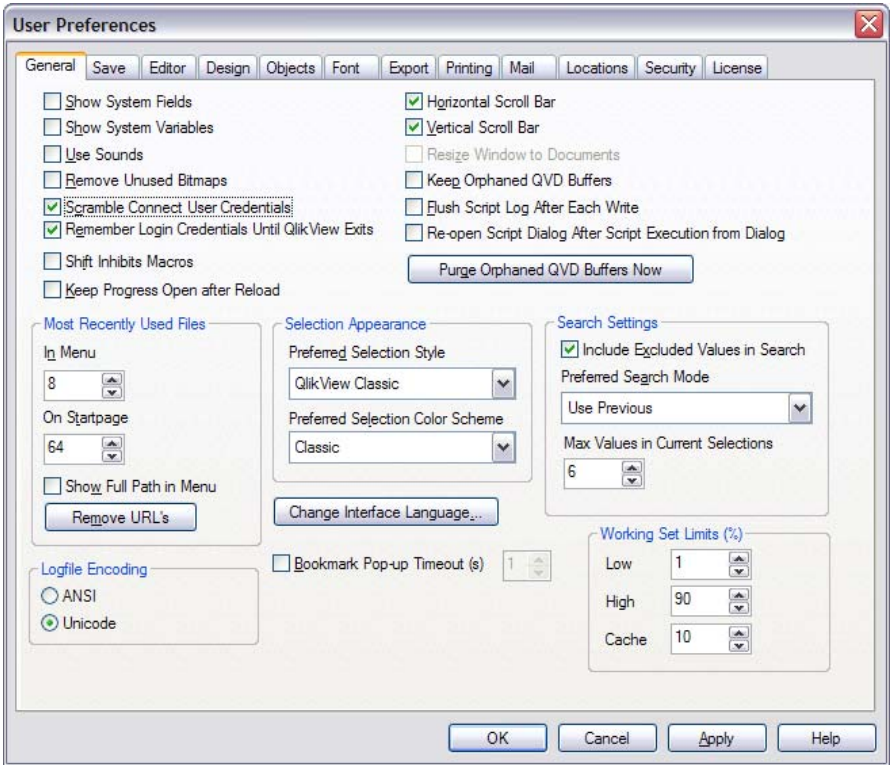


Figure 11. The General page in the User Preferences dialog

Show System Fields

Check this box to show the system fields in dialog field lists.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Show System Variables

Check this box to show the system variables in dialog variable lists.

Use Sounds

Adds sound effects to QlikView events.

Remove Unused Bitmaps

Bitmaps used in sheets and sheet objects are normally retained in the document even if their use is turned off. If this check box is marked, they will however be removed from the document when settings in a **Properties** dialog render them unused.

Scramble Connect User Credentials

This check box should be marked if you want the **connect** statement wizard to create connect statements with scrambled user ID and password (see page 300).

Remember Login Credentials Until QlikView Exits

QlikView will normally remember the user ID and password for a document after a successful login for the remainder of the QlikView session. This means that if you close the document and reopen it without closing QlikView, no new login will be required. By deselecting this check box you will force QlikView to ask for login every time the document is opened.

Shift Inhibits Macros

If this check box is selected, you may inhibit the execution of any OnOpen macro by keeping the SHIFT key depressed while opening a QlikView document.

Keep Progress Open after Reload

Marking this check box will keep the **Script Execution Progress** dialog open after the script has finished reloading.

Horizontal Scroll Bar

If this check box is selected, a horizontal scroll bar will appear in the sheet whenever any of the sheet objects cannot be fully accommodate horizontally inside the application window.

Vertical Scroll Bar

If this check box is selected, a vertical scroll bar will appear in the sheet whenever any of the sheet objects cannot be fully accommodated vertically inside the application window.

Resize Window to Documents

With this alternative checked, the size of the QlikView window is determined by the size of the document, i.e. the size of the QlikView window of the time the document was saved.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Keep Orphaned QVD Buffers

Unless this check box is marked, all automatically created QVD buffers (created via buffered prefix on **load** and **select** statements) will be removed by QlikView when the document that created them no longer exists. Each QVD buffer contains information about the complete path to the document that created it. If that path does not lead to a valid QlikView document, the QVD file will be considered orphaned. Note that this will be the case also if the QVW file has been moved or renamed. After a successful script execution (non partial reload) QlikView will scan all QVD buffers currently residing in the default folder for QVD buffers (see page 135). Any buffer found to be orphaned according to the criteria described above will be removed. By marking this check box this purge will not occur. Note that this may cause unnecessary use of hard disk space. If you decide to do it anyway, you may at all times use the **Purge Orphaned QVD Buffers Now** option to perform a manual purge.

Flush script log after each write

For performance reasons the script log is normally not written to disk after each individual statement. By selecting this check box it will. This may be useful if you use other programs to monitor the script execution via the log. However, using this setting may significantly increase script execution time, in cases where the script contains large numbers of statements.

Re-open Script Dialog After Script Execution from Dialog

If the script is executed from inside the **Edit Script** dialog and this check box is marked, the dialog will be re-opened after script execution.

Purge Orphaned QVD Buffers Now

Press this button to perform a manual purge of orphaned QVD buffers according to the rules described under **Keep Orphaned QVD Buffers** above.

Most Recently Used Files

This group is used for controlling the list of recently opened QlikView files in the **File** menu and on the **Start Page**.

In Menu

The number of files listed in the **File** menu. Default is 8.

On Start Page

The Number of files listed on the **Start Page**. Default is 64.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Show Full Path in Menu

If this box is marked the **File** menu will be widened as necessary to show full paths in the list of recently used files.

Remove URLs

By clicking this button, you remove all URLs from the list of most recently used files.

Log file Encoding

Select **ANSI** or **Unicode** for QlikView script log files.

Selection Appearance

QlikView supports a number of different ways of presenting data and making selections in list boxes and multi boxes. The **QlikView Classic**, **Corner Tag**, **LED** and **Tube** styles all use color coding for indication of selected, possible and excluded values. The **Windows Check boxes** style mimics the standard Windows interface with check boxes at each value. More information about the selection styles can be found in the chapter “Selection Styles” on page 157.

When using the selection styles based on color, there are a number of different color schemes available. The basic colors (green for selected, blue for locked etc.) cannot be changed, but variations of tone and intensity are possible.

Preferred Selection Style

Sets the default selection style. Select between the available alternatives in the drop-down list. This default can be overridden for a specific document by means of a corresponding setting on the **General** page of the **Document Properties** dialog (see page 16 in Book II).

Preferred Selection Color Scheme

Sets the default selection color scheme. Select between the available alternatives in the drop-down list. This default can be overridden for a specific document by means of a corresponding setting on the **General** page of the **Document Properties** dialog (see page 16 in Book II).

Max Values in Current Selections

Here you can specify the maximum number of distinct selected values to be shown in the current selections dialog and in the selection stamps in printouts. When more values are selected they will only be specified as ‘x values of y’ for the respective field. Selections in fields with no more than twelve distinct values in total will always be shown in full.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Change Interface Language

Press the button to open the **Select Interface Language** dialog. In this dialog all available languages on your computer will be listed. Select the language you prefer and restart QlikView to complete the change. The change affects both the language of the program user interface and the language of the on-line help, provided that the appropriate help files are available on your computer.

Bookmark Pop-up Time-out (s)

If this check box is marked bookmark pop-up windows will automatically close after a set number of seconds. The time delay is set in the scroll control to the right.

Search Settings

In this group settings are made for default search mode.

Include Excluded Values in Search

There are two ways to interpret text search: you either search among optional values, or you search among all values, i.e. you include the excluded values in the search. Mark this check box to do the latter. This default value can be overridden on sheet object level.

Preferred Search Mode

The default search mode for text search in list boxes, multi boxes etc. can be set in this drop-down box. The default only applies when you start typing directly and do not use any of the menu choices or keyboard shortcuts for starting the search. The normal search mode (with ** in the search box) will be used when **Use Normal Search** is selected. The fuzzy search mode (with ~ in the search box) will be used when **Use Fuzzy Search** is selected. When **Use Previous** is selected the search mode of the last completed search will be used. This default value can be overridden on sheet object level.

Working Set Limits %

This control sets the minimum and maximum of the physical amount of RAM that can be used by an application. This way it is possible to control if an application can be swapped out of physical memory or not. However, there are no guarantees that the operating system can serve the process with the amount of memory set here.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Using too high settings will degrade the performance of other processes on the computer, this may however be desirable if the computer is dedicated for QlikView.

Do not change these settings unless you are well acquainted with Windows Virtual Memory Manager! Read more about working sets in the Microsoft Windows documentation.

The settings are:

Low sets the minimum amount of memory, in percentage, to be allocated to the application/process.

High sets the maximum amount of memory, in percentage, to be allocated to the application/process.

Cache sets the amount of memory, in percentage, to be used as cache for the application/process.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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13.2 Save

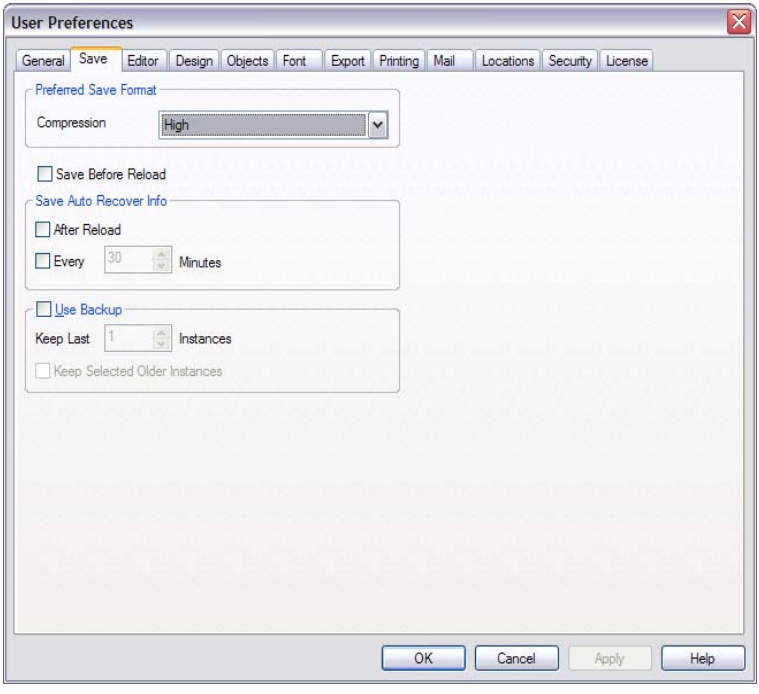


Figure 12. The Save page of the User Preferences dialog

The **Save** page contains settings for how to save QlikView documents.

Preferred Save Format

Here you can make settings with regard to the default document save format.

Compression

This drop-down list specifies the save compression mode for new documents. By using compression the size of the file will be reduced by typically 60-80% (actual results will vary with the document). When using compression, document save times will be slightly increased. With **Medium** compression all parts of the document except table data (which is already stored quite compressed inside QlikView) will undergo compression. With **High** compression (default) also table data will undergo compression, saving

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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some space but further increasing save and load times. By choosing **None** all data is saved without compression. See also **Save Format** settings, on **General** page of **Document Properties** (page 16 in Book II).

Save Before Reload

By checking this box the document will be automatically saved before the script is executed.

Save AutoRecover Info

In the **Save AutoRecover Info** group you can specify rules for when AutoRecover files should be saved. Such files can be used to restore lost work e.g. if the system crashes before changes have been saved. AutoRecover files are automatically deleted every time a document has been successfully saved or abandoned by the user. Every time QlikView is started a check will be made if AutoRecover files exist. If this is the case a dialog will be displayed allowing you to open (and resave) or delete these files.

After Reload

If this box is checked **AutoRecover** information will be saved after new data has been loaded with the script.

Every *n* Minutes

If this box is checked **AutoRecover** information will be saved every *n* minutes, where *n* can be specified in the corresponding edit box.

Note No **AutoRecover** files will be saved for a new document until it has been saved by the user under a document name.

Use Backup

If this box is checked backup copies of older versions will be retained according to the choices in the two settings below. You can specify rules for keeping copies of previous versions of the document as backup. The files are stored in the same folder as the current document and will be named "Version *n* of *filename*" where *n* is the version number (starting with 1) and *filename* is the original document name.

Keep Last *n* Instances

In the edit box you may specify how many backup versions will be retained of the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Keep Selected Older Instances

By checking this box a smart selection of older versions will be retained in addition to those kept as a result of the setting above. The density of saved versions will decrease with age.

13.3 Editor

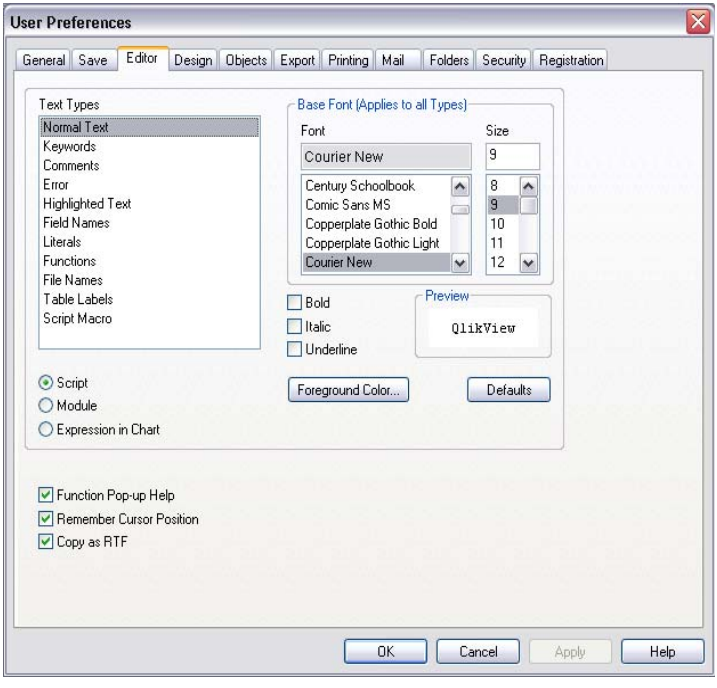


Figure 13. The Editor page in the User Preferences dialog

The **Editor** page makes it possible to customize the **Edit Script** dialog (page 227), the **Edit Module** dialog (page 299), and the **Edit Expression** dialog (page 229 in Book III). You can individually format each text type appearing in these dialogs.

Text Types

Select a text type in the list to apply a different formatting. Choose one of the options below the list to display the text types available in the **Edit Script** dialog (**Script**), the **Edit Module** dialog (**Module**)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

and the **Edit Expression** dialog (**Expression in Chart**), respectively.

Script Select this option to make the text types appearing in the **Edit Script** dialog available in the **Text Types** box. The formatting of the following text types can be configured:

Normal Text
Text that does not belong to any of the categories described below.

Keywords
The keywords used in the script (described under "Script Keywords and Statements in Alphabetical Order" on page 291 and forward), e.g. **load**, **select**, **directory**, **semantic**, etc.

Comments
Comments typed in the script. For more information, see page 334.

Error The errors that QlikView detects in the script.

Highlighted Text
When you approach a parenthesis with the cursor in the script, the parenthesis, as well as the commas enclosed by it, will be highlighted. Missing parentheses or commas will thus be easily detectable.

Field names
The names of the fields to be loaded.

Literals Text to be loaded literally, i.e. as a text string (usually enclosed by single quotation marks). For the difference between field names and literals see page 362.

Functions
The functions used in the script (described under "Aggregation Functions" on page 368 and forward), e.g. **div**, **left**, **if**, **num**, etc.

File Names
The name of the file from which the fields are to be retrieved.

Table Labels
The labels assigned to specific tables. For more information see "Table Names" on page 352.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Script Macro
The macro variables used in the script. For more information on macros, see page 353.

Module

Select this option to make the text types appearing in the **Edit Module** dialog available in the **Text Types** box. The formatting of the following text types can be configured:

Normal Text
Text that does not belong to any of the categories described below.

Keywords
Visual Basic Script reserved keywords.

Highlighted Text
When you approach a parenthesis with the cursor in the script, the parenthesis, as well as the commas enclosed by it, will be highlighted. Missing parentheses or commas will thus be easily detectable.

Expression in Chart

Select this option to make the text types appearing in the **Edit Expression** dialog available in the **Text Types** box. The formatting of the following text types can be configured:

Normal Text
Text that does not belong to any of the categories described below.

Comments
Comments typed in the chart expression.

Error The errors that QlikView detects in the expression, e.g. a missing parenthesis.

Highlighted Text
When you approach a parenthesis with the cursor in the expression, the parenthesis, as well as the commas enclosed by it, will be highlighted. Missing parentheses or commas will thus be easily detectable.

Strings Text literals.

Functions
QlikView standard function names for chart expressions.

Field names
The names of the fields used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Base Font for All Types

The font and the font size selected in this group will be applied to all the text types. Properties such as color, bold, italic and underline can be set individually (see below).

Bold Makes the text bold. This setting applies to the text type selected in the list.

Italic Displays the text in italics. This setting applies to the text type selected in the list.

Underline

Underlines the text. This setting applies to the text type selected in the list.

Preview

Gives a preview of the current settings.

Defaults

Applies the default settings.

Foreground Color

Opens a color map from which you can choose the color you wish to apply to the selected text type.

Function Pop-Up Help

If this check box is marked a pop-up help window will appear when you define functions in expressions in the script and in the **Edit Expression** dialog. This pop-up help window describes the syntax to be used in the expression.

Remember Cursor Position

If this check box is marked the editors for script and macro will remember the position of the cursor when you leave the editor. Next time you return to the editor the cursor will be where you left it. If this feature is not used the cursor will be positioned at the start of the macro module and at the end of the script.

Copy as RTF

If this check box is marked, copy operations from the editor windows will be put on the clipboard not only as pure text but also as RTF, enabling applications supporting RTF import to paste the text with full formatting.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

13.4 Design

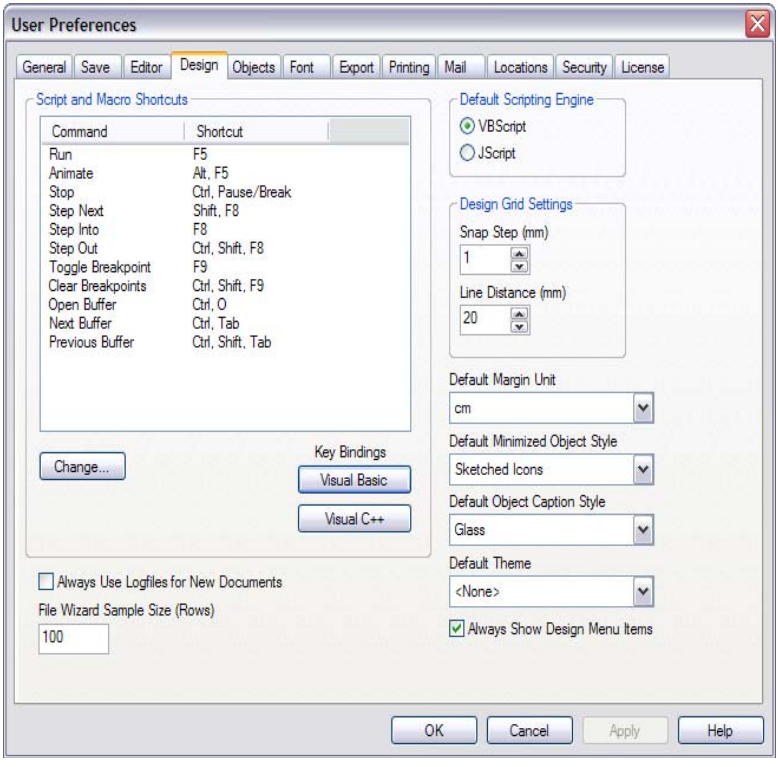


Figure 14. The Design page in the User Preferences dialog

In the **Design** page you can customize certain features related to document design.

Script and Macro Shortcuts

In the **Script and Macro Shortcuts** group you can customize keyboard shortcuts for certain actions in the script debug dialog.

Edit Select a command from the list and press the **Change** button to customize the keyboard shortcut for the command. Double-clicking in the list has the same effect.

Key Bindings

Visual Basic
Sets the keyboard shortcuts to defaults familiar to the Visual Basic debugging environment.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Visual C++
Sets the keyboard shortcuts to defaults familiar to the Visual C++ debugging environment.

Default Scripting Engine
Sets the default scripting engine in new documents. You may choose between **VBScript** and **JScript**.

Default Grid Settings
Sets measures for the layout design grid.

Snap Step (mm)
Sets the distance between the snap points when design grid is displayed.

Line Distance (mm)
Sets the distance between the grid lines when design grid is displayed.

Default Margin Unit
Here you may select if the default unit for margins in the **Layout** page of the **Print** dialog should be cm or inch.

Default Minimized Object Style
Select one of the available styles for minimized object icons in this drop-down. The style selected will be used as default for all new documents.

Default Object Caption Style
Select one of the available styles for sheet object captions in this drop-down. The style selected will be used for all new documents.

Always Use Logfiles for New Documents
If this box is checked, a log file will always be generated for new QlikView documents.

File Wizard Sample Size
Specifies the number of records read into the table file wizard. Normally a sample of 100 lines will be sufficient but in certain cases a higher number may be desired. Very high numbers in this setting will slow down the wizard unnecessarily and should thus be avoided.

Default Theme for New Objects
Here you may select a QlikView theme which will be applied to all newly created sheets and sheet objects in the document. The selected theme must be accessible from disc at all times in order to be used. It is also important that the theme used is defined for all types of objects that may occur in a QlikView document. At the bottom of the drop-down list there is a **Browse...** command in case

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

your theme resides in another location than in the default QlikView theme catalog. If no default theme is used, each new sheet object will inherit the properties of the last created or changed object.

Always Show Design Menu Items

If this check box is marked all design menu options will be available on the context menu at all times.

If unchecked some menu options will only be available when the design grid is turned on.

13.5 Objects

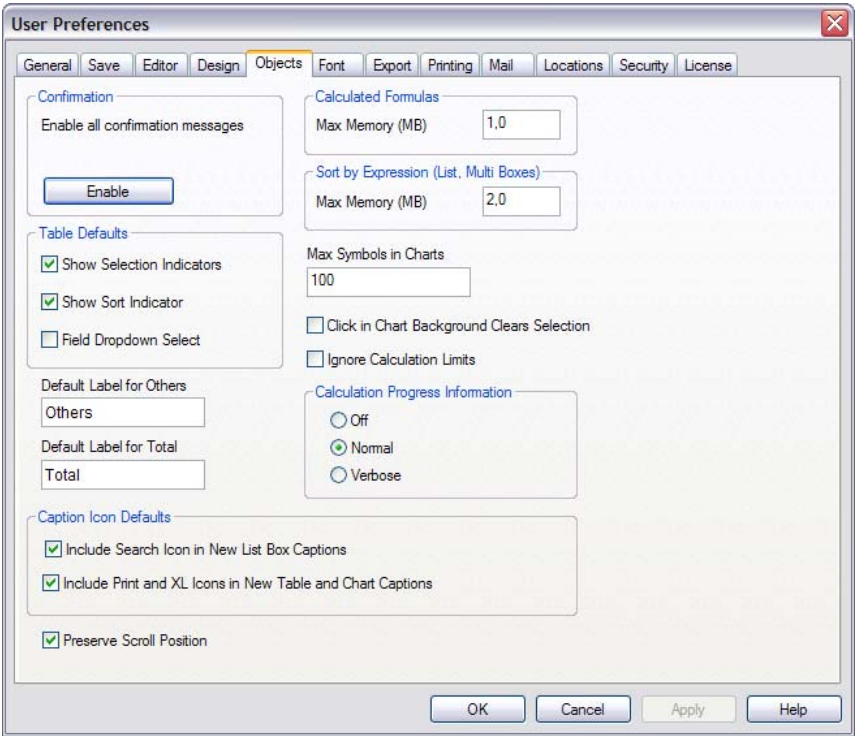


Figure 15. The Objects page in the User Preferences dialog

In the **Objects** page default settings for sheet objects are set.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Confirmation

When QlikView is first installed on a computer a number of warning dialogs are enabled. These will prompt you for confirmation before performing certain actions, such as deleting sheets and sheet objects or sending mail. In each of these warning dialogs there is a check box marked **Do not show this message again**. By marking this check box that particular warning dialog will be suspended for the future. If you want to turn on all previously disabled warning dialogs press the **Enable** button in this group.

Table Defaults

In the **Table Defaults** group you can set defaults for the column icons you want to have in new tables.

Show Selection Indicators

Mark this check box if you wish to have column selection indicators (beacons) turned on as default for new table boxes, pivot tables and straight tables.

Show Sort Indicator

Mark this check box if you want an icon indicating the primary sort column as default for new table boxes and straight tables.

Field Drop-down Select

Mark this check box if you wish to have drop-down selection icons as default in field columns for new table boxes, pivot tables and straight tables.

Default Label for Others

Here you can specify a default label for Others in bar charts and pie charts.

Default Label for Total

Here you can specify a default label for Totals in bar charts, pivot tables and straight tables.

Calculated Formulas - Max Memory (MB)

Here you may specify the maximum memory allocation for the evaluation of calculated formulas. The default is 1 Mbytes. This setting is by default overriden by the **Ignore Calculation Limits** setting.

Sort by Expression (List-, Multi Boxes) - Max Memory (MB)

Here you can specify the maximum memory allocation for sorting by expression. The default is 2.0 MB.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Max Symbols in Chart

Here you may specify an upper limit of the data points to be shown with symbols in line and combo charts. The default value is 100. When the total number of data points exceeds this limit, symbols will be turned off. This feature is only useful in line and combo charts and for expressions with both line and symbols turned on.

Click in Chart Background Clears Selection

If this box is checked, clicking in the background of a chart's plot area will cause all selections in the chart's dimension fields to be cleared. This was the default behavior in QlikView 5 and earlier.

Ignore Calculation Limits

Earlier versions of QlikView have largely relied on manual settings for limits on how much memory charts and other calculated sheet objects may use. With generally increasing memory sizes and improved memory management algorithms in QlikView, the old hard controls have become largely obsolete. When this check box is selected (default) the old memory settings will be disregarded and automatic size control, based on available memory, will take effect. When this setting is used the **Memory...** buttons in the various sheet object property dialogs will be disabled. The same applies to the memory limit controls on this page. It is recommended for best performance to leave this check box marked.

Calculation Progress Information

In the **Calculation Progress Information** group you can decide how much progress information should be shown when sheet objects require more than one second to complete calculation.

Off No progress information is displayed.

Normal A progress bar is displayed.

Verbose

A progress bar and additional text information is displayed.

Caption Icon Defaults

In this group it is possible to set defaults for selected caption icons.

Include Search Icon in New List Box Captions

When this check box is marked, all new list boxes will have the **Search** caption icon turned on at creation. This is recommended for better usability and especially if the document is to be published for the QlikView AJAX ZFC client.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Include Print and XL Icons in New Table and Chart Captions

When this check box is marked, all new tables and charts will have the **Print** and **Send to Excel** caption icons turned on at creation. This is recommended for better usability and especially if the document is to be published for the QlikView AJAX ZFC client.

Preserve Scroll Position

Mark this check box and the corresponding box on the **Layout** page of a sheet object to enable QlikView to try to preserve the scroll position after a selection in table objects and charts with an x-axis scroll bar.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

13.6 Font

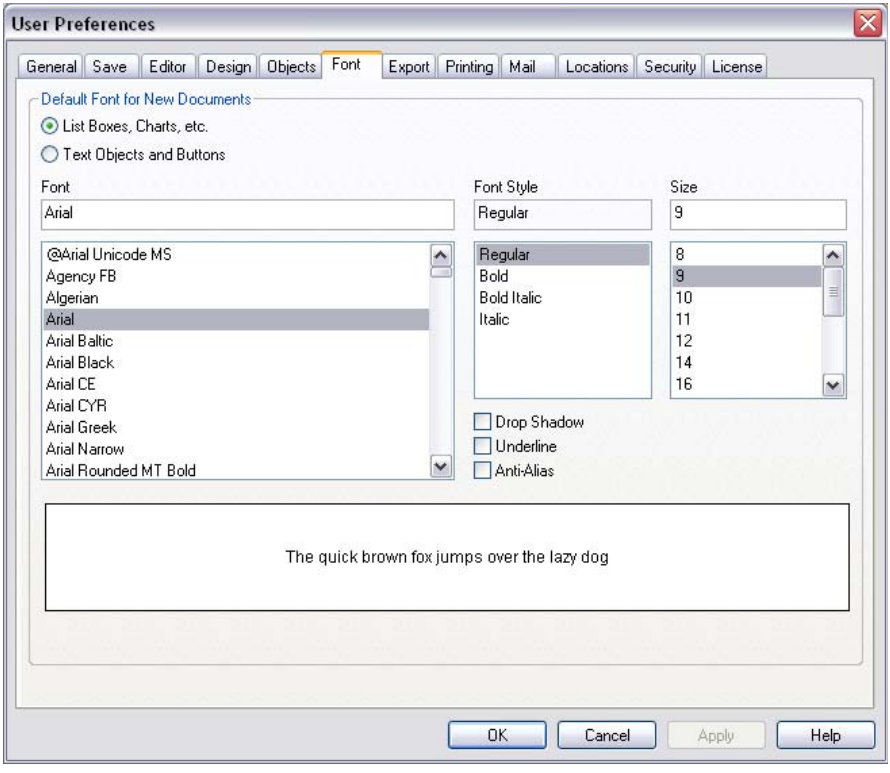


Figure 16. The Font page in the User Preferences dialog

In the **Font** page, you can change one or both of the default fonts for new documents. The first default font is used for most objects, including list boxes and charts. The second default font is used for buttons and text boxes, which are objects that usually need a larger font.

Drop Shadow
If this check box is marked a drop shadow will be added to the text.

Underline
If this check box is marked the text will be underlined.

Anti-Alias
If this check box is marked anti-aliasing will be applied to the text, making it fit more smoothly with the background. This option may degrade drawing speed on very slow computers.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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13.7 Export

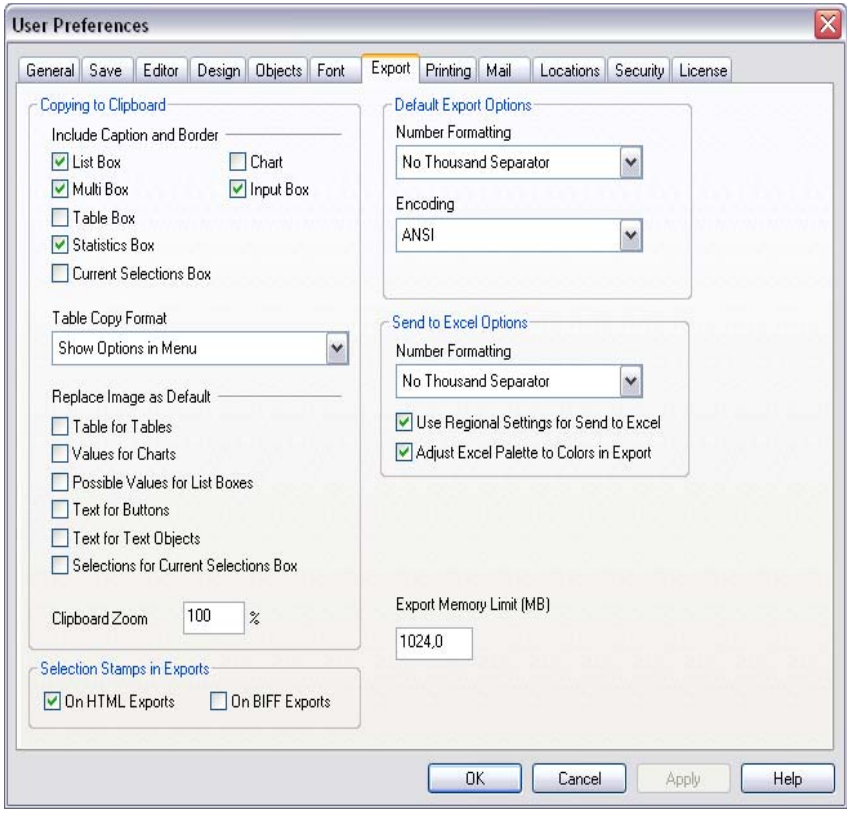


Figure 17. The Export page in the User Preferences dialog

In the **Export** page default settings are made for export and copying to clipboard.

Copying to Clipboard

The **Copying to Clipboard** group contains the preferences for copying sheet objects to the clipboard.

Include Caption and Border

The **Include Caption and Border** group contains the preferences for whether the sheet object caption and border should be included when sheet objects are copied to the clipboard as images. Separate settings are available for list box, statistics box, multi box, table box, input box, current

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

selections box and chart (including pivot table and straight table).

Table Copy Format

The **Table Copy Format** group contains a drop-down list indicating the preferences for copying tables (straight tables, pivot tables and table boxes) to the clipboard.

Full Table

If this option is selected, the full table (including header and sums) will be copied to the clipboard. Furthermore, an HTML-formatted version of the table will be added to the clipboard for applications that can read it.

Data Area Only

If this option is selected, only the data area of the table will be copied to the clipboard. No HTML version is generated.

Show Options in Menu

If this option is selected, selecting the **Copy Table to Clipboard** command in the table object menu will open a cascading menu containing the commands **Full Table** and **Data Area Only**.

Replace Image as Default

The **Replace Image as Default** group contains the preferences for what should be put on the clipboard to external applications when using the menu commands **Cut** and **Copy** in the **Edit** menu (CTRL+X and CTRL+C). Normally the image of the sheet object is put on the clipboard, but for certain types of sheet objects other options are available.

Table for Tables

If this check box is marked, tables (table boxes, straight tables and pivot tables) will be copied in table format instead of as an image when the **Copy** and **Cut** commands are used.

Values for Charts

If this check box is marked, charts will be copied as underlying values instead of as an image when the **Copy** and **Cut** commands are used.

Possible Values for List Boxes

If this check box is marked, list boxes will be copied as possible values instead of as an image when the **Copy** and **Cut** commands are used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Text for Buttons

If this check box is marked, buttons will be copied as text instead of as an image when the **Copy** and **Cut** commands are used.

Text for Text Objects

If this check box is marked, text objects will be copied as text instead of as an image when the **Copy** and **Cut** commands are used.

Selections for Current Selection Boxes

If this check box is marked, current selection boxes will be copied as a text selection stamp instead of as an image when the **Copy** and **Cut** commands are used.

Clipboard Zoom

Here you can specify the default zoom factor for copying a sheet object to the clipboard as an image. This setting is independent of the current zoom factor of the sheet. The default zoom factor is 100%. A bigger zoom factor will produce an image of higher quality for scaling, but the object will also be larger on disc.

Selection Stamps in Exports

In the **Selection Stamps in Exports** group you may state whether or not the selection stamps should be included when exporting to certain file types.

On HTML Exports

Mark this check box if selection stamps are to be included when exporting to HTML files.

On BIFF Exports

Mark this check box if selection stamps are to be included when exporting to BIFF (Excel) files.

Default Export Options

In the **Default Export Options** group you may set defaults for export formatting.

Number Formatting

Some other programs may have difficulties to handle numbers with number format correctly. QlikView offers three options for number formatting of numeric data to be exported to files or to the clipboard. This setting will affect the result of all **Export** and **Copy to Clipboard** commands on the menus and of all data transferred to the clipboard in **Copy Mode**. It will also be the default setting for new

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



export buttons. The setting can however be individually set for each export button (see page 198 in Book II).

Full Formatting
Instructs QlikView to export numeric data with its full number format, just as it is shown in the sheet objects of the document.

No Thousand Separator
Removes any thousand separator from numeric data. This option is recommended if data is to be exported to MS Excel.

No Formatting
Removes all number formatting from the data and exports the raw numbers. The decimal separator will be as defined in the system settings (**Control Panel**).

Encoding
Sets the default character set for export in new documents. You may choose between **ANSI**, **Unicode** and **UTF-8**.

Send to Excel Options
In the **Send to Excel Options** group you may set defaults for formatting used by the **Send to Excel** menu command.

Number Formatting
Excel is known for having difficulties to handle numbers with number format correctly. QlikView offers three options for number formatting of numeric data to be sent to Excel.

Full Formatting
Instructs QlikView to export numeric data with its full number format, just as it is shown in the sheet objects of the document.

No Thousand Separator
Removes any thousand separator from numeric data. This option is recommended if you experience problems with the data sent to Excel.

No Formatting
Removes all number formatting from the data and exports the raw numbers. The decimal separator will be as defined in the system settings (**Control Panel**).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Use Regional Settings for Send to Excel

As long as this check box is selected the regional settings of the operating system will be used for decimal separator when exporting tables via the **Send to Excel** command. If unchecked, decimal point will always be used. This may be necessary when using certain national versions of Microsoft Excel.

Adjust Excel Palette to Colors in Export

If this check box is marked, the color palette of QlikView replaces that of Excel. Thus the colors of that Excel document will differ from those in other Excel documents, but will be closer in hue to the colors of the original document.

If unchecked, the standard colors of the Excel palette will replace the colors chosen in QlikView. The original colors will be replaced by those that correspond the best to the colors in the standard palette.

Export Memory Limit (MB)

Sets the maximum amount of RAM that can be used for performing an export from a QlikView sheet object.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

13.8 Printing

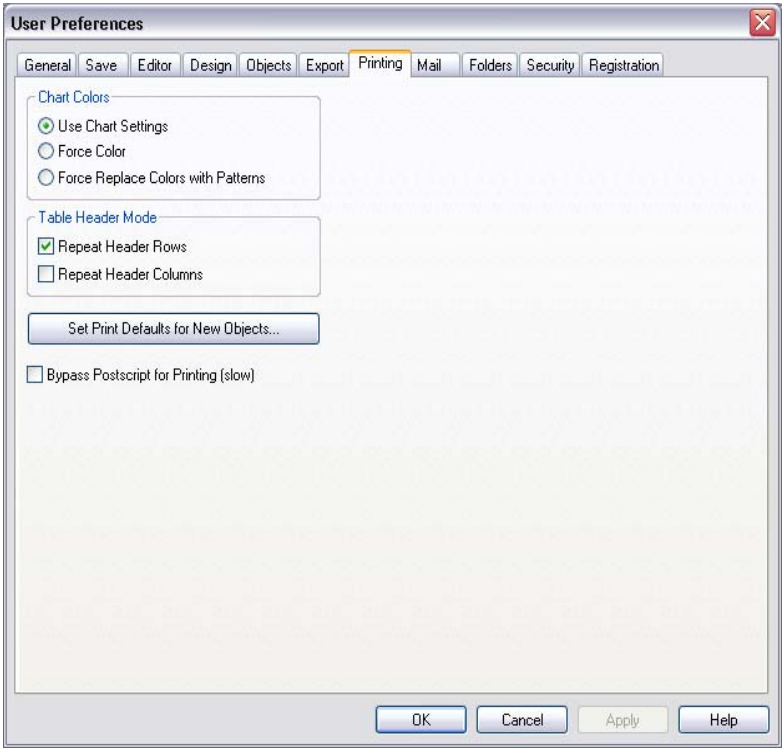


Figure 18. The Printing page in the User Preferences dialog

This group contains the preferences for printing sheet objects.

Chart Colors

In this group you may specify an override of the color print settings of all the image charts in your documents.

Use Chart Settings

When this option is selected, the individual settings for each image chart regarding color or black/white printing will be used.

Force Color

When this option is selected, all image charts will be printed in color, regardless of printer settings on the **Color** page of the **Chart Properties** dialog (see page 67 in Book III).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Force Replace Colors with Patterns

When this option is selected, all image objects will be printed in black/white, regardless of the settings on the **Color** page of the **Chart Properties** dialog (see page 67 in Book III). Color coding will be replaced by pattern coding.

Table Header Mode

When printing tables whose contents expand over several pages, you may want the header rows or columns to be displayed on all the pages. This is when the commands in this group are useful.

Repeat Header Rows

If this check box is selected, the header rows will appear on all the pages of the printed table.

Repeat Header Columns

If this check box is selected, the header columns (in pivot tables) will appear on all the pages of the printed table. If there is not room for at least one data column on the right-hand side of the header columns on one page, this setting will be disregarded.

Set Print Defaults for New Objects

Opens a dialog where default margins and print orientation can be set.

Bypass Postscript for printing (slow)

Due to the interaction between Microsoft graphics libraries and certain printer Postscript drivers, printouts from Print Sheet may sometimes be less sharp than expected. This effect can be avoided by marking this check box. Note however, that printing times may become considerably longer (up to several minutes).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

13.9 Mail

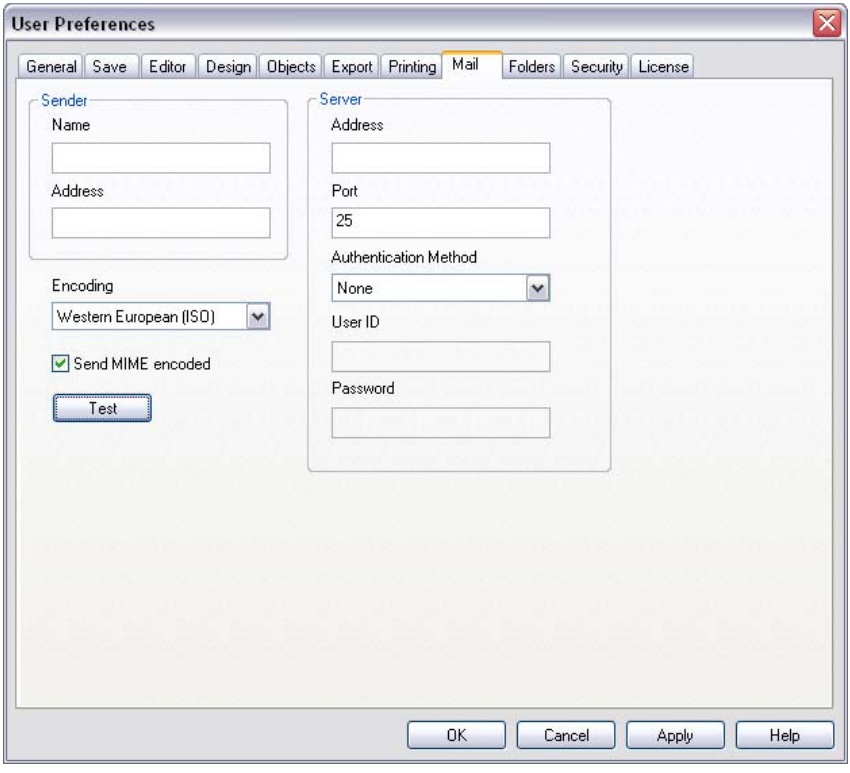


Figure 19. The Mail page in the User Preferences dialog

In this page you can make settings for sending mails from QlikView. In order to the mail functionality you must have access to an SMTP server.

Sender

In this group you specify the name and e-mail address that will appear as sender on the e-mails sent by QlikView.

Name The name that should appear as sender for outgoing mails.

Address

The e-mail address that should appear as sender for outgoing e-mails.

Encoding

Select the character code page to be used for sent mail.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Send MIME encoded

Mark this check box if mails are to be MIME encoded.

Server

In this group you specify the SMTP server to be used for outgoing mails from QlikView.

Address

The address (URL or IP number) of the SMTP server to be used.

Port The port used by the SMTP server.

Authentication Method

Select an authentication method from the list, if authentication is required by the SMTP server.

User ID

The user ID to be used for authentication.

Password

The password to be used for authentication.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

13.10Locations

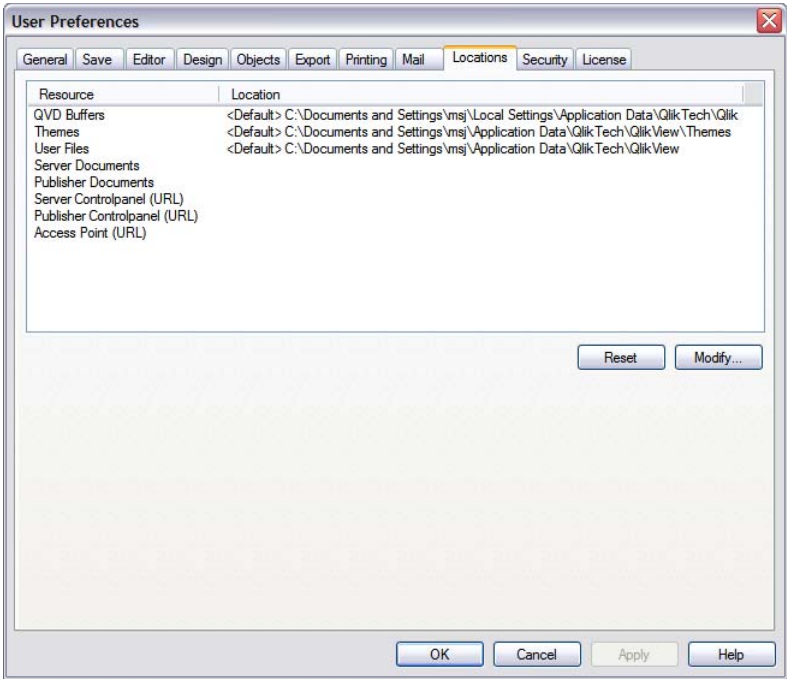


Figure 20. The Locations page of the User Preferences dialog

The **Locations** page is used for setting default folder locations for certain files created when working with QlikView. It can also be used to define shortcuts to document file folders for QlikView Server and QlikView Publisher. Finally you may specify URLs to the control panels of QlikView Server, QlikView Publisher and QlikView AccessPoint. The page contains a list of resource locations that can be modified.

Resource

The following resource locations can be modified:

QVD Buffers

The default storage location for QVD buffers generated via the **buffered** prefix to **load** and **select** statements in the script.

Themes

The default storage location for user defined layout themes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

User Files

The default root folder location where the folders storing user bookmarks, user reports and user alerts are stored. Note that by changing this location without moving the folder contents you will lose your existing user bookmarks, user reports and user alerts.

Server Documents

Here you may specify the location of your QlikView Server document folder, when applicable. If you do, you will find a shortcut icon to that folder in the **Open** and **Save As** dialogs.

Publisher Documents

Here you may specify the location of your QlikView Publisher source document folder, when applicable. If you do, you will find a shortcut icon to that folder in the **Open** and **Save As** dialogs.

Server Control Panel (URL)

Here you may specify a URL pointing at your QlikView Server control panel, when applicable. If you do, you will find a shortcut icon to the control panel in the **Open** and **Save As** dialogs.

Publisher Control Panel (URL)

Here you may specify a URL pointing at your QlikView Publisher control panel, when applicable. If you do, you will find a shortcut icon to the control panel in the **Open** and **Save As** dialogs.

AccessPoint (URL)

Here you may specify a URL pointing at your QlikView AccessPoint, when applicable. If you do, you will find a shortcut icon to that folder in the **Open** and **Save As** dialogs.

Reset Resets the location of the selected resource to the QlikView default. The path shown in the list will be preceded by the text **<default>**.

Modify...

When a folder resource is modified this button opens the **Browse for Folder** dialog where you may browse to the location you prefer for the selected folder. When a URL resource is modified this button opens a dialog where you can enter a URL.

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13.11Security

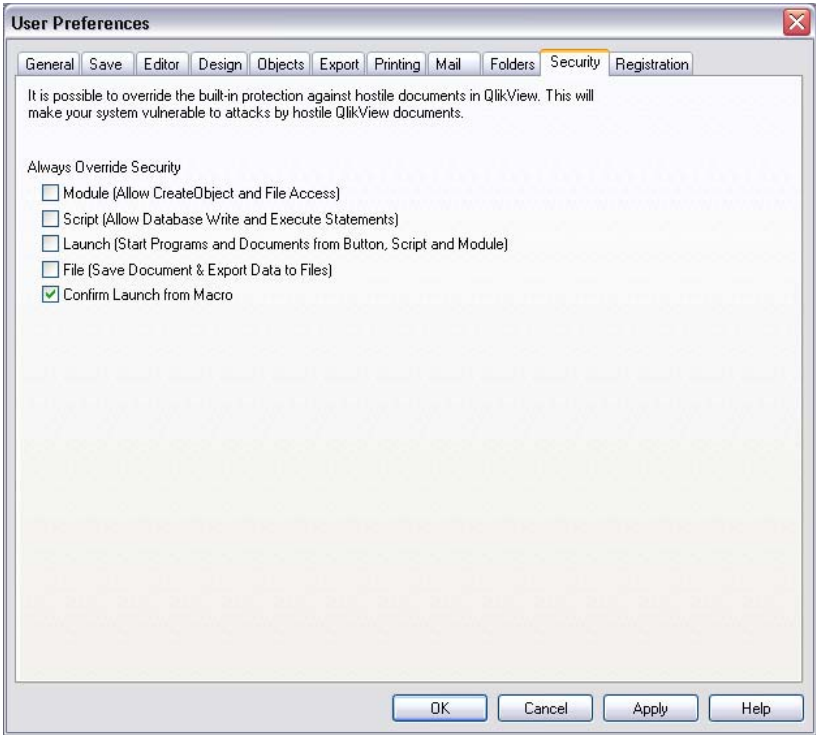


Figure 21. The Security page in the User Preferences dialog.

In this page you can choose to override one or more parts of the QlikView security measures against hostile macros and scripts embedded in the QlikView document. Use these options with caution and only when working with well-known documents.

Module (Allow CreateObject and file access)
By marking this box you turn off QlikView checks for macros containing CreateObject calls or accessing external files.

Script (Allow database write and execute statements)
By marking this box you turn off QlikView checks for scripts containing the **execute** command and **mode is write** qualifier in **select** statements.

Launch (Start programs and documents from button, script, module)
By marking this box you turn off QlikView checks for starting external programs and documents from QlikView script, module or buttons.

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File (Save doc and export data to file)

By marking this box you turn off QlikView checks for saving or exporting to files with suspect file extensions.

Confirm Launch from Macro

By keeping this check box marked, QlikView will have you confirm that you permit a macro to launch another application.

13.12License

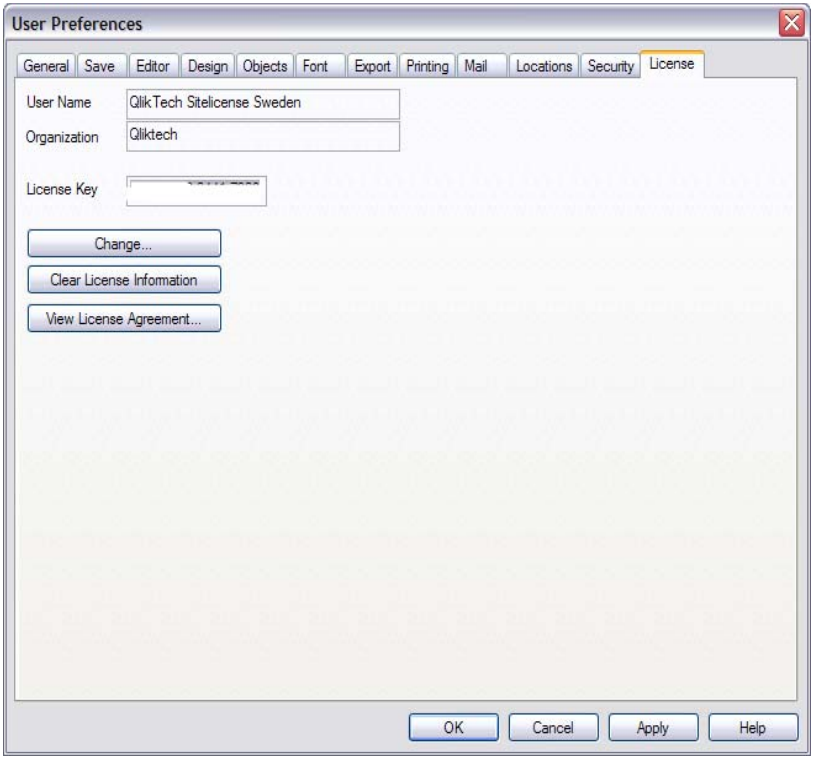


Figure 22. The License page in the User Preferences dialog.

This page is used only when you need to change the serial number of your QlikView license.

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Change...

By clicking this button, you will have the possibility to enter a new serial number and a new control number for your license. Changes take effect only after restarting QlikView.

Clear License Information

By clicking this button, your license number will be erased the next time the application is started.

View License Agreement

Clicking this button will show the license agreement.

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14 CALCULATION MEMORY SETTINGS

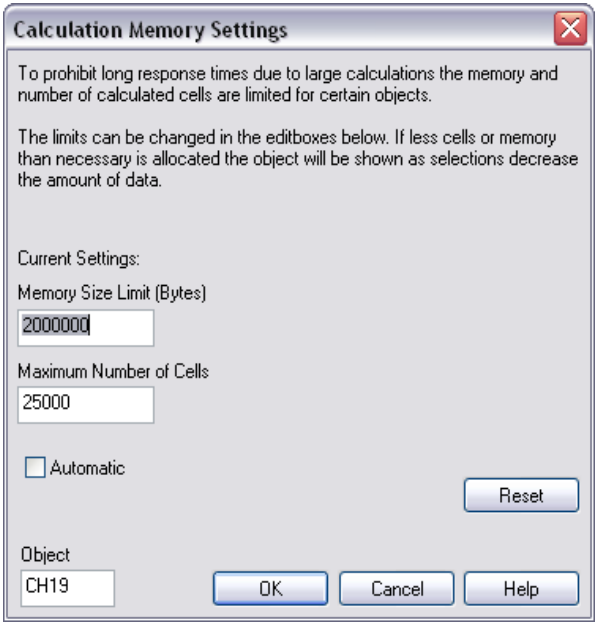


Figure 23. The Calculation Memory Settings dialog.

Charts and table boxes in QlikView are so called calculated sheet objects. This means that they do not only show field values, but rather the result of a sometimes complex calculation based upon field values.

In the case of the table box, the calculation involves finding all possible combinations between field values in the selected fields.

In the case of charts (including pivot tables and straight tables) the calculation involves two steps: first all possible combinations of field values in the dimensions must be found. Then the expressions must be evaluated over these combinations.

All calculated objects require some extra memory for the calculation. The amount of memory needed naturally depends on the complexity of the calculation. QlikView imposes very few hard limitations on the complexity of your calculated objects. However, if you decide to make a ten-dimensional pivot table over several million records, a substantial amount of RAM will be required. Windows will, if it runs out of physical RAM, start swapping memory to disk. This will slow down the computer considerably.

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If you make a chart or table box large enough, the program may actually appear to hang while trying to calculate the object. In order to prevent this from happening, QlikView may limit the amount of memory given to any calculated sheet object. When more memory is required, QlikView will display the error message “Out of object memory“ or "Too many Cells".

In most cases it is wiser to leave the setting of limits to QlikView. QlikView will do so taking into account the available RAM and other factors. Provided that the **Ignore Calculation Limits** setting has been selected in the **Objects** page of the **User Preferences** dialog, all memory limits will be handled automatically. Only if this setting is deselected will the **Calculation Memory Settings** dialog become available under **Chart Properties** and **Table Box Properties**. With this dialog you may set hard custom limits to specific sheet objects.

There are two separate limits available. First, you may run out of memory for the calculation and second, you may generate a table too large in number of cells. Please note that the cells require memory also after the calculation, as long as the object is displayed on the active sheet.

You may choose to increase **Memory Size Limit** or **Maximum Number of Cells** until the calculation can be performed. It is also possible to leave the object with insufficient memory. In many cases the calculation will be made possible as the data set is narrowed down by selections in the data.

As long as a calculated object cannot be properly calculated, it will show a message saying "Out of object memory" or "Too many Cells".

You may access the **Calculation Memory Settings** dialog for a calculated sheet object via the **Memory...** button in the appropriate **Properties** dialog.

Memory Size Limit (Bytes)
: Here you may change the amount of allocated memory.

Maximum Number of Cells
: Here you may change the maximum number of cells.

Automatic
: By marking this check box you turn on automatic limits for the specific sheet object even if the **Ignore Calculation Limits** setting has been deselected in the **Objects** page of the **User Preferences** dialog.

Reset Resets all values to the defaults defined on the **Objects** page in the **User Preferences** dialog (see page 121).

Object Here you can see the sheet object ID of the current chart or table box.

OK Accepts changes and closes the dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Cancel Closes the dialog without saving the changes.

Help Invokes help.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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144

15 LOGIC AND SELECTIONS



15.1 Single Field Value Selection

In order to select a value from a field, simply click the value. Once selected, the cell turns green to indicate its new state, i.e. selected. The selection may affect the states of a large number of values in the other sheet objects. White cells represent optional field values, whereas gray cells represent field values excluded by selections.

Selections can be made not only in list boxes, but also in statistics boxes, multi boxes, table boxes and charts.

In statistics boxes you can click on some of the statistical quantities in the statistics box, e.g. **Min**, **Max** and **Median**, and the corresponding value will be selected. The selection is not marked in the statistics box but only in other boxes.

When a selection is made, natural inner joins are dynamically created between all the associated tables.

To cancel a previously made selection, click it or choose **Clear** from the **Object** menu, or choose one of the **Clear** commands in the **Selections** menu. When an excluded value is clicked, selections in conflict with this value are canceled, and the value clicked becomes selected.

Color Codes

The state of a field value is shown by the color of its cell. The following color scheme is used:

Select	Green
Optional	White
Alternative	White
Locked	Blue
Excluded	Gray
Forced excluded	Red

When the option is on, i.e. checked (**Show Alternatives** page 100 in Book II) QlikView displays non-selected cells in the corresponding list box as alternative values (white), unless they are excluded by selections in other list boxes. They are however *logically excluded*, and not included in calculations made on possible (optional and selected) values. When the **Show Alterna-**

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tives option is off, i.e. not marked, QlikView displays non-selected cells as excluded (gray).

15.2 Multiple Selection within a Field

Multiple selections within a field (from one list box) can be made in a number of ways:

- Position the cursor in the list box, then drag it over a number of field values while pressing the mouse button.
- Click the first field value to be selected, then CTRL-click each additional selection.
- Click the top item to be selected, then SHIFT-click the bottom item to be selected. This way all the items in between will be selected. However, if the sort mechanism is on, the first selection may cause the order to change, which makes it difficult to make a correct second selection.
- Confirm a text search (see below) by hitting the ENTER key. This will result in all matching field values being selected. By keeping the CTRL key depressed while pressing ENTER the selections from the text search will be added to previous selections.

To deselect a previously made additional selection, CTRL-click it.

If you have made a multiple selection in one list box, and make a new selection from the available optional values in another list box, some of the selected values in the first list box may get excluded. However, when the selection in the second list box is cancelled, your previous selections will, by default, be recovered.

A multiple selection can be interpreted in two different ways, either as a logical **or** or as a logical **and**. Default is logical **or**, i.e. QlikView will find a solution that is associated to one or more of the selected field values. For logical **and**, see page 152.

15.3 Search



Selections can be made through text search as well. To enter a search string, click on the list box header, then simply type the search string. The search string will appear in the pop-up search box. As a result, QlikView will display all the values of the selected field that fulfill the criteria of the search string. When you press ENTER, or click on one of the cells in the result, the value(s) become(s) selected. By keeping the CTRL key depressed while pressing ENTER the selections from the text search will be added to previous selections.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The search box will close automatically when you hit ENTER, ESC or click in the layout. You may also close it by clicking the × icon in the search box.

If you need more room to enter your search string, click the » icon in the search box. The **Advanced Search** dialog () will then be opened.

If several list boxes are active (SHIFT-click on their headers to make them active), they are all included in the text search. Pressing ENTER to select the resulting values is however not possible until there are optional values in only one of the active list boxes.

If a selection has already been made, there are two ways in which a search can be interpreted: either you search only among the optional values, or you search among all values, i.e. you include the excluded values in the search. To set the search mode to work in, you can either select or deselect **Include Excluded Values in Search** in the **User Preferences** dialog. This mode can also be set on certain individual sheet objects.

Text Search

The simplest way of searching is text search. QlikView will search for field values matching a text string that you type. The search string typically contains wildcard characters. * denotes any number of arbitrary characters whereas ? denotes a single arbitrary character. When you start typing text it will by default appear between two wildcard characters, i.e. you will search for any field value containing the search text. Wild cards may appear several times in the search string, regardless of their location.

* Zero or more characters.

? Any single character.

The ENTER key can be pressed to select the values found, and the ESC key can be pressed to cancel the operation. If the logical **and** option is set for a field, it may not be possible to select multiple values found.

Examples:

a* will find all values that begin with the letter a.

b will find all values that contain the letter b.

Fuzzy Search

If you start your text search with a tilde sign ~ the text search window will be opened in fuzzy search mode. The search window will contain the tilde with the cursor placed after it. As you type all values will be sorted by the degree of resemblance to the search string with the best matches at the top of the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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list. If you hit ENTER the first value in the list will be selected. This command can also be invoked via the keyboard shortcut CTRL+SHIFT+F.

Numeric Search

Selections can be made through numeric search as well. This is very similar to text search. The only difference is that the search string must begin with one of the relational operators ">", ">=", "<" or "<=".

Examples:

>900	will find all values greater than 900.
<=900	will find all values less than or equal to 900.
>900<1000	will find all values greater than 900 and less than 1000.
<900>1000	will find all values less than 900 or greater than 1000.

Advanced Search

If you start your text search with an equal sign =, you may enter an advanced search expression involving serach criteria for associated fields and full boolean logic. After the equal sign you may type any valid QlikView layout expression (see chapter 14 in Book II). The expression will be evaluated for each field value in the search field. All values for which the search expression returns a non-zero value will be selected.

Examples:

=MyField like 'A* or MyField like '*Z'

if e.g. invoked from a list box containing the field *MyField*, the search would return all field values either starting with the letter A or ending with the letter Z.

=sum(Sales)>sum(Budget)

if e.g. invoked from a list box containing the field *Salesman*, the search would return all salesmen with an associated sales value larger than their associated *Budget*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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15.4 The Advanced Search Dialog

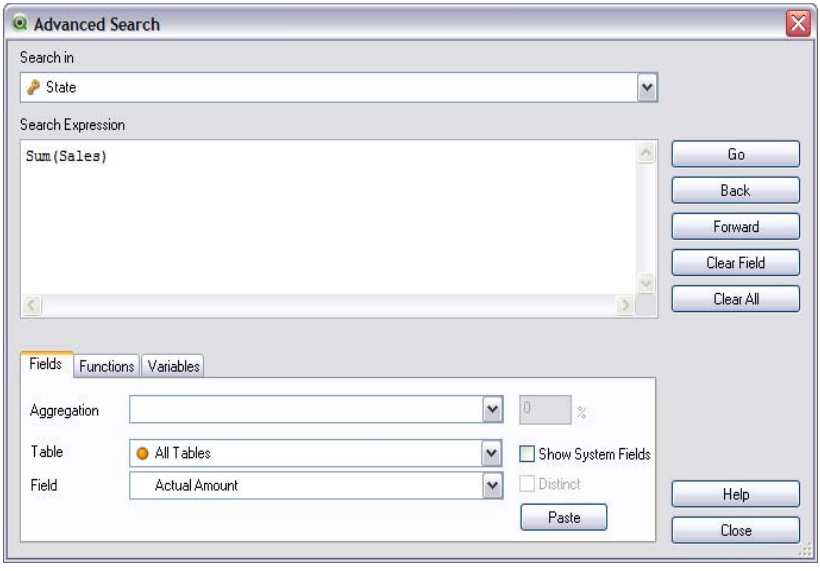


Figure 24. The Advanced Search dialog

This dialog is provided as a convenient way of formulating complex search queries to be applied on QlikView fields. Unlike the standard search box that appears when starting a search by typing when a list box is active, the result of a search is not interactively visible in the layout until you submit the search by pressing the **Go** button. The dialog can be kept open while you work in the QlikView layout. The dialog is fully sizeable in order to facilitate editing of large and complex expressions.

Search in
: The field in which the search will be made. When you enter the dialog it will be set to the field of the active list box. You may change search field by using the drop-down at any time.

Search Expression
: This is where you type the search expression. The same rules apply as when using the normal search box (see previous section).

Go
: Applies the search to the search field.

Back
: QlikView remembers the last 100 selections. By clicking this button, you go one step back in the list of selections.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Forward

By clicking this button, you go one step forward in the list of selections (equivalent of cancelling the last **Back** command). This is only possible if the **Back** command has been used immediately before.

Clear Field

Clears selections in the current search field.

Clear All

Clears all selections in the document.

Help Opens the **Help** dialog for advanced search.

Close Closes the dialog box.

In the bottom pane of the dialog you will find three tabs which can help you when building advanced search expressions.

Fields

On the **Fields** tab you will find controls for pasting syntax relating to QlikView field data.

Aggregation

In this drop-down you can choose from the statistical aggregation functions available in the QlikView layout.

Table In this drop-down you may select a specific input table from which to pick fields in order to make navigation in the **Field** drop-down easier.

Show System Fields

If this check box is marked, the list containing the fields of the document includes the system fields.

Distinct

The statistical functions are by default calculated on the number of occurrences in the original table. Sometimes, however, you do not want to calculate duplicates. If this is the case, mark this check box before pasting the function.

Paste Pastes the selected function or just the field into the Search Expression edit box. A percentage can be given when using the fractile function.

Functions

On the **Functions** tab you will find controls for pasting syntax relating to QlikView general functions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Function Category

In the drop-down you may select a category of functions in order to make navigation in the **Function Name** drop-down easier.

Function Name

In the drop-downdrop-down you may select a function for pasting into the expression out of all functions available in the QlikView layout. The list can be reduced to show only functions belonging to a certain category by means of a seelction in the Function Category drop-down above.

Paste Pastes the selected function name into the Search Expression edit box.

At the bottom of the tab there is a pane showing the argument syntax of the function selected in the **Function Name** drop-down.

Variables

On the **Variables** tab you will find controls for pasting syntax relating to QlikView variables.

Variables

In the drop-down you will find all currently defined variables in the document.

Paste Pastes the selected function into the **Search Expression** edit box.

Show System Variables

If this check box is marked, the list in the **Variables** drop-down will include the system variables.

At the bottom of the tab there is a pane showing the current value of any variable selected in the **Variables** drop-down.

15.5 Moving the Selection

The current selection in an active list box can be moved by means of keyboard keys:

↓ Moves the current selection one step downwards in the list in the current sort order. If more than one value is selected, each selection is stepped downwards. When the last value in the list box is passed, the selection is wrapped back to the first value. If no selection is made in the list box, the list box will be scrolled one cell downwards.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

↑ Moves the current selection one step upwards in the list in the current sort order. If more than one value is selected, each selection is stepped upwards. When the first value in the list box is passed, the selection is wrapped down to the last value. If no selection is made in the list box, the list box will be scrolled one cell upwards.

PgDn Moves the current selection downwards in the list in the current sort order by the same number of cells as the maximum distance between the first and last selected values in a multiple selection. When the last set of values in the list box is passed, the selection is wrapped back to the first set of values. If no selection is made in the list box, the list box will be scrolled one page downwards.

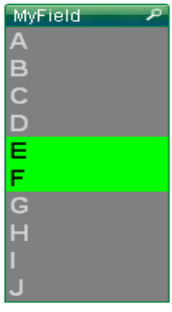
PgUp Moves the current selection upwards in the list in the current sort order by the same number of cells as the maximum distance between the first and last selected values in a multiple selection. When the first set of values in the list box is passed, the selection is wrapped down to the last set of values. If no selection is made in the list box, the list box will be scrolled one page upwards.

Home Moves the current set of selections upwards to the top of the list.

End Moves the current set of selections downwards to the end of the list.

Example:

Assume you have the following list box (E and F selected):



↓ F and G will be selected.

↑ D and E will be selected.

PgDn G and H will be selected.

PgUp C and D will be selected.

Home A and B will be selected.

End I and J will be selected.

15.6 Logical *And* Mode

A multiple selection within a list box is usually interpreted as logical *or*, meaning that data entries associated with any of the selected values will be shown. However, under certain circumstances it can be set to be interpreted as *and*, implying that QlikView must find the solutions that are associated to all the selected field values, not just to any of them. The list box is then set to *and* mode.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The mode for the field is set in the list box dialog (**Object** menu, **Properties**, **General**, **And mode**).

A value in a list box in *and* mode will be marked with an ampersand "&" when selected.

And-Tables

A field cannot always be set to logical *and* mode. The reason for this is that the *and* alternative is logically meaningful only if the concerned field is linked to only one other field. The following criteria must be fulfilled:

- the field must only exist in one logical table,
- this table must only contain two fields,
- the field must be the second column, and
- the table must not contain any duplicate records

and as of version 7.0

- the **load** or **select** statement must contain the field that is about to be set as *and* mode must be distinct.

Forced Exclusion / Not Selection

Closely related to the *and* selection is the forced exclusion, or *not* selection. Here it is possible to explicitly exclude a field value, i.e. the solutions found by QlikView may not be associated with the excluded value.

The *not* selection is made by clicking a cell and *keeping the mouse button depressed* until the cell turns red. CTRL-clicking in this manner is equivalent to an exclusion that is an additional requirement to the previous selections/ exclusions.

The *not* selection can only be made on a field that is in *and* mode.

15.7 Locking Selected Field Values

After selecting an excluded field value, previous selections in conflict with the new choice are canceled. To prevent a previous selection from getting canceled this way, you can lock all the selections in a list box by opening its **Object** menu and choosing the **Lock** command.

To unlock a previously set lock, open the list box **Object** menu, and select **Unlock**. General locks and unlocks of all the selections can be made from the **Selections** menu.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

When you try to select a value which is incompatible with a locked selection in another field, the selection will fail.

By means of the **Override Locked Field** setting for list boxes, multi boxes and slider objects it is possible to override a locked selection in a field from a specific sheet object. The field will still be locked for logical changes stemming from selections in other fields. This option is on by default for slider objects.

15.8 Selections in Charts and Tables

Selections in field data can be made directly in most of QlikView's charts and tables by means of clicking or painting with the mouse. The following section describes the possibilities for selections in the different types of charts and tables.

Bar, Line, Combo, Radar, Grid and Scatter Charts

Selections can be made inside the plot area by clicking on a single data point or painting over several data points. When painting, the area covered is shown covered with a green raster. The selection will be made for the dimension values used to calculate the selected data point(s).

Selections can be made by clicking or painting in the chart legend (except when the legend is indicating chart expressions rather than dimension values).

Selections can be made by clicking or painting over the dimension axes and its labels (except scatter charts). The corresponding field values will be selected.

Selections can be made by painting over the expression axes and its labels. The field values which generate data points in the indicated result area will be selected.

When painting selections in line charts and bar charts with more than one dimension the behavior of the QlikView selection logic differs slightly from other charts in order to better reflect the expectations of the user. Selections in these types of charts do not affect both dimensions at the same time. In line charts selections will be primarily done in the second dimension. This means that painting over a line will select the entire line over all x-axis dimension values. In bar charts the opposite applies. Selections primarily apply to the first dimension. This means e.g. that clicking one bar segment will result in a selection of that segment’s x-axis dimension value but leave all stack or cluster segments possible. When selections have narrowed down the primary selection dimension to one single value, the old selection logic will apply again, making selections prevail also in the secondary selection

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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dimension. In combo charts selections always affect all dimensions. If you find the above explanation incomprehensible, do not worry! The logic probably works like you would like it to do anyway!

Pie Charts

Selections can be made inside the plot area by clicking on a single pie slice or painting over several slices. When painting, the area covered is shown covered with a green raster. The selection will be made for the dimension values used to calculate the selected data point(s).

Selections can be made by clicking or painting in the chart legend.

Gauge charts

Selections cannot be made in gauge charts.

Straight Tables

Selections can be made in the dimension columns by clicking on a cell or painting over several cells. The selected area is marked green until the mouse button is released.

Selections can be made in the expression columns by clicking in a single cell. The selection will be made for the dimension values used to calculate the selected expression cell.

Pivot Tables

Selections can be made in the dimension columns/rows by clicking on a single cell. The selected cell is marked green until the mouse button is released.

Selections can be made in the expression columns/rows by clicking in a single cell. The selection will be made for the dimension values used to calculate the selected expression cell.

Table Boxes

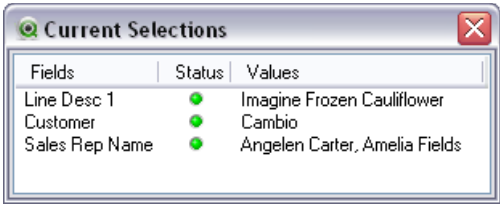
Selections can be made by clicking in any cell or by painting over an area covering one or more rows and one or more columns.

15.9 Current Selections

When many selections have been made in your document, it can sometimes be hard to get an overview of them. This is why the **Current Selections** window has been created.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The **Current Selections** window, which you open by choosing **Current Selections** from the **View** menu or by clicking the **Current Selections** button in the toolbar, contains a list of all the selections made in the document. The names of the fields in which the selections were made, the status of the selections, and the names of the selected values are listed.



It is possible to highlight one or several fields in the list by clicking them (to highlight several fields, SHIFT- or CTRL-click them). Right-clicking in the **Current Selections** window when one or several fields are highlighted opens a float menu containing the following commands:

Select Excluded
Selects the currently excluded values of the highlighted field. This command is not available when more than one field is highlighted.

Select All
Selects all the values of the highlighted field. This command is not available when more than one field is highlighted.

Clear Deselects the selected value(s) of the highlighted field(s).

Clear Other Fields
Selects all the possible values of the highlighted field, then clears the selections of all the other fields. This command is not available when more than one field is highlighted.

Lock Locks the selected value(s) of the highlighted field(s).

Unlock Unlocks the locked value(s) of the highlighted field(s).

Copy to Clipboard
Copies the name(s) of the highlighted field(s) and the name(s) of the selected value(s) in those fields to the clipboard.

If you right-click in the **Current Selections** window without having highlighted a field, the float menu contains the following commands:

Clear All Selections
Deselects all the selected values of the document.

Lock All Selections
Locks all the selected values of the document.

Unlock All Selections
Unlocks all the locked values of the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Copy to Clipboard

Copies the name(s) of all the selected value(s) of the document, as well as the name(s) of the field(s) in which the selections were made, to the clipboard.

The **Current Selections** window resembles a sheet object in the way that it is sizable and can be kept open while you work with your document. Just like the sheet objects, it is dynamically updated as soon as new selections are made, thus allowing you to always have an overview of your current selections.

The maximum number of distinct selected values to be shown in the **Current Selections** dialog is specified in the **User Preferences** dialog (**General** page). When more values are selected, they will only be displayed as 'x values of y' for the respective field. Selections in fields with no more than twelve distinct values in total will always be shown in full.

The **Current Selections** window can be kept open anywhere on the screen. It will stay open until you close it. It will be left open when you quit QlikView and reappear the next time you use the program.

Selections made in **and** boxes are preceded by & or !, depending on whether it is a selection or an exclusion.

15.10Selection Styles

QlikView supports a number of different ways of presenting data and making selections in list boxes and multi boxes. styles all use color coding for indication of selected, possible and excluded values. The **Windows Check boxes** style mimics the standard Windows interface with check box at each value. By choosing a specific style in this control, you may force the document to appear in one style or another whenever opened.

When using the selection styles based on color, there are a number of different color schemes available. The basic colors (green for selected, blue for locked etc.) cannot be changed, but variations in tone and intensity are possible.

QlikView Classic is the only style available in the QlikView Java client. The QlikView Java Objects client only supports the **Windows Check Boxes** style.

Which style is used can be controlled via settings on the **General** page of **Document Properties** (see page 16 in Book II) and the **General** page of **User Preferences** (see page 107).

This entire manual as well as the **Tutorial** are written for the **QlikView Classic** mode. The differences in the **Windows Check Boxes** mode are described below.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Representation of Logical State

The logical state of data in QlikView is in the color-coded **QlikView Classic** style represented by color coding of background and text in the cells of list boxes and multi boxes. In some other sheet objects and on the sheet tabs so called selection beacons may appear to indicate selections. The & and ! characters may appear to the left of data in list boxes and multi boxes in order to indicate AND and NOT selections.

With the **Windows Check Boxes** style the only color coding remaining is the white and gray background of cells to indicate possible and excluded values in list boxes and multi boxes. However all cells will also feature an icon to the data, which shows the logical status. These icons also appear in the place of the selection beacons in other parts of the document.

The differences are summarized in the table below:

	QlikView color-coded styles	**Windows Check Box Style (icons)**
QlikView State		
Possible	White/Black	
Excluded	Gray/Light Gray	
Selected	Green/Black	
Select Excluded	Gray/Light Gray	
Locked	Blue/Yellow	
Locked Excluded	Gray/Light Gray	
And Selected	Green/Black with **&**	
Not Selected	Red/Black with **!**	

Logical Behavior

The logical behavior of the **Windows Check Boxes** style differ in two ways from that of the color-coded styles.

1 All selections under the **Windows Check Boxes** style are considered toggle selections, i.e. they work as if you hold down the CTRL key while making selections under the color-coded styles.

2 All list boxes are treated as if the **Show Alternatives** option is selected, regardless of the actual setting of this property.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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15.11Loosely Coupled Tables

A loosely coupled table is one where the normal QlikView associative logic has been disconnected internally. This means that selections in one field do not propagate through to the other fields in the table. This chapter will show some examples of how loosely coupled tables alter the QlikView logic.

A Basic Example

Have a look at the following three table boxes, each one representing a table read into QlikView:

Tab1	
B	A
1	x
2	y
3	z

Tab2	
A	C
x	6
y	7
z	8

Tab3	
C	D
6	a
7	b
8	c

If you select the value 2 in field B the following will happen:

Tab1	
B	A
2	y

Tab2	
A	C
y	7

Tab3	
C	D
7	b

The selection ripples through all tables. Now let us keep this selection but make Tab2 loosely coupled. This means that the logic will be cut between the fields A and C in Tab2. The result will look this:

Tab1	
B	A
2	y

Tab2	
A	C
y	6
y	7
y	8

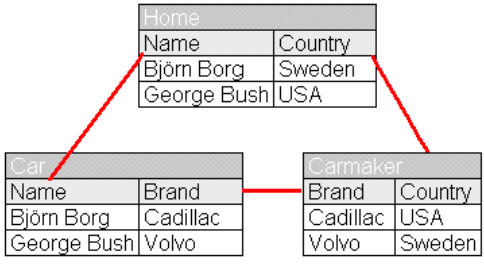
Tab3	
C	D
6	a
7	b
8	c

Note that Tab2 shown here is a table box and not the table itself. The table box will show all possible combinations between the fields of its columns. Since there is no logic between fields A and C all combinations of their respective possible values are shown.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Avoiding Circular References

The next example shows how loosely coupled tables can be useful for avoiding circular references in the data structure:



Home	
Name	Country
Björn Borg	Sweden
George Bush	USA

Car	
Name	Brand
Björn Borg	Cadillac
George Bush	Volvo

Carmaker	
Brand	Country
Cadillac	USA
Volvo	Sweden

This data structure is actually not a very good one since the field name Country is used for two different purposes. In one table it indicates where the car owner lives and in another it shows where the car manufacturer resides. With the data in the tables you face an impossible logical situation. Wherever you make a selection, it is possible to follow associations leading through every single cell in all three tables.

You have to decide whether the home country or the car manufacturing country is most important. If you make the Carmaker table loosely coupled, the associations from Cadillac to USA and from Volvo to Sweden will be broken. By clicking Sweden you will associate with Björn Borg and Cadillac. By clicking Volvo you will associate with George Bush and USA.

Would you prefer to concentrate on car manufacturers it would make sense to make the Home table loosely coupled instead.

Another Example

Let us have a look at another common situation where loosely coupled tables can be useful. Below you find three tables in a rather typical structure: one transaction table and two dimension tables associating to it via one field each.

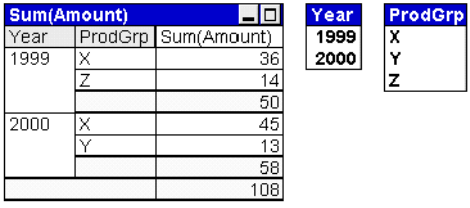
Time	
Year	Date
1999	1999-11-30
1999	1999-12-01
2000	2000-01-15
2000	2000-01-22

Trans		
Date	Prod	Amount
1999-11-30	A	10
1999-11-30	E	14
1999-12-01	A	15
1999-12-01	B	11
2000-01-15	C	17
2000-01-15	D	13
2000-01-22	B	16
2000-01-22	C	12

Product	
Proc	ProdGrp
A	X
B	X
C	X
D	Y
E	Z

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Now, let us say you want a pivot table showing sales per year and product group. If we just create one beside two list boxes showing the dimension fields it will look like this:

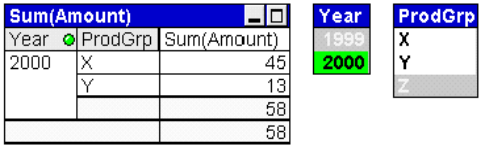


Sum(Amount)		
Year	ProdGrp	Sum(Amount)
1999	X	36
	Z	14
		50
2000	X	45
	Y	13
		58
		108

Year
1999
2000

ProdGrp
X
Y
Z

Even though this is a correct pivot table, the effects of QlikView's associative logic could here potentially lead to unwanted results. If we select the year 2000 the layout will look as follows:



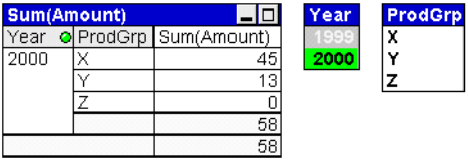
Sum(Amount)		
Year	ProdGrp	Sum(Amount)
2000	X	45
	Y	13
		58
		58

Year
1999
2000

ProdGrp
X
Y
Z

Product group Z is "gone". This is natural since the value Z in the field *ProdGrp* has been excluded by the selection of the value *2000* in the field *Year*. However, the boss is likely to want Z in the chart with a 0 in the *sum(Amount)* column, so that it is clear to everyone that product group Z exists and that nothing has been sold in 2000.

You could argue that the two fields *Year* and *ProdGrp* really have nothing to do with each other and therefore should not interact just because they happen to be associated via the *Trans* table. So let's fix that by declaring the *Trans* table as loosely coupled. Immediately our little layout will have the following look of:



Sum(Amount)		
Year	ProdGrp	Sum(Amount)
2000	X	45
	Y	13
	Z	0
		58
		58

Year
1999
2000

ProdGrp
X
Y
Z

The table looks like we want it to look. Note that the selection in the *Year* list box does not render any value in the *ProdGrp* list box excluded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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As a summary can be said that this situation, with one or more transaction tables surrounded by a number of dimensions which you do not want to exclude, is quite common. Loosely coupled tables is one possible way of handling such cases.

Loosely Couples Tables and Subtotals

When using loosely coupled tables in combination with non-hierarchical dimension data subtotals in pivot tables may become incorrect. The example below is very similar to the previous example, but product B now belongs to two product groups, *X* and *Y*. The product *D* has disappeared and that sale is now product *B* instead.

Time	
Year	Date
1999	1999-11-30
1999	1999-12-01
2000	2000-01-15
2000	2000-01-22

Trans		
Date	Prod	Amount
1999-11-30	A	10
1999-11-30	E	14
1999-12-01	A	15
1999-12-01	B	11
2000-01-15	B	13
2000-01-15	C	17
2000-01-22	B	16
2000-01-22	C	12

Product	
Prod	ProdGrp
A	X
B	X
B	Y
C	X
E	Z

This means that the total amount sold is the same, which can be seen if we take a look at the pivot table, now expanded with *Prod* as a third dimension:

Sum(Amount)			
Year	ProdGrp	Prod	Sum(Amount)
1999	X	A	25
		B	11
	Y	B	11
	Z	E	14
			50
2000	X	B	29
		C	29
	Y	B	29
			58
			108

As you can see from the absence of product group Z in the year 2000 we have not set any table loosely coupled. QlikView handles all subtotals correctly, i.e. the two occurrences of *B* under each year are only counted once in the subtotals. This is an effect of QlikView's normal associative logic.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Now let us loosen the *Trans* table as we did before. The pivot table will look as follows:

Sum(Amount)

Year	ProdGrp	Prod	Sum(Amount)
1999	X	A	25
		B	11
		C	0
	Y	B	11
	Z	E	14
			61
2000	X	A	0
		B	29
		C	29
	Y	B	29
	Z	E	0
			87
			148

By cutting the association within the *Trans* table there is now no way for QlikView to keep track of what has been counted before in the subtotals. The two occurrences of *B* will be counted twice and the subtotals are too big.

This situation should be avoided, which leads to the conclusion that loosely coupled in combination with non-hierarchical dimensions should be used with care.

Note The **Total Mode** (as set on the chart's **Expressions** page) is set to **Expression Total** (default) in all the cases above. If you use the **Sum of Rows** mode there is no difference between the two cases.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

16 BOOKMARKS

D P A

16.1 About bookmarks

There are different types of bookmarks:

Document bookmarks are stored inside the qvw document. They will always be available to whomever opens the document locally or from a QlikView Server.

User bookmarks are stored separately on the user's computer. They will only be available to the user who created them on the computer where they were created. If the document is moved or renamed all personal bookmarks related to it will be lost. In QlikView versions before QlikView 8, this was the only type of bookmarks that a user could create when working with a document on QlikView Server. Although still supported, they are largely made obsolete by the server bookmarks in QlikView 8.

Personal server bookmarks are only available when working with a document on QlikView server and only to authenticated users. They are stored in a repository on the server and are accessible to the user from any computer where authenticated.

Shared server bookmarks are only available when working with a document on QlikView Server and only to authenticated users. Any user who has created a personal server bookmark may flag this as shared to other users. The will then become available to other user. Just like personal server bookmarks shared server bookmarks are stored in a repository on the server.

16.2 Creating bookmarks

The current state of selections can be saved as a bookmark by choosing **Add Bookmark** from the **Bookmarks** menu or by pressing CTRL+B. Bookmarks can also be created via bookmark objects in the QlikView layout. Doing this will open the **Add Bookmarks** dialog. The dialog looks slightly different depending on whether you are working with a local document or with a document on QlikView Server. We start by

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

describing the dialog for local documents and then describe the differences for server documents.

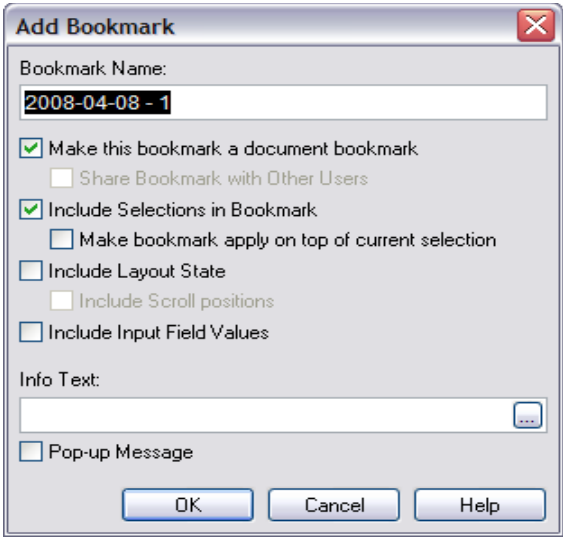


Figure 25. The Add Bookmark dialog for local documents

Bookmark Name

The default name for the created bookmark is that of the current date. In addition, the first bookmark created on a specific day gets number 1, the second number 2, etc. However, you can change the default name to a more explanatory text by entering a name of your choice.

Make this bookmark a document bookmark

By marking this check box, the bookmark will be saved with the document. This option is available for local documents only. If the check box is not marked, the bookmark will be created as a user bookmark, stored locally on your computer.

Include Selections in Bookmark

By marking this check box, the bookmark will include the selections made in the application.

Make bookmark apply on top of current selection

By marking this check box, the bookmark will be applied without first clearing existing selections in the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Include Layout State

By marking this check box**,** the bookmark will store information about the sheet from which it was created and the state of all sheet objects on that sheet at the time of the bookmark's creation, including, for example, the expanded or collapsed state of a pivot table and the cycling position of a chart. When recalling a bookmark with layout information, QlikView will attempt to activate the sheet and restore sheet objects to that state.

Include Scroll Posistions

Marking this check box will include the current scroll positions in the bookmark.

Include Input Field Values

By marking this check box, the values in Input Fields will be stored in the Bookmark.

Info Text

In the edit box you may enter a text describing the bookmark or a message to be shown when recalling the bookmark.

Pop-up Message

If this check box is marked, the bookmark info text (if it exists) will be displayed in a pop-up window each time the bookmark is recalled.

The differences for server documents are as follows:

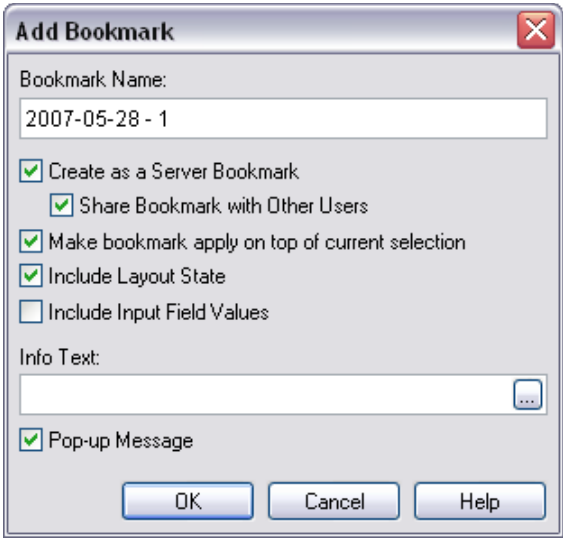


Figure 26. The Add Bookmark dialog for server documents

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Create as Server Bookmark

When this check box is marked, the bookmark will be created as a personal server bookmark, stored in a repository on the server. This option is available only is you are an authenticated user and provided that the QlikView Server and the document allows you to create server bookmarks.

Share Bookmark with Other Users

Provided you can create a personal server bookmark, marking this check box will immediately share the bookmark for use by other authenticated users of the same server document. You may at any time revoke the sharing by deselecting the **Share** check box in the **My Server Bookmarks** page of the Bookmarks dialog.

16.3 Applying bookmarks

The **Bookmarks** menu contains a list of the ten first document bookmarks and the ten first personal bookmarks. To apply a bookmark, simply select it in the list.

Further bookmarks are listed in the **Bookmarks** dialog, which is reached with the **More** command in the **Bookmarks** menu.

Bookmarks can also be selected in the drop-down list of a bookmark object.

16.4 Maintaining bookmarks

From the **Bookmarks** dialog additional bookmark tasks can be performed.

Bookmarks are exported to a bookmark file by choosing **Export** from the **Bookmarks** menu, which opens the **Export Bookmark(s)** dialog (see Figure 28 on page 172 below).

Bookmarks are imported to a bookmark file by choosing **Import...** from the **Bookmarks** menu, which opens the **Import Bookmark(s)** dialog (see Figure 29 on page 173 below). Imported bookmarks will of course only be meaningful if the document to which they are imported contains the fields and field values to which the bookmarks refer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

16.5 Bookmarks dialog

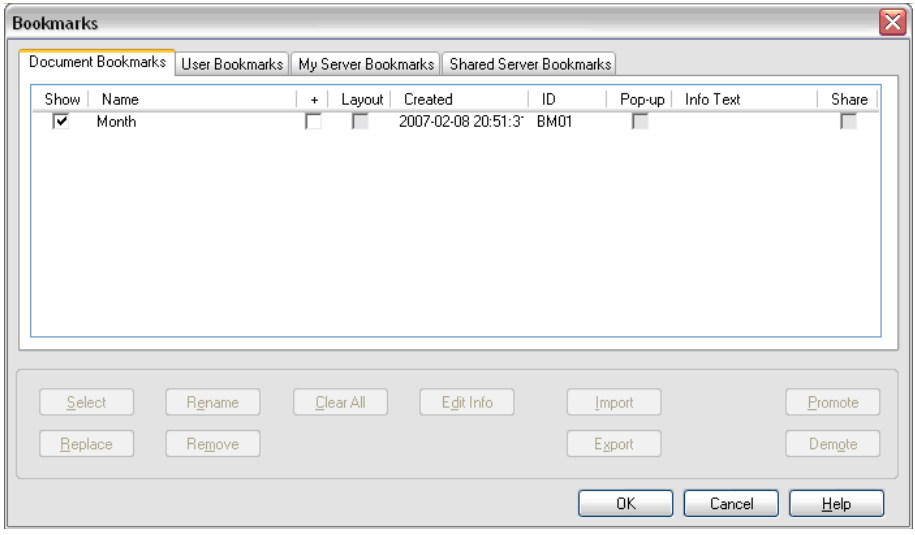


Figure 27. The Bookmarks dialog with four tabs, as it appears when working with a server document

The **Bookmarks** dialog is divided into two pages (local documents), or four pages (server documents), one for document bookmarks, one for user bookmarks, one for your personal server bookmarks (server documents only) and one for other users' shared bookmarks (server documents only).

At the top of the dialog you will find a list of all bookmarks currently defined in the QlikView document. The bookmarks can be sorted by several columns:

Show Mark this check box if you want the bookmark to appear in bookmark object listings and in the Bookmarks menu. If the check box is left unchecked, the bookmark will not appear in those places, but will remain accessible via this dialog.

Name Name of the bookmarks. To sort the bookmarks in alphabetical order, click the header of the column. If you click twice, the bookmarks are sorted in reverse alphabetical order.

+ If the check box is marked for a bookmark, that bookmark will be applied without first clearing existing selections in the document.

Layout
If the check box is marked for a bookmark, the bookmark contains information about the sheet from which it was created and the state

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

of all sheet objects on that sheet at the time of the bookmark's creation. When recalling a bookmark with layout information, QlikView will attempt to activate the sheet and restore sheet objects to that state. This check box can be toggled on/off for a bookmark containing layout state but never selected for a bookmark created without layout information. If deselected for a bookmark containing layout state, no attempt to restore layout will be made when recalling the bookmark.

Created

Information on when the bookmarks were created. To sort the bookmarks by their date of creation, click the header of the column. If you click twice, the last created bookmark is displayed at the top.

ID The unique ID of the bookmark. Upon creation, every bookmark is assigned a unique ID for control via Automation. The first bookmark of a document will be assigned the ID BM01. A bookmark ID may be changed via Automation to any other string that is currently not used as ID for any other bookmark, sheet or sheet object in the document. Renaming the bookmark does not change the bookmark ID. Exporting and then importing a bookmark will create a new bookmark ID. The bookmark ID may be preceded by a prefix describing its type (document, user etc.).

Pop-up

If this check box is marked for a bookmark, the bookmark info text (if it exists) will be displayed in a pop-up window each time the bookmark is recalled. The pop-up window is closed by clicking anywhere in the QlikView application window. You can also set a time on the **General page** of the **User Preferences** dialog after which bookmark pop-up windows will automatically close.

Info Text

A text that can either be used as a general comment for the bookmark or be displayed in a pop-up window each time the bookmark is recalled.

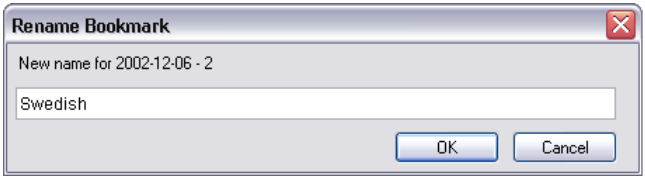
Share This check box is only available in the **My Server Bookmarks** page. By marking it for one of your personal server bookmarks, you will make that bookmark available to other authenticated users of the same server document in their **Shared Server Bookmarks** page. The bookmark will stay in your **My Server Bookmarks** page and will not appear in your **Shared Server Bookmarks** page. You may at any time revoke the sharing by deselecting the check box.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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At the bottom of the dialog you will find a number of buttons which can be used to perform actions with the bookmark currently selected in the list above.

Select Displays the selected bookmark on the screen.

Rename



Opens the **Rename Bookmark** dialog where you may specify a new name for the bookmark. On pressing **OK** you will come back to the **Bookmarks** dialog. You can only rename the bookmarks that you have created yourself.

Replace

Replaces the selected bookmark with the current selections. You can only rename the bookmarks that you have created yourself

Remove

Removes the selected bookmark. You can only remove the bookmarks that you have created yourself

Clear All

Removes all bookmarks in the current pane of the dialog. You can only remove the bookmarks that you have created yourself

Edit Info

Opens a dialog for editing the bookmark's info text. This text can either be used as a general comment for the bookmark or be applied in a pop-up window each time the bookmark is recalled. You can only edit the bookmarks that you have created yourself

Import

Allows you to select a QlikView bookmark file and then opens the **Import Bookmark(s)** dialog (see below).

Export

Opens the **Export Bookmark(s)** dialog (see below) where you can export selected bookmarks to a QlikView bookmark file.

Promote

Moves the selected bookmark one step up in the list. This can also be achieved by pointing at a bookmark with the mouse and dragging it to any position in the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Demote

Moves the selected bookmark one step down in the list. This can also be achieved by pointing at a bookmark with the mouse and dragging it to any position in the list.

Move Local User Bookmarks to Server

This text only appears when you work with a server document and in the **User Bookmarks** tab. By clicking on the text you can convert all your local user bookmarks to server bookmars, stored in the server repository. This is a recommended practice as your personal server bookmarks will stay accessible via the server even if you change computer or if the server document is renamed. You will be asked to confirm before the conversion takes place. The conversion is all-or-nothing (within the active document) and one-way only.

OK Accepts the changes and closes the dialog.

Cancel Closes the dialog without saving the changes.

Help Displays help on bookmarks.

16.6 Export Bookmark(s) dialog

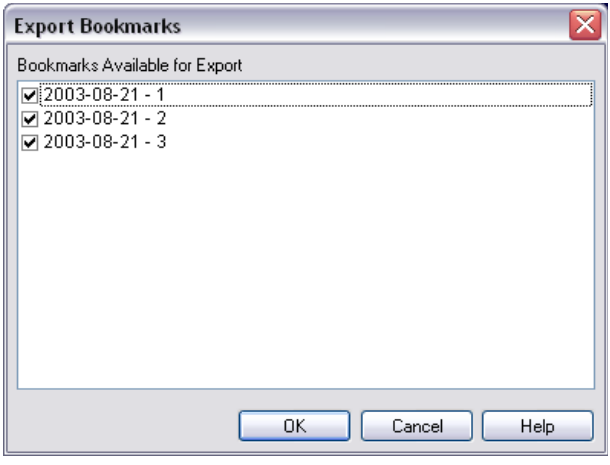


Figure 28. The Export Bookmark(s) dialog

In the **Export Bookmark** dialog you see all bookmarks which were defined in the current document. To the left of each bookmark name in the list is a check box, which is by default selected. By deselecting the check box for one or more bookmarks, you exclude these bookmarks from the export.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

On clicking **OK** you will be asked to choose a file name and location for the bookmark file. Once saved the bookmark file can be kept for later use or sent to other QlikView users using the same application.

16.7 Import Bookmark(s) dialog

When choosing **Import...** from the **Bookmarks** menu you will first be taken to a file browse dialog to open a QlikView bookmark file. After selecting a bookmark file (.qbm extension) you will be taken to the **Import Bookmark** dialog.

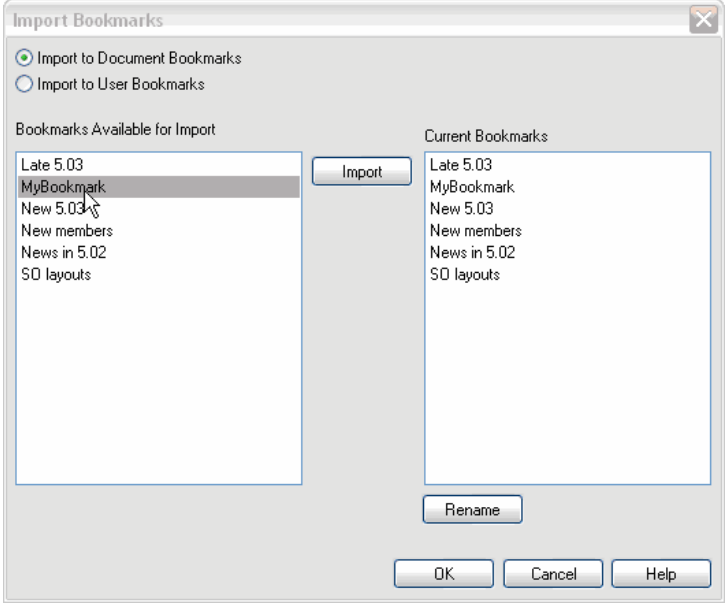


Figure 29. The Import Bookmark(s) dialog

Bookmarks Available for Import

To the left you see all bookmarks which were defined in the bookmark file.

Current Bookmarks

To the right you see a list of existing user bookmarks or document bookmarks in the document. Bookmarks must be imported into either the user bookmarks domain or into the document bookmarks domain. To choose between showing user bookmarks and document bookmarks use the following two controls:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Import to Document Bookmarks

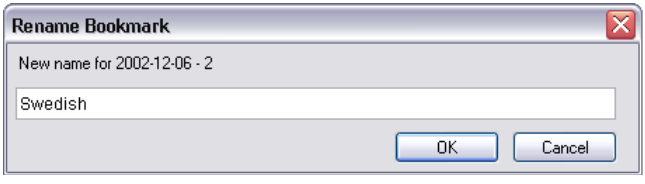
Mark this radio button to import bookmarks into the document bookmark domain and to show document bookmarks in the **Current Bookmarks list**. This option is only available when working in local documents.

Import to User Bookmarks

Mark this radio button to import bookmarks into the user bookmark domain and to show user bookmarks in the **Current Bookmarks** list.

Import Mark one or more bookmarks in the **Bookmarks Available for Import** list and press this button to import them into the **Current Bookmarks** list.

Rename



Before importing a bookmark with the same name as an existing bookmark you must first rename the existing bookmark. Select the existing bookmark in the right list by clicking on it and then press the **Rename** button. In the dialog **Rename Bookmark** that appears you may then specify a new name. On pressing **OK** you will come back to the **Import Bookmark(s)** dialog with the bookmark appearing renamed in the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

17 REPORTS

17.1 About Reports

Printing a report often means printing a single table or graph. In QlikView this is done as easily as selecting a sheet object and then choosing **Print** from a menu or toolbar. Sometimes however, there is a need for producing more complex reports including multiple charts and/or tables. This is where the QlikView **Report Editor** comes into the picture. The QlikView **Report Editor** offers the possibility to group a number of different sheet objects together on one or more pages with full control of page layout, including headers/footers etc.

QlikView reports come in two flavors, document reports and user reports.

Document Reports

Document reports are created with the QlikView document and stored as part of the QVW file. Any user accessing the QlikView document locally or via QlikView Server can access the document reports in the document.

User Reports

User reports are created by a user working with a document from QlikView Server. The report is stored on the local client machine in a manner similar to that of user bookmarks. Only the local user has access to his/her own user reports. User reports can only be created from the Windows based QlikView clients (not from Java or Zero-footprint clients).

Personal Server Reports

Personal server reports are only available when working with a document on QlikView Server and only to authenticated users. They are stored in a repository on the server and are accessible to the user from any computer where authenticated.

Shared Server Reports

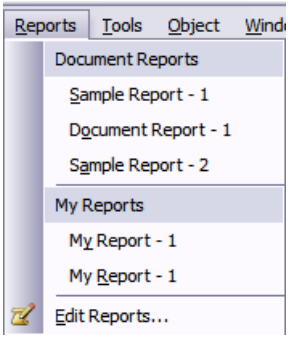
Shared server reports are only available when working with a document on QlikView Server and only to authenticated users. Any user who has created a personal server report may flag this as shared to other users. It will then become available to other users. Just like personal server reports, shared server reports are stored in a repository on the server.

Note When using the term “Report Generator“ one usually refers to a well defined category of software products. These typically work by combining data from several SQL queries (more or less obscured

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from the user by means of graphical interfaces), each of which is formatted for printing in different ways. QlikView reports fetch their data from QlikView sheet objects and lack the possibility to draw data from SQL queries. Just as it is absolutely correct to say that QlikView can produce reports, it is incorrect to label the QlikView Report Editor a report generator in the traditional sense.

17.2 The Reports Menu



The **Reports** menu lists all available existing reports for immediate selection. At the top all document reports are listed followed by user reports for the current document. When clicking one of the report names the **Print** dialog will be opened for printing the report.

Select **Edit Reports...** or click on in the toolbar to create new reports or edit existing reports in the **Report Editor** dialog.

17.3 The Report Editor Dialog

The **Report Editor** dialog consists of two pages, the **Report List** and the **Page Editor**. When first entering the report editor, the **Report List** will be shown.

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Report List

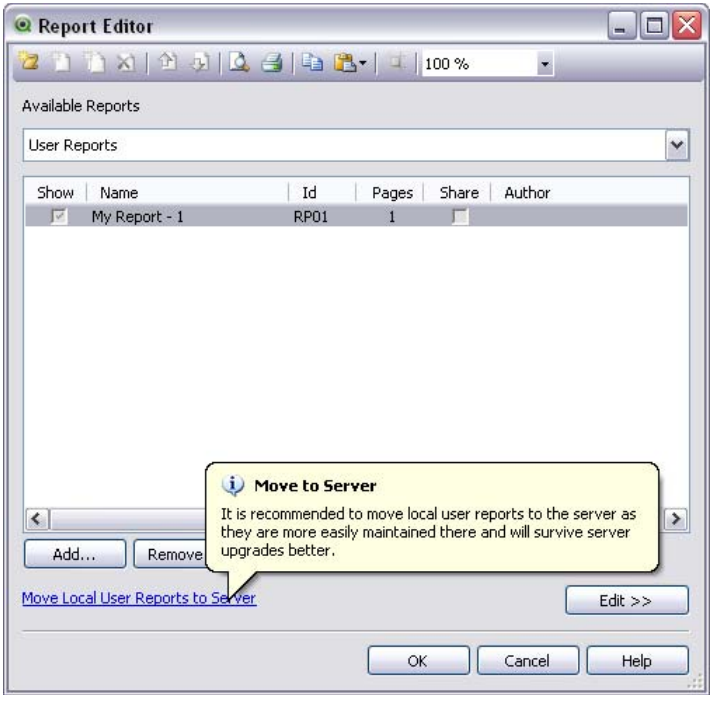


Figure 30. The Report List page of the Report Editor dialog

The **Report List** page is used to manage reports. You may create new reports and remove existing reports. This is also where you select a report for page editing in the **Page Editor**.

List of Reports

At the top of the page you will find a drop-down and a list of reports. The drop-down is used for selecting which type of reports should be shown in the list. For local documents you may choose between **Document Reports** or **User Reports**. For server documents you may choose between **My Server Reports**, **Shared Reports** or **User Reports**. The list itself includes several columns:

Show Mark this check box if you want the report to appear in the Reports menu. If the check box is left unchecked, the report will not appear but will still remain accessible via this dialog.

Name Name of the report.

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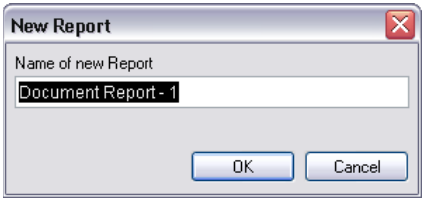
ID The unique report ID (see below).

Pages The number of pages currently defined in the report.

Share This check box is only available in the My Server Reports list. By marking it for one of your personal server reports, you will make that report available to other authenticated users of the same server document in their Shared Server Reports list. The report will stay in your My Server Reports list and will not appear in your Shared Server Reports list. You may at any time revoke the sharing by deselecting the check box.

Author The authenticated name of the creator of the report.

Add... Push this button to create a new report. If **Document Reports** is selected above the **List of Reports**, the new report will be a document report. If **User Reports** is selected, the new report will be a user report. The dialog **New Report** is opened so that you can name your report.



Remove

Push this button to remove the report currently selected in the **List of Reports**.

Promote

Push this button to promote the report currently selected in the **List of Reports** one step up in the list.

Demote

Push this button to demote the report currently selected in the **List of Reports** one step down in the list.

Move Local User Reports to Server

This text only appears when you work with a server document and if you have selected **User Reports** in the drop-down at the top of the list. By clicking on the text you can convert all your local user reports to server reports and store them in the server repository. This is a recommended practice as your personal server reports will stay accessible via the server even if you change computers or if the server document is renamed. You will be asked to confirm before the conversion takes place. The conversion is all-or-nothing (within the active document) and one-way only.

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Edit >>
Invokes the **Page Editor** for the selected report. Pushing this button is equivalent to double-clicking a report in the **List of Reports**.

OK Saves changes and closes the dialog.

Cancel Closes the dialog without saving changes.

Help Opens online help.

Pages

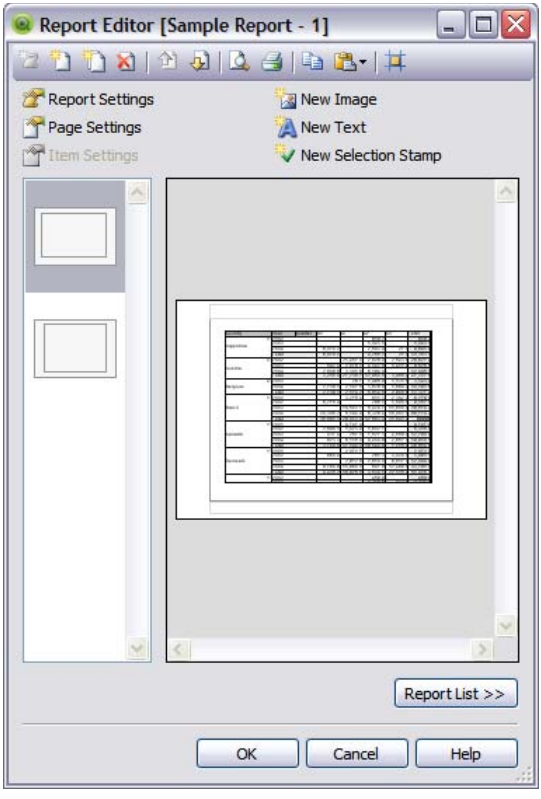


Figure 31. The Page Editor page of the Report Editor dialog

The **Page Editor** page is used to define the pages of a report selected on the **Report List** page. The page has three panes and a toolbar to assist you in designing report pages. At the bottom you find the following buttons:

Report List>>
Takes you back to the **List of Reports** page.

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OK Saves changes and closes the **Report Editor** dialog.

Cancel

Closes the **Report Editor** dialog without saving changes.

Help Invokes on-line help.

Settings Pane

At the top of the page you will find an area with control buttons. These are used to change the settings of various parts of the report and for creating special print items, only visible in the report.

Report Settings

Opens the **Report Settings** dialog where you can set various properties for the report. This includes margins, header/footer setting etc. See page 184 for a detailed documentation of this dialog.

Page Settings

Opens the **Page Settings** dialog where you can set various properties for the selected page. See page 189 for a detailed documentation of this dialog.

Item Settings

Opens the **Item Settings** dialog where you can set various properties for the selected print item. See page 192 for a detailed documentation of this dialog.

Add Text

Creates a new text object (in a hidden location in the document) and then opens the **Text Object Properties** dialog where the properties for the new text object can be edited. The text object will appear as a regular print item in the page preview pane, where it can be moved and sized just like any other print item.

Add Image

Creates a new text object (in a hidden location in the document) and then opens the **Text Object Properties** dialog for selection of an image. The image will appear as a regular print item in the page preview pane, where it can be moved and sized just like any other print item.

Add Selection Stamp

Creates a selection stamp object for the report. The selection stamp will appear as a regular print item in the page preview pane, where it can be moved and sized just like any other print item.

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Page List Panes

To the left you will find a list of all pages in the report. QlikView reports can contain two different types of pages, single-paper pages and multi-paper pages. Any number of pages can be added and the two types may be mixed in any combination within a report.

Single-Paper Pages
A single paper can contain any number of sheet objects. The page will always be printed on exactly one paper page (or PDF page) and the sheet objects will have to be zoomed or truncated to fit the page. Sheet objects may overlap on the page. Extra text can be added.

Multi-Paper Pages
A multi-paper page can contain one sheet object which may spread over any number of paper pages (or PDF pages), depending on the amount of data to be printed. A multi-paper page is the typical choice when printing large tables. In addition to the dynamic size objects you may add fixed size objects in introduction and/or appendix zones on the page. These zones work just like single-paper pages.

Manipulating the page list
You select a page for editing by clicking on it in the list. There are a number of toolbar commands directly associated with the page list pane:

Add Single-Paper Page
Adds a single-paper page after the currently selected page. 

Add Multi-Paper Page
Adds a multi-paper page after the currently selected page. 

Delete Page
Deletes the currently selected page. 

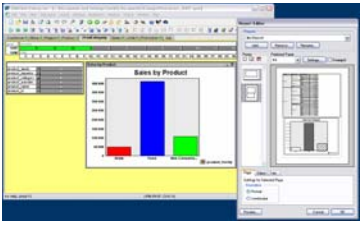
Promote Page
Promotes the currently selected page. This may also be achieved by means of dragging and dropping the page in the page list pane 

Demote Page
Demotes the currently selected page. This may also be achieved by means of dragging and dropping the page in the page list pane 

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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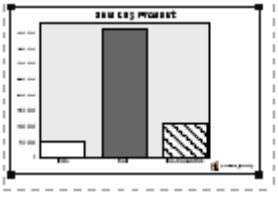
Page Preview Pane

To the right of the page list pane you will find a preview of the page currently selected in the page list pane.



Adding Sheet Objects to the Report

Simply drag any sheet object from the layout into the report page preview. The print objects will appear in the preview as they currently look in the QlikView layout. The exact appearance of the object in the report will of course dynamically reflect how the sheet object looks in the layout at the time of printing, with respect to property changes as well as to changes in selected data. It is possible to select multiple sheet objects in the layout and drag them as a group into the report. Note that only one print object can be added to the central dynamic area of a multi-paper page!



Sizing and Positioning Print Objects on Page

Once added the sheet object will appear in the page preview pane. There will be a border around the object and placeholders in each corner to mark that the object is selected. Point at it with the mouse and move it to the desired position. Use the corner placeholders to adjust the size. A dashed line shows the current margins. No print object can be placed outside these margins.

Navigating and Selecting Print Objects on Page

You select a print object by clicking it. Once you have selected one print object, you may move the selection to the next object using the TAB key (SHIFT+TAB to move backwards). You may use CTRL-click to select multiple objects. In multi-paper pages you may drag print objects between the different areas.

Right-Click Menu Commands

There are a number of menu commands available if you right-click the page in the preview pane:

Page Settings

Only available when no print object is selected and you right-click the page background. Opens the **Page Settings**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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dialog where you can set various properties for the selected page. See page 189 for a detailed documentation of this dialog.

Item Settings

Opens the **Item Settings** dialog where you can set various properties for the selected print item. See page 192 for a detailed documentation of this dialog.

Remove Item

Only available when a print object is selected. Removes the object from the report page.

Align Left

Only available when two or more print objects are selected (with the help of CTRL-click). Aligns the selected objects to the left.

Align Top

Only available when two or more print objects are selected (with the help of CTRL-click). Aligns the selected objects to the top.

Align Right

Only available when two or more print objects are selected (with the help of CTRL-click). Aligns the selected objects to the right.

Align Bottom

Only available when two or more print objects are selected (with the help of CTRL-click). Aligns the selected objects to the bottom.

Toolbar Commands

There are two toolbar commands directly associated with the page preview pane:

Design Grid



Toggles design grid on and off. This also activates the snap-to-grid functionality. With design grid and snap-to-grid turned on it is easier to align the sheet objects on the page, but you have less exact control.

Zoom In this drop-down you may specify a zoom factor for the entire preview pane. With a larger zoom factor it becomes much easier to do exact placement of objects. You may have to use scroll bars

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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to navigate to the different parts of the page in the preview pane.

Finally, there are some toolbar buttons for printing the report from inside the **Report Editor** dialog.

Print Preview...

Push this button to open the **Print Preview** dialog and see how the current report will look when printed with the current selections in the QlikView document. This button is also available from the **Page Editor** page of the **Report Editor** dialog.

Print...

Push this button to open the **Print** dialog and print the current report. This button is also available from the **Page Editor** page of the **Report Editor** dialog.

Report Settings Dialog

In this dialog you will find global (non-page related) settings for the report. The dialog has four pages.

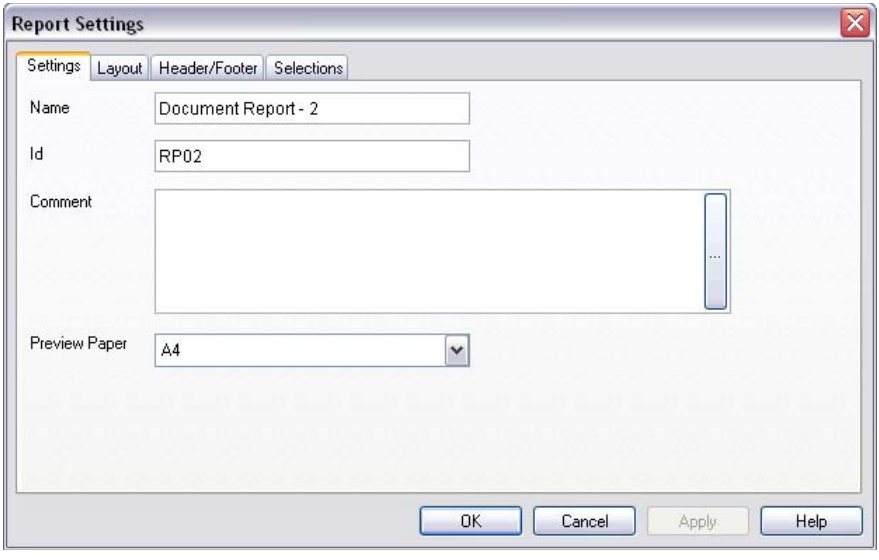


Figure 32. The Settings page of the Report Settings dialog

Settings

This page contains basic properties for the report:

Name Name of the report. This may be any text string. The name may be given as a calculated formula for dynamic update.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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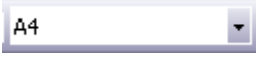
Report ID

The unique ID of the report. Upon creation, every QlikView layout entity, including reports, is assigned a unique ID for control via Automation. The ID by default consists of a combination of letters defining the type of entity, as well as of a number. The first report of a document will be assigned the ID RP01. An ID may be changed to any other string that is currently not used for any other report, sheet object, sheet, bookmark or alert in the document.

Comment

This is a commentary field where the creator of a report can describe the purpose of the report ar any details with regard to the report. It is not used outside of this dialog.

Preferred Paper Size



In the drop-down you can specify the size of paper intended for the report. The proportions of the selected paper size will be reflected in the page preview pane. If the report is ultimately printed on another paper size than the one the report was designed for, QlikView will attempt to adjust the report contents by means of zooming the print objects to fit the new paper size.

Conditional Show

If this check box is marked, the report may be dynamically shown or hidden depending on the value of a condition expression entered in the edit box to the right. The condition expression will be evaluated each time the list of available reports is generated. The report will only be available when the condition returns true. Users with ADMIN privileges for the document can override all show conditions with the **Show All Sheets and Sheet Objects** in the **Security** page of **Document Properties** (see page 81 in Book

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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II). This functionality can be toggled by pressing CTRL+SHIFT+S.

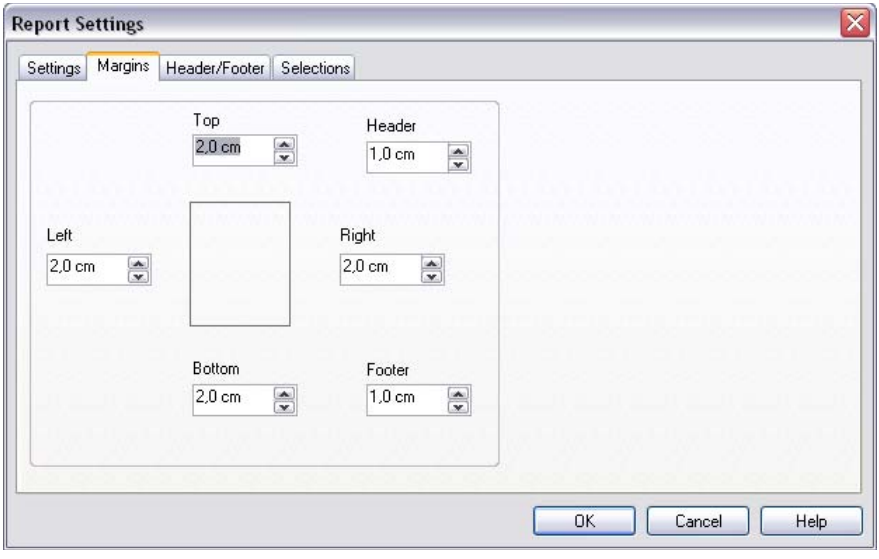


Figure 33. The Margins page of the Report Settings dialog

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Margins

This page contains margin settings for the report. The controls are the same as for the **Layout** page of the **Print** dialog see page 250 in Book II.

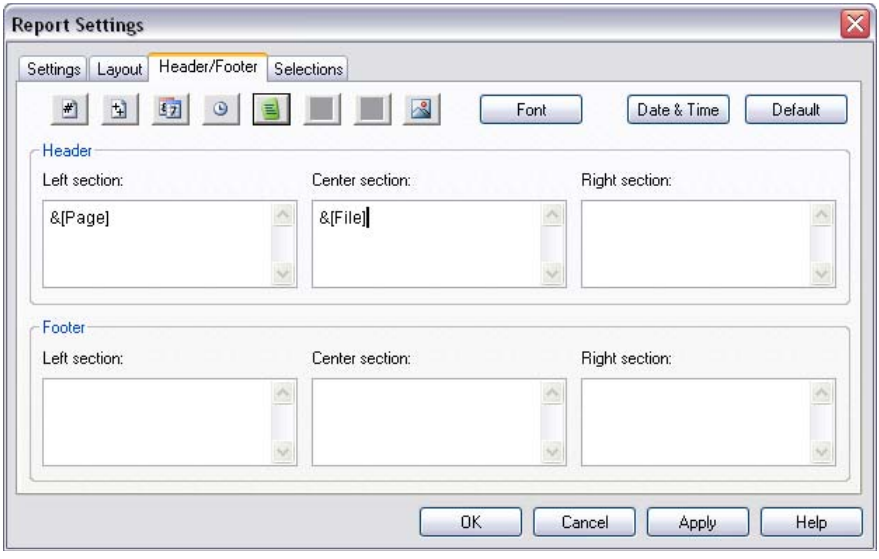


Figure 34. The Header/Footer page of the Report Settings dialog

Header/Footer

This page contains header/footer settings for the report. The controls are the same as for the **Header/Footer** page of the **Print** dialog see page 252 in Book II.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Selections

This page contains settings for the selections to be used when printing the report.

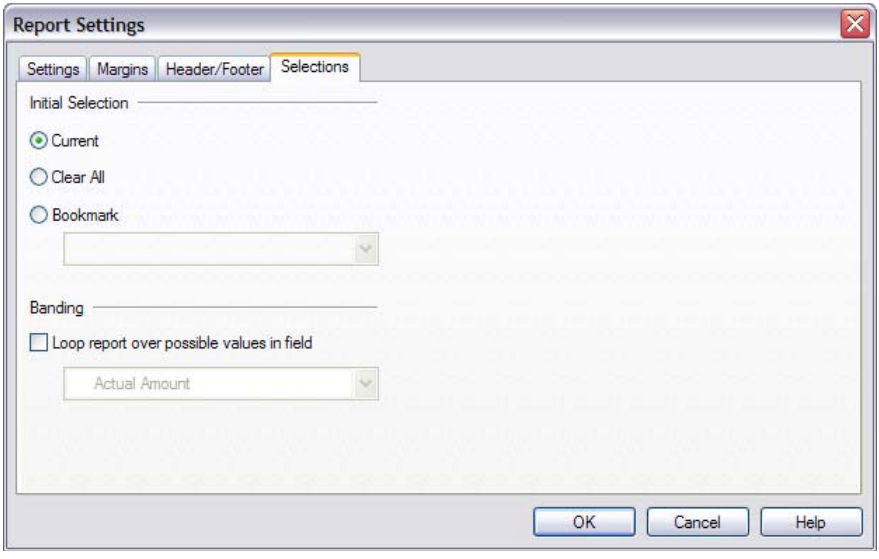


Figure 35. The Selections dialog of the Report Settings dialog

Initial Selections

These radio buttons allow you to state the initial selections for the report print. Regardless of which setting you use, selections prevailing before the report print will be re-established after the print.

Current Selections

Use current selections as the basis of the report print (default).

Clear All

All current selections in the document will be cleared before printing the report. After completed printing, the original selections will be reapplied.

Bookmark

A bookmark, which can be selected in the drop-down box will be applied before printing the report. After completed printing, the original selections will be reapplied.

Loop Report Over Possible Values in Field

When this check box is marked, the entire report will be printed repeatedly while selecting each possible value in the field specified

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in the drop-down box below. If there are no possible values in the specified field, nothing will be printed. After completed printing, the original selections will be reapplied. If page numbers are used, these will be continuous over all pages printed.

Page Settings Dialog

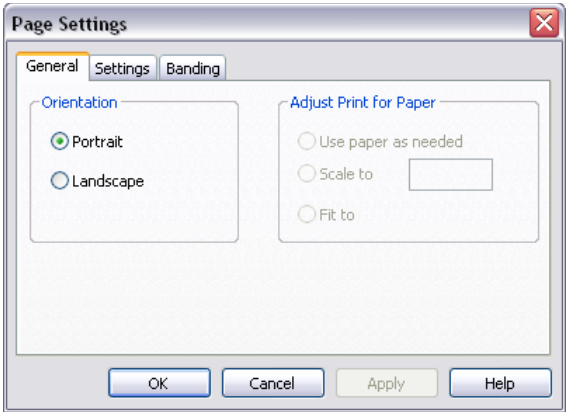


Figure 36. The General page of the Page Settings dialog

In this dialog you will find settings for the currently selected page. The dialog has three pages:

General

This page contains basic properties for the page

Orientation

Each page can have its separate setting for orientation. Choose between **Portrait** and **Landscape**.

Adjust Print for Paper

This setting is only available for multi-paper pages.

Use Paper as Needed

No scaling of the sheet object printout. As many pages as needed in each direction will be used.

Scale to x%

The sheet object printout will be scaled to a fixed percentage of its original size. As many pages as needed in each direction will be used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Fit to X by Y

The sheet object printout will be scaled to fit on a fixed number of pages.

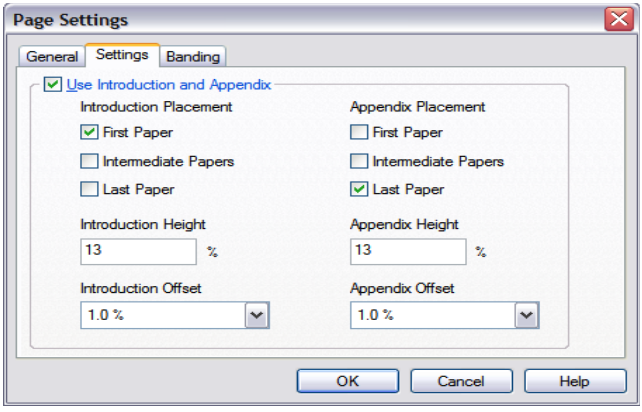


Figure 37. The Settings page of the Page Settings dialog

Settings

This page contains settings for introduction and appendix areas in multi-paper pages. It is not available for single-paper pages.

Use Introduction and Appendix

Mark this check box to enable the use of fixed size print items in addition to the dynamic size content on a multi-paper page. When doing this you will unfortunately loose backward compatibility with QlikView versions prior to 7.5.

Introduction Placement

By marking one, two or three of the check boxes you can choose to print the introduction area on the **First Page**, on all **Intermediate Pages** and/or on the **Last page**.

Introduction Height

Defines the height assigned on each page for the introduction area. The number is given in % of available print area (paper height minus header/footer areas). This setting may also be changed by dragging the border directly in the page preview pane.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Introduction Offset

Defines the spacing between the introduction area and the main area. the value is given in % of available print area (paper height minus header/footer areas).

Appendix Placement

By marking one, two or three of the check boxes you can choose to print the appendix area on the **First Page**, on all **Intermediate Pages** and/or on the **Last page**.

Appendix Height

Defines the height assigned on each page for the appendix area. The number is given in % of available print area (paper height minus header/footer areas). This setting may also be changed by dragging the border directly in the page preview pane.

Appendix Offset

Defines the spacing between the introduction area and the main area. the value is given in % of available print area (paper height minus header/footer areas).

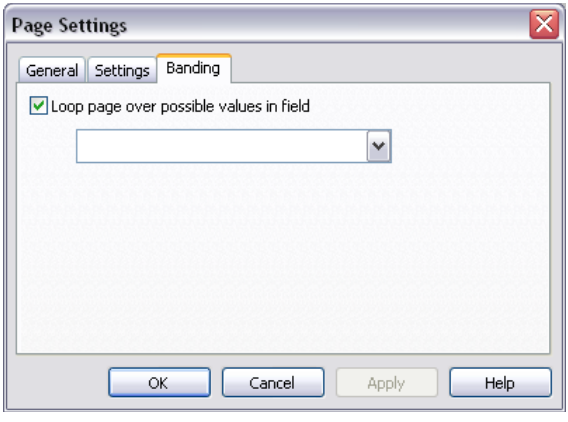


Figure 38. The Banding page of the Page Settings dialog

Banding

This page contains properties for banded output of the page. This means that the page is printed repeatedly for each possible value in a specified field.

Loop Page Over Possible Values in Field

When this check box is marked, the page will be printed repeatedly while selecting each possible value in the field specified in the drop-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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down box below. If there are no possible values in the specified field, nothing will be printed. Note that if a selection loop has been specified also on the report level (see the **Selections** page of the **Report Settings** dialog described above) you may face a situation where the report selection excludes all values in the page level loop variable. The page will then be skipped for that report loop value. After completed printing, the original selections will be reapplied. If page numbers are used, these will be continuous over all pages printed.

Item Settings Dialog

In this dialog you will find settings for the print item (object) currently selected in the page preview pane. The dialog has only a single page.

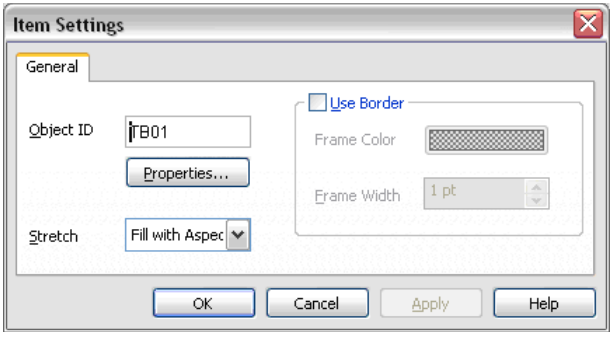


Figure 39. The General page of the Item Settings dialog

General

The General page contains settings for the print item currently selected in the page preview pane

Object ID

The sheet object ID of the sheet object to be printed.

Properties

Opens the Properties dialog for the sheet object associated with the print item. Changes made in this dialog will be applied on the actual sheet object and of course reflected in the report print result.

Stretch

This control is only available for objects on single-paper pages. Here you may select how the print object should be sized to fit inside the rectangle assigned to it.

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Clip Do not size the print object. If it is too large for the placeholder rectangle it will be truncated. If it is too small there will be blank space around it.

Fill Size the print object so that it fills the placeholder rectangle.

Fill with Aspect
Size the print object so that it fits in the placeholder rectangle while keeping the original sheet object ratio.

Use Border

The print object is normally printed on the page without any frame or border. By selecting this check box, you may have a border around the object.

Frame Color
Press this button to select the border color.

Frame Width
Here you may specify the thickness of the border.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18 ALERTS

18.1 About alerts

An alert is a composite entity typically consisting of three basic parts:

1. A **condition**, i.e. a QlikView expression forming a logical condition, that can be either true or false.
2. A **logical** state (bookmark, clear all or current selection state) that should be applied before checking the state of the condition expression.
3. One or more **actions** to be performed when the condition is checked and evaluates to true. Typical actions include showing a message in a pop-up window or sending a message as an e-mail to one or more recipients. Further actions can be programmed via macros.

When an alert is checked, the condition met and the actions performed, it can be said that the alert has “fired“.

18.2 Creating alerts

The easiest way to define an alert is by using the **Alert Wizard**, which can be invoked from the **Settings** menu. Alerts may also be created and maintained in the **Alerts** dialog, which can be opened from the **Settings** menu. Alerts are stored as part of the QlikView document. Alerts can only be created from QlikView Developer and QlikView Professional, but once defined they can be triggered from any Window version of QlikView (not QlikView Java clients and Zero Footprint clients).

18.3 Using alerts

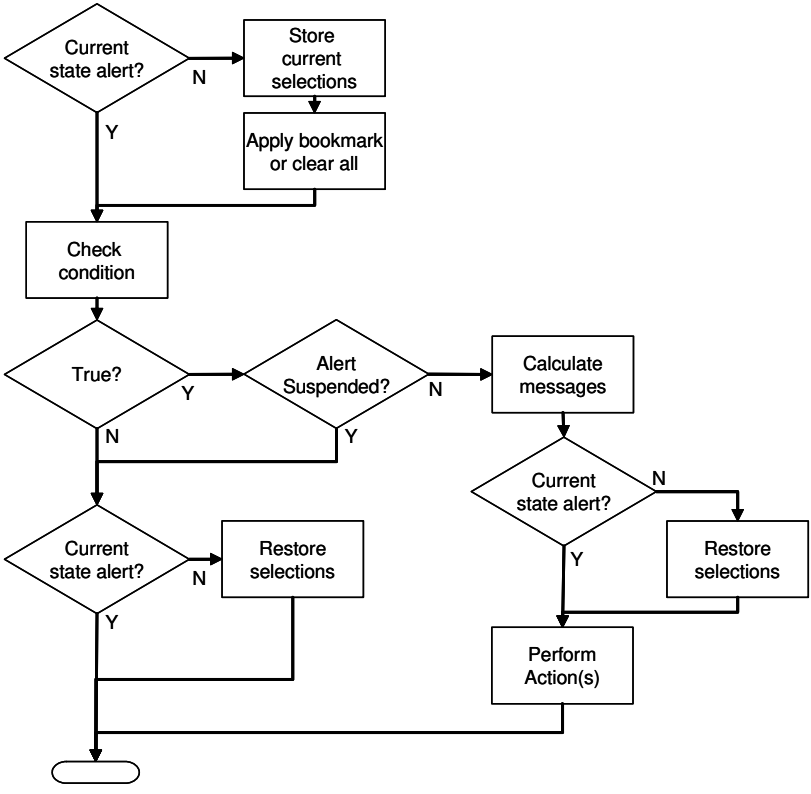
QlikView alert checks can be triggered in three different ways:

1. Automatically in the QlikView layout when there is a probability that the document’s data has changed, i.e. when the document is opened, when the script has been executed or when a Reduce Data operation has been performed.
2. Manually from a macro via special Automation APIs. Refer to the QlikView API guide for details.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 External programs running QlikView in batch mode have a special Automation API to retrieve a list of fired alerts from a given context.

The chain of events following the triggering of an alert check can be shown as follows:



Alerts can be suspended after being fired until a change occurs. As an example it may be quite annoying to be reminded every time you open a document that your budget goal has been fulfilled. In that case you may set the alert to fire only once and then suspend itself until next month.

As can be seen in the flowchart, each triggering of an alert initiates a chain of logical operations in the QlikView document. Typically QlikView has to perform the following major steps:

1 Applying the selection relevant to the alert.

2 Calculating the condition expression value.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 Restoring original selections.

The time needed to perform action 1 and 3 is of course each equal to the normal “click times“ if the selections had been applied interactively. The time needed for step 2 is the same as if the expression had resided e.g. in a sheet object. Added together, the time needed to check an alert can be quite substantial in large documents. This may be of less importance for single alerts triggered on opening or reload, but caution should be exercised when using large amounts of macro-triggered alerts, so that the document does not become sluggish.

18.4 The Alerts dialog

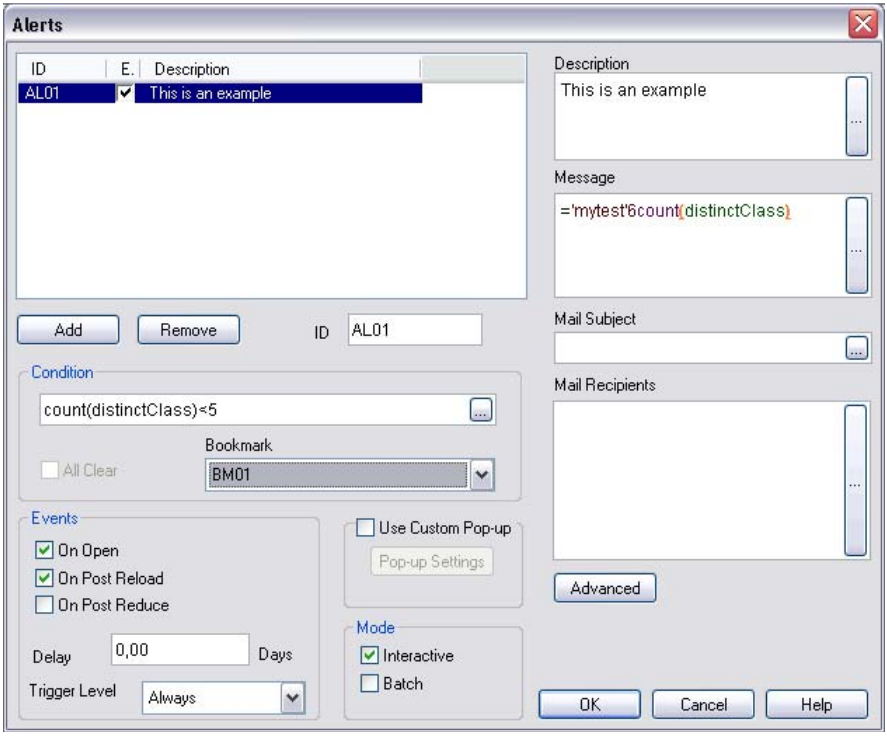


Figure 40. The Alerts dialog

List of Alerts

The top left part of the dialog contains a list with all alerts currently defined in the document. The list includes three columns:

ID The unique alert ID (see below).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Enable Select or deselect the check box in order to enable/disable the alert.

Comment

Description of alert as defined under **Description** (see below).

Add Click this button to add a new alert.

Remove

Select an alert in the list and click on this button to delete it.

ID The unique ID of the alert. Upon creation, every QlikView layout entity, including alerts, is assigned a unique ID for control via Automation. The ID by default consists of a combination of letters defining the type of entity, as well as of a number. The first alert of a document will be assigned the ID AL01. An ID may be changed to any other string that is currently not used for any other alert, sheet object, sheet, bookmark or report in the document.

Description

This is a commentary field where the creator of an alert can describe the purpose of the alert or any details with regard to the alert. It is only used in the list of alerts in this dialog.

Message

Here you type the message to be displayed with the alert. In case of pop-up alerts this is what appears in the pop-up. In case of mail alerts this is the body text of the mail. The text may be defined as a calculated expression for dynamic update (see page 229 in Book III).

Condition

A QlikView expression that should evaluate to true (non zero) when the alert is fire.

All Clear

If this check box is marked the all clear state will be used when evaluating the alert condition.

Bookmark

If the **All Clear** check box is not marked you may specify a bookmark to be applied before the alert condition is tested. The bookmark should be stated as a bookmark ID. The bookmark must exist for the alert to work properly. If no bookmark is specified and the **All Clear** check box is left unchecked, the current selections will be used when the alert condition is tested.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Use Custom Pop-up

Alert pop-ups are usually formatted according to the default set under **Alert Pop-up Settings** in the **General** page of the **Document Properties** dialog. By marking this check box you may define a custom pop-up format for the selected alert.

Pop-up Settings

Click this button to open the **Pop-up Window Settings** dialog to define a custom pop-up format for the selected alert. See page 21 in Book II for details on this dialog.

Events

The alert can be manually checked by means of Automation calls at any time. Automatic checks at relevant events can be made with the settings in this group.

On Open

Mark this check box if the alert is to be automatically checked when the document is opened.

On Post Reload

Mark this check box if the alert is to be automatically checked after a **Reload** of the document (script execution). The alert will be checked also upon opening of the document if the last reload time stored in the document is later than the time noted when the alert was last checked.

On Post Reduce

Mark this check box if the alert is to be automatically checked after a data reduction (**Reduce data** command) has taken place in the document.The alert will be checked also upon opening of the document if the last reduction time stored in the document is later than the time noted when the alert was last checked.

Delay The re-firing of automatically checked alerts may be suspended for a given time after that an alert has been fired. Enter a number of days in this edit box to do so. Decimal numbers may be used to specify parts of a day. The value 0 indicates of course that no suspension time will be applied.

Trigger Level

The re-firing of automatically checked alerts may also be suspended on the basis of whether the alert status has changed after the firing. In this drop-down you can choose between three levels of reoccurrence.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Always
The alert is fired every time the trigger event(s) occur and the alert condition is fulfilled.

Message Changes
The firing of the alert is suspended until the alert message changes. This is of course only meaningful with dynamic message text. Note that the state of the alert condition does not necessarily have to change in order for the evaluated message to change. Any change in the **Mail Subject** will be regarded as change of message.

State Changes
The firing of the alert is suspended until the alert state changes, i.e. the alert condition has been unfulfilled during at least one check and becomes fulfilled again during a later check. This is the strongest type of alert suspension.

Mode The alert can be defined as an interactive (automatic triggers in layout) and/or as an alert relevant for external programs running QlikView in batch mode (e.g. QlikView Publisher). If none of the check boxes in this group is marked, the alert can still be manually checked via macros.

Interactive
Mark this check box if the alert is designed for automatic triggering upon the events marked under **Events**.

Batch Mark this check box if the alert is designed for triggering from external programs (e.g. QlikView Publisher) via the special Automation API for Batch triggers.

Mail Recipients
Semi-colon separated list of mail addresses. Each of these addresses will receive an e-mail message whenever the alert fires. The list may be defined as a calculated string expression for dynamic update (see “edit expression” on page 229 in Book III). By clicking on the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Advanced
Not yet implemented.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

18.5 The Alert Wizard

The Alert wizard helps you with the task of defining an alert. The process has the following basic steps:

1 Name/describe the alert.

2 Define the alert condition.

3 Define when to test the alert condition.

4 Define a possible delay before checking the alert again after firing.

5 Define the action(s) to take when the alert fires

Depending on selections some of the above steps may be skipped.

Starting the Alert Wizard

You start the alert wizard by choosing **Alert Wizard** from the **Settings** menu.



Figure 41. The first start page of the Alert wizard

The first time you start the wizard you will be met by two start pages, the first one describing the concept of alerts and the second one outlining the wizard and the basic

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

steps involved. If you want to skip the start pages when you use the wizard in the future, mark the **Don't show this page again** check box in either or both pages.

Click **Next** to continue.



Figure 42. The second start page of the Alert wizard

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 1 - Name/Describe the Alert



Figure 43. The first page of the Alert wizard

Enter a name and/or a short text under **Alert Description**, describing the alert you are about to create. This is a commentary field where the creator of an alert can describe the purpose of the alert or any details with regard to the alert. It is only used in the list of alerts in the Alerts dialog.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 2 - Define the Alert Condition

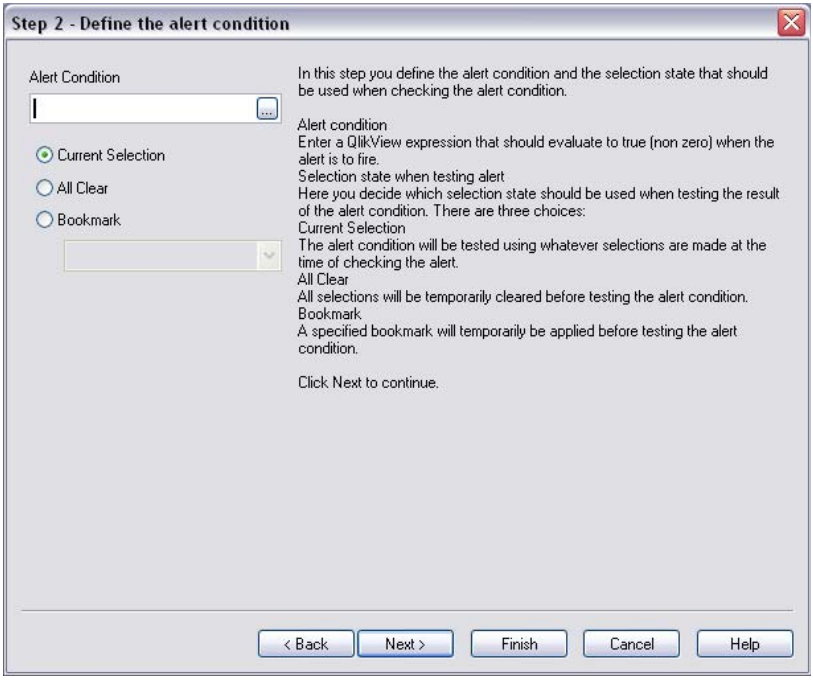


Figure 44. The second page of the Alert wizard

In this step you define the alert condition and the selection state that should be used when checking the alert condition.

Alert Condition

Enter a QlikView expression that should evaluate to true (non zero) when the alert is to fire.

Selection State when Testing Alert

Here you decide which selection state should be used when testing the result of the alert condition. There are three choices:

Current Selection

The alert condition will be tested using whatever selections are made at the time of checking the alert.

All Clear

All selections will be temporarily cleared before testing the alert condition.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Bookmark

A specified bookmark will temporarily be applied before testing the alert condition.

Click **Next** to continue.

Step 3 - Define when to Test the Alert Condition

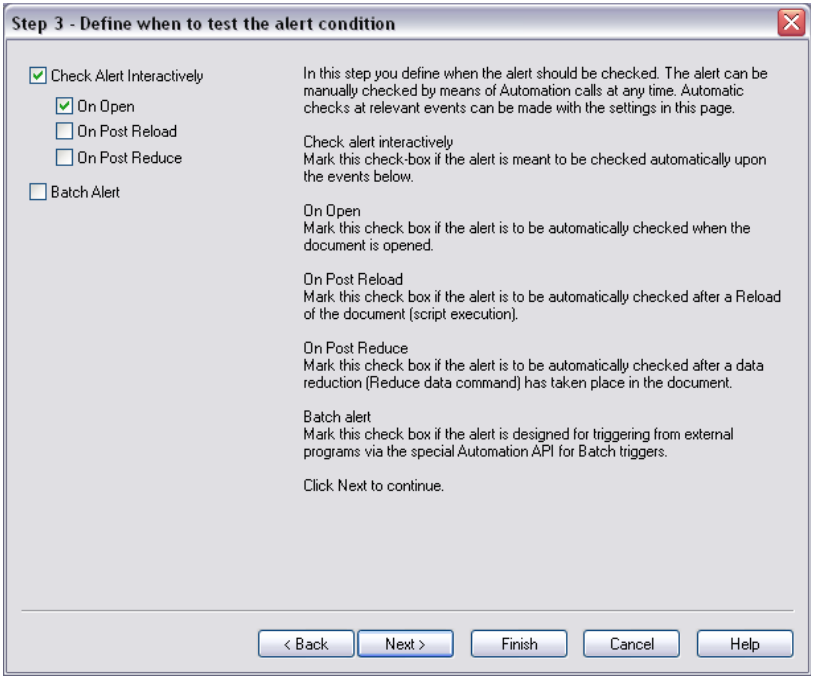


Figure 45. The third page of the Alert wizard

In this step you define when the alert should be checked. The alert can be manually checked by means of Automation calls at any time. Automatic checks at relevant events can be made with the settings in this page.

Check Alert Interactively

Mark this check box if the alert is meant to be checked automatically upon the events below.

On Open

Mark this check box if the alert is to be automatically checked when the document is opened.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

On Post Reload

Mark this check box if the alert is to be automatically checked after a **Reload** of the document (script execution).

On Post Reduce

Mark this check box if the alert is to be automatically checked after a data reduction (Reduce data command) has taken place in the document.

Batch Alert

Mark this check box if the alert is designed for triggering from external programs via the special Automation API for Batch triggers.

Click **Next** to continue.

Step 4 - Define test delay

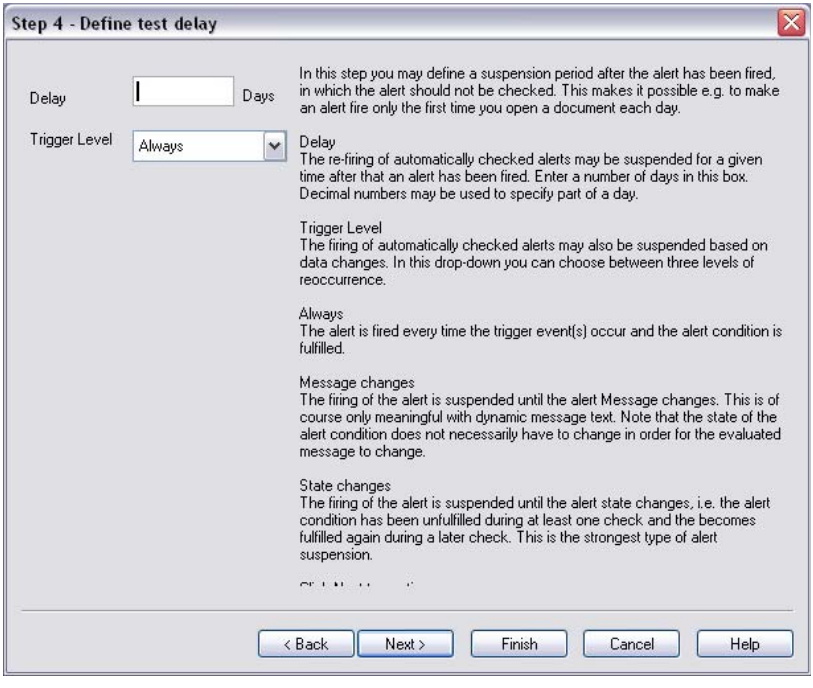


Figure 46. The fourth page of the Alert wizard

In this step you may define a suspension period after the alert has been fired, in which the alert should not be checked. This makes it possible e.g. to make an alert fire only the first time you open a document each day.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Delay The re-firing of automatically checked alerts may be suspended for a given time after that an alert has been fired. Enter a number of days in this box. Decimal numbers may be used to specify part of a day.

Trigger Level

The firing of automatically checked alerts may also be suspended based on data changes. In this drop-down you can choose between three levels of reoccurrence.

Always The alert is fired every time the trigger event(s) occur and the alert condition is fulfilled.

Message changes

The firing of the alert is suspended until the alert Message changes. This is of course only meaningful with dynamic message text. Note that the state of the alert condition does not necessarily have to change in order for the evaluated message to change.

State changes

The firing of the alert is suspended until the alert state changes, i.e. the alert condition has been unfulfilled during at least one check and the becomes fulfilled again during a later check. This is the strongest type of alert suspension.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 5 - Define the action(s) to take when the alert fires

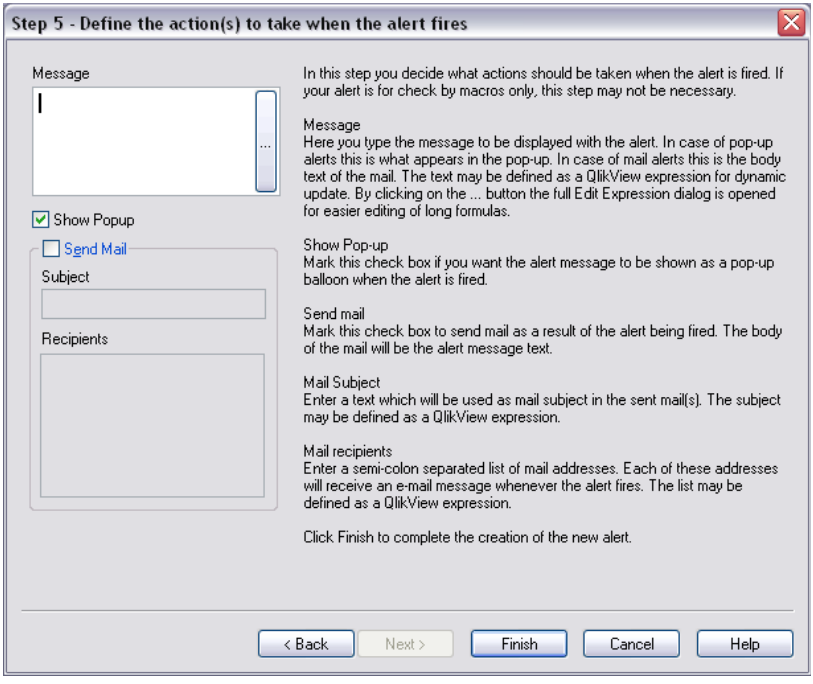


Figure 47. The fifth page of the Alert wizard

In this final step you decide what actions should be taken when the alert is fired. If your alert is for check by macros only, this step may not be necessary.

Message

Here you type the message to be displayed with the alert. In case of pop-up alerts this is what appears in the pop-up. In case of mail alerts this is the body text of the mail. The text may be defined as a QlikView expression for dynamic update. By clicking on the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Show Pop-up

Mark this check box if you want the alert message to be shown as a pop-up balloon when the alert is fired.

Use Custom Pop-up

Mark check box if you want to customize the pop-up. Click **Pop-up Settings** button to open the **Pop-up Window Settings** dialog to define a custom pop-up format.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Send mail

Mark this check box to send mail as a result of the alert being fired. The body of the mail will be the alert message text.

Mail Subject

Enter a text which will be used as mail subject in the sent mail(s). The subject may be defined as a QlikView expression.

Mail recipients

Enter a semi-colon separated list of mail addresses. Each of these addresses will receive an e-mail message whenever the alert fires. The list may be defined as a QlikView expression.

Click **Finish** to complete the creation of the new alert.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

19 VARIABLE OVERVIEW DIALOG

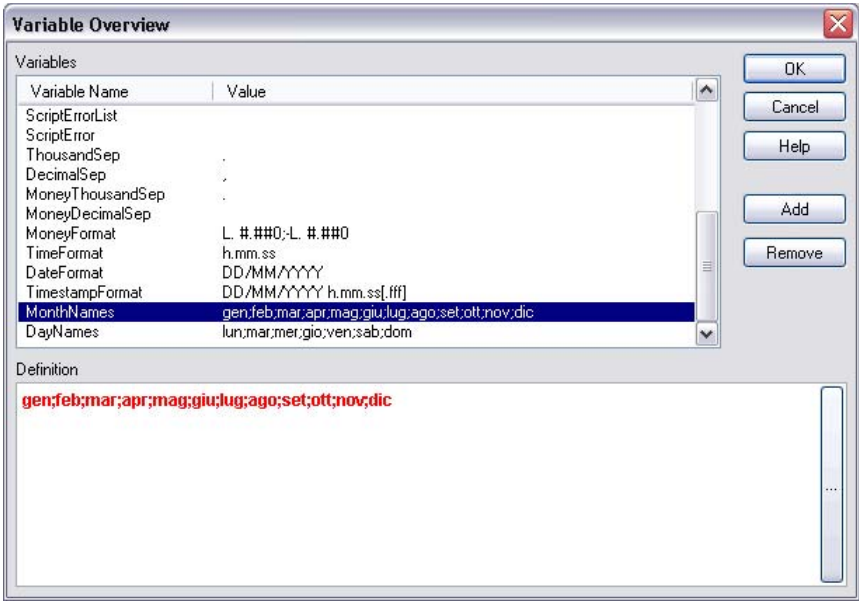


Figure 48. The Variable Overview dialog

This dialog shows all non-hidden variables and their values in a single list. By clicking on a variable you may edit its contents in the lower edit box. Together with the dollar-sign expansion feature in QlikView expressions, the variable overview may be used as a crude expression repository.

Variables
: In this two-column list you will find the names of all non-hidden variable and their respective values.

Definition
: When clicking on a variable in the **Variables** list, the variable's contents will be shown in this edit box. You may then freely edit the text making up the variable value. The changes will be immediately reflected in the **Value** column of the **Variables** list. Click on the **...** button in order to invoke the full **Edit Expression** dialog.

Add Opens the **New Variable** dialog, where a new variable can be defined.

Remove
: Removes the selected variable from the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

20 EXPRESSION OVERVIEW DIALOG

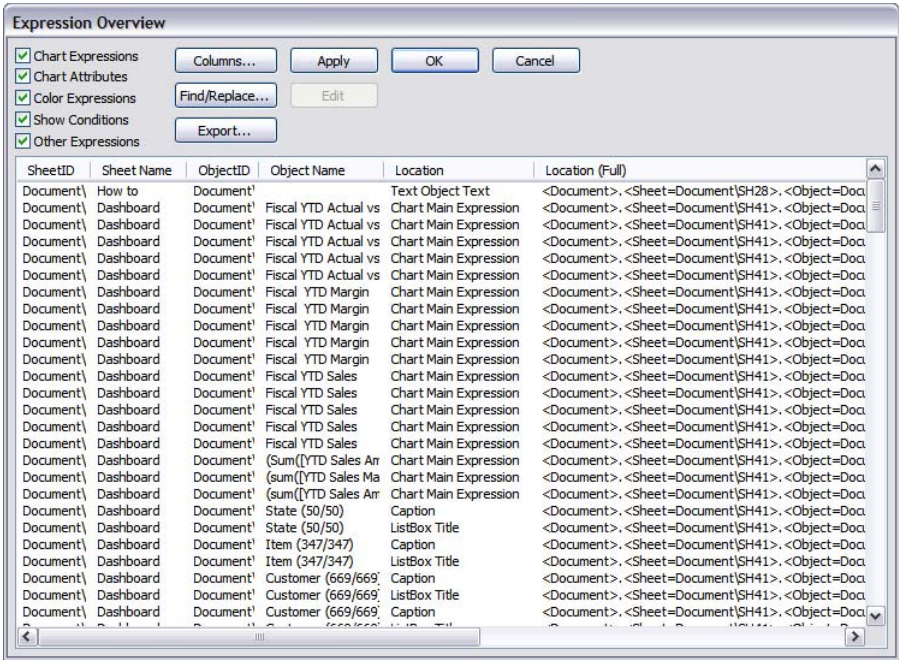


Figure 49. The Expression Overview dialog

This dialog shows all document, sheet and sheet object expressions in a single list. From this list you may edit single expressions or do Find/Replace on multiple expressions. You can select one or more expressions from the list. A selected line is shown in black. Click below the last expression to deselect.

The expression list may contain the following columns, based on settings in the **Columns** dialog (see below):

Sheet ID

The sheet ID of the sheet where the expression occurs. Empty for document expressions.

Sheet Name

The name (tab title) of the sheet where the expression occurs. Empty for document expressions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Object ID

The sheet object ID of the sheet object where the expression occurs. Empty for document and sheet expressions.

Location

The location of the expression within properties with 'friendly name', i.e. a simple explanation of the type of expression.

Location (Full)

The exact location of the expression within the properties structure. The notation corresponds to the object property hierarchies of the QlikView Automation Interface, which is explained in detail in the QlikView API guide.

Expression

The expression definition.

The following commands are available in the dialog:

Chart Expressions

Mark this check box to include chart expressions in the list.

Color Expressions

Mark this check box to include color expressions in the list.

Show Conditions

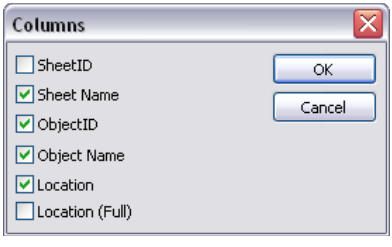
Mark this check box to include show condition expressions in the list.

Other Expressions

Mark this check box to include other types (than the three types listed above) of expressions in the list.

Columns...

Opens the **Columns** dialog where you may customize which columns that should appear in the **Expression Overview** dialog. The **Expression** column cannot be turned off.



Edit... After selecting a single expression in the list you may use this button to open the **Edit Expression** dialog for the selected expression.

Find/Replace...

Opens the **Find/Replace** dialog, where you may search for and replace specific text within the current list of expressions.

Export...

Use this button to export the table to a text file.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Apply Applies changes made in the list back to the properties of the document, sheets and sheet objects, without leaving the dialog. After using this command changes made so far will remain even if you use **Cancel** to leave the dialog.

OK Applies changes made and closes the dialog.

Cancel Closes the dialog without applying changes (unless of course the **Apply** command has been used previously).

Changes made from this dialog can be undone by the regular **Undo** command.

20.1 The Find/Replace Dialog

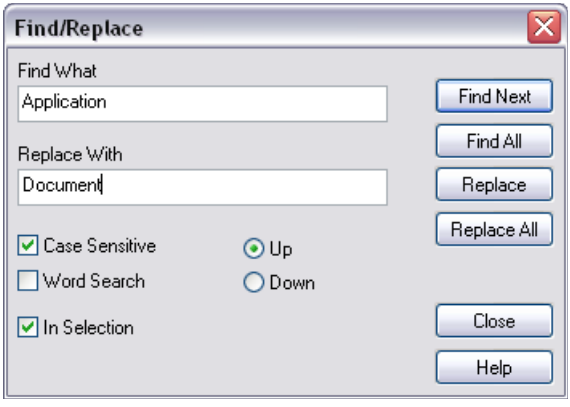


Figure 50. The Find/Replace dialog

This dialog is used for searching for specific text strings within the current list of expressions and for making multiple or bulk changes to the expressions.

Find What
The text string to search for.

Replace With
The text to replace the search string with.

Find Next
Moves selection to the next expression containing the search string.

Find All
Selects all expressions containing the search string

Replace
Makes a replacement in the selected expression.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Replace All
Makes replacements in all occurrences of the search string.

Case Sensitive
If this check box is marked the text search will be case sensitive.

Word Search
If this check box is marked QlikView will only find occurrences of the search string forming a whole word (delimited by spaces or other non-letter characters).

In Selection
If this check box is marked, search and replace will only be made within selected expressions in the list.

Search All Tabs
If this check box is marked, the find/replace operation will be made over all sheet tabs.

Up Mark this radio button to search up through the expression list.

Down Mark this radio button to search down through the expression list.

Close Closes the dialog.

Help Opens the online help.

20.2 Quick Chart Wizard

The fastest way towards a new chart in QlikView is the Quick Chart Wizard. The Quick Chart feature has been developed for the user who wants to create a simple chart in a quick and easy way without bothering about the great number of different settings and options available.

When you click the Quick Chart button in the toolbar or choose Create Quick Chart from the list box object menu, or Quick Chart from the Layout menu, the Quick Chart wizard appears.

For a complete description of the Quick Chart wizard see page 239 in Book III.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

21 INTERNAL FILES

21.1 File references in the QlikView layout

There are a number of places in the QlikView layout where external files can be referenced as info, as background images etc. External files are referenced by a local path or URL.

In certain cases it may be preferable to include the files in the QlikView document. This can be done as described under 21.2 below.

A small set of standard image files are embedded in the QlikView program itself and may be used in any document without any special preparations. This is described in the section 21.3 below.

21.2 Internal files in QlikView documents

The **info** prefix to **load** and **select** statements in the script (page 312 and page 319) can be preceded (or replaced) by the **bundle** prefix. The external files will then be read and embedded in the QlikView document. The external files will no longer be necessary for referencing the file contents, thereby making the QlikView document portable.

Show info and the info function will automatically use the embedded files when available. The syntax for explicit reference of embedded files is:

qmem://*fieldname***/***fieldvalue* |
qmem://*fieldname***/<***index***>**

where *index* is the internal index of a value within a field.

Examples:

```
'qmem://Country/Austria'
'qmem://MyField/34'
```

21.3 Internal files in the QlikView program file

A number of image files are available embedded in the QlikView program file. These may be used without any additional actions. The syntax for reference is:

qmem://<builtin>/*filename*

where *filename* is one of the filenames shown under the images listed below (including extension).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
'qmem://<builtin>/Arrow_N_G.png'
='qmem://<builtin>/
Smiley'&if(sum(Result)<0,1,3)&'_Y.png'
```

Arrow images

Arrows are available in eight directions and four colors. Filenames are coded as follows: The word “Arrow” followed by an _ (underscore) and map direction. That may be followed by _G for green color, _R for Red color and _Y for yellow color. If no color is stated in the filename as above the color is gray.

Gray	Green	Red	Yellow
 Arrow_N.png	 Arrow_N_G.png	 Arrow_N_R.png	 Arrow_N_Y.png
 Arrow_NE.png	 Arrow_NE_G.png	 Arrow_NE_R.png	 Arrow_NE_Y.png
 Arrow_E.png	 Arrow_E_G.png	 Arrow_E_R.png	 Arrow_E_Y.png
 Arrow_SE.png	 Arrow_SE_G.png	 Arrow_SE_R.png	 Arrow_SE_Y.png

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

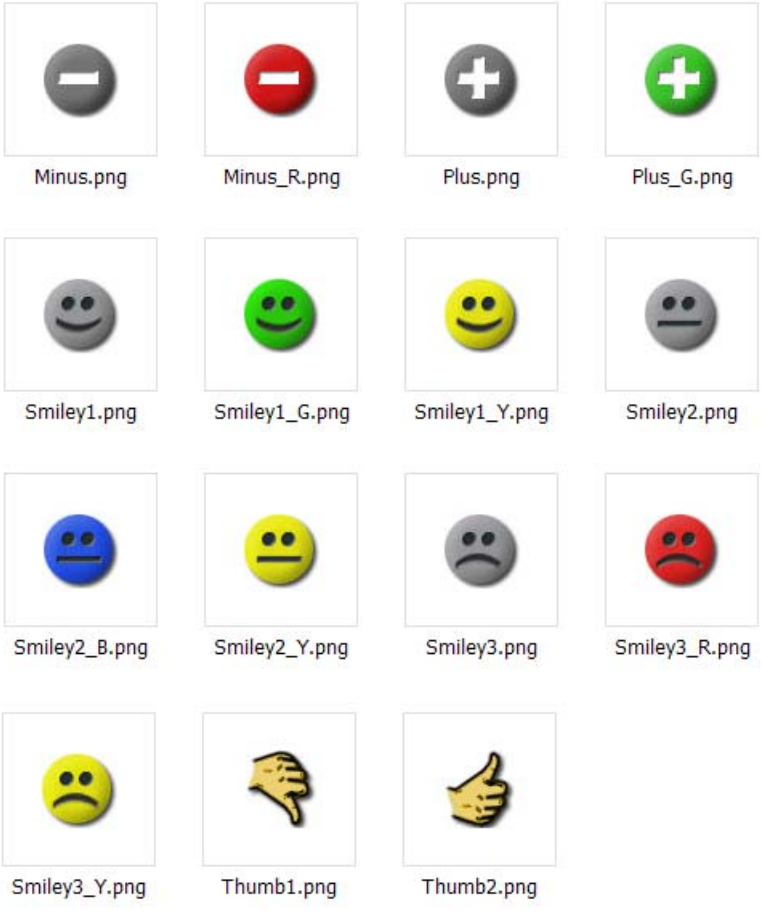


Other images

A number of other images are also available. Colors are coded as for arrows. _B in the filename indicates blue color.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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21.4 Bundled Sounds

A number of sounds are available as bundled resources within QlikView. The sounds can be accessed via the following paths:

qmem://<bundled>/sounds/qv_bttn.wav
qmem://<bundled>/sounds/qv_can.wav
qmem://<bundled>/sounds/qv_clear.wav
qmem://<bundled>/sounds/qv_load.wav
qmem://<bundled>/sounds/qv_lock.wav
qmem://<bundled>/sounds/qv_menu.wav

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

qmem://<bundled>/sounds/qv_ok.wav
qmem://<bundled>/sounds/qv_redo.wav
qmem://<bundled>/sounds/qv_reex.wav
qmem://<bundled>/sounds/qv_save.wav
qmem://<bundled>/sounds/qv_scrpt.wav
qmem://<bundled>/sounds/qv_ulock.wav
qmem://<bundled>/sounds/qv_undo.wav

Note This list may change in future versions of QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART IV: SCRIPT

- **Variables and Fields**
- **Script Dialog Boxes**
- **Script Syntax**
- **Data Structures**
- **Security**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

22 VARIABLES AND FIELDS



This chapter explains the different data-carrying entities in QlikView, most importantly **Fields** and **Variables**.

22.1 Fields

Fields are the primary data-carrying entity in QlikView. *A field typically contains a number of values*, called field values. The QlikView AQL logic works only on the fields and their field values.

Fields get their data in the script from **load**, **select** and **binary** statements reading database tables. The only way of changing data in a field (apart from input fields, see below) is by re-executing the script. *Field values can not be manipulated by the user* from the layout or from Automation. Once read into QlikView they can only be viewed and used for logical selections and calculations.

Field values can contain numeric or alphanumeric data. In case they are numeric they will always have dual values, the actual numeric value and the current (formatted) text representation of it. It is the latter which is shown in sheet objects etc.

22.2 Input Fields

Above it was stated that data in fields cannot be altered without running the script. No rule without an exception. Starting from version 8, QlikView supports a special type of field, which indeed can be changed without script execution, the input field.

An input field is just like any other field in QlikView, with the difference that its values, as read in the script, can later be changed without running the script again. Input fields can be used like any other fields in all types of sheet objects.

The script creates placeholders for each field value, which can later be edited to contain new data. Any field can be turned into an input field by listing it in an **inputfield** statement in the script before it appears in a **load** or **select** statement.

Values of an input field can be changed in list box cells, table box cells and in table chart expression cells. Only list boxes and table columns which contain input fields are editable. By hovering oven an editable cell you will see an input icon. Clicking the icon sets the cell in input edit mode. It is possible to use up/down arrow keys to move between cells while staying in input edit mode. The entire QlikView document will automatically recalculate whenever new values are entered.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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A table chart expression cell may contain the aggregation **inputsum (inputfield)** and still be open for input. The change will then be distributed back to the underlying field values, based on predefined algorithms, such as e.g. “spread equally“ or “spread proportionally“.

There are also Automation APIs for extracting and setting values programmatically.

22.3 Variables

Variables in QlikView are named entities containing a *single data value.*

Variables can get their values from **LET**, **SET** or other control statements in the script. However they can also be created and receive values via Automation calls or by the help of input boxes in the layout. The value of a variable can normally be changed by the user at any time.

Variables can contain numeric or alphanumeric data. If the first character of a variable value is an equal sign '=' QlikView will try to evaluate the value as a formula (QlikView expression) and then display or return the result rather than the actual formula text.

22.4 Other Entities in QlikView

Chart Dimensions

A chart dimension is the set of values for the chart to iterate over when it calculates the values for its expression(s). In the simple case one could say that it is what appears on the x-axis in a standard bar chart.

A chart can have one or more dimensions. The upper limit depends on chart type, data complexity and the amount of memory available. Pie, line and scatter charts can show a maximum of two dimensions, bar and grid charts three. Radar charts can only show one dimension, gauge charts show no dimensions at all.

A chart dimension gets its values from a field which is specified on the **Dimensions** page of the **Chart Properties** dialog. Instead of being a single field a dimension can also consist of a group of fields (see **Groups** below).

Chart dimensions may also be calculated from an expression.

Groups

Groups, or more correctly field groups, are collections of fields, which can be used instead of fields in chart dimensions. There are two types of field groups:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Drill-down groups are used to create hierarchies of fields allowing so called drill-down in charts.

Cyclic groups are non-hierarchical and are normally used just as a convenient way of letting the user switch chart dimension fields by a simple mouse click.

Groups are specified on the **Groups** page of the **Document Properties** dialog.

Expressions (Calculated Formula)

Expressions were in early versions of QlikView used only for charts. A chart can have one or more expressions and each of them will be calculated for each combination of field values in the chart's dimensions.

In QlikView 4 and 5 expressions can be used also in the script and in various places of the layout (then sometimes referred to as calculated formulas).

An expression consists of a combination of fields, variables, operators and functions put together according to a special syntax. The functions available vary slightly between script, charts and other parts of the layout.

In the script the expression will be evaluated as the script execution passes it by. In charts and other layout objects expressions will be evaluated automatically whenever any of the fields, variables or functions that the expression contains changes value or logical status.

For more information about script expressions see chapter “script expressions” on page 365.

For more information about chart expressions see chapter “chart expressions” on page 267 in Book III.

For more information about the use of expressions in other layout objects see chapter “calculated formulas” on page 439 in Book III.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23 SCRIPT DIALOG BOXES

23.1 Edit Script

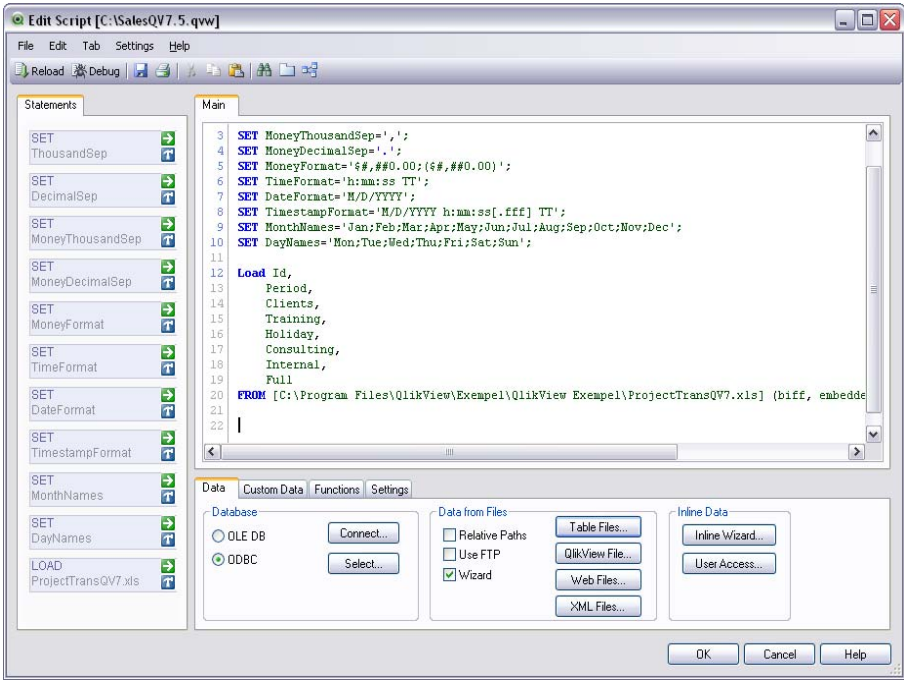


Figure 51. The Edit Script dialog



The **Edit Script** dialog box (above) is opened from the **File** menu or with a button in the toolbar. Here you can enter and execute a script that connects your application to an ODBC data source, or to data files of different types, and fetches the demanded information.

With QlikView Developer you can make scripts without any restrictions. With QlikView Professional you are only allowed limited scripting towards desktop data sources. See chapter “limited scripting in qlikview professional” on page 513 ff.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Scripts can be typed manually, or generated automatically. Complex script statements must, at least partially, be entered manually. The statements, expressions, functions etc. available for the creation of scripts are described in the chapters “script syntax” on page 291 and “script expressions” on page 365.

The **Edit Script** dialog window is sizable (point at the lower right-hand corner with the mouse, then drag).

The dialog contains a number of different components:

At the top you can find a **menu bar** with various script related commands. The most frequently used commands are also found on the adjacent **toolbar**.

The **script pane** to the upper right contains the actual script. This pane may be divided into different tabs.

The **statement graph** to the left is used for easier navigation in the script. Each statement is represented by a box outlining the most important properties of the statement.

At the bottom of the dialog you will find a **tool pane** with multiple tabs containing functions for script generation.

The dialog contains the following buttons:

OK Accepts changes made in the script and closes the dialog box.

Cancel Cancels the script editing, restores the script and closes the dialog box.

Help Invokes online help.

Menus and toolbar

File menu

Reload Executes the script, closes the dialog box and opens the **Fields** page in the **Sheet Properties** dialog box. This command is also available on the Edit Script dialog toolbar.



Debug...

Starts the script execution in the debugger. The debugger is used for searching for errors in the script. Every script statement can be monitored and the values of the variables can be examined while the script is executed. See page 288. This command is also available on the **Edit Script** dialog toolbar.



Edit Hidden Script...

Opens a script tab for hidden script. Here it is possible to define a hidden part of the script, which is executed before the general script at each reload. Hidden script tabs are always shown to the left of the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

open script tabs. A password is required to create or access hidden script. See below for details.

Change Hidden Script Password...

Opens the **New Hidden Script Password** dialog where a new password for access to the hidden script can be set.

Create Hidden Script

Opens the **New Hidden Script Password** dialog, where a password for the hidden script must be set, and then opens a new script tab in the script window called **Hidden Script**. Here it is possible to define a hidden part of the script, which is executed berfore the general script at each reload. Hidden script tabs are always shown to the left of the open script tabs.

Remove Hidden Script

Removes the hidden script from the **Edit Script** dialog.

Save Entire Document



Saves the active document in a file. Data, script and layout are saved. This command can also be invoked via the keyboard shortcut CTRL+S. This command is also available on the **Edit Script** dialog toolbar.

Save Entire Document As...

Saves the active document in a new document file under a new name. It is possible to save the QlikView file in a previous file format.

Export to Script File...

Saves the entire script in a text file to be specified in the **Save script** dialog that appears. The file will have the extension .qvs.

Print Tab...



Allows you to print the active script tab on a printer of your choice. This command can also be invoked via the keyboard shortcut CTRL+P. This command is also available on the **Edit Script** dialog toolbar.

Print All Tabs...

Allows you to print the entire script on a printer of your choice. Hidden script will not be printed via this command.

Table Viewer



Opens the **Table Viewer** dialog where the structure of the loaded data can be studied in a graphical view of tables, fields and associations. This command can also be invoked via the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

keyboard shortcut CTRL+T. Read more about the **Table Viewer** on page 237.

Edit menu

Undo Undoes the latest change (multiple step undo is possible). Equivalent to pressing CTRL+Z.

Redo Redoes the latest **Undo**. Equivalent to pressing CTRL+Y.

Cut Exports the selected text to the Clipboard. This command is is also available on the **Edit Script** dialog toolbar. Equivalent to pressing CTRL+X.



Copy Copies the selected text to the Clipboard. This command is also available on the **Edit Script** dialog toolbar. Equivalent to pressing CTRL+C.



Paste Pastes the contents of the Clipboard into the dialog at the position of the cursor. This command is also available on the **Edit Script** dialog toolbar. Equivalent to pressing CTRL+V.



Delete Deletes the text in the script that has been selected. Equivalent to pressing DEL.

Clear Entire Script

Clears the script, i.e. removes all the text except the initial autogenerated **set** statements.

Select All

Selects the entire script text. Equivalent to pressing CTRL+A.

Insert File...

Lets you browse for a file containing a script or part of a script and inserts its contents into the script at the position of the cursor. If the **Internet** check box is marked, see further on page 248.

Include Opens the **Include Scriptfiles** dialog. Script files can have one of the following formats: .qvs (a previously saved QlikView script file, , .txt or .sql.

Insert Domain SID

Retrieves the NT domain security ID for use in the script. The NTDOMAINSID is employed in the **section access** as one of the reserved fields that govern NT security.

Find/Replace...

Opens a dialog allowing you to find and replace numbers or characters in the script. This command is also available on the **Edit Script** dialog toolbar. Equivalent to pressing CTRL+F.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Goto... Opens a dialog allowing you to go to a specified line number in the script. Equivalent to pressing CTRL+G.

Upper Case
Puts the selected script text in upper case.

Lower Case
Puts the selected script text in lower case.

Invert Case
Inverts the casing of the selected script text.

Capitalize
Capitalizes the selected script text.

Comment
Transforms a text row in the script to a comment.

Uncomment
Transforms the text row back into original script text.

Tab Menu

Add Tab
Adds a new script tab. The script will be executed tab by tab in order from left to right. This command is also available on the **Edit Script** dialog toolbar. If the current script tab is part of the hidden script, the new tab will also be created within the hidden script.

Insert Tab at Cursor
Inserts a new tab after the active tab. Any text on the active tab positioned after the cursor will be moved to the new tab.

Rename...
Opens a dialog for renaming the active script tab.

Promote
Moves the active tab one step to the left. Tabs cannot be promoted to the left of the hidden script tab.

Demote
Moves the active tab one step to the right.

Merge with Previous
All text on the active tab is moved to the end of the preceding tab and the active tab is deleted.

Remove...
Removes the active script tab. The last remaining script tab cannot be removed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Settings menu

Configure

Opens the **Editor** page in the **User Preferences** dialog (page 115), where you can set the font and color of the different text types appearing in the script.

Help menu

Help Opens the QlikView help program.

Script Pane

The script pane contains the actual script. Each line of the script is numbered. The script may be divided into several parts on separate tabs. The tabs are executed from left to right.

If a hidden script is used it may be viewed as a separate tab to the very left (provided you know the password).

The script is color coded by syntax components. The color coding may be customized by choosing **Configure** on the **Settings** menu.

Statement Graph

The statement graph shows a box for each statement on the active script tab. The box outlines the most important features of the statement and provides an easier way to navigate the script.



By clicking the icon you will move the cursor in the script pane to the beginning of that statement's code.

By clicking the icon you will re-enter the wizard for the statement. This option is only available for certain statements. For more complex statements, it is sometimes possible to reflect the statement in the wizard context.

Tool Pane

The tool pane has four tab pages containing functions for script generation.

Data Page

The **Data** page contains basic commands for getting data into QlikView.

Database

The commands in the **Database** group are used to create a connection to and select fields from a data source. If you are using a commercial DBMS you may use ODBC or OLE DB as an interface between QlikView and the database. An ODBC or OLEDB driver

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

that supports your DBMS must be installed on your computer before you can retrieve data over the ODBC/OLE DB interface. Once the appropriate ODBC/OLE DB driver is installed, your database must be configured as an ODBC data source.

OLE DB
Mark this alternative to access databases through OLE DB.

ODBC Mark this alternative if you wish to access databases through ODBC.

Connect...
Opens the **Data Link Properties** dialog box (Figure 53 on page 240) where an ODBC or an OLE DB data source can be selected. Pressing **OK** will generate an appropriate **connect** statement.

Select...
Opens the **Create Select Statement** dialog box (Figure 56 on page 242) in which you can specify fields and tables from the chosen data source.

Data from Files
The commands in the **Data from Files** group are used for reading data from files.

Relative Paths
If this check box is marked, QlikView will use relative instead of absolute paths in the script. Relative paths are normally required when an application is to be moved between different computers. This setting is also available in the **User Preferences** dialog. If it is changed there, it will also be changed in the **Edit Script** and **Edit Hidden Script** dialog boxes.

Use FTP
If this check box is marked, a dialog allowing you to select files from an ftp file server will open when you click **Table Files, QlikView Files**, or **Include**. See Figure 58 on page 248.

Wizard If this check box is marked, the table file wizard (page 257) will open when you click **Open** in the **Open Local Files** dialog after having chosen **Table Files...** below.

Table Files...
Opens the **Open Local Files** dialog box listing text files. Selecting one or several files and pressing **OK** will generate

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

one or several **load** statements. When executed, the script loads data from the corresponding files. If the **Use FTP** option is checked (see above), select a server from the list (or enter the server you wish to use, then click **Connect**). When this is done, select a text file. For XML table files, use the XML Files... button below.

QlikView File...

Opens the **Open QlikView File** dialog box listing QlikView files (.qvw). Selecting a file and pressing **OK** will generate a **binary** statement. When executed, the script loads data from the corresponding file, however without using the layout settings. If the **Use FTP** option is check marked (see above), select a server from the list (or enter the server you wish to use, then click **Connect**). When this is done, select a QlikView file.

Web Files...

Opens the **Table Files Wizard** on the **Source** page where you may enter a URL as a source for your database table.

XML Files...

Opens the XML File Wizard (see). Completing the wizard will result in a load statement being generated. When executed, the script loads data from the corresponding XML file.

Inline Data

The options in the **Inline Data** group are used for generating data inline in the script.

Inline Wizard...

Opens the **Inline Data Wizard** with the help of which you can create load inline statements from a spreadsheet style control. See page page 253 for detailed information about this dialog.

User Access...

Opens the **Access Restriction Table Wizard** with the help of which you can create load inline statements for **section access** in the script. See page 256 for detailed information about this dialog.

Custom Data Page

The **Custom Data** page contains commands for getting data from custom data sources into QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Custom Data Sources

QlikView offers an open source plug-in interface, providing possibility to program custom interfaces to various types of data sources not covered from the traditional file, ODBC or OLEDB interfaces. The typical case is data available via Web Services. The plug-in should be programmed according to specifications shown in a template code provided (on request) as open source from QlikTech and compiled as a dll. The dll is then placed next to the QV.EXE file making the custom source available to use. It will then appear in the drop-down box for selection.

Connect...

Opens the **Connect** dialog for connecting to the custom data source. This dialog may look different depending on the what data source is used.

Select...

Opens the **Select** dialog box for selecting fields from the custom data source. This dialog may look different depending on what data source is used.

Functions Page

The **Functions** page contains tools for navigating and pasting data QlikView functions.

Function Category

This drop-down box contains a list of function categories. Select a category in the list to see the corresponding functions in the **Function Name** list below.

Function Name

This drop-down box contains a list of QlikView standard script functions. The list can be narrowed down by selecting a category in the **Function Category** list above.

Paste Select a function in the **Function Name** list above and press this button to paste it at the cursor position in the script.

Settings Page

The **Settings** page contains security settings for the QlikView script.

Script Privilegies

Open Databases in Read and Write Mode

If this option is selected the **mode is write** qualifier in **select** statements will be enabled for use.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Can Execute External Programs

If this option is selected **execute** statements may be used in the script.

Settings

Scramble Connect User Credentials

If this check box is marked, the USERID and PASSWORD in **connect** statements will be scrambled in the script.

23.2 Hidden Script

A hidden script is a closed part of the script, which will be executed before the normal script at each **Reload**. The hidden script is protected by a password.

When choosing **Edit Hidden Script** from the **File** menu in the **Edit Script** dialog you will be prompted for a password, which will be required before giving access to the hidden script again. If it is the first time you access a hidden script in a document (thereby creating one) you will have to confirm the new password. After this the Hidden Script tab will appear to the left of all other script tabs and remain there until you close the document.

Note If a hidden script is used, the **binary** command cannot be used in the normal script.

Note Tables generated by the hidden part of the script will not be represented by name in the *$Table* system field.

Note The **Progress** dialog will not be updated during the execution of a hidden script, unless **Show Progress for Hidden Script** is marked in **Document Properties, Security**. No entries will be made in the log file, if used.

Note If the hidden script contains a **section access**, such a section will not be permitted in the normal script or in a script starting with a binary load of the QlikView file containing the hidden script.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23.3 Table Viewer

The **Table Viewer** dialog is opened when you choose **Table Viewer** from the **File** menu or press CTRL+T.

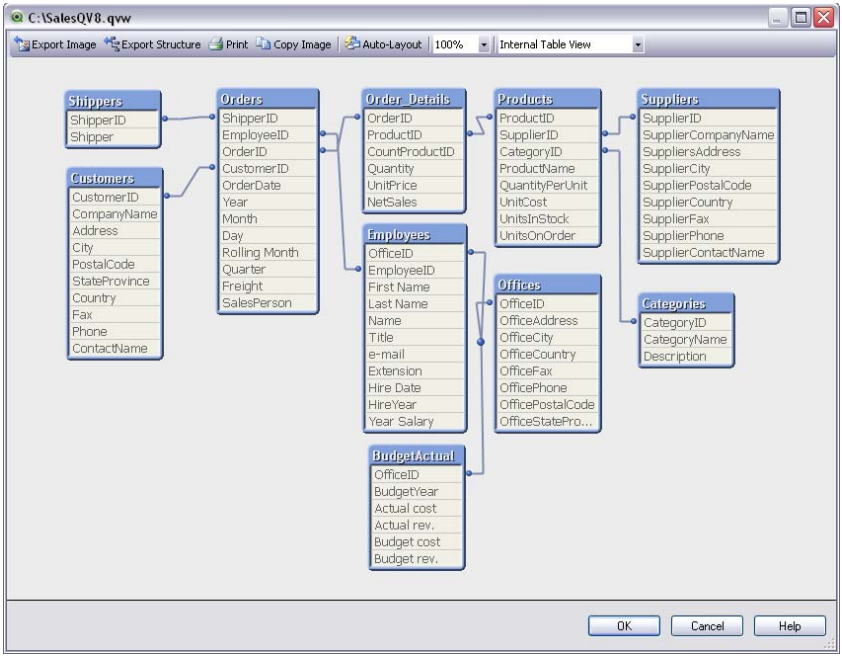


Figure 52. The Table Viewer dialog

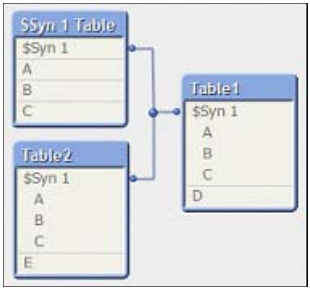
This dialog is used to display the data table structure of the current QlikView document. Tables are shown as boxes with a list of the fields they contain. Between the boxes there are connector lines showing the associations. Where more than two lines meet there are connector points in the form of small dots.

The tables, the connector points and also all points where the connectors bend can be moved by means of mouse drag and drop (see below). When you re-arrange the layout like this, your changes will be saved with the document unless you exit the dialog with **Cancel**.

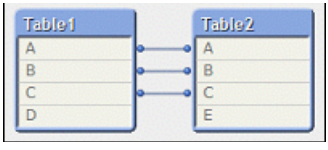
There are two views available, the layouts of which are stored separately. The two views are:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- The **Internal Table View** shows the data tables as QlikView stores them. Composite synthetic keys are formed in tables that share more than one field. Synthetic tables are used to link them. This view offers the best understanding of the QlikView logic and also provides a very clean layout where each pair of tables has a maximum of one connector between them. This is the default view.

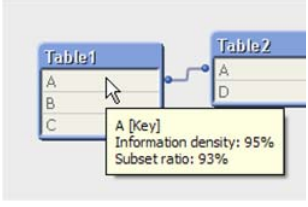


- The **Source Table View** shows data tables as QlikView reads them. Here you have no synthetic fields or synthetic tables. Composite keys are represented by multiple connectors between tables.



When hovering with the cursor above one of the fields in a table, a tool tip pops up with information about the content of this field:

- **Information density** is the number of records that have values (i.e. not NULL) in this field as compared to the total number of records in the table.
- **Subset ratio** is the number of distinct values of this field found in this table as compared to the total number of distinct values of this field (i.e. also other tables).The following actions can be performed in the table layouts:



Click on Table Caption

Highlights the table, all tables with direct logical associations with that table and the connections between them.

Point at Table Caption and Drag

Moves the table in the layout.

Hover Over Table Caption

Shows pop-up info about table.

Click on Field in Table

Highlights the table, the field, all tables containing that field and the connections between them.

Hover over Field in Table

Shows pop-up info about field.

Point at Connector Point or Connector Bend and Drag

Moves the connector point in the layout.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Right-click on Connector Point or Connector Bend
Moves the connector point back to automatic positioning.

Click on Layout Background
Cancels all highlighting of tables, fields and connectors.

The following commands are available in the dialog toolbar and buttons:

Export Image
Opens a file browser dialog so that you can save the current table view as a bitmap or png image to a file on disc. 

Export Structure

By pressing this button you can export the table structure of the document to a set of text files. These text files, one for the tables (*filename*.Tables.tab), one for the fields (*filename*.Fields.tab) and one for mapping in between (*filename*.Mappings.tab) can easily be read back into QlikView for further analysis with the full power of the QlikView logic. A dialog will appear where you can choose the target folder for the export. The default is to put the files in the same folder as the QlikView document.

Print Image
Opens the **Print** dialog from which you can print the current table view. Equivalent to pressing CTRL+P. 

Copy Image
Copies the current table view as an image to clipboard. Equivalent to pressing CTRL+C. 

Auto Layout
Re-arranges the tables in the current view. 

Zoom
The zoom factor of the current view can be set in this drop-down box.

View Select between **Internal Table View** and **Source Table View**.

OK Saves table viewer layouts and closes the dialog.

Cancel Closes the dialog without saving changes in the table viewer layouts.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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23.4 Data Link Properties

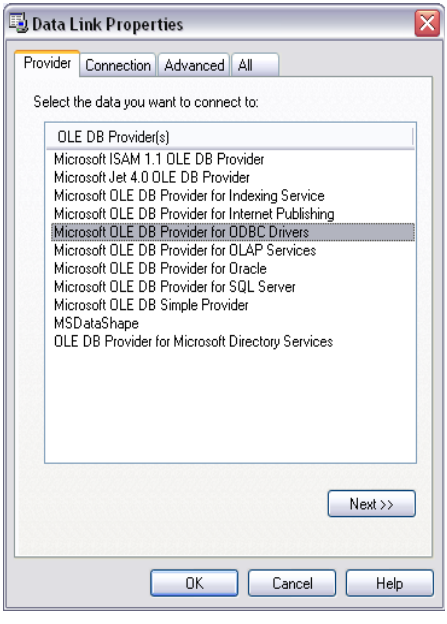


Figure 53. The first page of the Data Link Properties dialog

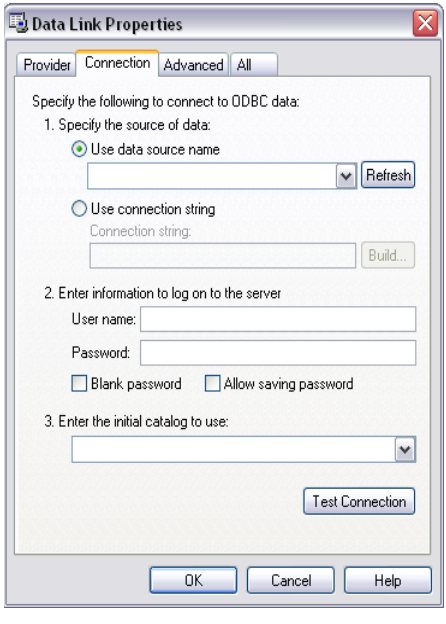


Figure 54. The second page of the Data Link Properties dialog

This dialog box is used for creating a connection to an OLE DB data source, typically via ODBC. The dialog is opened when you click the **Connect...** button in the **Data** page of the **Tool Pane** in the **Edit Script** dialog box.

The first page lists the names of the OLE DB providers. In order to create an ODBC data connection, select *OLE DB Provider for ODBC Drivers*, then click **Next>>** to get to the **Connection** page.

On the **Connection** page under **1. Specify the source of data**, you can specify which previously configured data source you wish to use. There are two different types of ODBC data sources that may come into question.

Pre-Defined Data Sources

Data sources which have been predefined according to the procedure described on page 63 can be accessed by selecting the radio button **Use data source name**. The drop-down list contains all the data sources that are defined. Select the data source you wish to use.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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You may if necessary specify **User name** and **Password** for the data source. You can also test the connection by pressing the **Test Connection** button.

Finally click the **OK** button. Your **connect** statement is ready.

Generic Data Sources

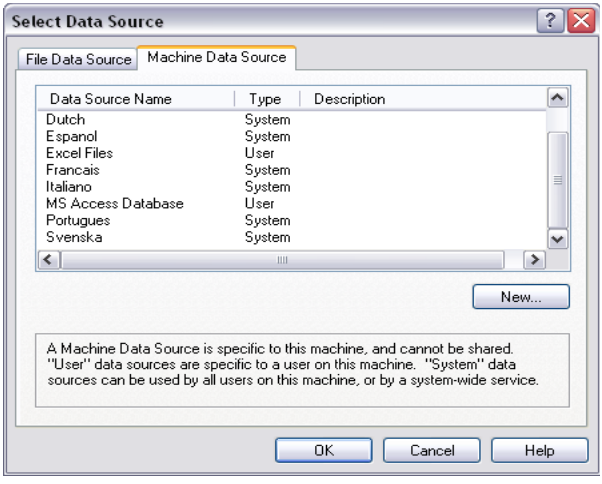


Figure 55. The Machine Data Source page of the Select Data Source dialog

Generic data sources are used e.g. for Excel files. If you want to use a generic data source or create a new source, select the **Use Connection String** radio button and click **Build**. This opens the **Select Data Source** dialog.

There are two types of data sources available: File data sources and Machine data sources. The latter data sources are specific to the local machine and user while file data sources are specific to a file. You may use any of the two. Each has a separate page in the **Select Data Source** dialog.

Double-click a data source, then browse to the applicable database file in the dialog that opens.

Note For MS Access data sources you must click the **Database** button in an intermediate dialog.

When you hit RETURN you will be returned to the second page of the **Data Link Properties** dialog.

You may if necessary specify **User name** and **Password** for the data source. You can also test the connection by pressing the **Test Connection** button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Finally click the **OK** button. Your **connect** statement is ready.

23.5 Create Select Statement

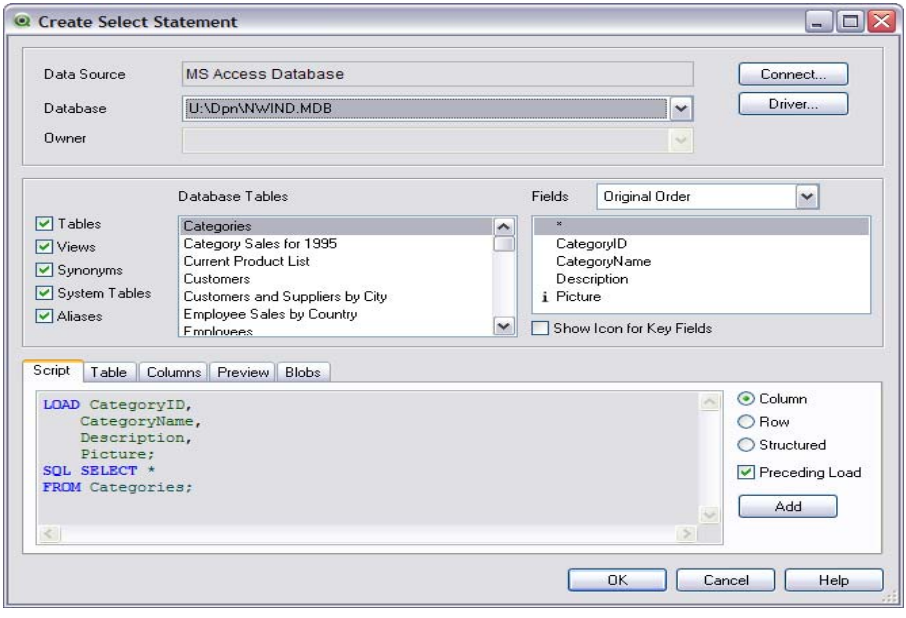


Figure 56. The Create Select Statement dialog

This dialog box is opened by clicking the **Select...** button in the **Data** page of the **Tool Pane** in the **Edit Script** dialog box. The dialog can be sized by dragging the lower right corner. It consists of three panes.

The top pane contains information about the data source.

Data Source

Here the name of the current ODBC/OLEDB data base is shown.

Database

Here the name of the database within the defined data source is shown. If more than one database is available within the data source, you may choose between available databases via a drop-down list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Owner Here the name of the database owner is shown. If more than one owner is available, you may choose between available owners via the drop-down list.

Connect...
By clicking this button, you get to the **Data Link Properties dialog** (see above, Figure 18 on page 120), where you choose a predefined data source or create a new one.

Driver...
Click this button to open the **ODBC Driver Information** or **OLEDB Driver Information** dialog, where you can see information about supported functionality in the driver currently used. The information available may vary between drivers, but typically includes SQL functionality supported and limits.

The middle pane is used for selecting tables and fields.

Database Tables
This list shows all available database tables. Click a table name to select it. The types of tables that will appear in the list can be controlled via the check boxes to the right (see description below).

Fields This list shows all available fields in the selected table. Choose one or more fields from the list to be included in the select statement. You can use "*" in order to select all of the field names at once. Your selection of fields will be reflected in the **Script** page of the bottom pane (see below). Fields can be sorted in **Original Order** from the database or in alphabetical **Text Order** by selection in the drop-down control.

Show Icon for Key Fields
If this check box is marked, all fields that are defined as keys in the source database will be shown with a key icon in the **Fields** list.

Tables This check box must be selected if regular database tables are to appear in the **Database Tables** list.

Views This check box must be selected if database views are to appear in the **Database Tables** list.

Synonyms
This check box must be selected if database table synonyms are to appear in the **Database Tables** list.

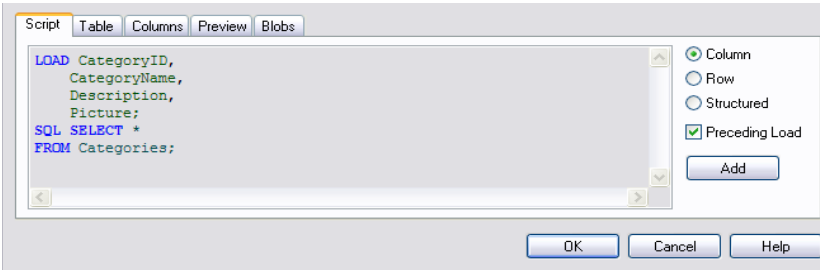
System Tables
This check box must be selected if database system tables are to appear in the **Database Tables** list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Aliases

This check box must be selected if database aliases are to appear in the **Database Tables** list.

The bottom pane shows the generated select statement and information about the selected table and fields. The pane contains four pages.



Script The script page shows the script about to be generated for the **select** statement. The three radio buttons to the right in the bottom pane are used to control the formatting of the select statement in the script.

Column

Select this option to generate the **select** statement with each field name appearing on a separate row in the script.

Row Select this option to generate the entire **select** statement appearing on a single row in the script.

Structured

Select this option to generate the **select** statement on structured rows in the script.

Preceding Load

If this check box is marked the **select** statement will be generated with a preceding **load** statement using the select statement as input. All fields will be listed in the load statement even if * is used in the select statement.

Add When clicking the **Add** button the select statement generated so far will be saved and the generation of a new select statement may begin without leaving the dialog. The old statement will be visible in the preview pane above a clear

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

divider. This procedure may be repeated any number of times.

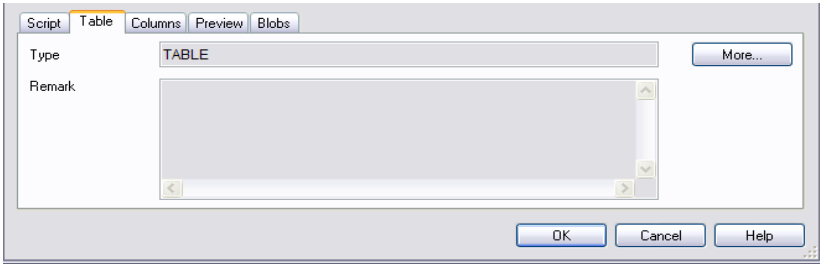


Table The **Table** page shows detailed information about the selected database table.

More...

Opens a separate sizable dialog with an expanded view of the **Table**, **Columns** and **Preview** pages described above.

Columns

The **Columns** page shows detailed information about the selected columns (fields) of the current table. The **More...** control described under **Table** above is also available on this page.

Preview

The **Preview** page shows a preview of the first rows that will be generated by the current **select** statement. The **More...** control described under **Table** above is also available on this page.

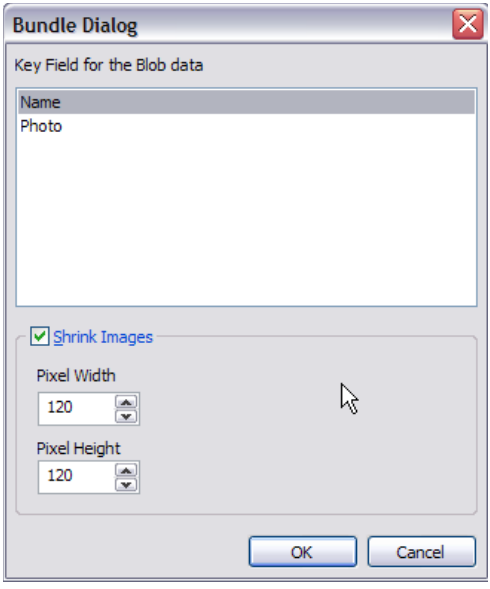
Blobs The **Blobs** page makes it possible to bundle so-called Blobs, Binary Large Objects, in a QlikView application. It is usually a picture, a text file or similar, stored as a single entity in a database management system. The icon indicates that the field contains a blob. The blobs in the database are listed together with size, in KB, and type in the **Blob Viewer**. The Blob is previewed next to the list if it is an image. QlikView supports jpg, png, bmp, pdf and rtf blobs.

Bundle

The **Bundle** button opens the **Bundle Dialog** where the **Key Field for the Blob data** is selected and the blob can be resized to fit in the table cell if it is an image. Mark **Shrink**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Images and apply width and height to resize the images to fit. The setting does not handle aspect ratio.



Note It is only possible to bundle Blobs using ODBC!

Once you have made your selections of table and fields you may click **OK** to insert the **select** statement generated at the cursor position in the QlikView script. Pressing **Cancel** will abandon changes.

The ODBC driver can usually interpret far more complicated **select** statements than the ones which can be produced by this dialog. An alternative way to generate a more complex **select** statement is to use a query tool, e.g. Microsoft Query, and graphically make your **select** statement there. When this is done, copy (CTRL+C) the **select** statement and paste it (CTRL+V) into the QlikView script. In MS Query, press the SQL button.

23.6 Open QlikView File

This dialog box is opened by clicking the **QlikView File...** button in the **Data** page of the **Tool Pane** in the **Edit Script** dialog box (Figure 17 on page 115).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

In the **Open QlikView File** dialog box, which looks very similar to the **Open Local Files** dialog (Figure 57 below), you can specify the qvw file to load data from. A multiple file selection is not possible in this dialog since only one binary file can be loaded. When the **Open** button is clicked, a **binary** statement that loads the selected file will be generated in the script.

If the **Use FTP** option in the **Edit Script** dialog is selected, this dialog looks somewhat different. See Figure 23 on page 126.

23.7 Open Local Files

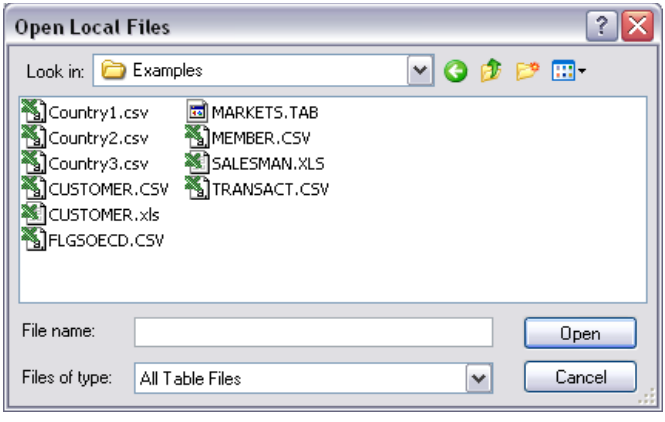


Figure 57. The Open Local Files dialog

The **Open Local Files** dialog box (Figure 57) is opened by clicking the **Table Files...** button in the **Data** page of the **Tool Pane** in the **Edit Script** dialog box (Figure 17 on page 115).

In the **Open Local Files** dialog you can specify the table files to study. In the drop-down list of file types, it is possible to specify the file type and delimiter in the file. When the **Open** button is clicked, a **load** statement that loads the selected files will be generated in the **Edit Script** dialog box. For multiple file selections, use CTRL-click or SHIFT-click.

If the **Internet** option in the **Edit Script** dialog is selected, this dialog looks like the one below (Figure 58).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23.8 Open Internet Files

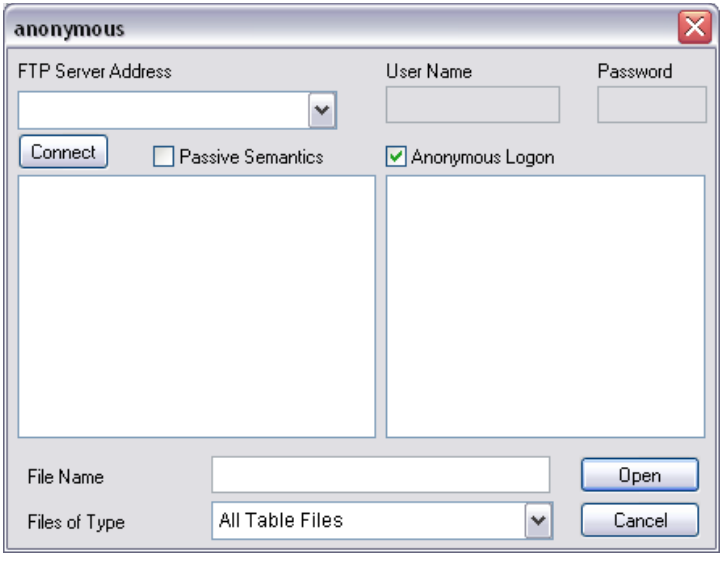


Figure 58. The Open Internet files dialog

This dialog box, allowing you to select one or several files from an Internet source and read them into QlikView by means of the script, appears when you click one of the buttons **QlikView File...** or **Table Files...** in the **Data** page of the **Tool Pane** in the **Edit Script** dialog - provided that the **Use FTP** check box is marked. You can also use this dialog to open QlikView documents. This is done by choosing **Open Ftp** from the **File** menu.

Select the server containing the file(s) you wish to open in the drop-down list box. If your server is not in the list (or if there is no list), enter a server name, then click **Connect**.

User Name

If the **Anonymous Logon** check box is not marked, enter your user name here.

Password

If the **Anonymous Logon** check box is not marked, enter your password here.

Connect

Click this button to connect to the server. If you select a server from the list, you don't need to click this button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Anonymous Logon

If this box is checked, you can log on without specifying your user name and your password. If the server requires this information, an error message will appear.

Once connected to the ftp server, browse through the files to find the one you want to use.

File Name

The name(s) of the selected file(s) will appear in this box.

Files of Type

Here you can specify the type and delimiter of the file you want to open.

When the **Open** button is clicked, a **load** statement that loads the selected files will be generated in the **Edit Script** dialog box. For multiple file selections, use CTRL-click or SHIFT-click.

If this dialog was opened from the **File** menu, clicking the **Open** button means opening the file in QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23.9 Connect to Server

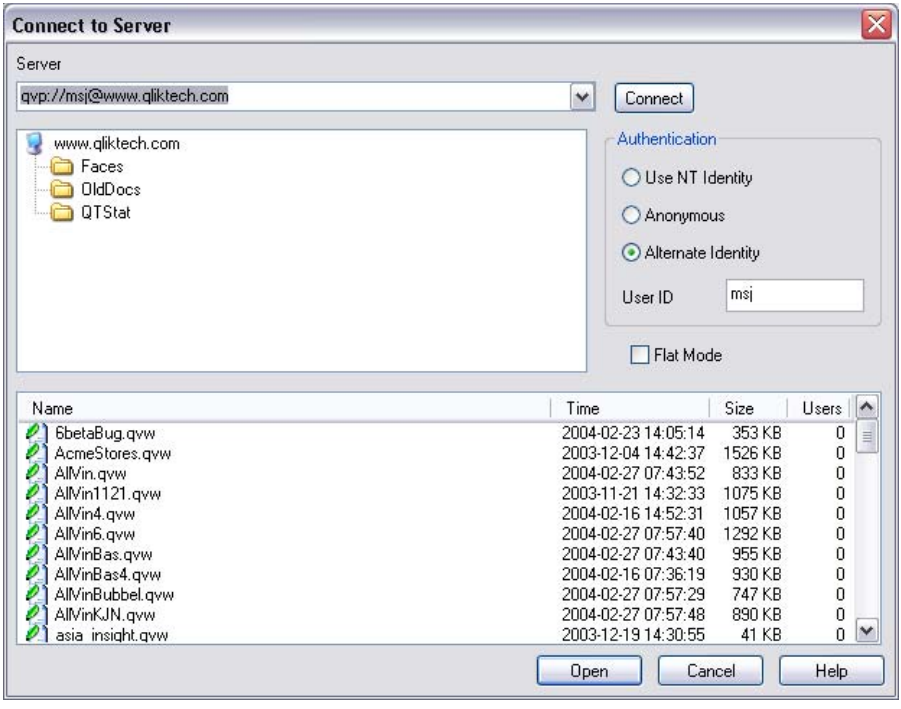


Figure 59. The Connect to Server dialog

This dialog is used for opening a QlikView document remotely on a QlikView Server. Note that when opening documents as a client to QlikView Server you will be restricted in what you can do with the document as compared to when opening local documents. As a client you may not be able to add or delete sheet objects, depending on the client license used and whether the document supports collaboration. Sheets cannot be added or deleted. Furthermore you cannot access most properties dialogs, change macros, access the script or save the document.

Server Enter the name or the URL to the computer running QlikView Server. Then click on **Connect** to connect. Recently visited servers can be retrieved in the drop-down list. A URL may contain additional connection data according to the syntax described in the next section.

Connect
Press this button in order to connect to a QlikView Server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

When connected, the central pane of the dialog will display the document folders available to you on the QlikView Server. Click on a folder and the available documents will be shown in the dialog's bottom pane. Double-click a document or select it and click on Open in order to open the document.

Authentication

Here you may select the way the QlikView Server will identify you when connecting. Three modes are available:

Use NT Identity

Use authenticated NT identity. Only works if you are working on a computer connected to the same Windows NT domain as the QlikView Server.

Anonymous

Use anonymous login. You will only be able to connect if the QlikView Server is set to allow anonymous users and you will only be able to see documents with file permissions for the QlikView Server anonymous account. The connection pseudo-URL under **Server** will be completed by a @ before the server name.

Alternate Identity

Use a specific NT user name known on the QlikView Server's domain. The user name is typed in the User ID edit box. You will be prompted for the corresponding user password when pressing the **Connect** button. The connection pseudo-URL under **Server** will be completed by *username@* before the server name, where *username* is the name you use.

Flat mode

Mark this check box if you prefer the bottom pane of the dialog to display the contents of all subfolders simultaneously rather than using the tree-view approach.

Open Opens the document selected in the bottom pane. Double-clicking the document name will have the same effect.

Cancel Closes the dialog without opening a document.

Help Opens interactive help.

Connection Pseudo URLs

When connecting to QlikView Server from Windows clients, either via the **Open in Server** dialog or via link files, a pseudo URL is used as document address.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The syntax is:

qvp://*[[username]@][documentname* **.qvw***][:(port | protocol)]*

where

username is a Windows user ID

documentname is the name of the QlikView document (excluding qvw extension)

port (e.g. 4749) can be used to specify a specific port used by the server

protocol (e.g. http) can be used to specify tunneling protocol

@ without *username* denotes anonymous identity.

If user identity is omitted altogether, the logged in Windows identity is assumed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23.10Inline Data Wizard

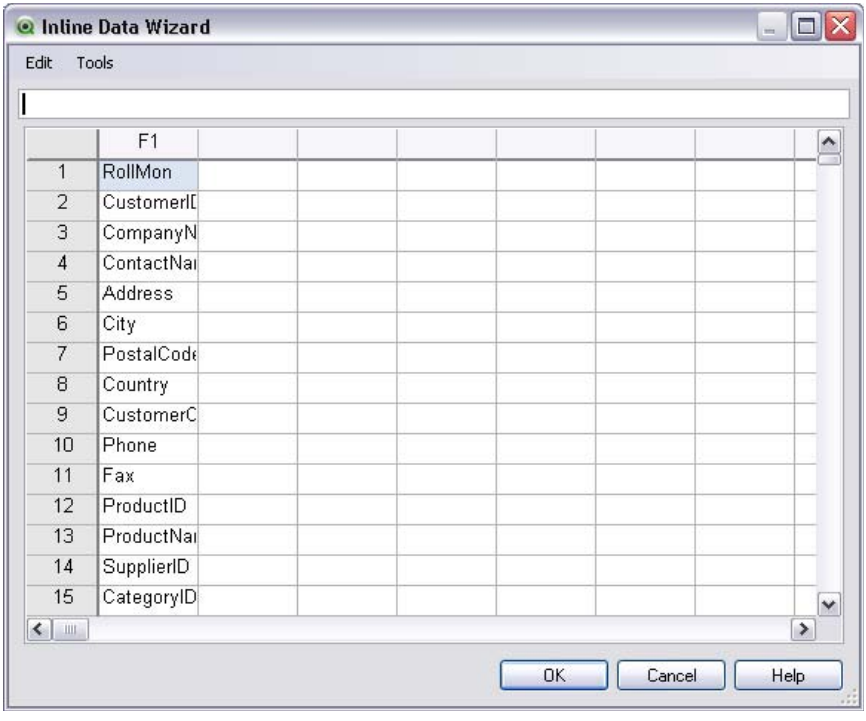


Figure 60. The Inline Data Wizard dialog box

The **Inline Data Wizard** dialog box (Figure 60) is opened by clicking the **Inline Wizard...** button in the **Data** page of the **Tool Pane** in the **Edit Script** dialog box (Figure 51 on page 227). It is used to create a **load inline** statement in the script.

The dialog contains something looking like a spreadsheet and in fact works like one in most respects. Note however that calculation formulas will not be evaluated in this spreadsheet as they would e.g. in Microsoft Excel.

Each column represents a field to be loaded into QlikView. Each row is a record in the table to be loaded. You select a data cell by clicking it. A value may then be entered. Press enter or an arrow key to accept the value and move to another cell. Note that empty cells in load inline statements represent ‘empty string’ . Data can also be pasted into one or more cells from the clipboard.

The dialog contains the following buttons:

OK The dialog is closed and a load inline statement reflecting the contents of the dialog’s table grid is generated.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Cancel Closes the dialog box without generating a load inline statement.

Help Invokes online help.

A number of commands are available in two menus:

EDIT menu

Cut Exports the selected cells to the Clipboard. This command is also available on the dialog toolbar. Equivalent to pressing CTRL+X.



Copy Copies the selected cells to the Clipboard. This command is also available on the dialog toolbar. Equivalent to pressing CTRL+C.



Paste Pastes the selected cells from the Clipboard. This command is also available on the dialog toolbar. Equivalent to pressing CTRL+V.



Insert Inserts a new blank row or column if one or more rows/columns are selected.

Delete Deletes a selected row or column. One or more whole rows or columns must be selected for this command to be available.

TOOLS menu

Document Data

Opens the **Import Document Data Wizard** from which it is possible to paste field values from any existing field in the document. In the dialog you can see how many field values are present in any

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

selected field. You may also choose to insert all values, selected values or excluded values into the inline wizard.

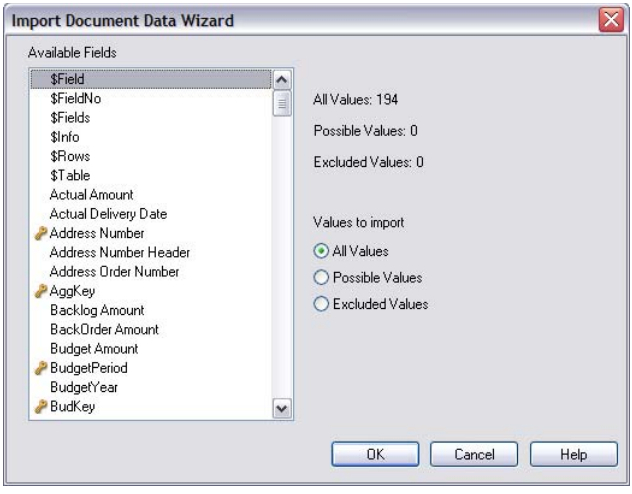


Figure 61. The Import Document Data Wizard

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23.11Access Restriction Table Wizard



Figure 62. The first page of the Access Restriction Table Wizard

The **Access Restriction Data Wizard** dialog box (Figure 62) is opened by clicking the **User Access...** button in the **Data** page of **Tool Pane** in the **Edit Script** dialog box (Figure 51 on page 227). It is used to generate a **load inline** statement for access control to the QlikView document.

The dialog contains the following commands:

Fields to Use
: The list contains all the possible reserved fields in a QlikView **section access**. Mark the check box for those you wish to include.

Basic User Access Table
: Press this button to mark ACCESS, USERID and PASSWORD while unmarking the other fields.

Basic NT Security
: Press this button to mark ACCESS, PASSWORD, NTNAME and NTDOMAINSID while unmarking the other fields.

OK
: The **Inline Data Wizard** dialog (see Figure 60 on page 253) will be opened with the selected fields as column labels. After you press **OK** in this dialog a **load inline** statement preceded by a **section access** statement and succeeded by a **section application** statement will be created.

Cancel
: Closes the dialog without generating a load inline statement.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Help Invokes online help.

23.12Table File Wizard

The table file wizard automatically appears when you open a file or an HTML table using the **Table Files...** button in the **Data** page of the **Tool Pane** in the **Edit Script** dialog (Figure 17 on page 115) provided that the **Wizard** check box is selected. The wizard also opens when a non-qvw file is opened from the **File** menu.

File types that QlikView can recognize are delimited text files (e.g. csv files), fix record files, dif files, Excel files, HTML files and XML files. In this manual these file types are referred to as **Table Files**.

Files can be loaded from the local network or directly from the Internet.

To load a file stored on a local network, use the **Table Files** button in the **Edit Script** dialog. If the file has a file extension of a table file, e.g. .csv, .txt, .tab, .skv, .fix, .dif, .htm, .html, .shtml, .xhtml, .php or .asp, the file will be shown in the **Open Local Files** dialog. It is possible to open the file even if it has a different extension; just set **Files of Type** to **All files (*.*)** in the **Open Local Files**. The content must however still be such that QlikView can interpret it. Whether or not QlikView can, is a different matter from what extension the file has.

To load a file directly from the Internet, paste the URL (previously copied from your web browser) into the text box named **File Name** in the FTP browsing dialog and click **Open**.

Once a file has been selected, the file wizard opens. It contains three pages: **Source**, **Type** and **Advanced**. Since one very rarely needs to change anything on the **Source** page, the wizard starts on the **Type** page. The **<<Back** and the **Next>>** buttons will take you from one page to another.

On the **Type** and **Advanced** pages there is a preview in which you can see how QlikView has interpreted the file.

The **Finish** button will close the wizard and generate a **load** statement in the load script.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Source Page

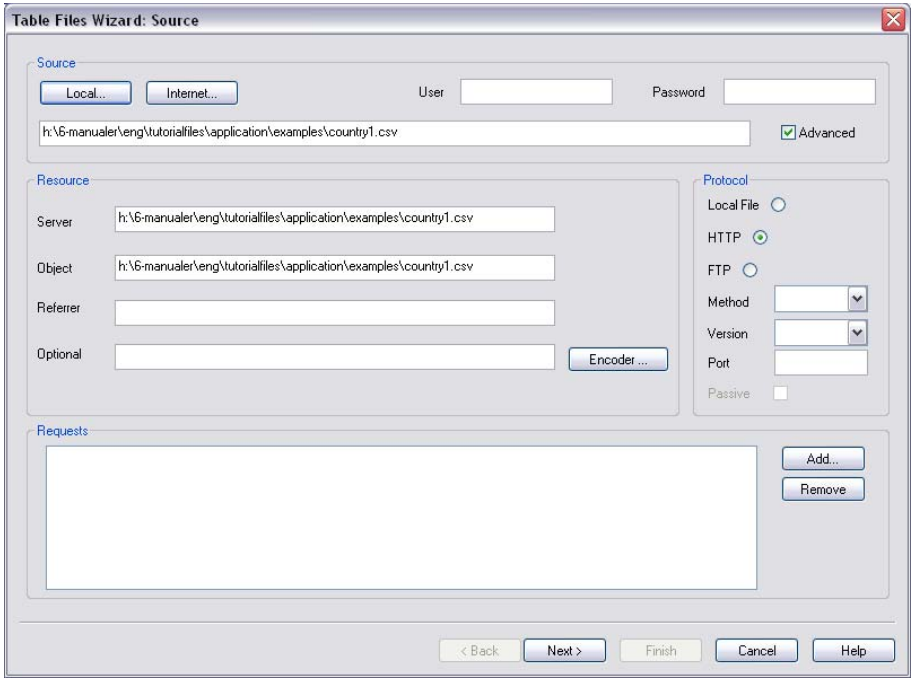


Figure 63. The Source page (advanced mode) of the Table Wizard

This page contains all the settings related to the source of the table. The source usually is well defined as soon as a file is selected in the **Open File** dialog, but if one needs to make changes in the source definition, which is often the case for e.g. tables fetched directly from Internet pages, this is the place to make them. Pressing the **<<Back** button on the **Type** page opens the **Source** page.

Source

In this area the source is specified. It is usually a reference to a file, but can also be a URL pointing at a remote table. It is possible to change the source by pressing any of the buttons.

Local This button opens a file-browsing dialog used to find and open local files containing tables.

Internet

This button opens an FTP file-browsing dialog used to find and open tables on the Internet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

User If the table is fetched from an Internet site that requires a logon, your logon user name may be entered here. It can also be entered in the dialog opened by the Internet button.

Password

If the table is fetched from an Internet site that requires a logon, your logon password may be entered here. It can also be entered in the dialog opened by the Internet button.

Advanced

If this box is checked, you can set advanced options and parameters used only for retrieval of tables on the Internet. These options and parameters are described below. By specifying some of these parameters it is possible not just to get published data, but also to e.g. mimic “POST” calls (normally used in forms) and to tell the server that the call comes from clicking on another specific http page.

Resource

The resources entered in this area are the resources used when making the HTTP or FTP request.

Server Here it is possible to specify the FTP or HTTP server on which the table is posted.

Object Here it is possible to specify the object containing the table.

Referrer

Here it is possible to set the referring page from which the call supposedly should be made. Only for HTTP calls.

Optional

Here it is possible to set optional parameters. Only for HTTP calls.

Encoder

Opens the CGI Encoder dialog.

Protocol

In this box it is possible to set the protocol used when the table is retrieved. It is also possible to differentiate between GET and POST calls. First a choice has to be made between **Local file**, **HTTP** and **FTP** depending on where the file is published.

Method

Here it is possible to set the method for the HTTP call. Choose between GET or POST.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Version

Here it is possible to set the HTTP version. Choose between HTTP 1.0 and HTTP 1.1.

Port What port to use. Default is port 80 for HTTP and port 21 for FTP.

Requests

Here it is possible to specify additional requests in the call. The **Add** button will open the HTTP request dialog. Only for HTTP calls.

CGI Encoder Dialog

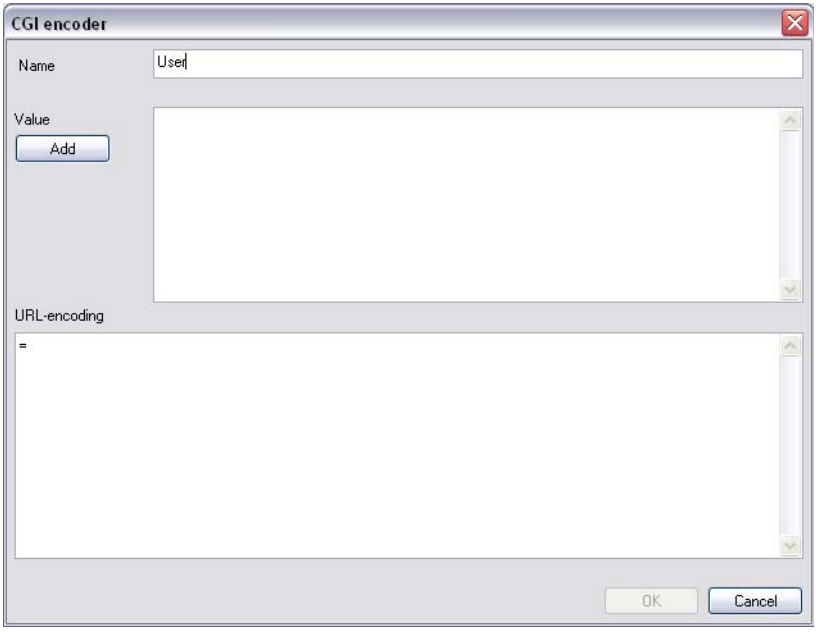


Figure 64. The CGI Encoder dialog

If an HTTP call should be made from a form, this dialog will help you create a correct URL-encoding for the call.

Name The name of the form field.

Value The value in the form field

Add Adds the combination of Name and Value to the URL encoding list.

URL Encoding

This is the URL-encoding of the field name and field value. This text string should, together with a question mark, be appended to the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

HTTP call, e.g. “http://www.qliktech.com/data.asp?Field-name=Fieldvalue”.

The **OK** button as well as the **Cancel** button closes the dialog without adding anything to the script.

HTTP Request Dialog

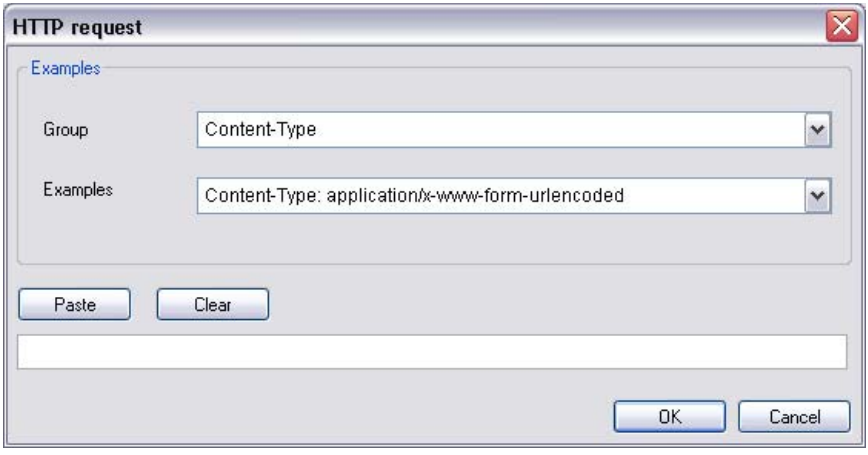


Figure 65. The HTTP Request dialog

An HTTP request is sometimes necessary in the call. This dialog creates some standard requests that easily can be modified for different purposes.

Examples

Group In this drop-down it is possible to select different request groups.

Examples

Some typical requests from the selected request group are shown in this drop-down list.

Paste Pastes the selected example into the edit box. This text can then be edited before the request is added to the request list.

Clear Clears the content of the edit box.

The **OK** button adds the content of the edit box to the request list and closes the dialog. The **Cancel** button closes the dialog without changing the request list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Type Page

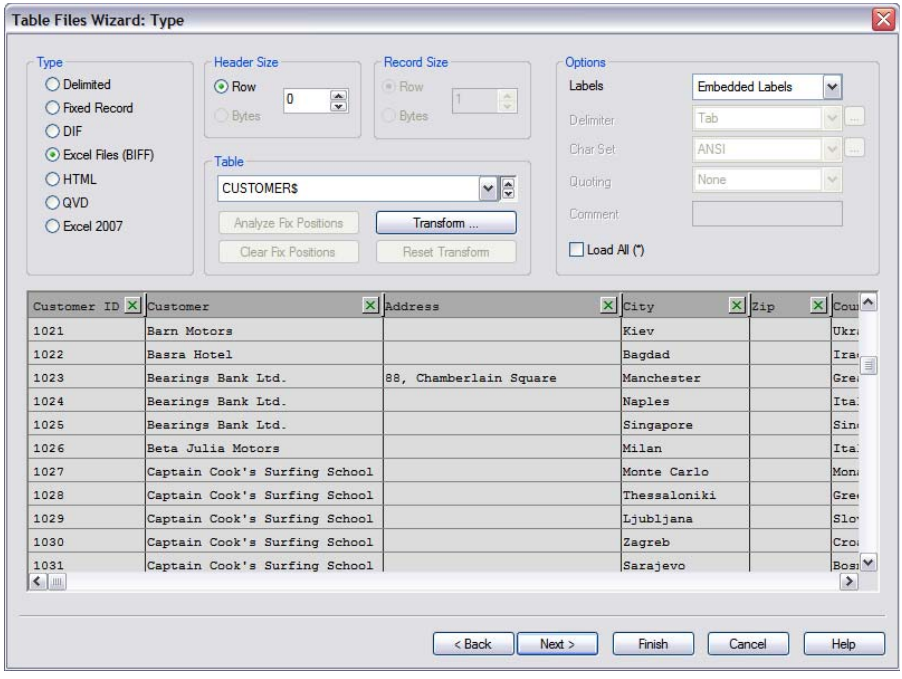


Figure 66. The Type page of the File Wizard

This page contains all the settings related to file type and table type. The upper half contains the parameters for the type of the file and the lower half contains a preview pane.

When opening a table file, the program tries to interpret the contents of the file. The initial values of the parameters are set this way, but can of course be changed manually by the user.

Type In the **Type** group the type of file - Delimited, Fixed record, DIF, Excel Files (BIFF), Excel 2007, HTML or QVD - is set.

Header Size

In the **Header Size** group you can choose to omit the header part of the file: the first line or a specified number of bytes (only for delimited, fixed record and Excel files).

Record Size

In the **Record Size** group you can specify the size of a record to be one line or a specified number of bytes (only for fixed record files).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Table In the **Table** group you can choose a specific table when reading from a file containing several tables, e.g. HTML or Excel files. In Excel, all sheets in a workbook and all named areas (e.g. multiple cells with names) in the worksheets are identified as possible tables.

Analyze Fix Positions

Analyzes and sets the columns widths for fix record files and for some HTML tables. After the analysis, column breaks can be added or removed in the preview pane.

Clear Fix Positions

Clears all column breaks (For fix record files and for some HTML tables).

Transform

This button will open the **Transform Table dialog**, where it is possible to make advanced filtering and transformation of the table.

Reset Transform

Resets the table to its original state after a transformation has been made.

Options

In the **Options** group you can make optional settings.

Labels If the field names (column headers) are stored in the first line of the table, this control should be set to **Embedded**. The **DIF** format also allows field names to be explicitly specified, and if that is the case, this control should be set to **Explicit**. If the table contains no field names, the **None** alternative should be used.

Delimiter

If you choose **Delimited** as **Type**, you can specify whether the file is separated by tabs, semicolons or commas. If some other delimiter is used, this can be entered by pressing the ellipsis button to the right.

Char Set

The character set of the table file is set here: **Ansi**, **Oem**, **Mac**, **UTF-8** or **Unicode** character sets. If some other character set is used, it can be entered by pressing the ellipsis button to the right.

Quoting

Here it is possible to set the quoting scheme to be used. Choose between **Standard**, **None** or **MSQ**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Comment

In some files, comments are used between records. Often a comment line begins with a special character or a set of characters, e.g. “//”. Here it is possible to specify the character(s) that mark the beginning of a comment.

Load All*

If this check box is marked, the **load** statement generated will load all the fields into QlikView (the asterisk is equivalent to "all fields"). However, the field names will not be displayed in the script.

Preview Pane

The result of the chosen settings is displayed in the preview pane (the lower part of the dialog page). When the settings are changed, the contents of the preview pane is changed accordingly.

It is also possible to make some changes directly in the preview pane. First, it is possible to omit fields by clicking the “cross” button to the right of the field name. The cross will then change into an exclamation mark and the field will not be included in the **load** statement. To revoke this change, just click the exclamation mark once more.

If you wish to rename a field, just click the field name, then enter the new name in this box. The **as** clauses in the **load** statement required are then created automatically.

Finally, for fix record files (and some HTML tables) it is also possible to set the column widths directly by clicking in the preview pane.

Transform Table Dialog

In the **Transform Table** dialog it is possible to filter and make advanced transformations of a table. For HTML files this is important, since there is no commonly used standard for how to store data in HTML. As a result, it is impossible to make QlikView capable of reading HTML tables as easily as other more structured data formats.

The Transform Table dialog provides a variety of filters that can be used to make tables more suitable for QlikView. The dialog has six pages; Garbage, Fill, Column, Context, Unwrap and Rotate. These are described below. The five button commands to the left in the Transform Table dialog are however used for all six pages:

Undo Undoes the last added change.

Redo Redoes the last Undo.

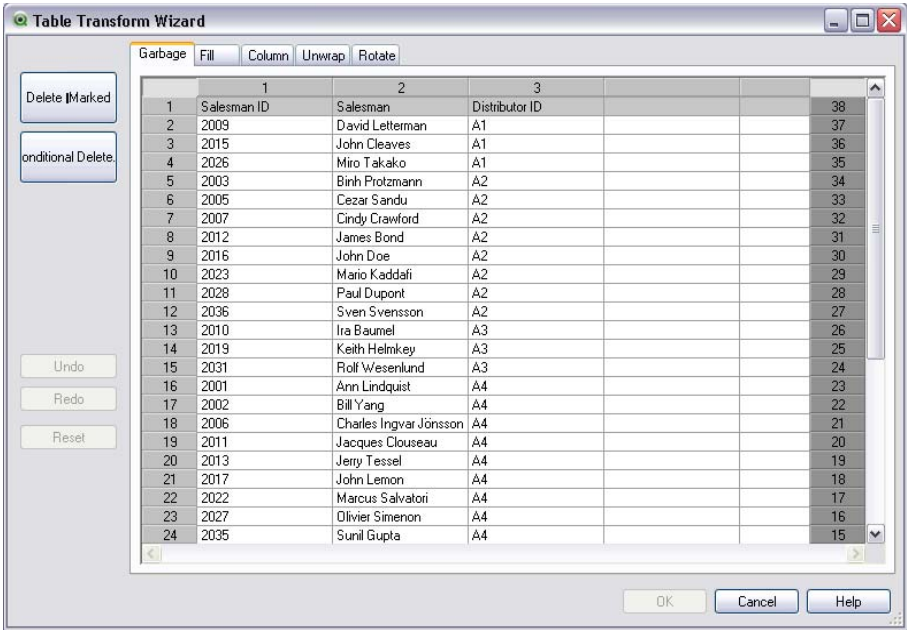
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Reset Resets the table to the original state.

OK Accepts all transformations and closes the dialog.

Cancel Resets the table to the original state and closes the dialog.

Garbage



	1	2	3			
1	Salesman ID	Salesman	Distributor ID			38
2	2009	David Letterman	A1			37
3	2015	John Cleaves	A1			36
4	2026	Miro Takako	A1			35
5	2003	Binh Protzmann	A2			34
6	2005	Cezar Sandu	A2			33
7	2007	Cindy Crawford	A2			32
8	2012	James Bond	A2			31
9	2016	John Doe	A2			30
10	2023	Mario Kaddafi	A2			29
11	2028	Paul Dupont	A2			28
12	2036	Sven Svensson	A2			27
13	2010	Ira Baumel	A3			26
14	2019	Keith Helmkey	A3			25
15	2031	Rolf Wesenlund	A3			24
16	2001	Ann Lindquist	A4			23
17	2002	Bill Yang	A4			22
18	2006	Charles Ingvar Jönsson	A4			21
19	2011	Jacques Clouseau	A4			20
20	2013	Jerry Tessel	A4			19
21	2017	John Lemon	A4			18
22	2022	Marcus Salvatori	A4			17
23	2027	Olivier Simenon	A4			16
24	2035	Sunil Gupta	A4			15

Figure 67. The Garbage page of the Transform Table wizard

On this page, rows and columns containing garbage can be removed from the table. For HTML files it is not uncommon with extra rows and columns that are there just for legibility and these must of course be removed before loading the data into QlikView.

Columns and rows can both be removed explicitly in which case their indices are stored in the script. Rows can also be removed using conditional criteria.

For instance, in the table shown in Figure 67 one would probably want to remove several rows. It is then easy to remove the lines 1, 12 and 13 by marking them and clicking the **Delete Marked** button. Once this has been done, row 2 can be used as labels for the columns.

Delete Marked

Removes marked rows and columns.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Conditional Delete

Opens the **Specify Row Condition** dialog where the conditional criteria for deletion of rows can be set.

Specify Row Condition

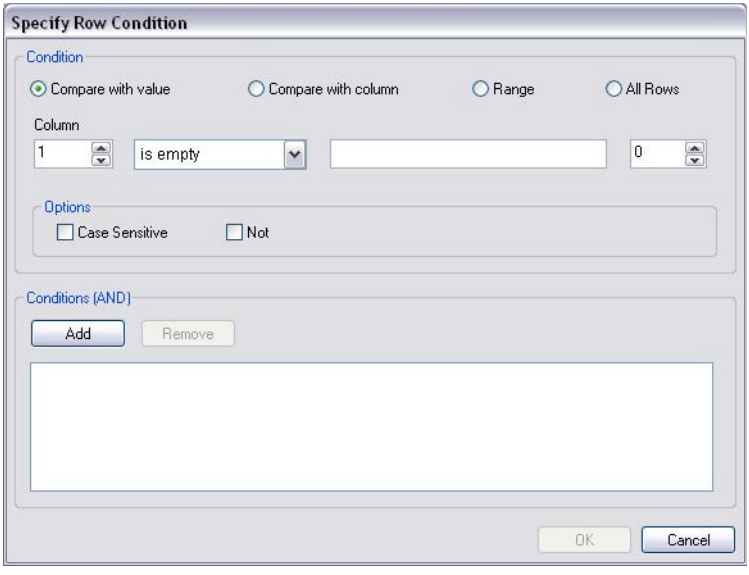


Figure 68. The Specify Row Condition dialog

This dialog helps you set the condition for which rows should be deleted.

Condition

In the **Condition** group you can specify a condition where a column equals a specific value or another column, a range of records or all records. Several conditions can be applied together. After defining a condition you must press the **Add** button to include it in the transformation.

Compare with Value

Matches the cell with a cell condition that can evaluate to true or false.

Compare with Column

Matches the cell with the corresponding cell in another column.

Range Selects x rows, then skips y rows. Starting and ending positions for this may be specified with indexes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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All Rows

Use this condition if all rows should be deleted.

Column

Sets the column number on which the condition should be applied.

From Only visible in **Range** mode. Sets the row number from which rows should be deleted or a second condition should be applied.

To Only visible in **Range** mode. Sets the row number to which rows should be deleted or a second condition should be applied.

Select Only visible in **Range** mode.

Here it is possible to set whether rows should be selected cyclically or skipped cyclically, e.g. cyclically select two rows, then skip one. If all rows should be used, Select should be set to 1 and Skip should be set to 0.

Options

In the **Options** subgroup you can specify modifiers for the selection.

Case Sensitive

Mark this check box if comparisons should be case sensitive.

Not Mark this check box if the selection criteria should be inverted.

Conditions (AND)

In the **Conditions (AND)** group you see the conditions specified and included in the transformation. A logical AND is applied between conditions.

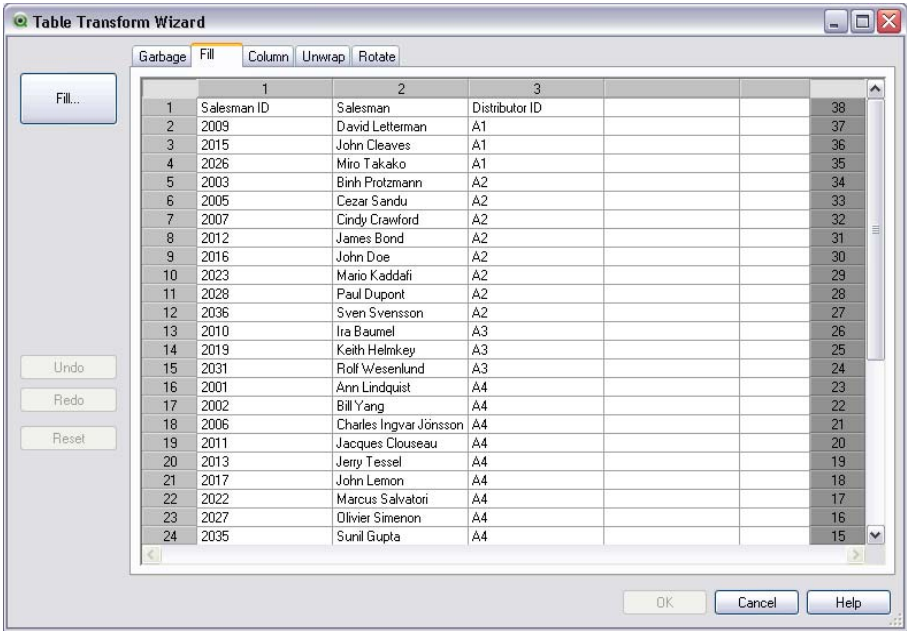
Add Adds the current condition to the list.

Remove

Removes a selected condition from the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Fill



	1	2	3			
1	Salesman ID	Salesman	Distributor ID			38
2	2009	David Letterman	A1			37
3	2015	John Cleaves	A1			36
4	2026	Miro Takako	A1			35
5	2003	Binh Protzmann	A2			34
6	2005	Cezar Sandu	A2			33
7	2007	Cindy Crawford	A2			32
8	2012	James Bond	A2			31
9	2016	John Doe	A2			30
10	2023	Mario Kaddafi	A2			29
11	2028	Paul Dupont	A2			28
12	2036	Sven Svensson	A2			27
13	2010	Ira Baumel	A3			26
14	2019	Keith Helmkey	A3			25
15	2031	Rolf Wesenlund	A3			24
16	2001	Ann Lindquist	A4			23
17	2002	Bill Yang	A4			22
18	2006	Charles Ingvar Jönsson	A4			21
19	2011	Jacques Clouseau	A4			20
20	2013	Jerry Tessel	A4			19
21	2017	John Lemon	A4			18
22	2022	Marcus Salvatori	A4			17
23	2027	Olivier Simenon	A4			16
24	2035	Sunil Gupta	A4			15

Figure 69. The Fill page of the Transform Table wizard

With this page you can replace cell values. The power of this feature will become evident as you use the wizard. In most cases certain cells that match a specific description are replaced with another value from the same column.

A common case is that cells are empty and that the first non-empty cell above contains the relevant value.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Fill Cells Dialog

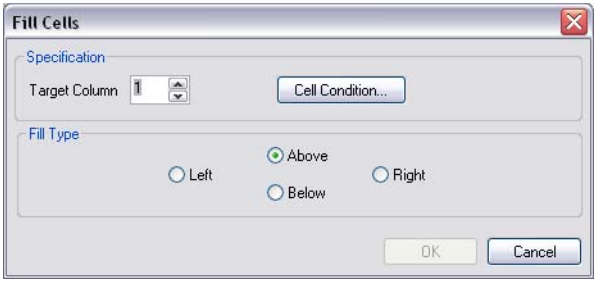


Figure 70. The Fill Cells dialog

Specification

In the **Specification** group it is possible to specify in what cases the cell should be filled.

Target Column

Sets the column number on which the condition should be applied.

Cell Condition

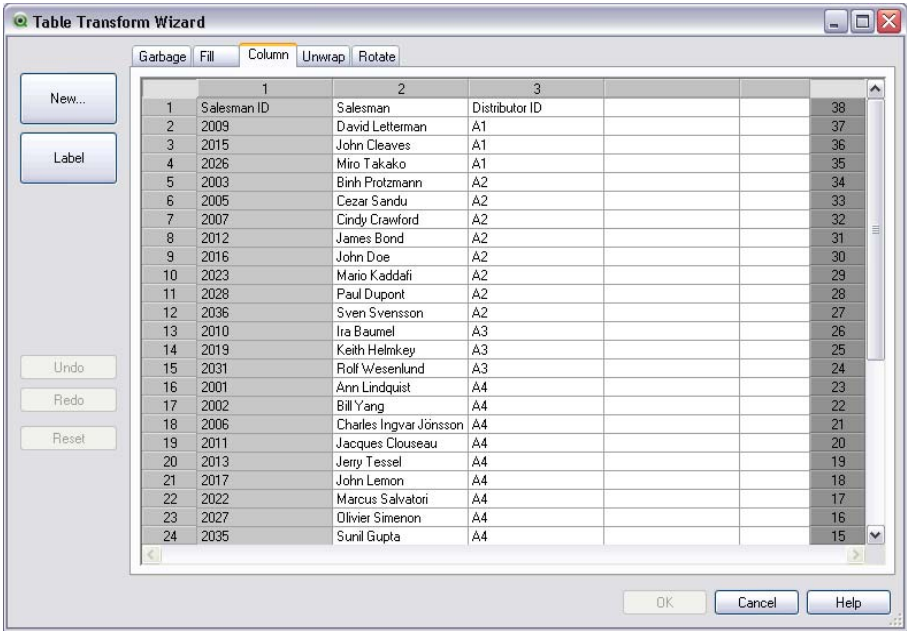
Opens the cell condition dialog where it is possible to set the cell condition.

Fill Type

Sets the strategy for how cells should be filled. Use one of the values **Above**, **Left**, **Right** or **Below**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Column



	1	2	3			
1	Salesman ID	Salesman	Distributor ID			38
2	2009	David Letterman	A1			37
3	2015	John Cleaves	A1			36
4	2026	Miro Takako	A1			35
5	2003	Binh Protzmann	A2			34
6	2005	Cezar Sandu	A2			33
7	2007	Cindy Crawford	A2			32
8	2012	James Bond	A2			31
9	2016	John Doe	A2			30
10	2023	Mario Kaddafi	A2			29
11	2028	Paul Dupont	A2			28
12	2036	Sven Svensson	A2			27
13	2010	Ira Baumel	A3			26
14	2019	Keith Helmkey	A3			25
15	2031	Rolf Wesenlund	A3			24
16	2001	Ann Lindquist	A4			23
17	2002	Bill Yang	A4			22
18	2006	Charles Ingvar Jönsson	A4			21
19	2011	Jacques Clouseau	A4			20
20	2013	Jerry Tessel	A4			19
21	2017	John Lemon	A4			18
22	2022	Marcus Salvatori	A4			17
23	2027	Olivier Simenon	A4			16
24	2035	Sunil Gupta	A4			15

Figure 71. The Column page of the Transform Table wizard

This page is used to copy a column to a new column. The new column may contain all the cells of the source column or a selection of the cells.

This feature can be useful if a column contains different kinds of values. It can also be used to duplicate a column that contains HTML links, so that one column contains the link's text, whereas the other column contains its URL.

New Opens the **Specify Cells for New Column** dialog where it is possible to specify how the new column should be created.

Label Sets the label for the column.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Specify Cells for New Column

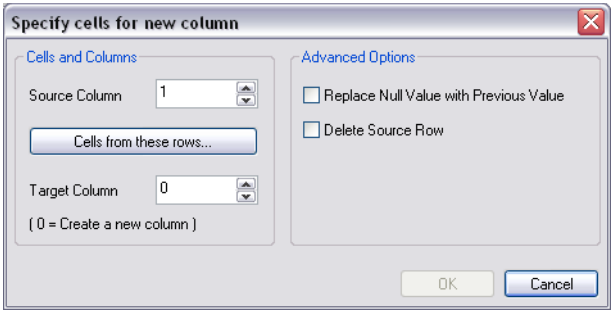


Figure 72. The Specify Cells for New Column

Cells and Columns

Source Column
Sets the column number from which cell values should be copied.

Cells from these rows
Opens the **Specify Row Condition** dialog (see below) where it is possible to set the Row condition.

Target Column
Specifies the number of the target columns.

Advanced Options

Replace Null Value with Previous Value
Fills empty cells with the value in the cell above.

Delete Source Row
Deletes the source row.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Specify Row Condition

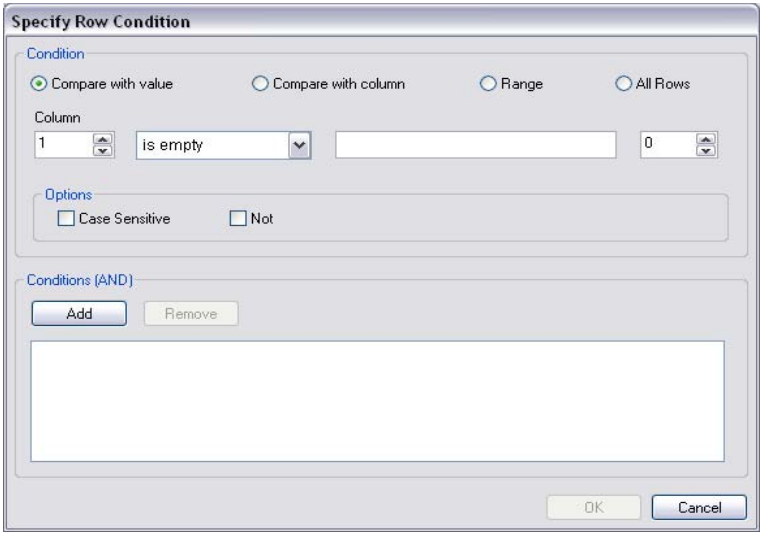


Figure 73. The Specify Row Condition dialog

The **Specify Row Condition** dialog helps you set the condition for which rows should be copied.

Condition

In the **Condition** group you can choose to have a condition where a column equals a specific value or another column, a range of records or all records. Several conditions can be applied together.

Compare with Value

Matches the cell with a cell condition that can evaluate to true or false.

Compare with Column

Matches the cell with the corresponding cell in another row.

Range Selects *x* rows, then skips *y* rows. Starting and ending positions for this may be specified with indexes.

All Rows

Use this condition if all rows should be deleted.

Column

Sets the column number on which the condition should be applied.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Cell Condition

Opens the Cell Condition dialog where it is possible to set the cell condition.

From Sets the row number from where the copying or a second condition should be applied.

To Sets the row number to where the copying or a second condition should be applied.

Select Here it is possible to set that rows should be selected cyclically or skipped cyclically, e.g. cyclically select two rows, then skip one. If all rows should be used, **Select** should be set to 1 and **Skip** should be set to 0

Compound

Mark this check box if a second condition should be applied. With the **Add** button you can add the current row condition to a list of conditions that must be true for the compound condition to be true.

Context

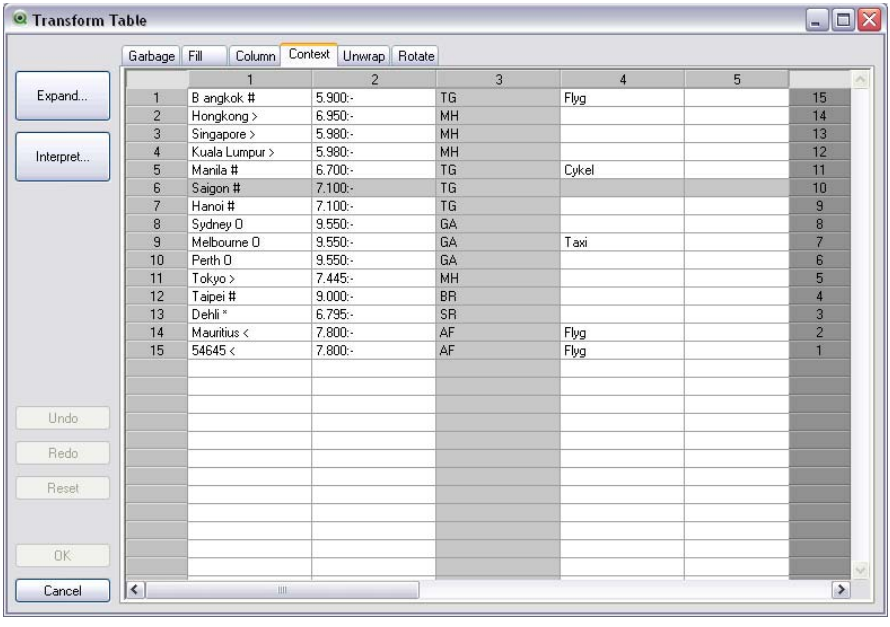


Figure 74. The Context page of the Transform Table wizard

In an html table more information than what is visible can be stored, e.g. in the case that the content of a cell is clickable, the address to where the browser should jump

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

must also be stored. The **Transform wizard** will show the text of the cell, but is also able to show the additional information belonging to the different cells. Naturally, it is also possible to read this information into QlikView.

Tags always enclose the additional information. A tag has a name and may have attributes, which sometimes have values. The context of a cell may look like this:

Example:

```
<A href=www.myurl.com/mypage.html name="MyName">
My link text
</A>
```

The visible text of the cell is *My link text*. The context contains two attributes, a start tag and an end tag. The tags specify a hypertext link. The start tag has two attributes, *href* and *name*.

The **Context** page can be used to read the attribute of tags instead of the main string. Other kinds of operations are also possible. You can right-click the cells in the wizard and choose **View context** to look at the context of the cell.

Expand Opens the **Context cell expansion** dialog in which an expansion of the contents of one cell into several cells can be defined. Note that both a column and a row must be marked in order for this button to be enabled. However, all the cells in the column will be expanded.

Interpretation

Opens the **Context Interpretation** dialog in which an interpretation of the contents of the cells can be defined. Note that both a column and a row must be marked in order for this button to be enabled. However, all the cells in the column will be interpreted.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Context Cell Expansion

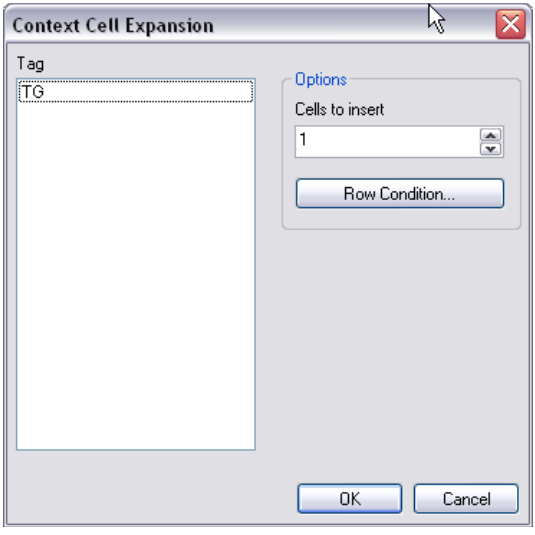


Figure 75. The Context Cell Expansion dialog of the table file wizard

With this dialog it is possible to expand the contents of one cell into several cells. In some situations you will find that several rows in a column is stored within one cell of the HTML table, i.e. between the <TD> and the </TD> tags. This cell can then be expanded into a column. Just mark the tag that is used as delimiter between the different rows within the column. Usually this is the
 symbol.

Cells to Insert
Number of cells to insert. Normally this should be set to 1, but if extra rows are needed, this control should be set to a higher number.

Row Condition
Condition for what rows to expand.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Context Interpretation

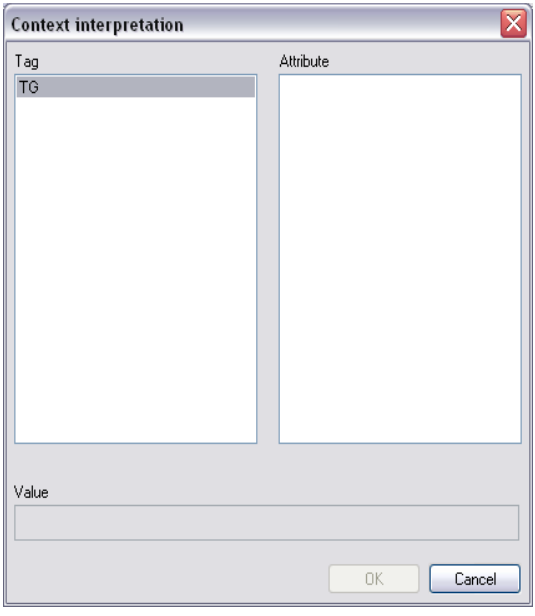


Figure 76. The Context Interpretation dialog of the table file wizard

With this dialog it is possible to exchange the value of a cell with piece of hidden information found in the cell.

The cell can contain several other tags, each with one, sometimes several, attributes. By selecting the appropriate tag and attribute and then pressing OK, the cell content is replaced with that of the value of the attribute.

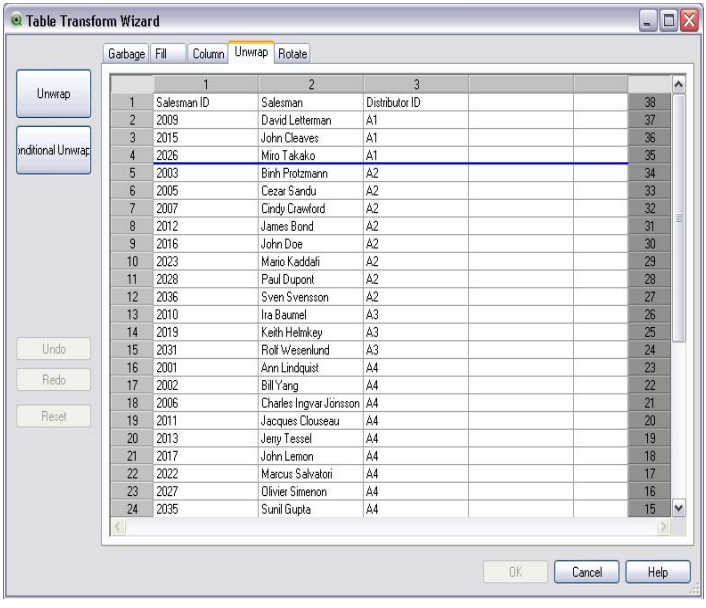
Tag A list of the tags found in the cell.

Attribute
The attribute of the marked tag.

Value The value of the attribute.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unwrap



	1	2	3			
1	Salesman ID	Salesman	Distributor ID			38
2	2009	David Letterman	A1			37
3	2015	John Cleaves	A1			36
4	2026	Miro Takako	A1			35
5	2003	Binh Protzmann	A2			34
6	2005	Cezar Sandu	A2			33
7	2007	Cindy Crawford	A2			32
8	2012	James Bond	A2			31
9	2016	John Doe	A2			30
10	2023	Mario Kaddafi	A2			29
11	2028	Paul Dupont	A2			28
12	2036	Sven Svensson	A2			27
13	2010	Ira Baumel	A3			26
14	2019	Keith Helmkey	A3			25
15	2031	Rolf Wesenlund	A3			24
16	2001	Ann Lindquist	A4			23
17	2002	Bill Yang	A4			22
18	2006	Charles Ingvar Jönsson	A4			21
19	2011	Jacques Clouseau	A4			20
20	2013	Jerry Tessel	A4			19
21	2017	John Lemon	A4			18
22	2022	Marcus Salvatori	A4			17
23	2027	Olivier Simenon	A4			16
24	2035	Sunil Gupta	A4			15

Figure 77. The Unwrap page of the Transform Table wizard

Here you can straighten out a wrapped table. “Wrapped” here means that a second part of the table continues, not below as it should, but beside the first part of the table. In the example above, the right half will thus be moved and put below the left half.

Unwrap

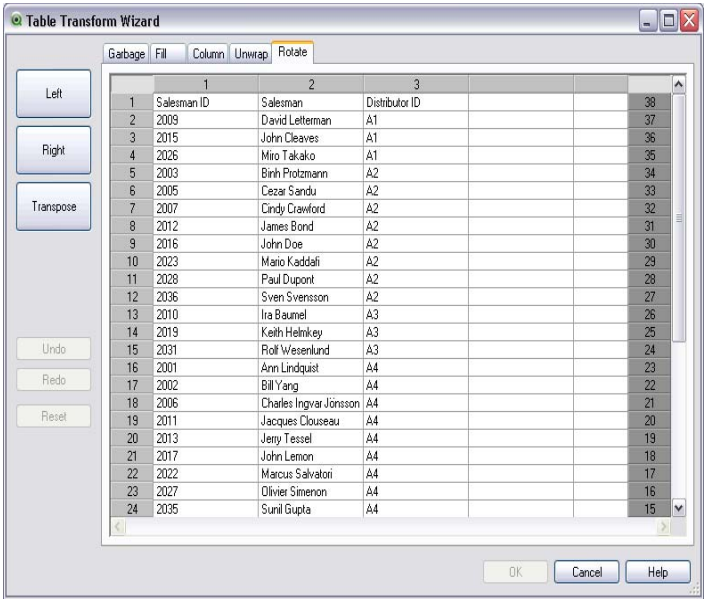
Unwraps the table. The border between the two halves must be set with the cursor first. It is possible to split the table either vertically or horizontally.

Conditional Unwrap

Defines the condition for a vertical split of the table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Rotate



	1	2	3			
1	Salesman ID	Salesman	Distributor ID			38
2	2009	David Letterman	A1			37
3	2015	John Cleaves	A1			36
4	2026	Miro Takako	A1			35
5	2003	Binh Protzmann	A2			34
6	2005	Cezar Sandu	A2			33
7	2007	Cindy Crawford	A2			32
8	2012	James Bond	A2			31
9	2016	John Doe	A2			30
10	2023	Mario Kaddafi	A2			29
11	2028	Paul Dupont	A2			28
12	2036	Sven Svensson	A2			27
13	2010	Ira Baumel	A3			26
14	2019	Keith Helmkey	A3			25
15	2031	Rolf Wesenlund	A3			24
16	2001	Ann Lindquist	A4			23
17	2002	Bill Yang	A4			22
18	2006	Charles Ingvar Jönsson	A4			21
19	2011	Jacques Clouseau	A4			20
20	2013	Jerry Tessel	A4			19
21	2017	John Lemon	A4			18
22	2022	Marcus Salvatori	A4			17
23	2027	Olivier Simenon	A4			16
24	2035	Sunil Gupta	A4			15

Figure 78. The Rotate page of the Transform Table wizard

Web designers often rotate tables to give them a nicer look. The main intention of the rotation feature is to make it possible to turn tables "back to normal"; to get fields as columns, field names on the first row etc.

Left Rotates the table counterclockwise.

Right Rotates the table clockwise.

Transpose

Transposes the table, i.e. turns the table around so that the top right cell becomes the bottom left cell and the bottom left becomes the top right. The top left and bottom right cells, however, stay in place.

Examples of Using the Transform Table Wizard

Example 1

This example shows how to use the **Transform Table Wizard** to add a column and fill it with the relevant header information and, after this, delete the header rows.

The html file looks like Figure 79. It is called *StockIndices.htm* and can be found in the installation directory *../Documentation/Examples*. The upper part contains some stock market indices for Europe/Africa and the lower part

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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some for Asia/Pacific. Obviously a necessary transformation will be to add a column with the Regional information and delete the header rows that contain the geographical information.

Europe/Africa

Index	Value	Chg	Pct Chg	Date
BLOOMBERG EUROPEAN 500 (EURO500)	257.29	0.47	0.18%	10:00
FT-SE 100 Index (UKX)	6305.90	11.60	0.18%	9:49
CAC 40 INDEX (CAC)	5903.59	-22.03	-0.37%	10:03
DAX INDEX (DAX)	6696.08	0.88	0.01%	10:04
IBEX 35 INDEX (IBEX)	9956.40	-133.70	-1.33%	9:44
MILAN MIB30 INDEX (MIB30)	44648.00	-140.00	-0.31%	9:49
BEL20 INDEX (BEL20)	2978.32	-1.50	-0.05%	9:44
AMSTERDAM EXCHANGES INDX (AEX)	635.63	3.06	0.48%	10:04
SWISS MARKET INDEX (SMI)	8065.10	23.70	0.29%	10:04

Asia/Pacific

Index	Value	Chg	Pct Chg	Date
NIKKEI 225 INDEX (NKY)	13845.28	149.22	1.09%	1:01
HANG SENG STOCK INDEX (HSI)	16099.82	55.61	0.35%	3:07
ASX ALL ORDINARIES INDX (AS30)	3265.00	-3.20	-0.10%	1/26
SING: STRAITS TIMES INDU (STI)	1932.05	26.16	1.37%	4:05

Figure 79. StockIndices.htm

1 Open the file using the **Table Files** button in the **Edit Script** dialog.

2 Open the **Transform Table** dialog using the **Transform** button in the **Table Files wizard**.

3 Switch to the **Column** sheet and press the **New** button. This will open the **Specify Cells for New Column** dialog.

4 Set the **Source Column** to 1. This specifies that the content of column 1 will for some rows be copied into a new column.

5 Press **Cells from these rows** to specify which rows should be copied. This will open the **Specify Row Condition** dialog.

6 Set the condition to **Compare with column** and change the right column number to 2. The condition should now be that column 1 equals column 2, i.e. a new column will be created and for those rows where column 1 is identical to column 2, column 1 will be copied into the new column.

7 Press **OK** to close the dialog.

8 Check **Replace Null Value with Previous Value**. This will fill all empty cells of the new column with the value above.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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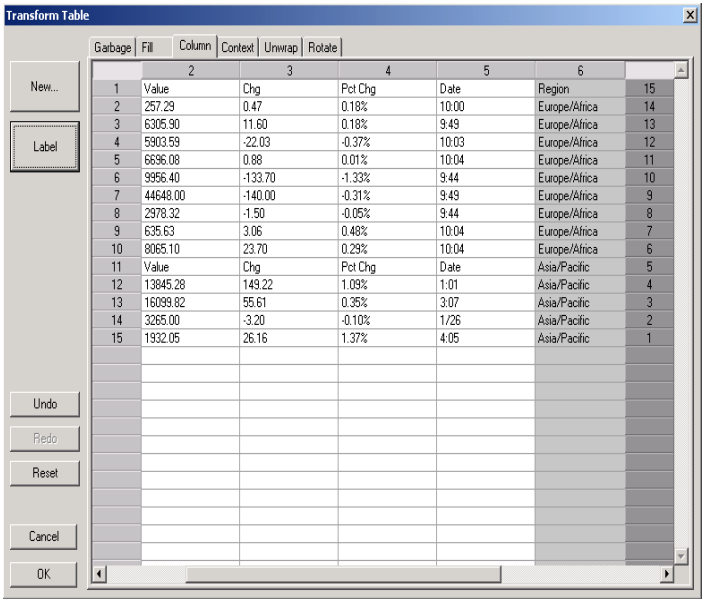
9 Check **Delete Source Row**. This will delete the header rows *“Europe/Africa”* and *“Asia/Pacific”*.

10 Press **OK**. A new column should now have been created.

11 Mark the new column and press **Label**.

12 Enter “*Region*” as the new column label and press **OK**.

The table should now look like the table in Figure 80. A new column by the name of “Region” should have been created and the old header rows should have disappeared. The next step is to delete the extra row with column names found on row 11.



	2	3	4	5	6	
1	Value	Chg	Pct Chg	Date	Region	15
2	257.29	0.47	0.18%	10:00	Europe/Africa	14
3	6305.90	11.60	0.18%	9:49	Europe/Africa	13
4	5903.59	-22.03	-0.37%	10:03	Europe/Africa	12
5	6696.08	0.88	0.01%	10:04	Europe/Africa	11
6	9956.40	-133.70	-1.33%	9:44	Europe/Africa	10
7	44648.00	-140.00	-0.31%	9:49	Europe/Africa	9
8	2978.32	-1.50	-0.05%	9:44	Europe/Africa	8
9	635.63	3.06	0.48%	10:04	Europe/Africa	7
10	8065.10	23.70	0.29%	10:04	Europe/Africa	6
11	Value	Chg	Pct Chg	Date	Asia/Pacific	5
12	13845.28	149.22	1.09%	1:01	Asia/Pacific	4
13	16099.82	55.61	0.35%	3:07	Asia/Pacific	3
14	3265.00	-3.20	-0.10%	1/26	Asia/Pacific	2
15	1932.05	26.16	1.37%	4:05	Asia/Pacific	1

Figure 80. New column - "Region"

13 Switch to the **Garbage** page.

14 Mark row 11 and press the **Delete Marked** button.

15 Close the dialog by pressing **OK** and run the script by pressing **Run**.

This is the entire transformation needed for this html file. However, this script will always delete row 11, even if the number of rows in the first part changes. It is better to use a more dynamic approach: use the conditional delete and demand that rows containing the word “Index” in the first column

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

and with a row number greater than or equal to 2 be deleted. Hence, the alternative approach would be:

1 Switch to the **Garbage** sheet and press the **Conditional Delete** button. This will open the **Specify Row Condition** dialog.

2 Set the condition to **Compare with value** and set the column number to 1.

3 Press the **Cell Condition** button.

4 Demand that the **Cell value** contains the string "*Index*" and press **OK**.

5 Mark the check box **Compound** to mark that this is the first half of a compound condition. Press the **Add** button.

6 Set the condition to **Range** to enter the second half of the condition.

7 Press **From** and set the beginning of the range to row number 2 from the Top. Press **OK**.

8 Press **To** and set the end of the range to row number 1 from the Bottom. Press **OK**.

9 Press **Select** and set **Select** to 1 and **Skip** to 0. (Select every row and skip none.) Press **OK**.

10 Press the **Add** button to add the second condition. Press **OK**.

11 Close the **Transform** dialog by pressing **OK**.

12 Close the **Table Files** wizard by pressing **Finish** and run the script by pressing **Run**.

This will also transform the table to something usable for QlikView.

Example 2:
This example shows how to use the **Transform Table Wizard** to delete a column and, after this, unwrap the table, i.e. interpret column 4, 5 and 6 as continuations of column 1, 2 and 3.

The html file looks like Figure 81. It is called *Travel.htm* and can be found in the installation directory *../Documentation/Examples*. The left part contains some travel destinations, their prices and the corresponding airlines. The right part contains some other destinations. Obviously the right part of the table is a continuation of the left, so a transformation including the **Unwrap**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

function will be needed. Also, the narrow column separating the two halves must be deleted.

Bangkok	5.900:-	*Thai Airlines*	Phuket	6.400:-	*Thai Airlines*
Hongkong	6.950:-	*Malaysian Airlines*	Penang	5.980:-	*Malaysian Airlines*
Singapore	5.980:-	*Singapore Airlines*	Bali	6.710:-	*Malaysian Airlines*
Kuala Lumpur	5.980:-	*Malaysian Airlines*	Langkawi	5.980:-	*Malaysian Airlines*
Manila	6.700:-	*Thai Airlines*	Cebu	7.200:-	*Malaysian Airlines*
Saigon	7.100:-	*Thai Airlines*	Jakarta	6.955:-	*Malaysian Airlines*
Hanoi	7.100:-	*Thai Airlines*	Kuching	6.230:-	*Malaysian Airlines*
Sydney	9.550:-	*Garuda*	Auckland	9.550:-	*Garuda*
Melbourne	9.550:-	*Garuda*	Brisbane	9.500:-	*Garuda*
Perth	9.550:-	*Garuda*	Peking	7.200:-	*Scandinavian Airlines*
Tokyo	7.445:-	*Malaysian Airlines*	Seoul	8.090:-	*Swiss Air*
Taipei	9.000:-	*Eva Air*	Koh Samui	7.300:-	*Thai Airlines*
Dehli	6.795:-	*Swiss Air*	Davao	7.500:-	*Singapore Airlines*
Mauritius	7.800:-	*Air France*	Tokyo	7.990:-	*Japan Air*
Vladivostok	7.800:-	*Aeroflot*			

Figure 81. The Travel.htm table

1 Open the file using the **Table Files** button in the **Edit script** dialog.

2 Open the **Transform Table** dialog using the Transform button in the Table Files wizard.

3 Switch to the **Garbage** page and mark the fourth column for deletion. Press the **Delete Marked** button.

4 Switch to the **Unwrap** page. Click the border between column 3 and column 4 (See Figure 82).

5 Press the **Unwrap** button. This will move the right part of the table down below the left part.

6 Close the **Transform** dialog by pressing **OK**.

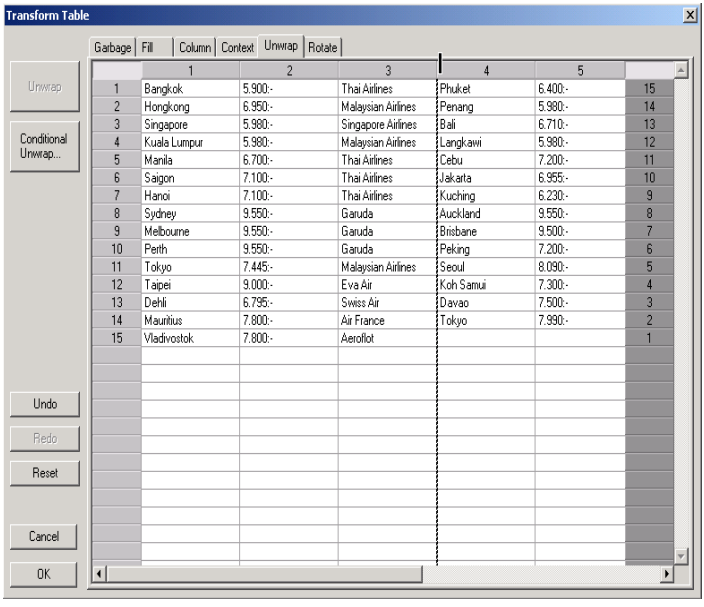
7 Change the **Labels** to **None**.

8 Click the @1, the @2 and the @3 in the preview pane and change these to *Destination*, *Price* and *Airline*, respectively.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

9 Close the **Table Files** wizard by pressing **Finish** and run the script by pressing **Run**.

This will transform the table to something usable for QlikView.



	1	2	3	4	5	
1	Bangkok	5.900:-	Thai Airlines	Phuket	6.400:-	15
2	Hongkong	6.950:-	Malaysian Airlines	Penang	5.980:-	14
3	Singapore	5.980:-	Singapore Airlines	Bali	6.710:-	13
4	Kuala Lumpur	5.980:-	Malaysian Airlines	Langkawi	5.980:-	12
5	Manila	6.700:-	Thai Airlines	Cebu	7.200:-	11
6	Saigon	7.100:-	Thai Airlines	Jakarta	6.955:-	10
7	Hanoi	7.100:-	Thai Airlines	Kuching	6.230:-	9
8	Sydney	9.550:-	Garuda	Auckland	9.550:-	8
9	Melbourne	9.550:-	Garuda	Brisbane	9.500:-	7
10	Perth	9.550:-	Garuda	Peking	7.200:-	6
11	Tokyo	7.445:-	Malaysian Airlines	Seoul	8.090:-	5
12	Taipei	9.000:-	Eva Air	Koh Samui	7.300:-	4
13	Dehli	6.795:-	Swiss Air	Davao	7.500:-	3
14	Mauritius	7.800:-	Air France	Tokyo	7.990:-	2
15	Vladivostok	7.800:-	Aeroflot			1

Figure 82. The Transform Table "Travel"

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Advanced

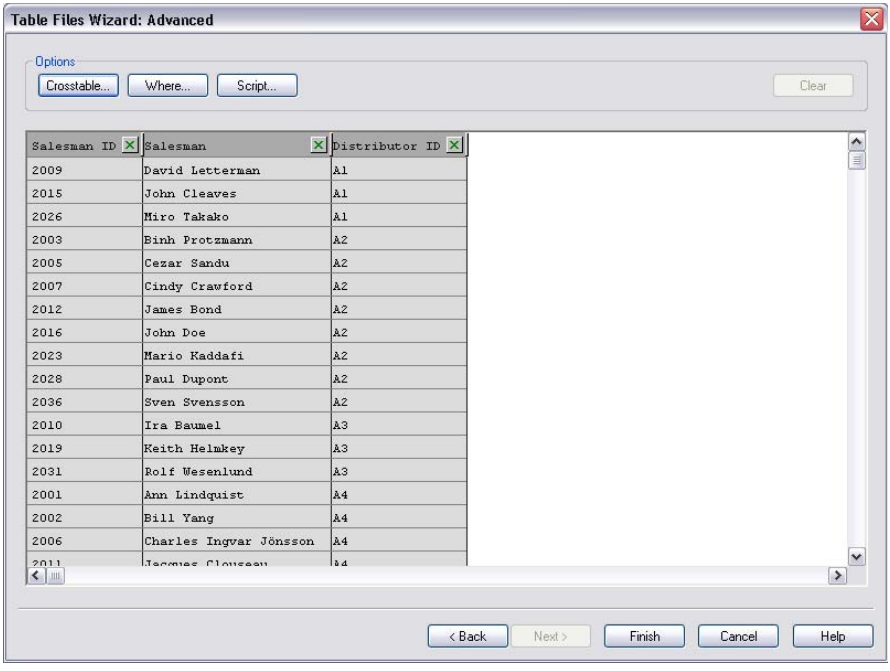


Figure 83. The Advanced page of the Table Files wizard

Crosstable...

Opens the cross table wizard, where it is possible to set the parameters for a transformation of a cross table into a three- (or more) column table.

Where...

Opens the **Where Clause** wizard, with which is possible to create a **where** clause for the **load** statement.

Script...

This button opens a dialog used for controlling the formatting of the **load** statement in the script. The Column option generates the load statement with each field name appearing on a separate row in the script. The Row option generates the entire load statement on a single row in the script. The Structured option generates the statement on structured rows in the script.

Clear Revokes the transformation of a cross table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Note that if both a cross table transformation and a **where** clause are used, the **where** clause is evaluated first. It is thus not possible to first transform from a cross table and then apply a **where** clause. However, if there is a need to apply a **where** clause on an already transformed table, a construction with a temporary table will solve the problem:

```
TempTable: Crosstable (…) Load … from …;
RealTable: Load … resident TempTable where …;
Drop Table TempTable;
```

The **Finish** button, finally, generates the **load** statement and closes the wizard.

23.13The XML File Wizard

With the XML file wizard it is possible to generate **Load** statements that load and interpret XML files. The wizard will analyze the XML files and it can generate several **load** statements, one for each table found.

An XML data source is often a hierarchical structure where entities can be the parent of other entities or belong to other entities. The parsing of such a structure can sometimes be time consuming.

In a relational data model, a table can have primary and foreign keys that define that relations between entities of different tables. In an XML data model this is not necessary. Instead the relation is defined by the position of the data in the file. Hence, keys are often missing.

Since QlikView uses a relational model and needs keys between the tables, such keys will be generated during the parsing of the XML file and can be loaded as normal fields into the QlikView application.

Note In order to use xml Microsoft's xml parser MSXML 3.0 or higher must be installed on the computer. MSXML is shipped with e.g. Windows XP and MS Internet Explorer 6. It can also be downloaded from the Microsoft home page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The Source Page

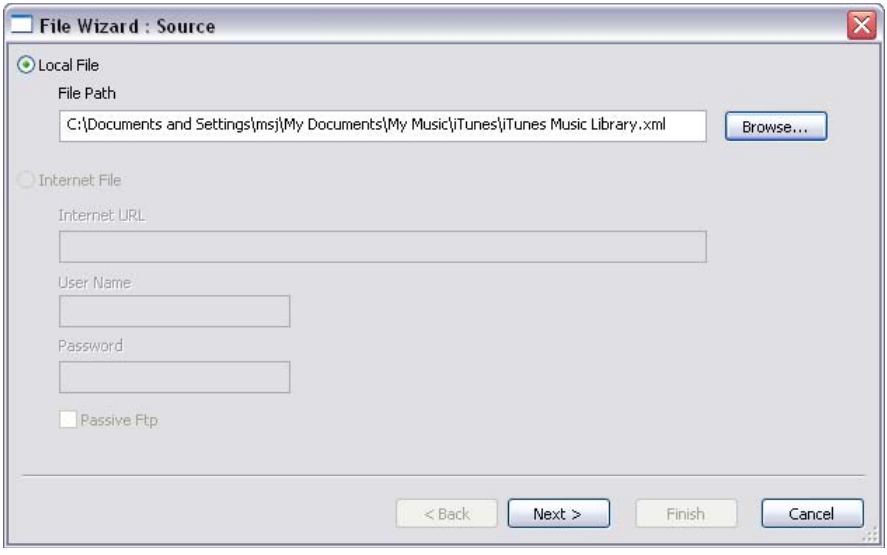


Figure 84. The Source page of the XML File Wizard

On this page the XML file is selected.

Local file

Here it is possible to browse for a file on the LAN. The file path must be a LAN or a UNC path.

Internet file

Here it is possible to enter an Internet URL (http or ftp) that defines the file's address. A User Name and a Password can also be supplied.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The XML Page

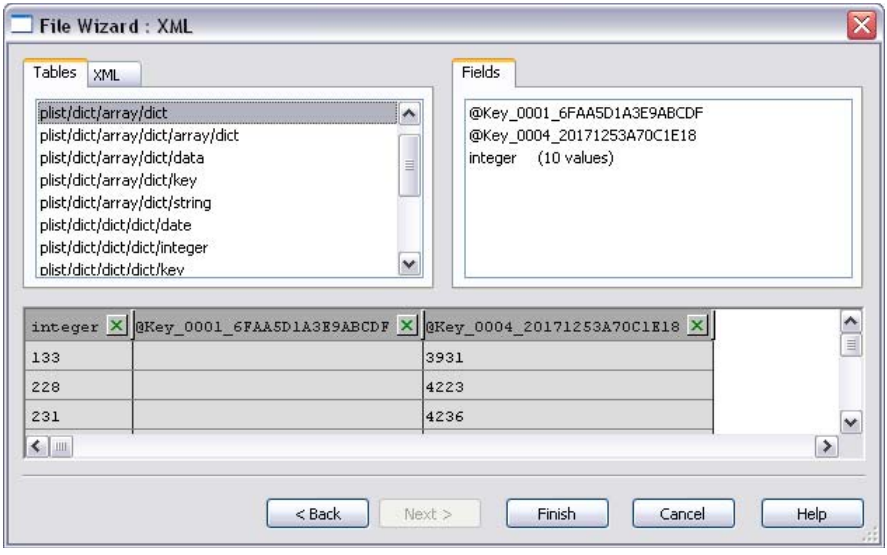


Figure 85. The XML page of the XML File Wizard

Tables The found tables are shown in this list. Each table is shown as a path that corresponds where in the XML structure it was found. When a table is selected, its fields will be shown in the Fields pane to the right. A Load statement will be generated for every checked table when the Finish button is clicked.

XML This sheet shows the interpreted XML structure.

Fields This sheet shows the fields of the selected table and the generated keys.

Preview Pane

The result of the chosen table is displayed in the preview pane (the lower part of the dialog page). When the table is changed the content of the preview pane is changed accordingly. Just as in the Table File Wizard, it is also possible to make changes directly in the preview pane.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Debugger

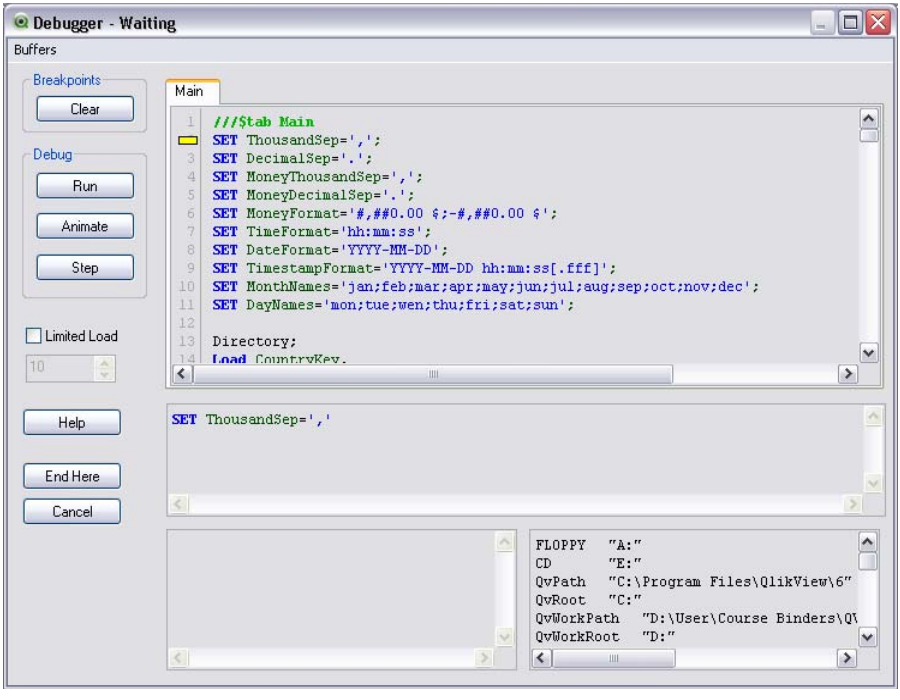


Figure 86. The Script Debugger

With the script debugger it is possible to search for errors in the script. Every script statement can be monitored and the values of variables can be examined while the script is executed.

The top window shows the script. The position of the execution is marked by a yellow cursor. Breakpoints can be set by clicking the number to the left of a statement. The breakpoint is marked by a red dot.

The middle window shows the statement that is about to be executed (step mode) or being executed (run mode).

The left bottom window shows error and status codes, essentially the same information as in the script progress dialog.

The right bottom window shows all the variables and their respective values. Changed variables are shown in red.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Breakpoints

In the **Breakpoints** group breakpoints that have been set in the script window to the right can be toggled or cleared. A breakpoint is shown as a red circle.

Clear Clears all the breakpoints.

Debug The **Debug** group contains the buttons that determine how the script is run in the Debugger.

Run Runs the script. The script execution will halt when a breakpoint is encountered.

Animate

Runs the script, but with a pause after each statement. This way it is possible to get an overview of the script execution, without interacting with the mouse.

Step Executes one statement of the script.

Limited Load

Limits the **load** sequences to the first N accepted records at each **load** and **select** statement. N is a number that is set in the box below.

Help Opens the QlikView help program.

End Here

Closes the Debugger, but lets QlikView keep the data loaded so far.

Cancel Aborts the script execution and discards all data loaded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Buffers

In the **Buffers** menu you may open tabs showing external script files referenced via **$ (include)**.

Open Displays a dialog where you may open a script file. The contents of the file will be displayed under a separate tab and can be used for debugging.

Close Closes the current debugger script tab. The Main tab cannot be closed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

24 SCRIPT SYNTAX



In the script, the name of the data source, the names of the tables and the names of the fields included in the logic are defined. Furthermore, the fields in the access rights definition are defined in the script.

The script consists of a number of statements that are executed consecutively.

For a formal description of the BNF syntax notation used in this and the following chapters, see page 493 in Book III.

24.1 Statements and Keywords

The QlikView script consists of a number of statements. A statement can be either a regular statement or a control statement. Certain statements can be preceded by prefixes.

Regular statements are typically used to manipulate data in one way or another. These statements may be written over any number of lines in the script and must always be terminated by a semicolon, ";".

Control statements are typically used for controlling the flow of the script execution. Each clause of a control statement must be kept inside one script line and may be terminated by a semicolon or the end-of-line.

Prefixes may be applied to applicable regular statements but never to control statements. The **when** and **unless** prefixes can however be used as suffixes to a few specific control statement clauses.

In the next subchapter you will find an alphabetical listing of all script statements, control statements and prefixes.

All script keywords can be typed with any combination of lower case and upper case characters. Field and variable names used in the statements are however case sensitive.

24.2 Script Keywords and Statements in Alphabetical Order

Add ..... page 294
Alias ..... page 295

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Binary ..... page 295
Buffer ..... page 296
Bundle ..... page 297
Call ..... page 298
Concatenate ..... page 299
Connect ..... page 300
Crosstable ..... page 301
Directory ..... page 301
Disconnect ..... page 302
Do..loop ..... page 302
Drop Field ..... page 303
Drop table ..... page 303
Execute ..... page 304
Exit script ..... page 304
First ..... page 305
For..next ..... page 305
For each..next ..... page 306
Force ..... page 308
Generic ..... page 309
Hierarchy ..... page 309
HierarchyBelongsTo ..... page 310
If..then..elseif..else..end if ..... page 311
Info ..... page 312
Inner ..... page 313
Inputfield ..... page 313
Intervalmatch ..... page 314
Intervalmatch (extended) ..... page 316
Join ..... page 317
Keep ..... page 317
Left ..... page 318
Let ..... page 319

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Load ..... page 319
Loosen table ..... page 327
Mapping ..... page 328
Map..using ..... page 329
Noconcatenate ..... page 331
NullAsValue ..... page 331
NullAsNull ..... page 332
Outer ..... page 333
Qualify ..... page 333
Rem ..... page 334
Rename field ..... page 335
Rename table ..... page 336
Replace ..... page 336
Right ..... page 337
Sample ..... page 338
Section ..... page 339
Select ..... page 339
Semantic ..... page 342
Set ..... page 342
Sleep ..... page 342
SQL ..... page 343
SQLColumns ..... page 343
SQLTables ..... page 344
SQLTypes ..... page 344
Star ..... page 345
Store ..... page 346
Sub..end sub ..... page 347
Switch..case..default..end switch ..... page 348
Trace ..... page 349
Unless ..... page 349
Unmap ..... page 350

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Unqualify ..... page 350
When ..... page 351

Add

The **add** prefix can be added to any **load**, **select** or **map..using** statement in the script. It only has a meaning during partial reloads. During a partial reload, the QlikView table whose table name is generated by the **add load** / **add select** statement (if such a table exists) will be appended with the result of the **add load** / **add select** statement. No check for duplicates is performed. Therefore, a statement using the **add** prefix will normally include either a **distinct** qualifier or a **where** clause guarding duplicates. The **add map..using** statement causes the mapping to take place also during partial script execution.

The syntax is:

add *[* **only** *] (loadstatement* | *selectstatement* | *map..usingstatement)*

where

only is an optional qualifier, which denotes that the statement should be disregarded during normal (non-partial) reloads.

Examples:

```
Tab1:
load Name, Number from Persons.csv;
add load Name, Number from NewPersons.csv;
```

During normal reload, data is loaded from *Persons.csv* and stored in the QlikView table *Tab1*. Data from *NewPersons.csv* is then concatenated to the same QlikView table.

During partial reload, data is loaded from *NewPersons.csv* and appended to the QlikView table *Tab1*. No check for duplicates is made.

```
Tab1:
select Name, Number from Persons.csv;
add load Name, Number from NewPersons.csv
   where not exists(Name);
```

During normal reload, data is loaded from *Persons.csv* and stored in the QlikView table *Tab1*. Data from *NewPersons.csv* is then concatenated to the same QlikView table.

During partial reload, data is loaded from *NewPersons.csv*, which is appended to the QlikView table *Tab1*. A check for duplicates is made by means of looking if *Name* exists in the previously loaded table data (see the function **exists** under “Inter-Record Functions” on page 421).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
Tab1:
load Name, Number from Persons.csv;
add only load Name, Number from NewPersons.csv
   where not exists(Name);
```

During normal reload, data is loaded from *Persons.csv* and stored in the QlikView table *Tab1*. The statement loading *NewPersons.csv* is disregarded.

During partial reload, data is loaded from *NewPersons.csv*, which is appended to the QlikView table *Tab1*. A check for duplicates is made by means of looking if *Name* exists in the previously loaded table data (see the function **exists** under “Inter-Record Functions” on page 421).

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

See also the **replace** keyword on page 336, which is used to replace tables during partial reload.

Alias

The **alias** statement is used to set an alias according to which a field will be renamed whenever it occurs in the script that follows. The syntax is:

alias *fieldname* **as** *aliasname { , fieldname* **as** *aliasname }*

where

fieldname and *aliasname* are strings representing what the respective names imply.

Examples:

```
Alias ID_N as NameID;
Alias A as Name, B as Number, C as Date;
```

The name changes defined through this statement are used on all subsequent **select** and **load** statements. A new **alias** for a field name can be defined by a new **alias** statement at any subsequent position in the script.

Binary

The **binary** statement is used to load the access and data parts of a QlikView document. It does not load the layout information. Only one **binary** statement is allowed in the script and it can only be put as the first statement of a script. The syntax is:

binary *file*

where

file ::= [path] filename

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
Binary customer.qvw;
Binary c:\qv\customer.qvw;
```

The path is the path to the file, either absolute, or relative to the qvw file containing this script line.

Buffer

QVD files can be created and maintained automatically via the **buffer** prefix. This prefix can be used on most **load** and **select** statements in script. It indicates that a QVD file is used to cache/buffer the result of the statement.

Numerous limitations exist, the most notable is that there must be either a file **load** or a **select** statement in "the foundation" of any complex statement.

The name of the QVD file is a *calculated* name (a 160-bit hexadecimal hash of the entire following **load** or **select** statement and other discriminating info) and is typically stored in the Application Data folder or another folder specified under **User Preferences** - **Folders** page (see page 135). This means that the QVD buffer will be rendered invalid by any change in the following **load** or **select** statement.

QVD buffers will normally be removed when no longer referenced throughout a complete script execution in the document that created it and when the document that created it no longer exists. This housekeeping can be turned off via settings in the **General** pages of **Document Properties** and **User Preferences** respectively.

The syntax is:

buffer *[* **(***option [, option])] (loadstatement* | *selectstatement)*

where

option ::= **incremental** | *expiry*
expiry::= **stale** *[***after***] amount [***(days | hours)***]*

amount is a number specifying the time period. Decimals may be used. The unit is assumed to be **days** if omitted.

The **incremental** option enables the ability to read only part on an underlying file. Previous size of the file is stored in the XML header in the QVD file. This is particularly useful with log files. All records loaded at a previous occasion are read from the QVD file whereas the following new records are read from the original source and finally an updated QVD file is created.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Note The **incremental** option can only be used with text files. It cannot be used for incremental load if previously read data has been changed or deleted from the source file.

The stale after option is typically used with DB sources where there is no simple timestamp on the original data. Instead one specifies how old the QVD snapshot can be to be used. A **stale after** clause simply states a time period from the creation time of the buffer that will be used as source for data and after that the original data source will be used. The QVD buffer file will then automatically be updated and a new period starts.

If no option is used, the QVD buffer created by the first execution of the script will be used indefinitely.

Examples:

```
buffer select * from MyTable;
buffer (stale after 7 days) select * from MyTable;
buffer (incremental) load * from MyLog.log;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Bundle

If a piece of external information, such as an image or a sound is to be connected to a field value, this can be done via a table that is loaded with the **info** prefix (see page 312 for details). If you want to include the external files into the qvw itself, e.g for portability reasons, you may use the **bundle** prefix. The info files will be stored in a compressed way but will nevertheless take up space both in the file and in RAM. It is therefore not recommended to use the **bundle** prefix when files are too large or too many.

The info may be referenced from the layout as normal info, via the info chart function or referenced as an internal file via the special syntax **qmem://** *fieldname* **/** *fieldvalue* alternatively **qmem://** *fieldname* **/ <** *index* **>** where *index* is the internal index of a field value.

The **info** prefix may be omitted when **bundle** is used.

The syntax is:

bundle *[***info***] (loadstatement | selectstatement)*

Examples:

```
Bundle info Load * from flagoecd.csv;
Bundle Select * from infotable;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Call

The **call** control statement calls a subroutine which must be defined by a **sub** statement.

The syntax is:

call (*[paramlist]* **)**

where

paramlist is a comma separated list of the actual parameters to be sent to the subroutine. Each item in the list may be a field name, a variable name or an arbitrary expression.

The subroutine called by a **call** statement must be defined by a **sub** statement encountered earlier during script execution.

Parameters are copied into the subroutine and, if the parameter in the **call** statement is a variable name, copied back out again upon exit from the subroutine.

Since the **call** statement is a control statement it must not cross a line boundary. It may be terminated by semicolon or end-of-line.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Examples:

```
// example 1
sub INCR (I,J)
   I = I + 1
   exit sub when I < 10
   J = J + 1
end sub
call INCR (X,Y)

// example 2 - list all QV related files on disk
sub DoDir (Root)
   for each Ext in 'qvw','qva','qvo','qvs'
      for each File in filelist (Root&'\*.'&Ext)
         Load '$(File)' as Name,
         FileSize('$(File)') as Size,
         FileTime('$(File)') as FileTime
         autogenerate 1;
      next File
   next Ext
   for each Dir in dirlist (Root&'\*')
      call DoDir (Dir)
      next Dir
   end sub
   call DoDir ('C:')
```

Concatenate

If two tables that are to be concatenated have different sets of fields, concatenation of two tables can be forced with the **concatenate** prefix. This statement forces concatenation with an existing named table or the latest previously created logical table. See further page 473.

The syntax is:

concatenate *[(tablename)] (loadstatement | selectstatement)*

Examples:

```
Load * from file1.csv;
Concatenate load * from file2.csv;
Concatenate select * from table3;

tab1:
Load * from file1.csv;
tab2:
load * from file2.csv;
.. .. ..
Concatenate (tab1) load * from file3.csv;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Connect

A general database can be accessed through the OLE DB/ODBC interface, but first, the data source must be specified. This is done through the **connect** statement. The syntax is:

*[***ODBC***]* **connect to** *connect-string [* **(** *access_info* **)** *]*

where

connect-string ::= datasourcename { **;** *conn-spec-item }*

The connection string is the name of the data source and an optional list of one or more connection specification items. If the name of the data source contains blanks, or if any connection specification items are listed, the connection string must be enclosed by quotation marks.

datasourcename must be a defined ODBC data source.

conn-spec-item ::= **DBQ=** *database_specifier* | **DriverID=** *driver_specifier* | **UID=** *userid* | **PWD=** *password*

The possible connection specification items may differ between different databases. For some databases, other items than those above are also possible. Normally only the database specifier (DBQ) is used.

access_info ::= access_item { , access_item }

*access_item ::= (***userid is** *username* | **xuserid is** *scrambledusername)* | *(***password is** *password* | **xpassword is** *scrambledpassword)* | **codepage is** *codepageID* | **mode is write**

codepageID ::= **ansi** | **oem** | *codepagenumber*

If the **connect** statement is generated by the provided wizard any user ID and password provided will be generated with the scrambled **xuserid is / xpassword is** syntax, provided that **Scramble Connect User Credentials** is selected on the **General** page of the **User Preferences** dialog (see page 107). If you type the connect statement yourself the non-scrambled **userid is / password is** syntax must be used for providing user ID and password. Full scrambling is currently only possible for **ODBC connect** statements. Some parts of the **OLEDB connect** string cannot be scrambled.

The **codepage is** specifier can be used if you encounter problems with national characters in specific ODBC/OLE DB drivers.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If **mode is write** is specified in the *access_info* the connection will be opened in read-write mode. In all other cases the connection will be opened as read-only. The use of **mode is write** must be enabled in the **Edit Script** dialog (see page 227).

If **ODBC** is placed before **connect**, the ODBC interface will be used; else, OLE DB will be used.

Example:

```
Connect to 'Nwind;
DBQ=C:\ProgramFiles\MSOffice95\Access\Samples\Northwi
nd.mdb'  (UserID is sa, Password is admin);
```

The data source defined through this statement is used by subsequent **select** statements, until a new **connect** statement is made.

Crosstable

To turn a cross table into a straight table, you can use a **crosstable** prefix. For a description of cross tables and how they can be handled in QlikView see page 482.

The syntax is:

crosstable (*attribute field , data field [, n]* **)**
(loadstatement | selectstatement)

where

attribute field is the field to contain the attribute values.
data field is the field to contain the data values.
n is the number of qualifier fields preceding the table to be transformed to generic form. Default is 1.

Examples:

```
Crosstable (Month,Sales) Load * from ex1.csv;
Crosstable (Month,Sales,2) Load * from ex2.csv;
Crosstable (A,B) Select * from table3;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Directory

Statements accessing the computer's file system, e.g. the **load** statement, can be preceded by a **directory** statement, defining in what directory to search for the files.

The syntax is:

directory *path*

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

where

path is a text that can be interpreted as the path to the file, either absolute, or relative to the qvw file.

Example:

```
Directory c:\userfiles\data;
```

The directory defined through this statement is used by subsequent **load** statements until a new **directory** statement is made.

A **directory** statement is generated automatically if two or more files are selected simultaneously in the **Open Local Files** dialog.

Disconnect

Terminates the current ODBC/OLEDB connection. This statement is optional. The connection will be automatically terminated when a new **connect** statement is executed or when the script execution is finished. The syntax is:

disconnect

Example:

```
disconnect;
```

Do..Loop

The **do..loop** control statement creates a loop which will be executed until a logical condition is met.

The syntax is:

do *[(* **while** | **until** *) condition]*
[statements]
[**exit do** *[(* **when** | **unless** *) condition]*
[statements]]
loop *[(* **while** | **until** *) condition]*

where

condition is a logical expression evaluating to true or false.

statements is any group of one or more QlikView script statements.

The **while** or **until** conditional clause must only appear once in any **do..loop** statement, i.e. either after **do** or after **loop**. Each *condition* is interpreted only the first time it is encountered but is evaluated for every time it is encountered in the loop.

If an **exit do** clause is encountered inside the loop, the execution of the script will be transferred to the first statement after the **loop** clause denoting the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

end of the loop. An **exit do** clause can be made conditional by the optional use of a **when** or **unless** suffix.

Since the **do..loop** statement is a control statement, each of its three possible clauses (**do**, **exit do** and **loop**) must not cross a line boundary. They may be terminated by semicolon or end-of-line.

Examples:

```
// load all files file1.csv..file9.csv
let a=1;
do while a<10
   load * from files$(a).csv;
   let a=a+1;
loop
```

Drop Field

One or more QlikView fields can be dropped from memory at any time during script execution by using a **drop field** statement.

The syntax is:

drop field*[***s***]* *fieldname [, fieldname2 ...] [***from** *tablename1 [, tablename2 ...]]*

Note Both **drop field** and **drop fields** are allowed forms with no difference in effect. If no table is specified, the field will be dropped from all tables where it occurs.

Examples:

```
drop field A;
drop fields A,B;
drop field A from X;
drop fields A,B from X,Y;
```

Drop Table

One or more QlikView input tables can be dropped from memory at any time during script execution by using a **drop table** statement. The following will disappear as a result of such a statement:

- the table(s)
- all fields which are not part of remaining tables
- field values in remaining fields, which came exclusively from the dropped table(s)

The syntax is:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

drop table*[***s***]* *tablename [, tablename2 ...]*

Note Both **drop table** and **drop tables** are allowed forms with no difference in effect.

Examples:

```
drop table Orders, Salesmen, T456a;
// drops three tables
Tab1:
Select * from Trans;
Load Month, Sum(Sales) resident Tab1 group by Month;
Drop table Tab1;
// Only the aggregates remain in memory.
// Trans data discarded.
```

Execute

With the **execute** statement it is possible to execute other programs during the execution of the QlikView script. The QlikView script execution is temporarily halted waiting for the other application to finish. The use of the **execute** statement must be enabled in the **Edit Script** dialog (see page 227).

The syntax is:

execute *commandline*

where

commandline is a text that the operating system can interpret as a command line.

Examples:

```
Execute C:\MSOffice95\Excel\Excel.exe;
Execute winword macro.doc;
```

Exit Script

The **exit script** control statement stops script execution. It may be inserted anywhere in the script. An **exit script** statement can be made conditional by the optional use of a **when** or **unless** clause.

The syntax is:

exit script *[(* **when** | **unless** *) condition]*

where

condition is a logical expression evaluating to true or false.

Since the **exit script** statement is a control statement it must not cross a line boundary. The statement may be terminated by semicolon or end-of-line.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
exit script
exit script;
exit script when A=1
```

First

The **first** prefix to a **load** or **select** statement is used to load only a set maximum number of records from the input table, regardless of its length.

The syntax is:

first *n (loadstatement* | *selectstatement)*

where

n is an arbitrary expression which evaluates to an integer indicating the maximum number of records to be read.

Examples:

```
First 10 Load * from abc.csv;
First 1 Select * from Orders;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

For..Next

The **for..next** control statement creates a loop with a counter. The statements inside the loop enclosed by **for** and **next** will be executed for each value of the counter variable between specified low and high limits.

The syntax is:

for *counter = expr1* **to** *expr2 [* **step** *expr3]*
[statements]
[**exit for** *[(* **when** | **unless** *)* *condition]*
[statements]]
next *[counter]*

where

counter is a script variable name. If *counter* is specified after **next** it must be the same variable name as the one found after the corresponding **for**.

expr1 is an expression which evaluates to the first value of the *counter* variable for which the loop should be executed.

expr2 is an expression which evaluates to the last value of the *counter* variable for which the loop should be executed.

IV

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

expr3 is an expression which evaluates to a value indicating the increment of the *counter* variable each time the loop has been executed.

condition is logical expression evaluating to true or false.

statements is any group of one or more QlikView script statements.

The expressions *expr1*, *expr2* and *expr3* are only evaluated the first time the loop is entered. The value of the *counter* variable may be changed by statements inside the loop, but such practice normally makes a script more difficult to follow.

If an **exit for** clause is encountered inside the loop, the execution of the script will be transferred to the first statement after the **next** clause denoting the end of the loop. An **exit for** clause can be made conditional by the optional use of a **when** or **unless** suffix.

Since the **for..next** statement is a control statement, each of its three possible clauses (**for..to..step**, **exit for** and **next**) must not cross a line boundary. They may be terminated by semicolon or end-of-line.

Examples:

```
// load files file1.csv..file9.csv
for a=1 to 9
   load * from file$(a).csv;
next

for counter=1 to 9 step 2
   set filename=X$(counter).csv;
   if rand()<0.5 then
      exit for unless counter=1
   end if
   load a,b from $(filename);
next
```

For Each..Next

The **for each..next** control statement creates a loop which executes for each value in a comma separated list. The statements inside the loop enclosed by **for** and **next** will be executed for each value of the list. Special syntax makes it possible to generate lists with file and directory names in the current directory.

The syntax is:

for each *var* **in** *list*
[statements]

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

[**exit for** *[(* **when** | **unless** *) condition]*
[statements]]
next *[var]*

where

var is a script variable name which will acquire a new value from *list* for every loop execution. If *var* is specified after **next** it must be the same variable name as the one found after the corresponding **for each**.

list := item {, item}

item := constant | **(** *expression* **)** | **filelist** *mask* | **dirlist** *mask*

constant is any number or string.

expression is an arbitrary expression.

mask is a filename or directory name mask which may include any valid filename characters and the standard wildcard characters * and ?.

condition is logical expression evaluating to true or false.

statements is any group of one or more QlikView script statements.

The **filelist** *mask* syntax produces a comma separated list of all files in the current directory matching the filename mask. The **dirlist** *mask* syntax produces a comma separated list of all directories in the current directory matching the directory name mask.

The value of the *var* variable may be changed by statements inside the loop, but such practice normally makes a script more difficult to follow.

If an **exit for** clause in encountered inside the loop, the execution of the script will be transferred to the first statement after the **next** clause denoting the end of the loop. An **exit for** clause can be made conditional by the optional use of a **when** or **unless** suffix.

Since the **for each..next** statement is a control statement, each of its three possible clauses (**for each**, **exit for** and **next**) must not cross a line boundary. They may be terminated by semicolon or end-of-line.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
for each a in 1,3,7,'xyz'
   load * from file$(a).csv
next

// list all QV related files on disk
sub DoDir (Root)
   for each Ext in 'qvw','qva','qvo','qvs'
      for each File in filelist (Root&'\*.'&Ext)
         Load '$(File)' as Name,
         FileSize('$(File)') as Size,
         FileTime('$(File)') as FileTime
         autogenerate 1;
      next File
   next Ext
   for each Dir in dirlist (Root&'\*')
      call DoDir (Dir)
   next Dir
end sub
call DoDir ('C:')
```

Force

The **force** statement forces QlikView to interpret field values of subsequent **load** and **select** statements as written with only upper case letters, with only lower case letters, always capitalized or as they appear (mixed). With the help of this statement it is possible to associate field values of tables made according to different conventions.

The syntax is:

force *(* **capitalization** | **case upper** | **case lower** | **case mixed** *)*

Examples:

```
Force Capitalization;
Force Case Upper;
Force Case Lower;
Force Case Mixed;
```

If nothing is specified, force case mixed is assumed. The **force** statement is valid until a new **force** statement is made.

The **force** statement has no effect in the access section: all field values loaded are case insensitive.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Generic

The unpacking and loading of a generic database can be done with a **generic** prefix. For a description of a generic database, see page 481.

The syntax is:

generic *(loadstatement | selectstatement)*

Examples:

```
Generic Load * from abc.csv;
Generic Select * from table1;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Tables loaded through a **generic** statement cannot be concatenated.

Hierarchy

The **hierarchy** keyword is a prefix to the **load** and **select** statements. It is used to transform an adjacent nodes table to an expanded nodes table. Hence, the input table must be an adjacent nodes table as described in section Hierarchies, page 487. The output of the **hierarchy** prefix is an expanded nodes table with all the needed additional fields.

Normally, the input table has exactly one record per node and in such a case the output table will contain the same number of records. However, sometimes there are nodes with multiple parents, i.e. one node is represented by several records. If so, the output table may have more records than the input table.

All nodes without a parent id or with a parent id not found in the nodeID column will be considered as roots. Also, only nodes with a connection to a root node – direct or indirect – will be loaded, thus avoiding circular references.

Additional fields containing the name of the parent node, the path of the node and the depth of the node can be created.

The syntax is:

Hierarchy (*NodeID***,** *ParentID, NodeName, [ParentName], [PathSource], [PathName], [PathDelimiter], [Depth]***)** *(loadstatement | selectstatement)*

Where

NodeID is the name of the field that contains the node id.

ParentID is the name of the field that contains the node id of the parent node.

NodeName is the name of the field that contains the name of the node.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ParentName is a string used to name the new **ParentName** field. If omitted, this field will not be created.

PathSource is the name of the field that contains the name of the node used to build the node path. Optional parameter. If omitted, **NodeName** will be used.

PathName is a string used to name the new Path field, which contains the path from the root to the node. Optional parameter. If omitted, this field will not be created.

PathDelimiter is a string used as delimiter in the new **Path** field. Optional parameter. If omitted, '/' will be used.

Depth is a string used to name the new **Depth** field, which contains the depth of the node in the hierarchy. Optional parameter. If omitted, this field will not be created.

Example:

```
Hierarchy(NodeID, ParentID, NodeName) Load
NodeID,
ParentID,
NodeName,
Attribute
From data.xls (biff, embedded labels, table is
[Sheet1$];
```

HierarchyBelongsTo

The **hierarchybelongsto** keyword is a prefix to the **load** and **select** statements. The input table must be an adjacent nodes table as described in section Hierarchies., page 487.

The prefix creates a table containing all ancestor-child relations of the hierarchy. The ancestor fields can then be used to select entire trees in the hierarchy. The output table usually contains several records per node.

An additional field containing the depth difference of the nodes can be created.

The syntax is:

HierarchyBelongsTo (*NodeID, ParentID, NodeName, AncestorID, AncestorName, [DepthDiff]***)** *(loadstatement | selectstatement)*

Where

NodeID is the name of the field that contains the node id.

ParentID is the name of the field that contains the node id of the parent node.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

NodeName is the name of the field that contains the name of the node.

AncestorID is a string used to name the new ancestor id field, which contains the id of the ancestor node.

AncestorName is a string used to name the new ancestor field, which contains the name of the ancestor node.

DepthDiff is a string used to name the new **DepthDiff** field, which contains the depth of the node in the hierarchy relative the ancestor node. Optional parameter. If omitted, this field will not be created.

Example:

```
HierarchyBelongsTo (NodeID, ParentID, Node, Tree,
ParentName) Load
NodeID,
ParentID,
NodeName
From data.xls (biff, embedded labels, table is
[Sheet1$];
```

If..Then..Elseif..Else..End If

The **if..then** control statement creates a conditional clause, which causes the script execution to take different paths depending on one or more logical conditions.

The syntax is:

if *condition* **then**
[statements]
{ **elseif** *condition* **then**
[statements] }
[**else**
[statements]]
end if

where

condition is a logical expression which can be evaluated as true or false.

statements is any group of one or more QlikView script statements.

Since the **if..then** statement is a control statement each of its four possible clauses (**if..then**, **elseif..then**, **else** and **end if**) must not cross a line boundary. They may be terminated by semicolon or end-of-line.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
if a=1 then
   load * from abc.csv;
   sql select e,f,g from tab1;
end if

if a=1 then; drop table xyz; end if;

if x>0 then
   load * from pos.csv;
elseif x<0 then
   load * from neg.csv;
else
   load * from zero.csv;
end if
```

Image_size

This statement is used with **Info** to resize images from a database management system to fit in the fields. Width and height is specified in pixels.

Example:

```
Info Image_size(122,122)Select ID, Photo From
infotable;
```

Info

If a piece of information, such as a text file, an image or a multimedia presentation is to be connected to a field value, this is done in a table that is loaded through an **info** prefix. The table must contain two columns only, the first one with the field values that should be keys to the information, the second one containing the file names of the images etc. See further page 493. The same applies to, for example, a picture from a database management system. On a binary field, a blob, the **info select** statement makes an implicit **bundle**, i.e. the binary data will be fetched immediately and stored in the qvw. The binary data must be the second field in a select statement. The syntax is:

info *(loadstatement | selectstatement)*

Examples:

```
Info Load * from flagoecd.csv;
Info Select * from infotable;
Info Select Key, Picture From infotable;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Info can also be embedded inside a QlikView document. See the **bundle** prefix syntax on page 297.

Inner

The **join** and **keep** prefixes in the QlikView script language can be preceded by the prefix **inner**.

If used before **join**, it specifies that the join between the two tables should be an inner join. The resulting table contains only combinations between the two tables with a full data set from both sides.

If used before **keep**, it specifies that the two tables should be reduced to their common intersection before being stored in QlikView. See further on page 474.

The syntax is:

inner *(***join** | **keep***) [(**tablename**)] (loadstatement |selectstatement)*

Examples:

```
QVTable:
Select * from Table1;
inner join select * from Table2;

QVTab1:
Select * from Table1;
QVTab2:
inner keep select * from Table2;

tab1:
Load * from file1.csv;
tab2:
load * from file2.csv;
.. .. ..
inner keep (tab1) load * from file3.csv;
```

The **outer** (page 333), **left** (page 318) and **right** (page 337) prefixes can be used in similar ways.

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Inputfield

A field may be flagged as an input field by listing it in an inputfield statement before it is referenced in any **load** or **select** statement.

Input fields behave somewhat differently as compared to regular fields. The most important difference is their ability to accept changes in field values,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

interactively or programmatically, without running the script. Field values must be loaded into the field via load or select statements. Each field value loaded in the script will create a placeholder for a field value replacement value. Only existing field values can thus be changed interactively or programmatically. In input fields all field values will be treated as distinct, regardless if several have the same value.

The syntax is

inputfield *ListOfFields*

where

ListofFields is one or more field names separated by commas.

The wildcard characters * and ? are allowed in field names. Quoting of field names is sometimes necessary when using the wildcards as part of field names.

Examples:

```
Inputfield B;
Inputfield A,B;
Inputfield B??x*;
```

IntervalMatch

The **intervalmatch** prefix to a **load** or **select** statement is used to link discrete numeric values to one or more numeric intervals. See further page 483.

The syntax is:

intervalmatch (*matchfield* **)** *(loadstatement* | *selectstatement)*

where

field is the field containing the discrete numeric values to be linked to intervals.

Loadstatement | *selectstatement* must result in a two-column table, where the first field contains the lower limit of each interval and the second field contains the upper limit of each interval. The intervals are always closed, i.e. the end points are included in the interval. Non-numeric limits render the interval to be disregarded.

The intervals may be overlapping and the discrete values will be linked to all matching intervals.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
intervalmatch (Day) Load PeriodStart, PeriodEnd from
intervals.csv;

intervalmatch (Day) Select PeriodStart, PeriodEnd from
intervaltable;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339. The extended **intervalmatch** statement syntax is described on page 316 and on page 485.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

IntervalMatch (Extended Syntax)

The extended **intervalmatch** prefix to a **load** or **select** statement is used to match discrete data to one or more dimensions that are changing over time. This is a very powerful and flexible feature which can be used to resolve problems with slowly changing dimensions by linking the specific key-field(s) to the appropriate numerical interval.
The syntax is:

> **intervalmatch (***matchfield, keyfield1 [, keyfield2,...keyfield5]***)**
> *(loadstatement | selectstatement)*

where *matchfield* is the field containing the discrete numeric values to be linked to the interval; and the *keyfield(s)* are fields that contain the attributes that are to be matched using the interval.

Loadstatement | *selectstatement* must result in a table where the first two fields contain the lower and upper limits of each interval and the third (and following fields) contains the keyfield(s) present in the intervalmatch statement. The intervals are always closed, i.e. the end points are included in the interval. Null limits render the interval to be disregarded (undefined) while non-numeric limits extend the interval infinitely (unlimited). The intervals may be overlapping and values will be linked to all matching intervals.

In order to avoid that undefined interval limits are disregarded it is necessary to allow null values to map to the fields that constitute the lower or upper limits of the interval. This is done by using the **nullasvalue** statement described on page 331.

Before the **intervalmatch** statement, the field containing the discrete data points (*Date* in the example below) must already have been read into QlikView. The **intervalmatch** statement does not by itself read this field from the database table.

Examples:

```
inner join intervalmatch (Date,Key) load FirstDate,
LastDate, Key resident Key;
```

On page 485 you will find comments on the use of the extended **intervalMatch** statement.

Note The inner join prefix that precedes the **intervalmatch** prefix in the example above is required in order to combine the data from the interval table with the data from the match table into one table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Join

The **join** prefix joins the loaded table with an existing named table or the last previously created logical table. The join is a natural join made over all the common fields. See further page 473. The **join** prefix may be preceded by one of the prefixes **inner** (page 313), **outer** (page 333), **left** (page 318) or **right** (page 337).

The syntax is:

join *[(tablename)] (loadstatement | selectstatement)*

Examples:

```
Join Load * from abc.csv;
Join Select * from table1;

tab1:
Load * from file1.csv;
tab2:
load * from file2.csv;
.. .. ..
join (tab1) load * from file3.csv;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Keep

The **keep** prefix between two **load** or **select** statements has the effect of reducing one or both of the two tables before they are stored in QlikView based on the intersection of table data. The **keep** prefix must always be preceded by one of the prefixes **inner** (page 313), **left** (page 318) or **right** (page 337). The selection of records from the tables is made in the same way as in a corresponding join. However, the two tables are not joined and will be stored in QlikView as two separately named tables. See further page 473.

The syntax is:

keep *[(tablename)] (loadstatement | selectstatement)*

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
Left Keep Load * from abc.csv;
Inner Keep Select * from table1;

tab1:
Load * from file1.csv;

tab2:
load * from file2.csv;
.. .. ..
left keep (tab1) load * from file3.csv;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Left

The **join** and **keep** prefixes in the QlikView script language can be preceded by the prefix **left**.

If used before **join**, it specifies that the join between the two tables should be a left join. The resulting table only contains combinations between the two tables with a full data set from the first table.

If used before **keep**, it specifies that the second table should be reduced to its common intersection with the first table before being stored in QlikView. See further page 473.

The syntax is:

left *(* **join** | **keep** *) [(*tablename**)]***(** *loadstatement* | *selectstatement)*

Examples:

```
QVTable:
Select * from Table1;
left join select * from Table2;

QVTab1:
Select * from Table1;
QVTab2:
left keep select * from Table2;

tab1:
Load * from file1.csv;
tab2:
load * from file2.csv;
.. .. ..
left keep (tab1) load * from file3.csv;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **inner** (page 313), **outer** (page 333), and **right** (page 337) prefixes can be used in similar ways.

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Let

The **let** statement has been created as a complement to the **set** statement (described on page 342), used for defining script variables. The **let** statement, in opposition to the **set** statement, evaluates the expression on the right side of the '=' before it is assigned to the macro variable.

The word **let** may be omitted, but the statement then becomes a control statement. Such a statement without the keyword **let** must be contained within a single script row and may be terminated either with a semicolon or the end-of-line.

The syntax is:

[**let** *] variablename* **=** *expression*

Examples:

```
Set X=3+4;
Let Y=3+4;
Y=3+4
Z=$(Y)+1;
Let T=now();
```

$ (X) will be evaluated as '3+4', whereas **$ (Y)** will be evaluated as '7'.

$ (Z) will be evaluated as '8'.

$ (T) will be given the value of the current time.

Load

The **load** statement loads fields from a typed ASCII file, from data defined in the script, from a previously loaded input table, from the result of a following **select** statement, or by generating data automatically. The general syntax of the **load** statement is:

load *[* **distinct** *] *fieldlist*
[(**from** *file [format-spec]* | **inline** *[format-spec] data* |
resident *table-label* |
autogenerate *size)]*
[**where** *criterion* | **while** *criterion]*
[**group by** *fieldlist]*
[**order by** *field [sortorder] {, field [sortorder]}]*

where

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

distinct is a predicate used if only the first of duplicate records should be loaded.

fieldlist::= (*** | field) { , field })*

A list of the fields to be selected. The " ***** " is used to select all the fields in the table.

field::= (fieldref | expression) [**as** *aliasname]*

The field definition must always contain a reference to an existing field, or an expression.

fieldref::= (fieldname | *@fieldnumber* | *@startpos***:***endpos[* **I** | **U** | **R**| **B***])*

fieldname is a text that is identical to a field name in the table. Note that the field name must be enclosed by straight double quotation marks or square brackets if it contains e.g. spaces. Sometimes field names are not explicitly available. Then a different notation is used:

@fieldnumber represents the field number in a delimited text file. It must be a positive integer preceded by "@". The numbering is always made from 1 and up to the number of fields.

*@startpos***:***endpos* represents the start and end positions of a field in a file with fixed length records. The positions must both be positive integers. The two numbers must be preceded by "@" and separated by a colon. The numbering is always made from 1 and up to the number of positions. If *@startpos***:***endpos* is immediately followed by the characters **I** or **U**, the bytes read will be interpreted as a binary signed (**I**) or unsigned (**U**) integer (Intel byte order). The number of positions read must be 1, 2 or 4. If *@startpos***:***endpos* is immediately followed by the character **R**, the bytes read will be interpreted as a binary real number (IEEE 32-bit or 64-bit floating point). The number of positions read must be 4 or 8. If *@startpos***:***endpos* is immediately followed by the character **B**, the bytes read will be interpreted as a binary real number (Binary Coded Decimal) according to the COMP-3 standard. Any number of bytes may be specified.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

expression can be a numeric function or a string function based on one or several other fields in the same table. For the syntax of expressions, see page 365.

as is used to assign a new name to the field.

from is used if data should be loaded from a file, and not typed within the script.

file::= [path] filename

The *path* is the path to the file, either absolute, or relative to the QlikView document (qvw file). If the path is omitted, QlikView searches for the file in the directory specified by the **directory** statement. If there is no **directory** statement, QlikView searches in the working directory, which is usually the directory in which the QlikView file is located. The path may also be a URL address (HTTP or FTP), pointing to a location on the Internet or an intranet.

The *filename* may contain the standard DOS wildcard characters (* and ?). This will cause all the matching files in the specified directory to be loaded.

format-spec ::= **(** *fspec-item {*, *fspec-item }* **)**

The format specification consists of a list of several format specification items, within brackets. For a description of these, see below, page 325.

inline is used if data should be typed within the script, and not loaded from a file.

data::= [text]

Data entered through an **inline** clause must be enclosed by quotation marks or square brackets. The text between these is interpreted in the same way as the content of a file. Hence, where you would insert a new line in a text file, you should also do it in the text of an inline clause, i.e. by pressing the ENTER key when typing the script.

resident is used if data should be loaded from a previously loaded input table.

Table label (see page 353) is a label preceding the **load** or **select** statement(s) that created the original input table. The label shall be given with a colon at the end.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

autogenerate is used if data should be automatically generated by QlikView.

size::=number

Number is an integer indicating the number of records to be generated. The field-list must not contain expressions that require data from a database. Only constants and parameter-free functions are allowed in the expressions.

where is a clause used to state whether a record should be included in the selection or not. The selection is included if *criterion* is true. See below under *Examples, Selecting certain records*.

while is a clause used to state whether a record should be repeatedly read. The same record is read as long as criterion is true. In order to be useful, a **while** clause must typically include the **IterNo()** function (see description of QlikView functions, page 411).

criterion is a logical expression. For the syntax of expressions, see page 365.

fieldname, *path*, *filename* and *aliasname* are text strings representing what the respective names imply.

group by is a clause used to define over which fields the data should be aggregated (grouped). The aggregation fields should be included in the expressions loaded in some way. No other fields than the aggregation fields may be used outside aggregation functions (see page 368) in the loaded expressions.

fieldlist ::= (field { , field }

order by is a clause used to sort the records of a resident input table before they are processed by the **load** statement. The resident table can be sorted by one or more fields in ascending or descending order. The sorting is made primarily by numeric value and secondarily by national ASCII value. This clause may only be used when the data source is a resident table.

field is the field in the resident table to sort by. The field can be specified by name or by its number in the resident table (the first field is number 1).

sortorder is either **asc** for ascending or **desc** for descending. If no sort order is specified, **asc** is assumed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Note If no source of data is given by means of a **from**, **inline**, **resident** or **autogenerate** clause, data will be loaded from the result of the immediately succeeding **load** or **select** statement. The succeeding statement should not have a prefix. The result of the succeeding **load** or **select** statement will be treated as a temporary input table, which is lost as soon as its contents have been used for the preceding **load**/**select** statement.

Examples:

Different file formats:

```
Load * from data1.csv;

Load * from 'c:\userfiles\data1.csv' (ansi, txt,
delimiter is ',', embedded labels);

Load * from 'c:\userfiles\data2.txt' (ansi, txt,
delimiter is '\t', embedded labels);

Load * from file2.dif (ansi, dif, embedded labels);

Load @1:2 as ID, @3:25 as Name, @57:80 as City from
data4.fix (ansi, fix, no labels, header is 0, record
is 80);
```

Selecting certain fields, calculating fields

```
Load FirstName, LastName, Number from data1.csv;
Load  @1 as A, @2 as B from data3.txt (ansi, txt,
delimiter is '\t', no labels);

Load FirstName&' '&LastName as Name from data1.csv;

Load Quantity, Price, Quantity*Price as Value from
data1.csv;
```

Selecting certain records

```
Load distinct FirstName, LastName, Number from
data1.csv;

Load * from Consumption.csv where Litres>0;

Load * from Consumption.csv where Litres>0 and
Litres<1000;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Loading data not on file

```
Load * Inline
[CatID, Category
0,Regular
1,Occasional
2,Permanent];

Load * Inline
[UserID, Password, Access
A, ABC456, User
B, VIP789, Admin];

Load RecNo() as A, rand() as B autogenerate(10000);
```

Loading data from previously loaded input table

```
tab1:
Select A,B,C,D from transtable;
Load A,B,month(C),A*B+D as E resident tab1;
Load A,A+B+C resident tab1 where A>B;
Load A,B*C as E resident tab1 order by A;
Load A,B*C as E resident tab1 order by 1,2;
Load A,B*C as E resident tab1 order by C desc, B asc,
1 desc;
```

Loading data from succeeding input table

```
Load A, B, if(C>0,'+','-') as X, weekday(D) as Y;
Select A,B,C,D from Table1;
```

Grouping data

```
Load ArtNo, round(Sum(TransAmount),0.05) as
ArtNoTotal from table.csv group by ArtNo;

Load Week, ArtNo, round(Avg(TransAmount),0.05) as
WeekArtNoAverages from
table.csv group by Week, ArtNo;
```

Reading one record repeatedly

```
My Tab:
Load Student,
   mid(Grades,IterNo(),1) as Grade,
   pick(IterNo(),'Math', 'English',
   'Science','History') as Subject
from Tab1.csv
   while mid(Grades,IterNo(),1)<>' ';
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Description of format specification items

Each format specification item defines a certain property of the text file:

fspec-item ::= [**ansi** | **oem** | **mac**| **UTF-8**| **Unicode** | **txt** | **fix** | **dif** | **biff** | **html** | **xml** | **qvd** |**delimiter is** *char* | **no eof** | **embedded labels** | **explicit labels** | **no labels** | **table is [** *tablename* **]** | **header is** *n* | **header is line** | **header is** *n* **lines** | **comment is** *string* | **recordis** *n* | **record is line** | **record is** *n* **lines** | **no quotes** | **msq** | **filters(***filter specifiers***)** *]*

Character set

ansi
oem
mac
UTF-8
Unicode

The file can be written with the **ansi** (Windows), the **oem** (DOS, OS/2 and others), **UTF-8**, **Unicode** or the **mac** character set. The conversion from the **oem** character set is not implemented for MacOS. If nothing is specified, **ansi** is assumed under Windows and **mac** under MacOS.

Note Under Windows 95/98/ME, files with the **mac** character set will be interpreted as **ansi**. In order to get correct interpretation of national character an applicable nls-file (national language support) must be installed (see Microsoft knowledge base article Q230147) and instead of the **mac** specifier an explicit code page must be stated in the load statement.

Example:

```
load * from a.txt (codepage is 10000, txt, delimiter
is ',', no labels)
```

Table format

txt
fix
dif
biff
html
xml
xmlsax

In a delimited text file, **txt**, the columns in the table are separated by a character. In a fixed record length file, **fix**, each column is a certain number of characters wide. In a **dif** file, (Data Interchange Format) a

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

special format for defining the table is used. **biff** (Binary Interchange File Format) is the format used by MS Excel .xls files. QVD denotes a file in the proprietary QVD (QlikView Data) file format, exported from a QlikView document. If nothing is specified, a **txt** file is assumed.

Note In order to use xmlsax Microsoft's xml parser MSXML 3.0 or higher must be installed on the computer. MSXML is shipped with e.g. Windows XP and MS Internet Explorer 6. It can also be downloaded from the Microsoft home page.

Delimiter (delimited text files only)

delimiter is *char*

For delimited text files, an arbitrary delimiter can be specified through the **delimiter is** specifier. *char* is here a single character with or without quotation marks or a "\t" representing a tab sign, or "\\" representing a backslash character, or the word spaces representing all combinations of one or more spaces. If nothing is specified, **delimiter is ','** is assumed. This specifier is relevant only for **txt** files.

no eof

If this option is used ASCII character 26 which often denotes end-of-file is disregarded.

Labels (field names)

embedded labels
explicit labels
no labels

The field names can be found in different places of the file. If the first record contains the field names, **embedded labels** should be used. If there are no field names to be found, **no labels** should be used. In **dif** files, a separate header section with explicit field names is sometimes used. In such a case, **explicit labels** should be used. If nothing is specified, **embedded labels** is assumed, also for **dif** files.

Table (biff and HTML files only)

table is [*tablename* | *@ tablenumber* **]**

When loading Excel files, you must specify the table in the workbook. When loading tables from HTML pages you must specify the table number.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Header size (fixed record files, delimited text files and Excel files only)

header is *n*
header is line
header is *n* **lines**

For fixed record length files, delimited text files and Excel files, an arbitrary header length can be specified through the **header is** specifier. A header is a text section not used by QlikView. The header length can be given in bytes (**header is** *n*), or in lines (**header is line** or **header is** *n* **lines**). *n* is here a positive integer, representing the header length. If not specified, **header is 0** is assumed.

Comment (fixed record and delimited text files only)

comment is *string*

Records in the file starting with string will be disregarded.

Record length (fixed record files only)

record is *n*
record is line
record is *n* **lines**

For fixed record length files, the record length must be specified through the **record is** specifier. The record length can be given in bytes (**record is** *n*), or in lines (**record is line** or **record is** *n* **lines**). *n* is here a positive integer, representing the record length. The **record is** specifier is only relevant for **fix** files.

Quotes (text files only)

no quotes
msq

If no quotes are to be accepted in the text file, the **no quotes** specifier should be used. By default, the quotes " " or ' ' can be used, but only if they are the first and last non blank character of a field value. The **no quotes** specifier is only relevant for **txt** files. **msq** indicates that modern style quoting is assumed.

Filters

filter specifiers ::= (filterspec { , filterspec })

Loosen Table

One or more QlikView input tables can be explicitly declared loosely coupled (see chapter“Loosely Coupled Tables” on page 159 for details on loosely coupled tables) during script execution by using a **loosen table** statement.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Tables declared as loosely coupled by this script statement will behave somewhat differently from those made loosely coupled interactively. The Loosen Table script statement will prevent the formation of synthetic keys in the table and the loosely coupled status of that table will not be possible to change interactively via the **Table** page of the **Document Properties** dialog.

The syntax is:

loosen table*[***s***]* *tablename [, tablename2 ...]*

Both **loosen table** and **loosen tables** are allowed forms with no difference in effect.

Example:

```
Tab1:
Select * from Trans;
Loosen table Tab1;
```

Note When QlikView finds circular references in the data structure which cannot be broken by tables declared loosely coupled interactively or explicitly in the script, one or more additional table will be forced loosely coupled until no circular references remain. Tables made loosely coupled in this way have the same status as those made loosely coupled interactively via the **Table** page of the **Document Properties** dialog.

Mapping

The **mapping** prefix is used to create a mapping table. Tables read via **mapping load** or **mapping select** are treated differently from other tables. They will be stored in a separate area of the memory and used only as mapping tables during script execution. After script execution they will be automatically dropped.

A mapping table must have two columns, the first one containing comparison values and the second the desired mapping values. The two columns must be named, but the names have no relevance in themselves. The column names have no connection to field names in regular input tables.

When mapping tables are used to map a certain field value or expression, that value will be compared to the values in the first column of the mapping table. If found, the original value will be replaced by the corresponding value in the second column of the mapping table. If not found, no replacement is made. See further “Map..Using” on page 329; “Rename Field” on page 335 and “Rename Table” on page 336. See also page 494.

The syntax is:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

mapping *(load statement | select statement)*

Examples:

```
mappingtable:
mapping load * from x.csv;
mapping select a,b from map1;

map1:
mapping load * inline [
x,y
US,USA
U.S.,USA
America,USA
];
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Map..Using

This script statement enables mapping of field values in one or more fields as they are encountered in the script after the **map** statement. The fields are mapped using a previously loaded mapping table specified by name (see above). See also page 494.

The automatic mapping will compare the value of the field to the values in the first column of the mapping table. If found, it will replace the original value with the corresponding value in the second column of the mapping table. If not found, the original value is kept.

The automatic mapping is done last in the chain of events that leads up to the field being stored in the QlikView table. For a typical **load** or **select** statement the order of events is roughly as follows:

1 Evaluation of expressions

2 Renaming of fields by as

3 Renaming of fields by alias

4 Qualification of table name, if applicable

5 Mapping of data if field name matches

This means that the mapping is not done every time a field name is encountered as part of an expression but rather when the value is stored under the field name in the QlikView table. If you need mapping on expression level, you should use the **ApplyMap** function (see page 420).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

For the mapping to take place also during partial script execution, the **map..using** statement must be preceded by **add** (see page 294) or **replace** (see page 336).

The syntax is:

map *fieldlist* **using** *mapname*

where

*fieldlist := *| (field { , field })*

Using * as fieldlist indicates all fields.

field is the name of a field that should be mapped from this point in the script. The wildcard characters * and ? are allowed in the field names. Quoting of field names may be necessary when using the wildcards.

mapname is the name of a mapping table previously read in a **mapping load** or **mapping select** statement (see "Mapping" on page 328).

Examples:

```
map Country using Cmap;
```

enables mapping of the field *Country* using the mapping table *Cmap*.

```
map A,B,C using X;
```

enables mapping of the fields *A*, *B* and *C* using the mapping table *X*.

```
map * using GenMap;
```

enables mapping of all fields using the mapping table *GenMap*.

```
map "A*", "?B?" using C;
```

enables mapping of fields starting with *A* and three character fields with *B* as second character using the mapping table *C*.

Example of entire script:

```
mappingtable:
mapping load x,y from CountryMap.csv;

map Country using mappingtable;

load Country,City,Customer,Address from
CustomerInfo.csv;
```

To disable mapping of fields, use the **Unmap** statement (page 350).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Noconcatenate

If two tables have the same set of fields and thus would normally be automatically concatenated, you can prevent the concatenation with the **noconcatenate** prefix. This statement prevents concatenation with any existing logical table with the same set of fields.

The syntax is:

noconcatenate *(loadstatement | selectstatement)*

Example:

```
Load A,B from file1.csv;
Noconcatenate load A,B from file2.csv;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

NullAsValue

By default QlikView considers null values to be missing or undefined entities. However, certain database contexts imply that null values are to be considered as special values rather than simply missing values. The fact that null values are normally not allowed to link to other null values can be suspended by means of the **nullasvalue** statement. Thus the null values of the specified fields are considered to be unknown rather than undefined when using the **nullasvalue** statement. The **nullasvalue** statement could be considered to supersede the **nulldisplay** variable (see page 355) at field level.

The syntax is:

nullasvalue *ListOfFields*

where *ListOfFields* is one or more field names separated by commas.

Example:

```
nullasvalue FirstDate,LastDate;
```

The wildcard characters * and ? are allowed in the field names. It is also possible to replace *ListOfFields* by the character * to turn **nullasvalue** on for all fields. Quoting of field names is sometimes necessary when using wildcards as part of field names.

Examples:

```
NullAsValue A,B;
Load A,B from x.csv;
```

```
NullAsValue *;
```

turns **nullasvalue** on for all fields.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
NullAsValue "*ID";
```
turns **nullasvalue** on for all fields with field names ending with *ID*.

```
NullAsValue "NR*",A;
```
turns **nullasvalue** on for *A* and all fields with field names starting with *NR*.

```
NullAsValue F??;
```
turns **nullasvalue** on for all fields with three character field names starting with *F*.

Please note the following points when using the nullasvalue statement:

- Linking of null values is always turned off by default at the beginning of script execution.
- Linking of null values of a specific field can be turned on at any time using a **nullasvalue** statement.
- Linking of null values can be turned off at any time using a **nullasnull** statement (see below).

NullAsNull

The **nullasnull** statement turns off the linking of null values previously set by a **nullasvalue** statement. See further on page 331.

The syntax is:

nullasnull *ListOfFields*

where

ListOfFields is one or more field names separated by commas.

The wildcard characters * and ? are allowed in the field names. It is also possible to replace *ListOfFields* by the character * to turn **nullasnull** on for all fields. Quoting of field names is sometimes necessary when using wildcards as part of field names.

Examples:

```
NullAsValue A,B;
Load A,B from x.csv;
NullAsNull *;
```

```
NullAsNull *;
```
turns NullAsValue off for all fields.

```
NullAsNull "*ID";
```
turns NullAsValue off for all fields with field names ending with *ID*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

NullAsNull "NR*",A;

turns NullAsValue on for *A* and all fields with field names starting with *NR*.

NullAsNull F??;

turns NullAsValue on for all fields with three character field names starting with *F*.

Outer

The explicit **join** prefix in the QlikView script language can be preceded by the prefix **outer** in order to specify an outer join. In an outer join all combinations between the two tables are generated. The **outer** prefix is optional. See further page 474.

The syntax is:

outer join *[(tablename)] (loadstatement | selectstatement)*

Example:

```
Select * from Table1;
outer join select * from Table2;
```

is equivalent to:

```
Select * from Table1;
join select * from Table2;
```

The **inner** (page 313), **left** (page 318), and **right** (page 337) prefixes can be used in similar ways.

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Qualify

The automatic join between fields with the same name in different tables can be suspended by means of the **qualify** statement, which qualifies the field name with its table name. If qualified, the field name(s) will be renamed when found in a table. The new name will be in the form of *tablename.fieldname*. *Tablename* is equivalent to the label of the current table, or, if no label exists, to the name appearing after **from** in **load** and **select** statements.

Qualification is always turned off by default at the beginning of script execution. Qualification of a field name can be turned on at any time using a **qualify** statement. Qualification can be turned off at any time using an **unqualify** statement (see further on page 350).

The syntax is:

qualify *ListOfFields*

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

where

ListOfFields is one or more field names separated by commas.

The wildcard characters * and ? are allowed in the field names. It is also possible to replace *ListOfFields* by the character * to turn qualification on or off for all field names. Quoting of field names is sometimes necessary when using the wildcards as part of field names.

Examples:

```
Qualify B;
Load A,B from x.csv;
Load A,B from y.csv;
```

The two tables *x.csv* and *y.csv* will be joined only on *A*. Three fields will be found: *A*, *x.B*, *y.B*.

```
Qualify Comment;
```

turns qualification on for all fields named *Comment*.

```
Qualify *;
```

turns qualification on for all field names.

```
Qualify "*ID";
```

turns qualification on for all field names ending with *ID*.

```
Qualify "NR*",A;
```

turns qualification on for *A* and all field names starting with *NR*.

```
Qualify F??;
```

turns qualification on for three character field names starting with *F*.

In an unknown database, you may want to start by associating only one or a few fields:

```
Qualify *;
Unqualify TransID;
Select * from tab1;
Select * from tab2;
Select * from tab3;
```

Only *TransID* will be used for associations between the tables.

Rem

The **rem** statement is used to insert remarks in the script. Everything between the **rem** and the semicolon is considered to be a comment.

The syntax is:

rem *string*

where

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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string is an arbitrary text. (Often the text is a script statement that temporarily should not be used.)

Comments can also be inserted at any point in the script, except inside a quotation, if enclosed by /* and */.

Furthermore, two double slashes // will cause the rest of the line in the script to be treated as a comment. Exception: //: can be part of a URL.

Note If you wish an external script specified by the **include** variable to be treated as a comment, you need to enclose it by /* and */ if the script contains several statements. Neither **rem** nor // can thus be used in this case.

Examples:

```
Rem ** This is a comment **;
Load a,b /* This is a comment */ from c.csv;
Load a,b from c.csv; // This is a comment
/* $(Include=abc.qvs); */
```

Rename Field

Renames one or more existing QlikView field(s).

The syntax is:

rename field*[***s***]* *(***using** *mapname* | *oldname* **to** *newname*
{, oldname **to** *newname})*

where

mapname is the name of a previously loaded mapping table containing one or more pairs of old and new field names

oldname is the old field name and

newname is the new field name.

Note Both **rename field** and **rename fields** are allowed forms with no difference in effect.

Examples:

```
Rename field XAZ0007 to Sales;
FieldMap:
Mapping select oldnames, newnames from datadict;
Rename fields using FieldMap;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Rename Table

Renames one or more existing QlikView input table(s).

The syntax is:

rename table[s] (using *mapname* | *oldname* **to** *newname*
{, oldname **to** *newname})*

where

mapname is the name of a previously loaded mapping table containing one or more pairs of old and new table names

oldname is the old table name and

newname is the new table name.

Note Both **rename table** and **rename tables** are allowed forms with no difference in effect.

Examples:

```
Tab1:
Select * from Trans;
Rename table Tab1 to Xyz;

TabMap:
Mapping load oldnames, newnames from tabnames.csv;
Rename tables using TabMap;
```

Replace

The **replace** prefix can be added to any **load**, **select** or **map..using** statement in the script. The **replace load** / **replace select** statement has the effect of dropping the entire QlikView table - whose table name is generated by the **replace load** / **replace select** statement - and replacing it with a new table containing the result of the **replace load** / **replace select** statement. The effect is the same during partial and full reload. The **replace map..using** statement causes the mapping to take place also during partial reload.

The syntax is:

replace *[* **only** *] (loadstatement* | *selectstatement* | *map..usingstatement)*

where

only is an optional qualifier, which denotes that the statement should be disregarded during normal (non-partial) reloads.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
Tab1:
Replace Load * from File1.csv;
```

During both normal and partial reload, the QlikView table *Tab1* is first dropped and then new data is loaded from *File1.csv* and stored in *Tab1*.

```
Tab1:
Replace Only Load * from File1.csv;
```

During normal reload, this statement is disregarded.

During partial reload, any QlikView table previously named *Tab1* is first dropped and then new data is loaded from *File1.csv* and stored in *Tab1*.

```
Tab1:
Load a,b,c from File1.csv;
Replace Load a,b,c from File2.csv;
```

During normal reload, the file *File1.csv* is first read into the QlikView table *Tab1*, but then immediately dropped and replaced with new data from *File2.csv.* All data from *File1.csv* is lost.

During partial reload, the entire QlikView table *Tab1* is first dropped and then replaced with new data loaded from *File2.csv.*

```
Tab1:
Load a,b,c from File1.csv;
Replace only Load a,b,c from File2.csv;
```

During normal reload, data is loaded from *File1.csv* and stored in the QlikView table *Tab1*. *File2.csv* is disregarded.

During partial reload, the entire QlikView table *Tab1* is first dropped and then new data is loaded only from *File2.csv* and stored in *Tab1*. All data from *File1.csv* is lost.

See also the **add** keyword (page 294), which can be used to append data to tables during partial reload.

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Right

The **join** and **keep** prefixes in the QlikView script language can be preceded by the prefix **right**.

If used before **join**, it specifies that the join between the two tables should be a right join. The resulting table only contains combinations between the two tables with a full data set from the second table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If used before **keep**, it specifies that the first table should be reduced to its common intersection with the second table before being stored in QlikView. See further on page 474.

The syntax is:

right *(* **join** | **keep** *) [(**tablename**)] (loadstatement | selectstatement))*

Examples:

```
QVTable:
Select * from Table1;
right join select * from Table2;

QVTab1:
Select * from Table1;
QVTab2:
right keep select * from Table2;

tab1:
Load * from file1.csv;
tab2:
load * from file2.csv;
.. .. ..
right keep (tab1) load * from file3.csv;
```

The **outer** (page 333), **inner** (page 313), and **left** (page 318) prefixes can be used in similar ways.

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Sample

The **sample** prefix is used to load a random sample of records from the input table.

The syntax is:

sample *p (loadstatement | selectstatement)*

where

p is an arbitrary expression which evaluates to a number larger than 0 and lower or equal to 1. The number indicates the probability for a given record to be read.

Examples:

```
Sample 0.15 Select * from Longtable;
Sample 0.15 Load * from Longtab.csv;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Section

With the **section** statement, it is possible to define whether the subsequent **load** and **select** statements should be considered as data or as a definition of the access rights.

The syntax is:

section *(* **access** | **application** *)*

Examples:

```
Section access;
Section application;
```

If nothing is specified, **section application** is assumed. The section definition is valid until a new **section** statement is made.

Note All fields defined in the **section access** must be written in uppercase in the script.

Select

The selection of fields from an ODBC data source is made through standard SQL **select** statements. However, the extent to which the **select** statements are accepted depends largely on the ODBC driver used. Below a brief syntax description:

select *[* **all** | **distinct** | **distinctrow** | **top** *n [* **percent** *]] *fieldlist*
from *tablelist*
[**where** *criterion]*
[**group by** *fieldlist [* **having** *criterion]]*
[**order by** *fieldlist [* **asc** | **desc** *]]*
[(**inner** | **left** | **right** | **full** *)* **join** *tablename* **on** *fieldref* **=** *fieldref]*

where

distinct is a predicate used if duplicate combinations of values in the selected fields only should be counted once.

distinctrow is a predicate used if duplicate records in the source table only should be counted once.

**fieldlist::= (* | field) { , field }*

A list of the fields to be selected. The "*" is used to select all the fields in the table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

fieldlist::= field { , field }

A list of one or more fields, separated by commas.

field::= (fieldref | expression) [**as** *aliasname]*

The expression can e.g. be a numeric or string function based on one or several other fields. Some of the operators and functions usually accepted are: +, -, *, /, & (string concatenation), sum(fieldname), count(fieldname), avg(fieldname) (average), month(fieldname), etc. See the documentation of your ODBC driver for more information.

fieldref::= [tablename **.** *] fieldname*

The tablename and the fieldname are text strings identical to what they imply. They must be enclosed by straight double quotation marks if they contain e.g. spaces.

The **as** clause is used to assign a new name to the field.

tablelist::= table { , table }

The list of tables that the fields are to be selected from.

table::= tablename [[**as** *] aliasname]*

The tablename may or may not be put within quotes.

where is a clause used to state whether a record should be included in the selection or not.

criterion is a logical expression that can sometimes be very complex. Some of the operators accepted are: numeric operators and functions, =, <> or #(not equal), >, >=, <, <=, and, or, not, exists, some, all, in and also new **select** statements. See the documentation of your ODBC driver for more information.

group by is a clause used to aggregate (group) several records into one. Within one group, for a certain field, all the records must either have the same value, or the field can only be used from within an expression, e.g. as a sum or an average. The expression based on one or several fields is defined in the expression of the field symbol. **having** is a clause used to qualify groups in a similar manner as the **where** clause is used to qualify records.

order by is a clause used to state the sort order of the resulting table of the **select** statement.

join is a qualifier stating if several tables are to be joined together into one.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Field names and table names must be put within quotes if they contain spaces or letters from the national character sets. When the script is automatically generated by QlikView, the quotation mark used is the one preferred by the ODBC driver specified in the data source definition of the data source in the **connect** statement.

Furthermore, several **select** statements can sometimes be concatenated into one through the use of a **union** operator:

selectstatement **union** *selectstatement*

The **select** statement is interpreted by the ODBC driver, so deviations from the general SQL syntax may occur depending on the capabilities of the ODBC drivers, e.g.

- **as** is sometimes not allowed, i.e. *aliasname* must follow immediately after *fieldname*.
- **as** is sometimes compulsory if an *aliasname* is used.
- **distinct**, **as**, **where**, **group by**, **order by**, or **union** are sometimes not supported.
- the ODBC driver sometimes does not accept all the different quotation marks listed above.

Note This is not a complete description of the SQL **select** statement! E.g., **select** statements can be nested, several joins can be made in one **select** statement, the number of functions allowed in expressions is sometimes very large, etc.

Examples:

```
Select * from `Categories`;
Select `Category ID`, `Category Name` from
`Categories`;
Select `Order ID`, `Product ID`,
`Unit Price` * Quantity * (1-Discount) as NetSales
from `Order Details`;
Select `Order Details`.`Order ID`,
Sum(`Order Details`.`Unit Price` * `Order
Details`.Quantity) as `Result`
from `Order Details`, Orders
where Orders.`Order ID` = `Order Details`.`Order ID`
group by `Order Details`.`Order ID`;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Semantic

Tables containing relations between objects can be loaded using the **semantic** prefix. See further page 489.

The syntax is:

semantic *(loadstatement | selectstatement)*

Examples:

```
Semantic Load * from abc.csv;
Semantic Select Object1, Relation, Object2,
InverseRelation from table1;
```

The **load** statement syntax is described on page 319. The **select** statement syntax is described on page 339.

Tables loaded using a **semantic** prefix cannot be concatenated.

Set

The **set** statement is used to define script variables. These can be used to substitute strings, paths, drives, etc. See further page 353. If the expression on the right side of the '=' should be evaluated before it is assigned to the macro variable, use the **let** statement (described on page 319) instead.

The syntax is:

set *variablename* **=***string*

Examples:

```
Set FileToUse=Data1.csv;
Set Constant="My string";
Set BudgetYear=1997;
Set YearRel = "RecNo()";
Set Year = "$(YearRel) + 1997";
```

Examples showing the difference between set and let:

```
Set X=3+4;
Let Y=3+4;
Let Z=$(Y)+1;
```

$ (X) will be evaluated as '3+4', whereas **$ (Y)** will be evaluated as '7'. Finally, **$ (Z)** will be evaluated as '8'.

Sleep

Pauses script execution n milliseconds, where n is a positive integer no larger than 3600000 (equals 1 hour wait). The value may be an expression. The syntax is:

sleep *n*

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
sleep 10000;
sleep t*1000;
```

SQL

The SQL statement allows you to send an arbitrary SQL command through an ODBC or OLE DB connection.

The syntax is:

SQL *command*

where

command is a valid SQL statement.

Example:

```
SQL Leave;
```

Sending SQL statements that update the database will return an error, unless the ODBC or OLE DB connection has been opened with the **mode is write** qualifier.

The syntax:

```
SQL select * from tab1;
```

is allowed and will in future documentation be the preferred syntax for **select** (for consistency reasons). The SQL prefix will however remain optional for **select** statements.

SQLColumns

The **sqlcolumns** statement returns a set of fields describing the columns of an ODBC data source to which a connection has been made. These fields can be combined with the fields generated by the **sqltables** and **sqltypes** commands in order to give a good overview of a database.

The standard fields are:
TABLE_QUALIFIER
TABLE_OWNER
TABLE_NAME
COLUMN_NAME
DATA_TYPE
TYPE_NAME
PRECISION
LENGTH
SCALE
RADIX
NULLABLE
REMARKS

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

For a detailed description of these fields, see an ODBC reference handbook.

Note Some ODBC drivers may not support this command.

Some ODBC drivers may produce additional fields.

The syntax is:

sqlcolumns

Example:

```
CONNECT TO 'MS Access 7.0
Database;DBQ=C:\Course3\DataSrc\QWT.mdb';
sqlcolumns;
```

SQLTables

The **sqltables** statement returns a set of fields describing the tables of an ODBC data source to which a connection has been made. These fields can be combined with the fields generated by the **sqlcolumns** and **sqltypes** commands in order to give a good overview of a database.

The standard fields are:
TABLE_QUALIFIER
TABLE_OWNER
TABLE_NAME
TABLE_TYPE
REMARKS

For a detailed description of these fields, see an ODBC reference handbook.

Note Some ODBC drivers may not support this command.

Some ODBC drivers may produce additional fields.

The syntax is:

sqltables

Example:

```
CONNECT TO 'MS Access 7.0
Database;DBQ=C:\Course3\DataSrc\QWT.mdb';
sqltables;
```

SQLTypes

The **sqltypes** statement returns a set of fields describing the types of an ODBC data source to which a connection has been made. These fields can be

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

combined with the fields generated by the **sqlcolumns** and **sqltables** commands in order to give a good overview of a database.

The standard fields are:
TYPE_NAME
DATA_TYPE
PRECISION
LITERAL_PREFIX
LITERAL_SUFFIX
CREATE_PARAMS
NULLABLE
CASE_SENSITIVE
SEARCHABLE
UNSIGNED_ATTRIBUTE
MONEY
AUTO_INCREMENT
LOCAL_TYPE_NAME
MINIMUM_SCALE
MAXIMUM_SCALE

For a detailed description of these fields, see an ODBC reference handbook.

Note Some ODBC drivers may not support this command. Some ODBC drivers may produce additional fields.

The syntax is:

sqltypes

Example:

```
CONNECT TO 'MS Access 7.0
Database;DBQ=C:\Course3\DataSrc\QWT.mdb';
sqltypes;
```

Star

The string used to represent the set of all the values of a field in the database can be set through the **star** statement. It affects the subsequent **load** and **select** statements.

The syntax is:

star is *[string]*

where

string is an arbitrary text. Note that the string must be enclosed by quotation marks if it contains blanks.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
Star is *;
Star is %;
Star is;
```

If nothing is specified, **star is;** is assumed, i.e. there is no star symbol available unless explicitly specified. This definition is valid until a new **star** statement is made. See further page 497.

Store

A QVD file can be created by a **store** statement in the script. The statement will create an explicitly named QVD file. The statement can only export fields from one logical table.

The syntax is:

store *[*fieldlist* **from***] table* **into** *filename;*

where

**fieldlist::= (* | field { , field })*

A list of the fields to be selected. The " * " is used to select all the fields in the table.

field::= fieldname [**as** *aliasname]*

fieldname is a text that is identical to a field name in the table. Note that the field name must be enclosed by straight double quotation marks or square brackets if it contains e.g. spaces.

aliasname is an alternate name for the field to be used in the resulting QVD file. Note that the name must be enclosed by straight double quotation marks or square brackets if it contains e.g. spaces.

table is a script labeled, already loaded table to be used as source for data.

filename is the name of the target file. The file name is interpreted similar to names in LOAD statements, i.e. the DIRECTORY statements apply.

Examples:

```
store mytable into xyz.qvd;
store * from mytable into xyz.qvd;
store Name, RegNo from mytable into xyz.qvd;
store Name as a, RegNo as b FROM mytable into xyz.qvd;
```

The two first statements have identical function.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Sub..End Sub

The **sub** control statement defines a subroutine, which can be called upon from a **call** statement.

The syntax is:

sub *name [* **(** *paramlist* **)** *]*
statements
end sub

where

name is the name of the subroutine.

paramlist is a comma separated list of variable names for the formal parameters of the subroutine.

statements is any group of one or more QlikView script statements.

Parameters are copied into the subroutine and, if the corresponding parameter in the calling **call** statement is a variable name, copied back out again upon exit from the subroutine.

If a subroutine has more formal parameters than actual parameters passed by a **call** statement, the extra parameters will be initialized to NULL and can be used as local variables within the subroutine.

Since the **sub** statement is a control statement, each of its two clauses (**sub** and **end sub**) must not cross a line boundary. They may be terminated by semicolon or end-of-line.

Examples:

```
// example 1
sub INCR (I,J)
      I = I + 1
      exit sub when I < 10
      J = J + 1
end sub
call INCR (X,Y)
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
// example 2 - parameter transfer
sub ParTrans (A,B,C)
      A=A+1
      B=B+1
      C=C+1
end sub

A=1
X=1
C=1
call ParTrans (A,(X+1)*2)
// A=2 (copied back from sub)
// X=1 (expression not copied back)
// C=1 (C in sub is local)
// B=null (local in sub)
```

Switch..Case..Default..End Switch

The **switch** control statement creates a fork where one of several groups of statements is executed, depending on the value of an *expression*.

The syntax is:

switch *expression*
{ **case** *valuelist*
[statements] }
[**default**
statements]
end switch

where

expression is an arbitrary expression.

valuelist is a comma separated list of values with which the value of *expression* will be compared. Execution of the script will continue with the statements in the first **case** clause encountered with a value in *valuelist* equal to the value of *expression*. Each value in *valuelist* may be an arbitrary expression. If no match is found in any **case** clause, the statements under the **default** clause, if it exists, will be executed.

statements is any group of one or more QlikView script statements.

Since the **switch** statement is a control statement, each of its four possible clauses (**switch**, **case**, **default** and **end switch**) must not cross a line boundary. They may be terminated by semicolon or end-of-line.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
switch I
   case 1
      load '$(I): CASE 1' as case autogenerate 1;
   case 2
      load '$(I): CASE 2' as case autogenerate 1;
   default
      load '$(I): DEFAULT' as case autogenerate 1;
end switch
```

Trace Writes string to the script progress dialog window and to the script log file, if such is used. The syntax is:

trace *string*

Example:

```
trace Main table loaded;
trace $(MyMessage);
```

Unless

The **unless** prefix and suffix is used to create a conditional clause, which determines whether a statement or an **exit** clause should be executed or not. It can be seen as a compact alternative to a full **if..end if** statement.

The syntax is:

(**unless** *condition statement* | *exitstatement* **unless** *condition)*

where

condition is a logical expression evaluating to true or false.

statement is any QlikView script statement except control statements.

exitstatement is an **exit for**, **exit do** or **exit sub** clause or an **exit script** statement.

The *statement* or *exitstatement* will only be executed if *condition* is evaluated to false.

The **unless** prefix may be used on statements which already have one or more other prefixes, including additional **when** and **unless** prefixes.

Examples:

```
exit script unless A=1
unless A=1 load * from myfile.csv;
unless A=1 when B=2 drop table Tab1;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Unmap

The **unmap** statement disables mapping of specified fields from the current point in the script.

The syntax is:

unmap *fieldlist*

where

fieldlist := *| (field { , field })

Using * as fieldlist indicates all fields.

field is the name of a field that should no longer be mapped from this point in the script. The wildcard characters * and ? are allowed in the field names. Quoting of field names may be necessary when using the wildcards.

Examples:

```
UnMap Country;
```
disables mapping of the field *Country.*

```
UnMap A,B,C;
```
disables mapping of the fields *A*, *B* and *C*.

```
UnMap *;
```
disables mapping of all fields.

```
UnMap "A*", "?B?";
```
disables mapping of fields starting with *A* and three character fields with *B* as second character.

See also “Mapping” on page 328 and “Map..Using” on page 329, as well as page 494.

Unqualify

The **unqualify** statement turns off qualification of field names previously set by a **qualify** statement. See further on page 350.

The syntax is:

unqualify *ListOfFields*

where

ListOfFields is one or more field names separated by commas.

The wildcard characters * and ? are allowed in the field names. It is also possible to replace *ListOfFields* by the character * to turn qualification on or off for all field names. Quoting of field names is sometimes necessary when using the wildcards as part of field names.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

Unqualify Comment;
turns qualification off for all fields named *Comment*.

Unqualify *;
turns qualification off for all field names.

Unqualify "*ID";
turns qualification off for all field names ending with *ID*.

Unqualify "NR*",A;
turns qualification on for *A* and all field names starting with *NR*.

Unqualify F??;
turns qualification on for three character field names starting with *F*.

In an unknown database, you may want to start by associating only one or a few fields:

```
Qualify *;
Unqualify TransID;
Select * from tab1;
Select * from tab2;
Select * from tab3;
```

Only *TransID* will be used for associations between the tables.

When

The **when** prefix and suffix is used to create a conditional clause, which determines whether a statement or an **exit** clause should be executed or not. It can be seen as a compact alternative to a full **if..end if** statement.

The syntax is:

(**when** *condition statement* | *exitstatement* **when** *condition)*

where

condition is a logical expression evaluating to true or false.

statement is any QlikView script statement except control statements.

exitstatement is an **exit for**, **exit do** or **exit sub** clause or an **exit script** statement.

The *statement* or *exitstatement* will only be executed if *condition* is evaluated to true.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **when** prefix may be used on statements which already have one or more other prefixes, including additional **when** and **unless** prefixes.

Examples:

```
exit script when A=1
when A=1 load * from myfile.csv;
when A=1 unless B=2 drop table Tab1;
```

24.3 Table Names

Naming of Tables

QlikView input tables are named as they are stored in the QlikView internal database. The table names can be used e.g. for **load...resident**, **peek** etc. and can be seen in the *$Table* system field in the layout.

Tables are named according to the following rules:

1 If a label immediately precedes a **load** or **select** statement the label will be used as table name. The label must be followed by a colon (see below under *Table labels*).

2 If no label is given, the filename or table name immediately following the keyword **from** in the **load** or **select** statement is used. A maximum of 32 characters is used. For filenames the extension is skipped.

3 Tables loaded inline will be named INLINExx, where xx is a number. The first inline table will be given the name *INLINE01*.

4 Automatically generated tables will be named AUTOGENERATExx, where x is a number. The first autogenerated table will be given the name *AUTOGENERATE01*.

5 If a table name generated according to the rules above should be in conflict with a previous table name, the name will be extended with -x , where x is a number. The number is increased until no conflict remains. For example, three tables could be named *Budget*, *Budget-1* and *Budget-2*.

There are three separate domains for table names: **section access**, **section application** and mapping tables. Table names generated in **section access** and **section application** will be treated separately. If a table name referenced is not found within the section, QlikView will search the other section as well. Mapping tables are treated separately and have no connection whatsoever to the other two domains of table names.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Table Labels

An input table can be labeled for later reference by a **load** statement with a **resident** clause or with expressions containing the **peek** function. The label, which can be an arbitrary string of numbers and characters, should precede the first **load** or **select** statement that creates the input table. The label must end with a colon.

Examples:

```
Table1:
Load a,b from c.csv;
...
Load x,y from d.csv where x=peek("a",y,Table1);
Transactions:

Select * from Transtable;
...
Load Month, sum(Sales) resident Transactions group by
Month;
```

24.4 Script Variables

Script variables are entities that can be assigned any text or numeric value. When used, the variable is substituted by its value. Variables can be used in the script for macro expansion and in various control statements.

Some special system variables will be set by QlikView at the start of the script execution regardless of their previous values.

When defining a script variable, the syntax

set *variablename* **=** *string*

or the syntax

let *variable* **=** *expression*

is used. The **Set** command assigns the variable the text to the right of the equal sign, whereas the **Let** command evaluates the expression.

Variables are case sensitive.

Example:

`set HidePrefix = $ ;` // the variable will get the character '$' as value.

`let vToday = Num(Today());` // returns the date serial number of today.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Special Variables

There are some variable names that have special meanings in QlikView:

Floppy Returns the drive letter of the first floppy drive found, normally **a:**. A system defined variable.

CD Returns the drive letter of the first CD-ROM drive found. If no CD-ROM is found, then **c:** is returned. A system defined variable.

QVPath

Returns the browse string to the QlikView executable. A system-defined variable.

QVRoot

Returns the root directory of the QlikView executable. A system-defined variable.

QVWorkPath

Returns the browse string to the current QlikView document. A system-defined variable.

QVWorkRoot

Returns the root directory of the current QlikView document. A system-defined variable.

WinPath

Returns the browse string to Windows. A system-defined variable.

WinRoot

Returns the root directory of Windows. A system-defined variable.

Include This variable specifies a file that contains text that should be included in the script. The entire script can thus be put in a file. It is called through

$(Include=*filename***)**

Example:

```
$(Include=abc.txt)
```

I.e. the construction **set Include=***filename* is not applicable.

HidePrefix

All field names beginning with this text string will be hidden in the same manner as the system fields. A user-defined variable.

Example:

```
set HidePrefix='_';
```

If this statement is used, the field names beginning with an underscore will not be shown in the field name lists when the system fields are hidden.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

HideSuffix

All field names ending with this text string will be hidden in the same manner as the system fields. A user-defined variable.

Example:

```
set HideSuffix='%';
```

If this statement is used, the field names ending with a percentage sign will not be shown in the field name lists when the system fields are hidden.

StripComments

If this variable is set to 0, stripping of /*..*/ and // comments in the script will be inhibited. This may be useful with certain database drivers which use /*..*/ comments to define hints in select statements. It is recommended to reset the variable to 1 after the statement(s) where it is needed in order to avoid errors in script execution. If the variable is not defined in a document, stripping of comments will always take place.

Example:

```
set StripComments=0;
```

Verbatim

Normally all field values are stripped of preceding and succeeding blank characters (ASCI 32) before being loaded into the QlikView database. By setting this variable to 1 this stripping is suspended.

Example:

```
set Verbatim=1;
```

OpenUrlTimeout

This variable defines the time-out in seconds that QlikView should respect when getting data from URL sources (e.g. HTML pages). If omitted the time-out is about 20 minutes.

Example:

```
set OpenUrlTimeout=10
```

Value Handling Variables

NullDisplay

The defined symbol will substitute all NULL values from ODBC on the lowest level of data. See “NULL Value Handling in QlikView” on page 498.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
set NullDisplay='<NULL>';
```

NullInterpret

The defined symbol will when it occurs in a text file or an **inline** statement be interpreted as NULL. See “NULL Value Handling in QlikView” on page 498.

Example:

```
set NullInterpret='';
```

NullValue

The defined symbol will substitute all NULL values that are considered to be unknown rather than undefined. The only NULL values affected are those included in the **nullasvalue** statement (see page 331)

Example:

```
set NullValue='<NULL>';
```

OtherSymbol

Defines a symbol to be treated as ‘all other values’ before a **load**/**select** statement. See page 497.

Example:

```
set OtherSymbol='+';
```

Number Interpretation Variables

The following variables will be automatically generated according to the current operating system settings when a new document is created. They are used to substitute the operating system defaults for certain number formatting settings at the time of the script execution. They may be deleted, edited or duplicated freely. These variables can make a QlikView document portable to computers with other default settings.

ThousandSep

The thousand separator defined replaces the digit grouping symbol of the operating system (Control Panel).

Example:

```
Set ThousandSep=',';
```

DecimalSep

The decimal separator defined replaces the decimal symbol of the operating system (Control Panel).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Set DecimalSep='.';
```

MoneyThousandSep

The thousand separator defined replaces the digit grouping symbol for currency of the operating system (Control Panel).

Example:

```
Set MoneyThousandSep=',';
```

MoneyDecimalSep

The decimal separator defined replaces the decimal symbol for currency of the operating system (Control Panel).

Example:

```
Set MoneyDecimalSep='.';
```

MoneyFormat

The symbol defined replaces the currency symbol of the operating system (Control Panel).

Example:

```
Set MoneyFormat='#,##0.00; (#,##0.00)';
```

TimeFormat

The format defined replaces the time format of the operating system (Control Panel).

Example:

```
Set TimeFormat='hh:mm:ss';
```

DateFormat

The format defined replaces the date format of the operating system (Control Panel).

Example:

```
Set DateFormat='M/D/YY';
```

TimestampFormat

The format defined replaces the date and time formats of the operating system (Control Panel).

Example:

```
Set TimestampFormat='M/D/YY hh:mm:ss[.fff]';
```

MonthNames

The month names defined replace standard short month names of the operating system (Regional Settings).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Set MonthNames='Jan;Feb;Mar;Apr;...';
```

DayNames

The day names defined replace standard short weekday names of the operating system (Regional Settings).

Example:

```
Set DayNames='Mon;Tue;Wed;Thu;Fri...';
```

LongMonthNames

The month names defined replace standard month names of the operating system (Regional Settings).

Example:

```
Set LongMonthNames='January;February;...';
```

LongDayNames

The day names defined replace standard weekday names of the operating system (Regional Settings).

Example:

```
Set LongDayNames='Monday;Tuesday;...';
```

Error Variables

There are four special variables which can be used for error handling in the script:

ErrorMode

Determines the action to be taken by QlikView when an error is encountered during script execution. By default (ErrorMode=1) the script execution will halt and the user will be prompted for action (non-batch mode). By setting ErrorMode=0 QlikView will simply ignore the failure and continue script execution at the next script statement. By setting ErrorMode=2 QlikView will trigger a "Execution of script failed…" error message immediately on failure, without prompting the user for action beforehand.

Example:

```
set ErrorMode=0;
```

ScriptError

The error code of the last executed script statement. This variable will be reset to 0 after each successfully executed script statement. If an error occurs it will be set to an internal QlikView error code. The error code is a dual value with a numeric and a text value. Error codes are as follows:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1 No Error
2 General Error
3 Syntax Error
4 General ODBC Error
5 General OLEDB Error
6 General XML Error
7 General HTML Error
8 File Not Found
9 Database Not Found
10 Table Not Found
11 Field Not Found
12 File Has Wrong Format

Examples:

```
set ErrorMode=0;
load * from abc.csv;
if ScriptError=8 then
exit script;
//no file;
end if

set ErrorMode=0;
load * from abc.csv;
if '$(ScriptError)'='File Not Found' then
exit script;
end if
```

ScriptErrorDetails

Returns a more detailed error description for some of the error codes above. Most importantly this variable will contain the error message returned by ODBC and OLEDB drivers for error codes 3 and 4.

ScriptErrorCount

Returns the total number of statements that have caused errors during the current script execution. This variable is always reset to 0 at the start of script execution.

The values of all four variables will remain after script execution. The value of the last three variables for error handling inside the script is of course dependent on the use of ErrorMode=0.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Set ErrorMode=0;
Load * from abc.csv;
if ScriptErrorCount >= 1 then
exit script;
end if
```

ScriptErrorList

This variable will contain a concatenated list of all script errors that have occurred during the last script execution. Each error is separated by a line feed.

24.5 Dollar-Sign Expansions

Dollar-sign expansions are definitions of text replacements used in the script or in expressions. This process is known as expansion - even if the new text is shorter. The replacement is made just before the script statement or the expression is evaluated. Technically it is a macro expansion.

A macro expansion always begins with '$(' and ends with ') ' and the content between brackets defines how the text replacement will be done. To avoid confusion with script macros we will henceforth refer to macro expansions as dollar-sign expansions.

Note Macro expansion is unrelated to script macros (VB or Java script defined in the script module).

Dollar-Sign Expansion using a variable

When using a variable for text replacement in the script or in an expression, the syntax

$(*variablename***)**

is used. **$(** *variablename* **)** expands to the value in *variablename*. If this is a number or a date, the string will format according to active regional settings. If *variablename* does not exist the expansion will be the empty string.

For numeric variable expansions the syntax

$(#*variablename***)**

is used. **$(#***variablename***)** always yields a legal decimal-point number reflection of the numeric value of variablename, possibly with exponential notation (for very large/small numbers). If *variablename* does not exist or does not contain a numeric value, it will be expanded to 0 instead.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

After execution of the following script:

```
SET DecimalSep=',';
LET X = 7/2;
```

$(*X***)** will expand to 3,5 while **$(#***X***)** will expand to 3.5.

Examples:

```
set MyPath=C:\MyDocs\Files\
...
load * from $(MyPath)abc.csv;
set CurrentYear=1992;
...
select * from table1 where Year=$(CurrentYear);
```

Dollar-Sign Expansion with Parameters

Parameters can be used in variable expansions. The variable must then contain formal parameters, such as $1, $2, $3 etc. When expanding the variable, the parameters should be given in a comma separated list:

Examples:

```
set MUL='$1*$2';
set X=$(MUL(3,7)); // returns '3*7' in X
let X=$(MUL(3,7)); // returns 21 in X
```

If the number of formal parameters exceeds the number of actual parameters only the formal parameters corresponding to actual parameters will be expanded. If the number of actual parameters exceeds the number of formal parameters the superfluous actual parameters will be ignored.

Examples:

```
set MUL='$1*$2';
set X=$(MUL); // returns '$1*$2' in X
set X=$(MUL(10)); // returns '10*$2' in X
let X=$(MUL(5,7,8)); // returns 35 in X
```

The parameter **$0** returns the number of parameters actually passed by a call.

Example:

```
set MUL='$1*$2 $0 par';
set X=$(MUL(3,7)); // returns '3*7 2 par' in X
```

Dollar-Sign Expansion with an Expression

Expressions can be used in dollar-sign expansions. The content between the brackets must then start with an equal sign:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

$(=*expression***)**

The expression will be evaluated and the value will be used in the expansion.

Example:

```
$(=Year(Today()));
```
// returns e.g. '2008'

```
$(=Only(Year)-1);
```
// returns the year before the selected one

Dollar-Sign Expansion of File – Include statement

File inclusions are made using dollar-sign expansions. The syntax is then:

$(include=*filename* **)**

The above text will be replaced by the content of the file specified after the equal sign. This feature is very useful if you want to store scripts or parts of scripts in text files.

Example:

```
$(include=C:\Documents\MyScript.qvs);
```

24.6 Quotation Marks

If quotation marks are possible or necessary within a statement, it is mentioned below. In a **load** statement the following symbols should be used as quotation marks:

Field names: [ ], " ", `` or ´ ´

String literals: ''

For a **select** statement interpreted by the ODBC driver it may be slightly different, though. Usually you should use the straight double quotation marks (alt+0034) for names and the straight single quotation marks (alt+0039) for literals, and thus never the oblique: ´ ´ or ` `. However, some ODBC drivers not only accept the oblique quotation marks, but also prefer them. In such a case the generated **select** statements contain oblique quotation marks.

Example: Difference between Names and Literals

The difference between names and literals becomes clearer if you compare the following expressions:

```
'Sweden' as Country
```

as a part of the field list in a **load** or **select** statement will load the text string *Sweden* as field value into the QlikView field *Country*, whereas

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
"land" as Country
```

as a part of the field list in a **load** or **select** statement will load the content of the database field or table column named *land* as field values into the QlikView field *Country*. I.e. *land* will be treated as a field reference.

Example: Difference between Numbers and String Literals

The difference between names and string literals becomes clearer if you compare the following expressions:

```
'12/31/96'
```

as a part of an expression will be interpreted as the text string *12/31/96*, whereas

```
12/31/96
```

as a part of an expression will be interpreted numerically as the date *Dec 12, 1996*, and assigned the corresponding numeric value, provided that the system date format is MM/DD/YY.

Example: MS Access

Microsoft Access ODBC Driver 3.4 (included in MS Access 7.0) accepts the following quotes when analyzing the select statement.

Field names and table names: [ ], " " or ``

String literals: ''

Not accepted: ´´

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

364

25 SCRIPT EXPRESSIONS

Expressions can be used in both the **load** statement and the **select** statement. The syntax and functions described here apply to the **load** statement, and not to the **select** statement, since the latter is interpreted by the ODBC driver and not by QlikView. However, most ODBC drivers are often capable of interpreting a number of the functions described below.

All expressions in a QlikView script return a number and/or a string, whichever is appropriate. Logical functions and operators return 0 for false and -1 for true. Number to string conversions and vice versa are implicit. Logical operators and functions interpret 0 as false and all else as true.

25.1 Expression Syntax

The general syntax for an expression is:

expression ::=(*constant* |
fieldref |
operator1 expression |
expression operator2 expression |
function |
(*expression* **)**)

where

constant is a string (a text, a date or a time) enclosed by single straight quotation marks, or a number. Constants are written with no thousand separator and with a decimal point as decimal separator.

fieldref is a field name of the loaded table.

operator1 is a unary operator (working on one expression, the one to the right).

operator2 is a binary operator (working on two expressions, one on each side).

function ::= functionname **(** *parameters* **)**

parameters ::= expression { **,** *expression }*

The number and types of parameters is not arbitrary. It depends on the function used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Expressions and functions can thus be nested freely, and as long as the expression returns an interpretable value, QlikView will not give any error messages.

25.2 Operators

There are two types of operators in QlikView, unary operators that take only one operand, and binary operators that take two operands. Most operators are binary.

Numeric Operators

All numeric operators use the numeric values of the operands and return a numeric value as result.

+ Sign for positive number (unary operator) or arithmetic addition. The binary operation returns the sum of the two operands.

- Sign for negative number (unary operator) or arithmetic subtraction. The unary operation returns the operand multiplied by -1, and the binary the difference between the two operands.

***** Arithmetic multiplication. The operation returns the product of the two operands.

/ Arithmetic division. The operation returns the ratio between the two operands.

String Operators

There are two string operators. One uses the string values of the operands and returns a string as result. The other one compares the operands and returns a boolean value to indicate match.

& String concatenation. The operation returns a text string that consists of the two operand strings, one after another.

Example:
'abc' **&** 'xyz' returns 'abcxyz'

like String comparison with wildcard characters. The operation returns a boolean true (-1) if the string before the operator is matched by the string after the operator. The second string may contain the wildcard characters * (any number of arbitrary characters) or ? (one arbitrary character).

Examples:
'abc' like 'a*' returns true (-1)
'abcd' like 'a?c*' returns true (-1)
'abc' like 'a??bc' returns false (0)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Logical Operators

All logical operators interpret the operands logically and return true (-1) or false (0) as result.

not Logical inverse. One of the few unary operators. The operation returns the logical inverse of the operand.

and Logical and. The operation returns the logical and of the operands.

or Logical or. The operation returns the logical or of the operands.

xor Logical exclusive or. The operation returns the logical exclusive or of the operands. I.e. like logical or, but with the difference that the result is false if both operands are true.

Relational Operators

All relational operators compare the values of the operands and return true (-1) or false (0) as result. All relational operators are binary.

< Less than. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

<= Less than or equal. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

> Greater than. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

>= Greater than or equal. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

= Equals. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

<> Not equivalent to. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

follows

ASCII greater than. Returns true if the left-hand operand has a text representation which, in an ASCII comparison, comes after the text representation of the right-hand operand. Unlike the > operator no attempt is made to make a numeric interpretation of the argument values before the comparison.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
'23' **follows** '111' returns true
'23' > '111' returns false

precedes

ASCII less than. Returns true if the left-hand operand has a text representation which, in an ASCII comparison, comes before the text representation of the right-hand operand. Unlike the < operator no attempt is made to make a numeric interpretation of the argument values before the comparison.

Examples:
'11' **precedes** '2' returns true
'11' < '2' returns false

Bit operators

All bit operators convert the operands to signed integers (32 bit) and return the result in that way. All operations are performed bit by bit.

bitnot Bit inverse. Unary operator. The operation returns the logical inverse of the operand performed bit by bit.

bitand Bit and. The operation returns the logical and of the operands performed bit by bit.

bitor Bit or. The operation returns the logical or of the operands performed bit by bit.

bitxor Bit exclusive or. The operation returns the logical exclusive or of the operands performed bit by bit.

>> Bit right shift. Unary operator. The operation returns the operand shifted one step to the right.

<< Bit left shift. Unary operator. The operation returns the operand shifted one step to the left.

25.3 Aggregation Functions

Functions can have different numbers of parameters as well as different types of parameters. In the functions below, the parameters are expressions where *x* should be interpreted as a real valued number, *n* as an integer and *s* as a string.

The QlikView script language supports more than 110 standard functions. These have been divided into groups as follows:

Basic Aggregation Functions ..... page 369
String Aggregation Functions..... page 371

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Counter Aggregations Functions ..... page 372
Statistical Aggregation Functions ..... page 373
Financial Aggregation Functions ..... page 380
Statistical Test Functions ..... page 381

Basic Aggregation Functions

These functions can only be used in field lists for **load** statements with a **group by** clause.

sum(*[* **distinct** *]* *expression* **)**

Returns the sum of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, sum(Sales) as SalesPerMonth
from abc.csv group by Month;
```

min(*expression [, rank]***)**

Returns the minimum numeric value of *expression* encountered over a number of records as defined by a **group by** clause. *Rank* defaults to 1 which correspond to the lowest value. By specifying *rank* as 2 the second lowest value will be returned. If *rank* is 3 the third lowest value will be returned and so on.

Examples:

```
Load Month, min(Sales) as
SmallestSalePerMonth from abc.csv
group by Month;

Load Month, min(Sales,2) as
SecondSmallestSalePerMonth from abc.csv
group by Month;
```

max(*expression [, rank]***)**

Returns the maximum numeric value of *expression* encountered over a number of records as defined by a **group by** clause. *Rank* defaults to 1 which correspond to the highest value. By specifying *rank* as 2 the second highest value will be returned. If *rank* is 3 the third highest value will be returned and so on.

Examples:

```
Load Month, max(Sales) as
LargestSalePerMonth from abc.csv
group by Month;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
Load Month, max(Sales,2) as
SecondLKargestSalePerMonth from abc.csv
group by Month;
```

only(*expression* **)**

If *expression* over a number of records as defined by a **group by** clause contains only one value, that value is returned, else NULL is returned. **Only** can return numeric values as well as text values.

Examples:

```
Load Month, only(Price) as
OnlyPriceSoldFor from abc.csv
group by Month;

Load Month, only(Salesman) as
OnlyPersonWhoSold from abc.csv
group by Month;
```

mode(*expression* **)**

Returns the mode value, i.e. the most commonly occurring value, of *expression* over a number of records as defined by a **group by** clause. If more than one value is equally commonly occurring, NULL is returned. **Mode** can return numeric values as well as text values.

Examples:

```
Load Month, mode(ErrorNumber) as
MostCommonErrorNumber from abc.csv
group by Month;

Load Month, mode(Product) as
ProductMostOftenSold from abc.csv
group by Month;
```

firstsortedvalue (*[* **distinct** *] expression [, sort-weight [, n]]* **)**

returns the first value of *expression* sorted by corresponding *sort-weight* when *expression* is iterated over a number of records as defined by a **group by** clause.. *Sort-weight* should return a numeric value where the lowest value will render the corresponding value of *expression* to be sorted first. By preceding the *sort-value* expression with a minus sign, the function will return the last value instead. If more than one value of expression share the same lowest *sort-order*, the function will return null. By stating an n larger than 1, you will get the *n*th value in order. If the word **distinct** occurs before the *expression*, all duplicates will be disregarded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Customer,
firstsortedvalue(PurchasedArticle, OrderDate)as
FirstProductBought from abc.csv
group by Customer;
```

String Aggregation Functions

MinString(*expression* **)**

Returns the first text value in text sort order of *expression* over a number of records as defined by a **group by** clause. If no text value is found, NULL is returned.

Example:

```
Load City, MinString(Name) as FirstName from
abc.csv group by City;
```

MaxString(*expression* **)**

Returns the last text value in text sort order of *expression* over a number of records as defined by a **group by** clause. If no text value is found, NULL is returned.

Example:

```
Load City, MaxString(Name) as LastName from
abc.csv group by City;
```

FirstValue(*expression*)

Returns the first value in load order of *expression* over a number of records as defined by a **group by** clause. If no text value is found, NULL is returned. This function is only available as a script function.

Example:

```
Load City, FirstValue(Name), as FirstName from
abc.csv group by City;
```

LastValue(*expression*)

Returns the last value in load order of *expression* over a number of records as defined by a **group by** clause. If no text value is found, NULL is returned. This function is only available as a script function.

Example:

```
Load City, LastValue(Name), as FirstName from
abc.csv group by City;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

concat (*[* **distinct** *] expression, [delimiter [, sort-weight]]* **)**

returns the aggregated string concatenation of all values of **expression** iterated over a number of records as defined by a *group by* clause. Each value may be separated by the string found in *delimiter*. The order of concatenation may be determined by *sort-weight*. *Sort-weight* should return a numeric value where the lowest value will render the item to be sorted first. If the word **distinct** occurs before the *expression*, all duplicates will be disregarded.

Example:

```
Load Department, concat(Name,';') as NameList
from abc.csv group by Department;
```

Counter Aggregation Functions

count(*[* **distinct** *] expression* | ***** *)*

Returns the count of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Occurrences of *expression* returning NULL are disregarded; if **count(*)** is used, however, NULL values are counted as well as non-NULL values.

Examples:

```
Load Month, count(Sales) as
NumberOfSalesPerMonth from abc.csv
group by Month;
```

```
Load Month, count(distinct Customer) as
CustomersBuyingPerMonth from abc.csv group by
Month;
```

```
Load Month, count(*) as
NumberOfRecordsPerMonth from abc.csv group by
Month;
```

NumericCount(*[* **distinct** *] expression* **)**

Returns the numeric count of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, NumericCount(Item) as
NumberOfNumericItems from abc.csv
group by Month;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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TextCount(*[* **distinct** *]* *expression* **)**

Returns the text count of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, TextCount(Item) as
NumberOfTextItems from abc.csv
group by Month;
```

NullCount(*[* **distinct** *]* *expression* **)**

Returns the null count of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, NullCount(Item) as
NumberOfNullItems from abc.csv
group by Month;
```

MissingCount(*[* **distinct** *]* *expression* **)**

Returns the missing count of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded. Missing values are all non-numeric values, including null values.

Example:

```
Load Month, MissingCount(Item) as
NumberOfMissingItems from abc.csv
group by Month;
```


Statistical Aggregation Functions

avg(*[* **distinct** *]* *expression* **)**

Returns the average of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, avg(Sales) as
AverageSalesPerMonth from abc.csv
group by Month;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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stdev(*[* **distinct** *]* *expression* **)**

Returns the standard deviation of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, stdev(Sales) as
SalesStandardDeviation from abc.csv group by
Month;
```

fractile (*expression, fractile* **)**

returns the aggregated fractile of *expression* over a number of records as defined by a **group by** clause.

Example:

```
Load Class, fractile(Grade, 0.75) as F from
abc.csv group by Class;
```

median (*expression* **)**

returns the aggregated median of expression over a number of records as defined by a **group by** clause.

Example:

```
Load Class, Median(Grade) as MG from abc.csv
group by Class;
```

skew(*[* **distinct** *]* *expression* **)**

Returns the skewness of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, skew(Sales) as SalesSkew from
abc.csv group by Month;
```

kurtosis(*[* **distinct** *]* *expression* **)**

Returns the kurtosis of *expression* over a number of records as defined by a **group by** clause. If the word **distinct** occurs before the expression, all duplicates will be disregarded.

Example:

```
Load Month, kurtosis(Sales) as
SalesKurtosis from abc.csv group by Month;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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correl (*[x-expression, y-expression* **)**

returns the aggregated correlation coefficient for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

Example:

```
Load Month, correl(X,Y) as CC from abc.csv
group by Month;
```

sterr (*[* **distinct** *] expression* **)**

returns the aggregated standard error (stdev/sqrt(n)) for a series of values represented by *expression* iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values will be disregarded. If the word **distinct** occurs before the function arguments, duplicates result¬ing from the evaluation of the function arguments will be disregarded.

Example:

```
Load Key, sterr(X) as Z from abc.csv
group by Key;
```

steyx (*x-expression, y-expression* **)**

returns the aggregated standard error of the predicted y-value for each x-value in the regression for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

Example:

```
Load Key, steyx(X,Y) as Z from abc.csv
group by Key;
```

linest_m (*x-expression, y-expression [, y0 [, x0]]* **)**

returns the aggregated m value (slope) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_m(X,Y) as Z from abc.csv
group by Key;
```

linest_b (*x-expression*, *y-expression [, y0 [, x0]]* **)**

returns the aggregated b value (y-intercept) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_b(X,Y) as Z from abc.csv
group by Key;
```

linest_r2 (*x-expression*, *y-expression [, y0 [, x0]]* **)**

returns the aggregated r2 value (coefficient of determination) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_r2(X,Y) as Z from abc.csv
group by Key;
```

linest_sem (*x-expression*, *y-expression [, y0 [, x0]]* **)**

returns the aggregated standard error of the m value of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_sem(X,Y) as Z from abc.csv
group by Key;
```

linest_seb (*x-expression*, *y-expression [, y0 [, x0]]* **)**

returns the aggregated standard error of the b value of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_seb(X,Y) as Z from abc.csv
group by Key;
```

linest_sey (*x-expression*, *y-expression [, y0 [, x0]]* **)**

returns the aggregated standard error of the y estimate of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_sey(X,Y) as Z from abc.csv
group by Key;
```

linest_df (*x-expression*, *y-expression [, y0 [, x0]]* **)**

returns the aggregated degrees of freedom of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Key, linest_df(X,Y) as Z from abc.csv
group by Key;
```

linest_f (*x-expression, y-expression [, y0 [, x0]]* **)**
returns the aggregated F statistic (r2/(1-r2)) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_f(X,Y) as Z from abc.csv
group by Key;
```

linest_ssreg (*x-expression, y-expression [, y0 [, x0]]* **)**
returns the aggregated regression sum of squares of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_ssreg(X,Y) as Z from abc.csv
group by Key;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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linest_ssresid (*x-expression, y-expression [, y0 [, x0]]* **)**

returns the aggregated residual sum of squares of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and y-expression iterated over a number of records as defined by a **group by** clause. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

Example:

```
Load Key, linest_ssresid(X,Y) as Z from abc.csv
group by Key;
```

Financial Aggregation Functions

irr(*expression* **)**

returns the aggregated internal rate of return for a series of cash flows represented by the numbers in *expression* iterated over a number of records as defined by a **group by** clause. These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.The function needs at least one positive and one negative value to calculate. Text values, null values and missing values are disregarded.

Example:

```
Load Year, irr(Payments) as IRate from abc.csv
group by Year;
```

xirr (*valueexpression, dateexpression* **)**

returns the aggregated internal rate of return for a schedule of cash flows (that is not necessarily periodic) represented by paired numbers in *valueexpression* and *dateexpression* iterated over a number of records as defined by a **group by** clause. All payments are discounted based on a 365-day year. Text values, null values and miss-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ing values in any or both pieces of a data-pair will result in disregarding the entire data-pair.

Example:

```
Load Year, xirr(Payments, PayDates) as Irate
from abc.csv group by Year;
```

npv (*rate*, *expression* **)**

returns the aggregated net present value of an investment based on a discount rate and a series of future payments (negative values) and incomes (positive values) represented by the numbers in *expression* iterated over a number of records as defined by a **group by** clause. The result has a default number format of money. Rate is the interest rate per period. The payments and incomes are assumed to occur at the end of each period. Text values, null values and missing values are disregarded.

Example:

```
Load Year, npv(0.05, Payments) as PValue from
abc.csv group by Year;
```

xnpv (*rate*, *valueexpression*, *dateexpression* **)**

returns the aggregated net present value for a schedule of cash flows (not necessarily periodic) represented by paired numbers in *valueexpression* and *dateexpression* iterated over a number of records as defined by a **group by** clause. Rate is the interest rate per period. The result has a default number format of money. All payments are discounted based on a 365-day year. Text values, null values and missing values in any or both pieces of a data-pair will result in disregarding the entire data-pair.

Example:

```
Load Year, npv(0.05, Payments, PayDates) as
PValue from abc.csv group by Year;
```

Statistical Test Functions

The following three functions apply to chi^2-tests.

chi2test_p (*col, row, observed_value [, expected_value]* **)**

returns the aggregated chi^2-test p value (significance) for one or two series of values iterated over a number of records as defined by a **group by** clause. The test can be done either on the values in *observed_value* testing for variations within the specified *col* and *row* matrix or by comparing values in *observed_value* with corre-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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sponding values in *expected_values*. Text values, null values and missing values in the value expressions will result in the function returning null

Example:

```
Load Year, chi2test_p
(Gender,Description,Observed,Expected)
as X from abc.csv group by Year;
```

chi2test_df (*col, row, observed_value [, expected_value]* **)**

returns the aggregated chi^2-test df value (degrees of freedom) for one or two series of values iterated over a number of records as defined by a **group by** clause. See the **chi2test_p** function, page 381, for argument descriptions.

Example:

```
Load Year,chi2test_df
(Gender,Description,Observed,Expected)
as X from abc.csv group by Year;
```

chi2test_chi2 (*col, row, observed_value [, expected_value]* **)**

returns the aggregated chi^2-test value for one or two series of values iterated over a number of records as defined by a **group by** clause. See the **chi2test_p** function, page 381, for argument descriptions.

Example:

```
Load Year,
chi2test_chi2(Gender,Description,Observed,
Expected) as X from abc.csv group by Year;
```

The following eight functions apply to two independent samples' student's t-tests.

TTest_t (*group, value [, eq_var = true]* **)**

returns the aggregated student's t-test t value for two independent series of values iterated over a number of records as defined by a **group by** clause. The values should be returned by *value* and be logically grouped via exactly two values in *group*. If *eq_var* is specified as false, separate variances of the two samples will be assumed, else equal variances between the samples will be assumed. Text values, null values and missing values in *value* will result in the function returning null.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Year, ttest_t(Group, Value) as X from
abc.csv group by Year;
```

TTest_df (*group, value [, eq_var = true]* **)**

returns the aggregated student's t-test df value (degrees of freedom) for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTest_t** function, page 382, for argument descriptions.

Example:

```
Load Year, ttest_df(Group, Value) as X from
abc.csv group by Year;
```

TTest_sig (*group, value [, eq_var = true]* **)**

returns the aggregated student's t-test 2-tailed level of significance for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTest_t** function, page 382, for argument descriptions.

Example:

```
Load Year, ttest_sig(Group, Value) as X from
abc.csv group by Year;
```

TTest_dif (*group, value [, eq_var = true]* **)**

returns the aggregated student's t-test mean difference for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTest_t** function, page 382, for argument descriptions.

Example:

```
Load Year, ttest_dif(Group, Value) as X from
abc.csv group by Year;
```

TTest_sterr (*group, value [, eq_var = true]* **)**

returns the aggregated student's t-test standard error of the mean difference for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTest_t** function, page 382, for argument descriptions.

Example:

```
Load Year, ttest_sterr(Group, Value) as X from
abc.csv group by Year;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTest_conf (*group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated t value for two independent series of values iterated over a number of records as defined by a **group by** clause. The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTest_t** function, page 382, for descriptions of the other arguments.

Example:

```
Load Year, ttest_conf(Group, Value) as X from
abc.csv group by Year;
```

TTest_lower (*group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated value for the lower end of the confidence interval for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTest_t**, page 382, and **TTest_conf**, page 384, functions for argument descriptions.

Example:

```
Load Year, ttest_lower(Group, Value) as X from
abc.csv group by Year;
```

TTest_upper (*group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated value for the upper end of the confidence interval for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTest_t**, page 382, and **TTest_conf**, page 384, functions for argument descriptions.

Example:

```
Load Year, ttest_upper(Group, Value) as X from
abc.csv group by Year;
```

The following eight functions apply to two independent samples' student's t-tests where the input data series is given in weighted two-column format.

TTestw_t (*weight, group, value [, eq_var = true]* **)**
returns the aggregated student's t-test t value for two independent series of values iterated over a number of records as defined by a **group by** clause. The values should be returned by *value* and be logically grouped via exactly two values in *group*. Each value in *value* can be counted one or more times according to a corresponding weight value in *weight*. If *eq_var* is specified as false, separate variances of the two samples will be assumed, else equal variances

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

between the samples will be assumed. Text values, null values and missing values in *value* will result in the function returning null.

Example:

```
Load Year, ttestw_t(Weight, Group, Value) as X
from abc.csv group by Year;
```

TTestw_df (*weight, group, value [, eq_var = true]* **)**
returns the aggregated student's t-test df value (degrees of freedom) for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTestw_t** function, page 384, for argument descriptions.

Example:

```
Load Year, ttestw_df(Weight, Group, Value) as X
from abc.csv group by Year;
```

TTestw_sig (*weight, group, value [, eq_var = true]* **)**
returns the aggregated student's t-test 2-tailed level of significance for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTestw_t** function, page 384, for argument descriptions.

Example:

```
Load Year, ttestw_sig(Weight, Group, Value) as
X from abc.csv group by Year;
```

TTestw_dif (*weight, group, value [, eq_var = true]* **)**
returns the aggregated student's t-test mean difference for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTestw_t** function, page 384, for argument descriptions.

Example:

```
Load Year, ttestw_dif(Weight, Group, Value) as
X from abc.csv group by Year;
```

TTestw_sterr (*weight, group, value [, eq_var = true]* **)**
returns the aggregated student's t-test standard error of the mean difference for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTestw_t** function, page 384, for argument descriptions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Year, ttestw_sterr(Weight, Group, Value)
as X from abc.csv group by Year;
```

TTestw_conf (*weight, group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated t value for two independent series of values iterated over a number of records as defined by a **group by** clause. The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTestw_t** function, page 384, for descriptions of the other arguments.

Example:

```
Load Year, ttestw_conf(Weight, Group, Value)
as X from abc.csv group by Year;
```

TTestw_lower (*weight, group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated value for the lower end of the confidence interval for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTestw_t**, page 384, and **TTestw_conf**, page 386, functions for argument descriptions.

Example:

```
Load Year, ttestw_lower(Weight, Group, Value)
as X from abc.csv group by Year;
```

TTestw_upper (*weight, group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated value for the upper end of the confidence interval for two independent series of values iterated over a number of records as defined by a **group by** clause. See the **TTestw_t**, page 384, and **TTestw_conf**, page 386, functions for argument descriptions.

Example:

```
Load Year, ttestw_upper(Weight, Group, Value)
as X from abc.csv group by Year;
```

The following eight functions apply to one-sample student's t-tests.

TTest1_t (*value* **)**
returns the aggregated t value for a series of values iterated over a number of records as defined by a **group by** clause. The values should be returned by *value*. Text values, null values and missing values in *value* will result in the function returning null.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example:

```
Load Year, ttest1_t(Value) as X from abc.csv
group by Year;
```

TTest1_df (*value* **)**

returns the aggregated student's t-test df value (degrees of freedom) for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1_t** function, page 386, for argument descriptions.

Example:

```
Load Year, ttest1_df(Value) as X from abc.csv
group by Year;
```

TTest1_sig (*value* **)**

returns the aggregated student's t-test 2-tailed level of significance for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1_t** function, page 386, for argument descriptions.

Example:

```
Load Year, ttest1_sig(Value) as X from abc.csv
group by Year;
```

TTest1_dif (*value* **)**

returns the aggregated student's t-test mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1_t** function, page 386, for argument descriptions.

Example:

```
Load Year, ttest1_dif(Value) as X from abc.csv
group by Year;
```

TTest1_sterr (*value* **)**

returns the aggregated student's t-test standard error of the mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1_t** function, page 386, for argument descriptions.

Example:

```
Load Year, ttest1_sterr(Value) as X from
abc.csv group by Year;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTest1_conf (*value [, sig = 0.025]* **)**

returns the aggregated t value for a series of values iterated over a number of records as defined by a **group by** clause. The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTest1_t** function, page 386, for descriptions of the other arguments.

Example:

```
Load Year, ttest1_conf(Value) as X from abc.csv
group by Year;
```

TTest1_lower (*value [, sig = 0.025]* **)**

returns the aggregated value for the lower end of the confidence interval for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1_t**, page 386, and **TTest1_conf**, page 388, functions for argument descriptions.

Example:

```
Load Year, ttest1_lower(Value) as X from
abc.csv group by Year;
```

TTest1_upper (*value [, sig = 0.025]* **)**

returns the aggregated value for the upper end of the confidence interval for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1_t**, page 386, and **TTest1_conf**, page 388, functions for argument descriptions.

Example:

```
Load Year, ttest1_upper(Value) as X from
abc.csv group by Year;
```

The following eight functions apply to one-sample student's t-tests where the input data series is given in weighted two-column format.

TTest1w_t (*weight, value* **)**

returns the aggregated t value for a series of values iterated over a number of records as defined by a **group by** clause. The values should be returned by *value*. Each value in *value* can be counted one or more times according to a corresponding weight value in *weight*. If *eq_var* is specified as false, separate variances of the two samples will be assumed, else equal variances between the samples will be assumed. Text values, null values and missing values in *value* will result in the function returning null.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Year, ttest1w_t(Weight, Value) as X from
abc.csv group by Year;
```

TTest1w_df (*weight, value* **)**

returns the aggregated student's t-test df value (degrees of freedom) for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1w_t** function, page 388**,** for argument descriptions.

Example:

```
Load Year, ttest1w_df(Weight, Value) as X from
abc.csv group by Year;
```

TTest1w_sig (*weight, value* **)**

returns the aggregated student's t-test 2-tailed level of significance for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1w_t** function, page 388**,** for argument descriptions.

Example:

```
Load Year, ttest1w_sig(Weight, Value) as X from
abc.csv group by Year;
```

TTest1w_dif (*weight, value* **)**

returns the aggregated student's t-test mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1w_t** function, page 388**,** for argument descriptions.

Example:

```
Load Year, ttest1w_dif(Weight, Value) as X from
abc.csv group by Year;
```

TTest1w_sterr (*weight, value* **)**

returns the aggregated student's t-test standard error of the mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1w_t** function, page 388**,** for argument descriptions.

Example:

```
Load Year, ttest1w_sterr(Weight, Value) as X
from abc.csv group by Year;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTest1w_conf (*weight, value [, sig = 0.025]* **)**

returns the aggregated t value for a series of values iterated over a number of records as defined by a **group by** clause. The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTest1w_t** function, page 388**,** for descriptions of the other arguments.

Example:

```
Load Year, ttest1w_conf(Weight, Value) as X
from abc.csv group by Year;
```

TTest1w_lower (*weight, value [, sig = 0.025]* **)**

returns the aggregated value for the lower end of the confidence interval for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1w_t,** page 388**,** and **TTest1w_conf,** page 390**,** functions for argument descriptions.

Example:

```
Load Year, ttest1w_lower(Weight, Value) as X
from abc.csv group by Year;
```

TTest1w_upper (*weight, value [, sig = 0.025]* **)**

returns the aggregated value for the upper end of the confidence interval for a series of values iterated over a number of records as defined by a **group by** clause. See the **TTest1w_t,** page 388**,** and **TTest1w_conf,** page 390**,** functions for argument descriptions.

Example:

```
Load Year, ttest1w_upper(Weight, Value) as X
from abc.csv group by Year;
```

The following five functions apply to z-tests.

ZTest_z (*value [, sigma]* **)**

returns the aggregated z-test t value for a series of values iterated over a number of records as defined by a **group by** clause. The values should be returned by *value*. A population mean of 0 is assumed. If you want the test to be performed around another mean, subtract that value from the sample values. If known, the standard deviation can be stated in *sigma*. If *sigma* is omitted the actual sample standard deviation will be used. Text values, null values and missing values in *value* will result in the function returning null.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Year, ztest_z(Value-TestValue) as X from
abc.csv group by Year;
```

ZTest_sig (*value [, sigma]* **)**

returns the aggregated z-test 2-tailed level of significance for a series of values iterated over a number of records as defined by a **group by** clause. See the **ZTest_z** function, page 390, for argument descriptions.

Example:

```
Load Year, ztest_sig(Value-TestValue) as X from
abc.csv group by Year;
```

ZTest_dif (*value [, sigma]* **)**

returns the aggregated z-test mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **ZTest_t** function, page 390, for argument descriptions.

Example:

```
Load Year, ztest_dif(Value-TestValue) as X from
abc.csv group by Year;
```

ZTest_sterr (*value [, sigma]* **)**

returns the aggregated z-test standard error of the mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **ZTest_z** function, page 390, for argument descriptions.

Example:

```
Load Year, ztest_sterr(Value-TestValue) as X
from abc.csv group by Year;
```

ZTest_conf (*value [, sigma [, sig = 0.025]* **)**

returns the aggregated z-test t value for a series of values iterated over a number of records as defined by a **group by** clause. The two-tailed level of significance can be specified in sig. If omitted sig will be set to 0.025, resulting in a 95% confidence interval. See the **ZTest_z** function, page 390, for descriptions of the other arguments.

Example:

```
Load Year, ztest_conf(Value-TestValue) as X
from abc.csv group by Year;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The following five functions apply to z-tests where the input data series is given in weighted two-column format.

ZTestw_z (*weight, value [, sigma]* **)**

returns the aggregated z value for a series of values iterated over a number of records as defined by a **group by** clause. The values should be returned by *value*. A sample mean of 0 is assumed. If you want the test to be performed around another mean, subtract that value from the sample values. Each value in *value* can be counted one or more times according to a corresponding weight value in *weight*. If known, the standard deviation can be stated in *sigma*. If *sigma* is omitted the actual sample standard deviation will be used. Text values, null values and missing values in *value* will result in the function returning null.

Example:

```
Load Year, ztestw_t(Weight,Value-TestValue) as
X from abc.csv group by Year;
```

ZTestw_sig (*weight, value [, sigma]* **)**

returns the aggregated z-test 2-tailed level of significance for a series of values iterated over a number of records as defined by a **group by** clause. See the **ZTestw_z** function, page 392, for argument descriptions.

Example:

```
Load Year, ztestw_sig(Weight,Value-TestValue)
as X from abc.csv group by Year;
```

ZTestw_dif (*weight, value [, sigma]* **)**

returns the aggregated z-test mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **ZTestw_z** function, page 392, for argument descriptions.

Example:

```
Load Year, ztestw_dif(Weight,Value-TestValue)
as X from abc.csv group by Year;
```

ZTestw_sterr (*weight, value [, sigma]* **)**

returns the aggregated z-test standard error of the mean difference for a series of values iterated over a number of records as defined by a **group by** clause. See the **ZTestw_z** function, page 392, for argument descriptions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load Year, ztestw_sterr(Weight,Value-TestValue)
as X from abc.csv group by Year;
```

ZTestw_conf (*weight, value [, sigma] [, sig = 0.025]* **)**

returns the aggregated z value for a series of values iterated over a number of records as defined by a **group by** clause. The two-tailed level of significance can be specified in sig. If omitted sig will be set to 0.025, resulting in a 95% confidence interval. See the **ZTestw_z** function, page 392, for descriptions of the other arguments.

Example:

```
Load Year, ztestw_conf(Weight,Value-TestValue)
as X from abc.csv group by Year;
```

25.4 Other Functions

General numeric functions ..... page 394
Range functions ..... page 398
Exponential and logarithmic functions ..... page 403
Trigonometric and hyperbolic functions ..... page 404
Statistical distribution functions ..... page 404
Financial functions ..... page 407
Mathematical constants and parameter-free functions ..... page 411
Counter functions ..... page 411
String functions ..... page 414
Mapping functions ..... page 420
Inter-record functions ..... page 421
Conditional functions ..... page 424
Logical functions ..... page 426
Null functions ..... page 426
System functions ..... page 427
File functions ..... page 429
Table functions ..... page 432
Document functions ..... page 433
Date and time functions ..... page 433

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Number interpretation functions ..... page 457
Formatting functions ..... page 461
Color functions ..... page 466

General Numeric Functions

div(*x1 , x2* **)**

Integer division. Both parameters are interpreted as real numbers, i.e. they do not have to be integers. The result is the integer part of the result of the arithmetic division, a real number.

Examples:

div(7,2 **)** returns 3
div(9,3 **)** returns 3
div(-4,3 **)** returns -1
div(4,-3 **)** returns -1
div(-4,-3 **)** returns 1

mod(*x1 , x2* **)**

Mathematical modula function. Both parameters must have integer values. *x2* must be greater than 0. The result is the mathematical modula function, i.e. the non-negative remainder of an integer division.

Examples:

mod(7,2 **)** returns 1
mod(9,3 **)** returns 0
mod(-4,3 **)** returns 2
mod(4,-3 **)** returns NULL
mod(-4,-3 **)** returns NULL

fmod(*x1 , x2* **)**

Generalized modula function. Both parameters are interpreted as real numbers, i.e. they do not have to be integers. The result is the remainder of the integer division, a real number.

Examples:

fmod(7,2 **)** returns 1
fmod(9,3 **)** returns 0
fmod(-4,3 **)** returns -1
fmod(4,-3 **)** returns 1
fmod(-4,-3 **)** returns -1

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ceil(*x [, base [, offset]]* **)**

Rounding of *x* upwards to the nearest multiple of *base* with an offset of *offset*. The result is a number.

Examples:

ceil(2.4 **)** returns 3
ceil(2.6 **)** returns 3
ceil(3.88 , 0.1 **)** returns 3.9
ceil(3.88 , 5 **)** returns 5
ceil(1.1 , 1 , 0.5 **)** returns 1.5

floor(*x [, base [, offset]]* **)**

Rounding of *x* downwards to the nearest multiple of *base* with an offset of *offset*. The result is a number.

Examples:

floor(2.4 **)** returns 2
floor(2.6 **)** returns 2
floor(3.88 , 0.1 **)** returns 3.8
floor(3.88 , 5 **)** returns 0
floor(1.1 , 1 , 0.5 **)** returns 0.5

frac(*x* **)**

Returns the fraction part of *x*. The fraction is defined in such a way that **frac(** *x* **)**+**floor(** *x* **)**=*x*.

Examples:

frac(11.43 **)** returns 0.43
frac(-1.4 **)** returns 0.6

round(*x [, step [, offset]]* **)**

Rounding of *x* upwards or downwards n number of steps with an offset of *offset*. The result is a number. If *x* is exactly in the middle of an interval, it is rounded upwards.

Examples:

round(2.4 **)** returns 2
round(2.6 **)** returns 3
round(2.5 **)** returns 3
round(3.88 , 0.1 **)** returns 3.9
round(3.88 , 5 **)** returns 5
round(1.1 , 1 , 0.5 **)** returns 1.5

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

fabs(*x* **)**

The absolute value of *x*. The result is a positive number.

Examples:

fabs(2.4 **)** returns 2.4
fabs(-3.8 **)** returns 3.8

sign(*x* **)**

Returns 1, 0, or -1 depending on whether *x* is a positive number, 0, or a negative number. If no numeric value is found, NULL is returned.

Examples:

sign(66 **)** returns 1
sign(0 **)** returns 0
sign(-234 **)** returns -1

numsum(*expr1 [, expr2, … exprN]* **)**

Obsolete. Superseded by range function **rangesum.**

numcount(*expr1 [, expr2, … exprN]* **)**

Obsolete. Superseded by range function **rangenumericcount**.

numavg(*expr1 [, expr2, … exprN]* **)**

Obsolete. Superseded by range function **rangeavg**.

nummin(*expr1 [, expr2, … exprN]* **)**

Obsolete. Superseded by range function **rangemin**.

nummax(*expr1 [, expr2, … exprN]* **)**

Obsolete. Superseded by range function **rangemax**.

fact(*n* **)**

Returns the factorial of a positive integer *n*. If the number *n* is not an integer it will be truncated. Non-positive numbers will return NULL.

Examples:
fact(1 **)** returns 1
fact(5 **)** returns 120 (1*2*3*4*5 = 120)
fact(-5 **)** returns NULL

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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combin(*n1*, *n2* **)**

Returns the number of combinations of *n2* items that can be picked from a group of *n1* items. The order in which the items are picked is not significant. Non-integer arguments will be truncated.

Example:
How many combinations of seven numbers can be picked from a total of 35 lotto numbers?

combin(35,7 **)** returns 6 724 520

permut(*n1*, *n2* **)**

Returns the number of permutations of *n2* items that can be selected from a group of *n1* items. The order in which the items are picked is significant. Non-integer arguments will be truncated.

Example:
In how many ways could the gold, silver and bronze medals be distributed after a 100m final with 8 participants?

permut(8,3 **)** returns 336

even(*n* **)**

Returns true if *n* is an even integer, false if *n* is an odd integer and NULL if *n* is not an integer.

Examples:
even(3 **)** returns false
even(2*10 **)** returns true
even(3.14 **)** returns NULL

odd(*n* **)**

Returns true if *n* is an odd integer, false if *n* is an even integer and NULL if *n* is not an integer.

Examples:

odd(3 **)** returns true
odd(2*10 **)** returns false
odd(3.14 **)** returns NULL

BitCount(*i* **)**

Returns the number of set bits in *i*. I will be interpreted as a signed 32-bit integer.

Examples:
bitcount(3 **)** returns 2
bitcount(-1 **)** returns 32

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

bitcount(*n*)+bitcount(bitnot *n*) returns 32 (as long as n is a valid integer)

Range Functions

rangesum(*expr1 [, expr2, … exprN]* **)**

Returns the sum of a range of 1 to N arguments. As opposed to the + operator, **rangesum** will treat all non-numeric values as 0.

Examples:
rangesum(1,2,4 **)** returns 7
rangesum(1,'xyz'**)** returns 1
rangesum(null() **)** returns 0

rangeavg(*expr1 [, expr2, … exprN]* **)**

Returns the average of a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Examples:
rangeavg(1,2,4 **)** returns 2.33333333
rangeavg(1,'xyz'**)** returns 1
rangeavg(null(), 'abc' **)** returns NULL

rangecount(*expr1 [, expr2, … exprN]* **)**

Returns the number of values found within a range of 1 to N arguments. Null values are not counted.

Examples:
rangecount(1,2,4 **)** returns 3
rangecount(2,'xyz'**)** returns 2
rangecount(null() **)** returns 0

rangecorrel(*x-value, y-value {,x-value, y-value}***)**

returns correlation coefficient for a series of coordinates.

X-value is a single value or a range of values as returned by an inter-record function with a third optional parameter (see page 421).

Y-value is a single value or a range of values as returned by an inter-record function with a third optional parameter (see page 421). Each value or range of values must correspond to an *x-value* or a range of *x-values*.

The function needs at least two pairs of coordinates to calculate. Text values, null values and missing values are disregarded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
rangecorrel (2,3,6,8,9,4) returns 0,269
rangecorrel (**above**(**sum**(X), 0, 10), **above**(Y, 0, 10))
rangecorrel (**above**(**total** X,0,**rowno**(**total**)),
above(**total** Y,0,**rowno**(**total**)))

rangemin(*expr1 [, expr2, … exprN]* **)**
Returns the lowest numeric value found within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Examples:
rangemin(1,2,4 **)** returns 1
rangemin(1,'xyz'**)** returns 1
rangemin(null(), 'abc' **)** returns NULL

rangemax(*expr1 [, expr2, … exprN]* **)**
Returns the highest numeric values found within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Examples:
rangemax(1,2,4 **)** returns 4
rangemax(1,'xyz'**)** returns 1
rangemax(null(), 'abc' **)** returns NULL

rangestdev(*expr1 [, expr2, … exprN]* **)**
Returns the standard deviation within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Examples:
rangestdev(1,2,4 **)** returns 1.5275252316519
rangestdev(null() **)** returns NULL

rangeskew(*expr1 [, expr2, … exprN]* **)**
Returns the skewness within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Example:
rangeskew(1,2,4**)** returns 0.93521952958283

rangekurtosis(*expr1 [, expr2, … exprN]* **)**
Returns the kurtosis within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Example:
rangekurtosis (1,2,4,7**)** returns -0.28571428571429

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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rangefractile(*fractile, expr1 [, expr2, … exprN]* **)**

Returns the fractile within a range of 1 to N arguments.

Example:
rangefractile (0.25,1,2,4,6**)** returns 1.5

rangenumericcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of numeric values found within a range of 1 to N arguments.

Examples:
rangenumericcount (1,2,4**)** returns 3
rangenumericcount (2,'xyz'**)** returns 1
rangenumericcount (null()**)** returns 0

rangetextcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of text values found within a range of 1 to N arguments.

Examples:
rangetextcount (1,2,4**)** returns 0
rangetextcount (2,'xyz'**)** returns 1
rangetextcount (null()**)** returns 0

rangenullcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of numeric values found within a range of 1 to N arguments.

Examples:
rangenullcount (1,2,4**)** returns 0
rangenullcount (2,'xyz'**)** returns 0
rangenullcount (null(),null()**)** returns 2

rangemissingcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of non-numeric values (including null values) found among 1 to N arguments.

Examples:
rangemissingcount (1,2,4**)** returns 0
rangemissingcount (2,'xyz'**)** returns 1
rangemissingcount (null()**)** returns 1

rangemode(*expr1 [, expr2, … exprN]* **)**

Returns the mode value, i.e. the most commonly occurring value within a range of 1 to N arguments. If more than one value shares the highest frequency, NULL is returned.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
rangemode (1,2,9,2,4**)** returns 2
rangemode ('a',4,'a',4**)** returns NULL
rangemode (null()**)** returns NULL

rangeonly(*expr1 [, expr2, … exprN]* **)**

If exactly one non-null value exists among the range of N expressions, that value will be returned. In all other cases, NULL is returned.

Examples:
rangeonly (1,2,4**)** returns NULL
rangeonly (1,'xyz'**)** returns NULL
rangeonly (null(), 'abc'**)** returns 'abc'

rangeminstring(*expr1 [, expr2, … exprN]* **)**

Returns the first text value in text sort order found among 1 to N arguments.

Examples:
rangeminstring (1,2,4**)** returns 1
rangeminstring ('xyz','abc'**)** returns 'abc'
rangeminstring (null()**)** returns NULL

rangemaxstring(*expr1 [, expr2, … exprN]* **)**

Returns the last text value in text sort order found among 1 to N arguments.

Examples:
rangemaxstring (1,2,4**)** returns 4
rangemaxstring ('xyz','abc'**)** returns 'xyz'
rangemaxstring (null()**)** returns NULL

rangeirr(*value {,value}***)**

returns the internal rate of return for a series of cash flows represented by the numbers in values. These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.

Value is a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). The

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

function needs at least one positive and one negative value to calculate. Text values, null values and missing values are disregarded.

Examples:
rangeirr(-70000,12000,15000,18000,21000,26000) returns 0,0866
rangeirr(**above**(**sum**(value), 0, 10))
rangeirr(**above**(**total** value, 0, **rowno**(**total**)))

rangenpv (*rate*, *value {,value}* **)**

returns the net present value of an investment based on a discount rate and a series of future payments (negative values) and incomes (positive values). The result has a default number format of money.

Rate is the interest rate per period.

Value is a payment or income occurring at the end of each period. Each *value* may be a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). Text values, null values and missing values are disregarded.

Examples:
rangenpv(0.1,-10000,3000,4200,6800) returns 1188,44
rangenpv(0.05, **above**(**sum**(value), 0, 10))
rangenpv(0.05, **above**(**total** value, 0, **rowno**(**total**)))

rangexirr(*value*, *date {,value, date}*)

returns the internal rate of return for a schedule of cash flows that is not necessarily periodic. To calculate the internal rate of return for a series of periodic cash flows, use the **rangeirr** function.

Value is a cash flow or a series of cash flows that corresponds to a schedule of payments in dates. Each *value* may be a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). Text values, null values and missing values are disregarded. All payments are discounted based on a 365-day year. The series of values must contain at least one positive and one negative value.

Date is a payment date or a schedule of payment dates that corresponds to the cash flow payments.

Examples:
rangexirr(-2500,'2008-01-01',2750,'2008-09-01') returns 0,1532
rangexirr (**above**(**sum**(value), 0, 10), **above**(date, 0, 10))
rangexirr(**above**(**total** value,0,**rowno**(**total**)),
above(**total** date,0,**rowno**(**total**)))

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangexnpv(*rate, value, date {,value, date}*)

Returns the net present value for a schedule of cash flows that is not necessarily periodic. The result has a default number format of money. To calculate the net present value for a series of periodic cash flows, use the **rangenpv** function.

Rate is the interest rate per period.

Value is a cash flow or a series of cash flows that corresponds to a schedule of payments in dates. Each *value* may be a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). Text values, null values and missing values are disregarded. All payments are discounted based on a 365-day year. The series of values must contain at least one positive and one negative value.

Date is a payment date or a schedule of payment dates that corresponds to the cash flow payments.

Examples:
rangexnpv(0.1, -2500,'2008-01-01',2750,'2008-09-01') returns 80,25
rangexnpv (0.1, **above**(**sum**(value), 0, 10), **above**(date, 0, 10))
rangexnpv(0.1, **above**(**total** value,0,**rowno**(**total**)),

above(**total** date,0,**rowno**(**total**)))

Exponential and Logarithmic Functions

exp(*x* **)**

Exponential function, with the base of the natural logarithm *e* as base. The result is a positive number.

log(*x* **)**

The natural logarithm of *x*. The function is only defined if x>0. The result is a number.

log10(*x* **)**

The 10-logarithm (base 10) of *x*. The function is only defined if x>0. The result is a number.

sqrt(*x* **)**

Square root of *x*. The function is only defined if x >= 0. The result is a positive number.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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sqr(*x* **)** Square of x. The result is a number.

pow(*x*,*y* **)**

Returns *x* to the power of *y*. The result is a number.

Trigonometric and Hyperbolic Functions

All angles are measured in radians.

cos(*x* **)** Cosine of *x*. The result is a number between -1 and 1.

acos(*x* **)**

Arcus cosine of *x*. The function is only defined if -1 <= x <= 1. The result is a number between 0 and π.

sin(*x* **)** Sine of *x*. The result is a number between -1 and 1.

asin(*x* **)**

Arcus sine of *x*. The function is only defined if -1 <= x <= 1. The result is a number between -π/2 and π/2.

tan(*x* **)** Tangent of *x*. The result is a number.

atan(*x* **)**

Arcus tangent of *x*. The result is a number between -π/2 and π/2.

atan2(*y*,*x* **)**

Two-dimensional generalization of the arcus tangent function. Returns the angle between the origin and the point represented by the coordinates x and y. The result is a number between -π and +π .

cosh(*x* **)**

Cosine hyberbolicus of *x*. The result is a positive number.

sinh(*x* **)**

Sine hyberbolicus of *x*. The result is a number.

tanh(*x* **)**

Tangent hyberbolicus of *x*. The result is a number.

Statistical Distribution Functions

The statistical distribution functions described below are all implemented in QlikView using the Cephes library. For references and details on algorithms used, accuracy etc., please see http://www.netlib.org/cephes/. The Cephes function library is used by permission.

chidist (*value*, *degrees_freedom* **)**

returns the one-tailed probability of the chi-squared distribution.

The χ^2 distribution is associated with a χ^2 test. *Value* is the value at which you want to evaluate the distribution. *Value* must not be negative. *Degrees_freedom* is a positive integer stating the number

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

of degrees of freedom. Both arguments must be numeric, else null will be returned. This function is related to the **chiinv** function in the following way:
If *prob* = **chidist(***value,df***),** then **chiinv(***prob, df***)** = *value*.

Example:
chdist(8, 15 **)** returns 0.9237827

chiinv (*prob, degrees_freedom* **)**
returns the inverse of the one-tailed probability of the chi-squared distribution. *Prob* is a probability associated with the chi-squared distribution. It must be a number between 0 and 1. *Degrees_freedom* is an integer stating the number of degrees of freedom. Both arguments must be numeric, else null will be returned. This function is related to the **chidist** function in the following way:
If *prob* = **chidist(***value,df***)**, then **chiinv(***prob, df***)** = *value*.

Example:
chiinv(0.9237827, 15 **)** returns 8.0000001

normdist (*value, mean, standard_dev* **)**
returns the cumulative normal distribution for the specified mean and standard deviation. *Value* is the value at which you want to evaluate the distribution. *Mean* is a value stating the arithmetic mean for the distribution. *Standard_dev* is a positive value stating the standard deviation of the distribution. All arguments must be numeric, else null will be returned. If *mean* = 0 and *standard_dev* = 1, the function returns the standard normal distribution. This function is related to the **norminv** function in the following way:
If *prob* = **normdist(***value, m, sd***)**, then **norminv(***prob, m, sd***)** = *value*.

Example:
chdist(0.5, 0, 1 **)** returns 0.6914625

norminv (*prob, mean, standard_dev* **)**
returns the inverse of the normal cumulative distribution for the specified mean and standard deviation. *Prob* is a probability associated with the normal distribution. It must be a number between 0 and 1. *Mean* is a value stating the arithmetic mean for the distribution. *Standard_dev* is a positive value stating the standard deviation of the distribution. All arguments must be numeric, else null will be returned. This function is related to the **normdist** function in the following way:
If *prob* = **normdist**(*value, m, sd***)**, then **norminv(***prob, m, sd***)** = *value*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:
norminv(0.6914625, 0, 1 **)** returns 0.4999717

tdist (*value, degrees_freedom, tails* **)**

returns the probability for the Student t-distribution where a numeric value is a calculated value of t for which the probability is to be computed. *Value* is the value at which you want to evaluate the distribution and must not be negative. *Degrees_freedom* is a positive integer stating the number of degrees of freedom. *Tails* must be either 1 (one-tailed distribution) or 2 (two-tailed distribution). All arguments must be numeric, else null will be returned. This function is related to the **tinv** function in the following way:
If *prob* = **tdist(***value, df ,2***)**, then **tinv(***prob, df***)** = *value*.

Example:
chdist(1, 30, 2 **)** returns 0.3253086

tinv (*prob, degrees_freedom* **)**

returns the t-value of the Student's t-distribution as a function of the probability and the degrees of freedom. *Prob* is a two-tailed probability associated with the t-distribution. It must be a number between 0 and 1. *Degrees_freedom* is an integer stating the number of degrees of freedom. Both arguments must be numeric, else null will be returned. This function is related to the **tdist** function in the following way:
If *prob* = **tdist(***value, df ,2***)**, then **tinv(***prob, df***)** = *value*.

Example:
tinv(0.3253086, 30 **)** returns 1

fdist (*value, degrees_freedom1, degrees_freedom2* **)**

returns the F-distribution.. *Value* is the value at which you want to evaluate the distribution. *Value* must not be negative. *Degrees_freedom1* is a positive integer stating the number of numerator degrees of freedom. *Degrees_freedom2* is a positive integer stating the number of denominator degrees of freedom. All arguments must be numeric, else null will be returned. This function is related to the **finv** function in the following way:
If *prob* = **fdist(***value, df1, df2***)**, then **finv(***prob, df1, df2***)** = *value*.

Example:
fdist(15, 8, 6 **)** returns 0.0019369

finv (*prob, degrees_freedom1, degrees_freedom2* **)**

returns the inverse of the F-distribution. *Prob* is a probability associated with the F-distribution and must be a number between 0 and 1. *Degrees_freedom* is an integer stating the number of degrees of free-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

dom. All arguments must be numeric, else null will be returned. This function is related to the **fdist** function in the following way: If *prob* = **fdist(***value, df1, df2***)**, then **finv(***prob, df1, df2***)** = *value*.

Example:
finv(0.0019369, 8, 5 **)** returns 15.0000197

Financial Functions

Note When using the financial functions described below, it is vital to be consistent about the units you use for specifying *rate* and *nper*. If you make monthly payments on a five-year loan at 6% annual interest, use 0.005 (6%/12) for *rate* and 60 (5*12) for *nper*. If you make annual payments on the same loan, use 6% for *rate* and 5 for *nper*. In all the functions, cash you pay out is represented by negative numbers. Cash you receive is represented by positive numbers.

BlackAndSchole(*strike, time_left, underlying_price, vol, risk_free_rate, type* **)**

Returns the theoretical value of an option according to Black and Schole's unmodified formula (European style options).

Strike is the future purchase price of the stock.

Time_left is the number of time periods remaining.

Underlying_price is the current value of the stock.

Vol is the volatility in % per time period.

Risk_free_rate is the risk free rate in % per time period.

Type is 'c', 'call' or any non-zero numeric value for call-options and 'p', 'put' or 0 for put-options..

Example:
The theoretical price of an option to buy in 4 years at a value of 130 a share which is today worth 68.5 assuming a volatility of 40% per year and a risk-free interest rate of 4%?

blackandschole(130, 4, 68.5, 0.4, 0.04, 'call' **)** returns11.245…

The following approximation is used to calculate the inverse of the normal cumulative distribution in the Black and School formula:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

For x>0

$$\int_{-\infty}^{x} e^{-u^2/2}du \approx \sqrt{2\pi} \; - (b_1k+b_2k^2+b_3k^3)e^{-x^2/2}$$

$$k = \frac{1}{1+0.33267x} \qquad b = \begin{pmatrix} 0.4361836 \\ -0.1201676 \\ 0.937298 \end{pmatrix}$$

For x<0

f(x)=1 - f(-x).

fv(*rate, nper, pmt [, pv [, type]]* **)**

Returns the future value of an investment based on periodic, constant payments and a constant interest rate. The result has a default number format of money.

Rate is the interest rate per period.

Nper is the total number of payment periods in an annuity.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *pv* argument.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now. If *pv* is omitted, it is assumed to be 0 (zero), and you must include the *pmt* argument.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Example:

You pay a new VCR by 36 monthly installments of $20. The interest rate is 6% per annum. The bill comes at the end of the month. What is the total value of the money you invested when the last bill has been paid?

fv(0.005,36,-20 **)** returns $786.72

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

nper(*rate, pmt, pv [, fv [, type]]* **)**

Returns the number of periods for an investment based on periodic, constant payments and a constant interest rate.

Rate is the interest rate per period.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *pv* argument.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, it is assumed to be 0.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Example:
You want to sell a VCR by monthly installments of $20. The interest rate is 6% per annum. The bill comes at the end of the month. How many periods are required if the value of the money you have received after the last bill has been paid should equal $786.72?

nper(0.005,-20,0,786.72 **)** returns 36

pmt(*rate, nper, pv [, fv [, type]]* **)**

Returns the payment for a loan based on constant payments and a constant interest rate. The result has a default number format of money.

Rate is the interest rate per period.

Nper is the total number of payment periods in an annuity.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, it is assumed to be 0.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

To find the total amount paid over the duration of the loan, multiply the returned pmt value by nper.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

The following formula returns the monthly payment on a $20,000 loan at an annual rate of 10 percent that you must pay off in 8 months:

pmt(0.1/12, 8, 20000 **)** returns -$2594.66

For the same loan, if payments are due at the beginning of the period, the payment is:

pmt(0.1/12, 8, 20000, 0, 1 **)** returns -$2573.21

pv(*rate, nper, pmt [, fv [, type]]* **)**

Returns the present value of an investment. The result has a default number format of money. The present value is the total amount that a series of future payments is worth now. For example, when you borrow money, the loan amount is the present value to the lender.

Rate is the interest rate per period.

Nper is the total number of payment periods in an annuity.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *fv* argument.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, you must include the *pmt* argument.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Example:

What is the present value of $100 paid to you at the end of each month during a five-year period? The interest rate is 7%.

pv(0.07/12, 12*5, 100, 0, 0 **)** returns -$5050.20

rate(*nper, pmt, pv [, fv [, type]]* **)**

Returns the interest rate per period of an annuity.

Nper is the total number of payment periods in an annuity.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *fv* argument.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, it is assumed to be 0.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Rate is calculated by iteration and can have zero or more solutions. If the successive results of **rate** do not converge, a NULL value will be returned.

Example:
What is the interest rate of a five-year $10,000 annuity loan with monthly payments of $300?

rate(60,-300,10000 **)** returns 2.18%
This is the monthly rate, which has to be multiplied with 12 in order to get the annual rate, in this case 26.1%.

Mathematical Constants and Parameter-Free Functions

These functions do not have any parameters. The parentheses are however still needed.

e( ) Base of the natural logarithms, e. The function returns 2.71828...

false( ) Returns a dual value with text value 'false' and numeric value 0, which can be used as logical false in expressions.

pi( ) The function returns 3.14159...

rand( ) Returns a random number between 0 and 1.

true( ) Returns a dual value with text value 'true' and numeric value -1, which can be used as logical true in expressions.

Counter Functions

These functions do not have any parameters. The parentheses are however still needed.

RecNo( )

Returns an integer for the number of the currently read row of the input table. The first record is number 1.

RowNo( )

Returns an integer for the position of the current row in the resulting QlikView input table. In contrast to **RecNo( )**, which counts the records in the raw data table, the **RowNo( )** function doesn't count records excluded by **where** clauses and is not reset when a raw data table is concatenated to another. The first row is number 1.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

Tab1.csv (raw data)

A	B
1	aa
2	cc
3	ee

Tab2.csv (raw data)

A	C
5	xx
4	yy
6	zz

```
QVTab:
Load *, RecNo(), RowNo() from Tab1.csv
where A<>2;
Load *, RecNo(), RowNo() from Tab2.csv
where A<>5;
```

QVTab (QV input table)

A	B	RecNo()	RowNo()
1	aa	1	1
3	ee	3	2
4	yy	2	3
6	zz	3	4

IterNo( )

This function only has a meaning if used together with a **while** clause (see the documentation on “Load” on page 319). **IterNo( )** returns an integer indicating for which time one single record is evaluated in a **load** statement with a **while** clause. The first iteration has number 1.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

Tab1.csv

A	B	C
1	5	xx
2	4	yy

```
Load *, IterNo() as D from Tab1.csv
while IterNo() <=3;
```

QVTab

A	B	C	D
1	5	xx	1
1	5	xx	2
1	5	xx	3
2	4	yy	1
2	4	yy	2
2	4	yy	3

autonumber(*expression [, AutoID]* **)**

Returns a unique integer value for each distinct evaluated value of *expression* encountered during the script execution. This function can be used e.g. for creating a compact memory representation of a complex key.

In order to create multiple counter instances if the **autonumber** function is used on different keys within the script, an optional parameter *AutoID* can be used to name each counter.

Examples:
autonumber(Region&Year&Month **)**
autonumber(Region&Year&Month, 'Ctr1' **)**

autonumberhash128(*expression {, expression}* **)**

Calculates a 128-bit hash of the combined input expression values and returns a unique integer value for each distinct hash value encountered during the script execution. This function can be used e.g. for creating a compact memory representation of a complex key.

Example:
autonumberhash128 (Region, Year, Month **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

autonumberhash256(*expression {, expression}* **)**

Calculates a 256-bit hash of the combined input expression values and returns a unique integer value for each distinct hash value encountered during the script execution. This function can be used e.g. for creating a compact memory representation of a complex key.

Example:
autonumberhash256 (Region, Year, Month **)**

fieldvaluecount (*fieldname* **)**

Returns the number of distinct values in a field. *Fieldname* must be given as a string (e.g. a quoted literal).

Example:
let x =**fieldvaluecount** ('Alfa') ;

String Functions

ord(*s* **)** ASCII number of first character of string *s*. The result is an integer.

Example:

ord('A' **)** returns the number 65.

chr(*n* **)** The ASCII character corresponding to number *n*. The result is a string.

Example:

chr(65 **)** returns the string 'A'.

len(*s* **)** Length of string *s*. The result is an integer.

Example:

len(Name **)** where Name = 'Peter' returns 5.

left(*s* , *n* **)**

Substring of the string *s*. The result is a string consisting of the first *n* characters of *s*.

Examples:

left('abcdef',3 **)** returns 'abc'.
left(Date, 4 **)** where Date = 1997-07-14 returns 1997.

For a more complicated example, see the **index** function below.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

right(*s* , *n* **)**

Substring of the string *s*. The result is a string consisting of the last *n* characters of *s*.

Examples:

right('abcdef',3 **)** returns 'def'.
right(Date,2 **)** where Date = 1997-07-14 returns 14.

mid(*s* , *n1 [, n2]* **)**

Substring of the string *s*. The result is the string starting at character *n1* with the length of *n2* characters. If *n2* is omitted, the function returns the rightmost part of the string starting at character *n1*. The positions in the string are numbered from 1 and up.

Examples:

mid('abcdef',3 **)** returns 'cdef'.
mid('abcdef',3, 2 **)** returns 'cd'.
mid(Date,3 **)** where Date = 970714 returns 0714
mid(Date,3,2 **)** where Date = 970714 returns 07

For a more complicated example, see the **index** function below.

index(*s1 , s2 [, n]* **)**

Position of a substring. This function gives the starting position of the *nth* occurrence of substring *s2* in string *s1*. If *n* is omitted, the first occurrence is assumed. If *n* is negative, the search is made starting from the end of string *s1*. The result is an integer. The positions in the string are numbered from 1 and up.

Examples:

index('abcdefg', 'cd' **)** returns 3
index('abcdabcd', 'b', 2 **)** returns 6
index('abcdabcd', 'b', -2 **)** returns 2
left(Date, **index(** Date,'-' **)** -1 **)**
where Date = 1997-07-14 returns 1997
mid(Date, **index(** Date, '-', 2 **)** -2, 2 **)**
where Date = 1997-07-14 returns 07

upper(*text expression* **)**

Forces upper case for all the data in the expression.

Example:

upper('abcD' **)** returns 'ABCD'.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

lower(*text expression* **)**

Forces lower case for all the data in the expression.

Example:

lower('abcD' **)** returns 'abcd'.

capitalize(*s* **)**

Returns the string *s* with all words capitalized.

Examples:

capitalize('my little pony' **)** returns 'My Little Pony'.
capitalize('AA bb cC Dd' **)** returns 'Aa Bb Cc Dd'.

repeat(*s, n* **)**

Forms a string consisting of the string *s* repeated *n* times.

Example:

repeat('*', rating **)** where rating = 4 returns '****'.

ltrim(*s* **)**

Returns the string *s* trimmed of any leading spaces.

Examples:

ltrim (' abc'**)** returns 'abc'.
ltrim ('abc '**)** returns 'abc '.

rtrim(*s* **)**

Returns the string *s* trimmed of any trailing spaces.

Examples:

rtrim (' abc'**)** returns ' abc'.
rtrim ('abc '**)** returns 'abc'.

trim(*s* **)**

Returns the string *s* trimmed of any leading and trailing spaces.

Examples:

trim (' abc'**)** returns 'abc'.
trim ('abc '**)** returns 'abc'.
trim (' abc '**)** returns 'abc'.

KeepChar(*s1, s2* **)**

Returns the string *s1* less all characters not contained in string *s2*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Example:

keepchar('a1b2c3' , '123' **)** returns '123'.

PurgeChar(*s1, s2* **)**

Returns the string *s1* less all characters contained in string *s2*.

Example:

purgechar('a1b2c3' , '123' **)** returns 'abc'.

replace (*string, fromstring, tostring* **)**

Returns a *string* after replacing all occurrences of a given substring within the string with another substring. The function is non-recursive and works from left to right.

String is the original string.

fromstring is a string which may occur one or more times within *string*.

tostring is the string which will replace all occurrences of *fromstring* within *string*.

Example:
replace('abccde','cc','xyz')

TextBetween (*s, beforetext, aftertext [, n]* **)**

Returns the text between the *n*th occurrence of *beforetext* and the immediately following occurrence of *aftertext* within the string *s*.

Examples:

TextBetween('<abc>', '<', '>'**)** returns 'abc'
TextBetween('<abc><de>', '<', '>',2**)** returns 'de'

subfield(*s,* **'***delimiter***'** *[, index]* **)**

In its three parameter version, this script function returns a given substring from a larger string (*s*) with delimiters (**'***delimiter***'**). *Index* is an optional integer denoting which of the substrings should be returned. If *index* is omitted when **subfield** is used in a field expression in a **load** statement, the **subfield** function will cause the **load** statement to automatically generate one full record of input data for each substring that can be found in *s*.

In its two parameter version, the **subfield** function generates one record for each substring that can be taken from a larger string (*s*) with delimiters (**'***delimiter***'**). If several **subfield** functions are used

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

in the same **load** statement, the cartesian product of all combinations will be generated.

The returned strings are not trimmed from leading and trailing spaces.

Example 1 (three parameters):

subfield(S, ';' ,2**)** returns 'cde' if S is 'abc;cde;efg'
subfield(S, ':' ,1**)** returns NULL if S is an empty string
subfield(S, ':' ,1**)** returns an empty string if S is ':'

Example 2 (two parameters):

MeetingID	Start	Stop	Participants
Dev	9:00	10:00	John;Peter;Ann
Market	11:30	12:45	Jean;Julia;Robert;Peter

```
MyTab:
Load MeetingID, Start, Stop,
subfield(Participants, ';') as People
from Tab1.csv;
```

MeetingID	Start	Stop	People
Dev	9:00	10:00	John
Dev	9:00	10:00	Peter
Dev	9:00	10:00	Ann
Market	11:30	12:45	Jean
Market	11:30	12:45	Julia
Market	11:30	12:45	Robert
Market	11:30	12:45	Peter

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example 3 (two parameters):

BATCH	PRODUCTS	MACHINES
A	Alpha,Beta	Slicer;Cutter
B	Gamma	Slicer;Packer;Loader

```
MyTab:
Load Batch,
subfield(Products, ',')
as Products,
subfield(Machines, ';')
as Machines
from Tab2.csv;
```

BATCH	PRODUCTS	MACHINES
A	Alpha	Slicer
A	Alpha	Cutter
A	Beta	Slicer
A	Beta	Cutter
B	Gamma	Slicer
B	Gamma	Packer
B	Gamma	Loader

evaluate(*s* **)**

If the text *s* can be interpreted as a valid QlikView expression, the evaluated result of the expression will be returned. If *s* is not a valid expression, NULL is returned.

Example:

evaluate(5*8 **)** returns 40

findoneof (*text*, *characterset* [, *n*] **)**

returns the position of the *n*th occurrence in the string text of any of the characters found in the string *characterset*. If *n* is omitted the position of the first occurrence is returned. If there is no match 0 is returned.

Examples:
findoneof('my example text string', 'et%s'**)** returns 4
findoneof('my example text string', 'et%s', 3**)** returns 12
findoneof('my example text string', '¤%s&'**)** returns 0'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

substringcount(*text , substring* **)**

Returns the number of times the string substring appears within the string text. The result is an integer. If there is no match, 0 is returned.

Example:
substringcount ('abcdefgcdxyz' , 'cd' **)** returns 2

hash128(*expression {, expression}* **)**

Returns a 128-bit hash of the combined input expression values. The result is a string.

hash160(*expression {, expression}* **)**

Returns a 160-bit hash of the combined input expression values. The result is a string.

hash256(*expression {, expression}* **)**

Returns a 256-bit hash of the combined input expression values. The result is a string.

Mapping Functions

ApplyMap(*'mapname', expr, [, defaultexpr]* **)**

Maps any expression on a previously loaded mapping table. *Mapname* is the name of a mapping table previously loaded by a **mapping load** or **mapping select** statement (see page 328). The name must be quoted with single quotes. *Expr* is the expression whose result shall be mapped. *Defaultexpr* is an optional expression, which will be used as default mapping value if the mapping table does not contain any matching value for expr. If no default is provided, the value of *expr* is returned as is.

Examples:

```
// Assume the following mapping table
map1:
mapping load * inline [
x,y
1,one
2,two
3,three];
```

ApplyMap('map1' , MyVal **)** returns 'two' if MyVal = 2
ApplyMap('map1' , MyVal **)** returns 4 if MyVal = 4

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ApplyMap('map1' , MyVal, 'x' **)**
returns 'x' if MyVal <> 1, 2 or 3
ApplyMap('map1' , MyVal, **null())**
returns null if MyVal <> 1, 2 or 3
ApplyMap('map1' , MyVal, **null())**
returns 'one' if MyVal = 1

MapSubstring('*mapname*' , *expr* **)**

This function can be used for mapping parts of any expression on a previously loaded mapping table. The mapping is case sensitive and non-recursive. The substrings are mapped from the left to the right. *Mapname* is the name of a mapping table previously read by a **mapping load** or a **mapping select** statement. The name must be enclosed by single straight quotation marks. *Expr* is the expression whose result should be mapped by substrings.

Examples:

```
// Assume the following mapping table
map1:
mapping load * inline [
x,y
1,<one>
aa,XYZ
x,b];
```

MapSubstring('map1' , 'A123' **)** returns 'A<one>23'
MapSubstring('map1' , 'baaar' **)** returns 'bXYZar'
MapSubstring('map1' , 'xaa1' **)** returns 'bXYZ<one>'

Inter-Record Functions

These functions are used when a value from previously loaded records of data is needed for the evaluation of the current record.

previous(*expression* **)**

Returns the value of *expression* using data from the previous input record that was not discarded due to a **where** clause. In the first record of an input table the function will return NULL. The **previous** function may be nested in order to access records further back. Data is fetched directly from the input source, which makes it possible to refer also to fields which have not been loaded into QlikView and stored in its associative database.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
Load *, Sales / previous(Sales) as Increase
from..;

Load A, previous(previous(A)) as B from..;
```

peek(*fieldname [, row [, tablename]]* **)**

Returns the contents of the field *fieldname* in the record specified by *row* in the input table *tablename*. Data is fetched from the associative QlikView database.

Fieldname must be given as a string (e.g. a quoted literal).

Row must be an integer. 0 denotes the first record, 1 the second record and so on. Negative numbers indicate order from the end of the table. -1 denotes the last record read.

If no row is stated, -1 is assumed.

Tablename is a table label without the ending colon. If no tablename is stated, the current table is assumed.

Examples:

peek('Sales' **)**
: returns the value of Sales in the previous record read (equivalent to **previous(** Sales **))**.

peek('Sales', 2 **)**
: returns the value of Sales from the third record read from the current input table.

peek('Sales', -2 **)**
: returns the value of Sales from the second last record read into the current input table.

peek('Sales',0,'Tab1' **)**
: returns the value of Sales from the first record read into the input table labeled Tab1.

Load A, B, **numsum(**B, **peek(** 'Bsum' **))** as Bsum...;
: creates an accumulation of B in Bsum.

exists(*field [, expr]* **)**

Determines whether a specific field value exists in a specified field of the data loaded so far. *Field* is a name or a string expression evaluating to a field name. The field must exist in the data loaded so far by the script. *Expr* is an expression evaluating to the field value to look for in the specified field. If omitted, the current record's value in the specified field will be assumed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

exists(Month, 'Jan' **)**

returns -1 (true) if the field value *Jan* can be found in the current contents of the field *Month*.

exists(IDnr, IDnr **)**

returns -1 (true) if the value of the field *IDnr* in the current record already exists in any previously read record containing that field.

exists(IDnr **)**

is identical with the previous example.

Examples:

```
Load Employee, ID, Salary from
Employees.csv;
Load FirstName&' '&LastName as Employee,
Comment
from Citizens.csv
where exists (Employee, FirstName&'
'&LastName);
```

Only comments regarding citizens who are employees are read.

```
Load A, B, C from Employees.csv
where not exists(A);
```

This is equivalent to performing **distinct load** on field *A*.

fieldvalue(*fieldname, n* **)**

Returns the field value found in position *n* of the field *fieldname* (by load order). *Fieldname* must be given as a string value, e.g. the field name must be enclosed by single quotes. The first field value is returned for n=1. If *n* is larger than the number of field values, NULL is returned.

Example:

fieldvalue('Helptext', 5 **)**

fieldindex(*fieldname, value* **)**

Returns the position of the field value *value* in the field *fieldname* (by load order). If *value* cannot be found among the field values of the field *fieldname*, 0 is returned. *Fieldname* must be given as a string value, e.g. the field name must be enclosed by single quotes.

Example:

fieldindex('Name', 'John Doe' **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

lookup(*fieldname, matchfieldname, matchfieldvalue [, tablename]* **)**

Returns the value of *fieldname* corresponding to the first occurrence of the value *matchfieldvalue* in the field *matchfieldname*.

Fieldname, *matchfieldname* and *tablename* must be given as strings (e.g. quoted literals).

The search order is the load order unless the table is the result of complex operations such as joins, in which case the order is not well defined.

Both *fieldname* and *matchfieldname* must be fields in the same table, specified by *tablename*. If *tablename* is omitted the current table is assumed.

If no match is found, null is returned.

Example:

lookup('Price', 'ProductID', 'InvoicedProd', 'pricelist'**)**

Conditional Functions

if(*condition , then [, else]* **)**

The three parameters *condition*, *then* and *else* are all expressions. The first one, *condition*, is interpreted logically. The two other ones, *then* and *else*, can be of any type. They should preferably be of the same type. The third parameter, *else*, is optional. If excluded it will be assumed null. If *condition* is true, the function returns the value of the expression *then*. If *condition* is false, the function returns the value of the expression *else*.

Example:

if(Amount >= 0, 'OK', 'Alarm' **)**

alt(*case1 [, case2 , case3 , ...] , otherwise* **)**

The **alt** function returns the first of the parameters that has a valid number representation. If no such match is found, the last parameter will be returned. Any number of parameters can be used.

Example:

alt(date#(dat,'YYYY/MM/DD' **),**
date#(dat,'MM/DD/YYYY' **)**,
date#(dat,'MM/DD/YY' **)**,
'No valid date')

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

will test if the variable *dat* contains a date according to any of the three specified date formats. If so, it will return the original string and a valid number representation of a date. If no match is found, the text 'No valid date' will be returned (without any valid number representation).

pick(*n, expr1 [, expr2,...exprN]* **)**

Returns the *nth* expression in the list. *n* is an integer between 1 and *N*.

Examples:

pick(2, 'A', 'B', 4 **)** returns 'B'
pick(3, 'A', 'B', 4 **)** returns 4

match(*s, expr1 [, expr2, ...exprN]* **)**

Compares the string *s* to a list of strings or string expressions. The result of the comparison is an integer indicating which of the comparison strings/expressions matched. If no match is found, 0 is returned. The match function performs a case sensitive comparison.

Examples:

match(M , 'Jan' , 'Feb' , 'Mar' **)**
where M is 'Feb' returns 2
match(M , 'Jan' , 'Feb' , 'Mar' **)**
where M is 'Apr' or 'jan' returns 0

mixmatch(*s, expr1 [, expr2, ...exprN]* **)**

Compares the string *s* to a list of strings or string expressions. The result of the comparison is an integer indicating which of the comparison strings/expressions matched. If no match is found, 0 is returned. The mixmatch function performs a case insensitive comparison.

Example:

mixmatch(M , 'Jan' , 'Feb' , 'Mar' **)**
where M is 'jan' returns 1

wildmatch(*s, expr1 [, expr2, ...exprN]* **)**

Compares the string *s* to a list of strings or string expressions. The result of the comparison is an integer indicating which of the comparison strings/expressions that matched. If no match is found, 0 is returned. The wildmatch function performs a case insensitive com-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

parison. The wildcard characters * and ? are allowed in the comparison string.

Examples:

wildmatch(M , 'ja*' , 'fe?' , 'mar' **)**
where M is 'January' returns 1
wildmatch(M , 'ja*' , 'fe?' , 'mar' **)**
where M is 'fex' returns 2

class(*expression, interval [, label [, offset]]* **)**
Creates a classification of *expressions*. The bin width is determined by the number set as *interval*. The result is shown as a<=x<b, where *a* and *b* are the upper and lower limits of the bin. The *x* can be replaced by an arbitrary string stated in *label*. 0 is normally the default starting point of the classification. This can be changed by adding an *offset*.

Examples:

class(var,10 **)** with var = 23 returns '20<=x<30'
class(var,5,'value' **)** with var = 23 returns '20<= value <25'
class(var,10,'x',5 **)** with var = 23 returns '15<=x<25'

Logical Functions

IsNum(*expr* **)**
Returns -1 (true) if the expression can be interpreted as a number, otherwise 0 (false).

IsPartialReload()
Returns -1 (true) if the current reload is partial, otherwise 0 (false).

IsText(*expr* **)**
Returns -1 (true) if the expression has a text representation, otherwise 0 (false).

Null Functions

Null( ) Returns a real NULL value.

IsNull(*expr* **)**
Returns -1 (true) if *expr* returns NULL, otherwise 0 (false).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

System Functions

OSuser( )

Returns a string containing the name of the current user as returned by the operating system.

QVuser( )

Returns a string containing the name of the current QlikView user as defined in a **section access**.

qlikviewversion( )

Returns the full QlikView version and build number (e.g. 7.52.3797.0409.3) as a string. This function is only available in QlikView builds after 7.52.3795.

ComputerName( )

Returns a string containing the name of the computer as returned by the operating system.

ReloadTime( )

Returns a timestamp for the last finished execution of the script.

GetRegistryString(*path, key* **)**

Returns the value of a named registry *key* with a given registry *path*.

Example:
getregistrystring('HKEY_LOCAL_MACHINE\SOFT-WARE\QlikTech\QlikViewServer\Settings 7','EnableSessionLog')

Input(*str cue [, str caption]* **)**

This function can be used in the script only and opens an input box that prompts the user for a value during the script execution. The parameters *cue* and *caption* are used as message and caption texts, respectively. The function returns the entered value.

The input box function returns NULL if the dialog is cancelled, closed or cannot be shown.

Example:

```
Load
 Input('Enter value', 'Input box') as v,
Recno () as r
autogenerate 3;
```

IMsgBox(*str msg [, str caption [, mb_buttons [,mb_icons [,mb_defbutton]]]]* **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

This function can be used in the script only and opens a message box during the script execution. The parameters *msg* and *caption* are used as message and caption texts, respectively. The parameter *mb_buttons* defines what buttons will be shown in the message box, according to:

0 or 'OK' for a single OK button,
1 or 'OKCANCEL' for two buttons, OK and Cancel,
2 or 'ABORTRETRYIGNORE' for three buttons, Abort, Retry and Ignore,
3 or 'YESNOCANCEL' for three buttons, Yes, No and Cancel,
4 or 'YESNO' for two buttons, Yes and No,
5 or 'RETRYCANCEL' for two buttons, Retry and Cancel.

The parameter *mb_icons* defines what icon will be shown in the message box, according to:

0 or empty string for no icon,
16 or 'ICONHAND' for an icon with an X, used for critical errors,
32 or 'ICONQUESTION' for an icon with a question mark,
48 or 'ICONEXCLAMATION' for icon with an exclamation mark, used for minor errors, cautions and warnings
64 or 'ICONASTERISK' icon with an “i”, used for informational messages.

The parameter *mb_defbutton* defines what button will have focus when the message box is shown, according to:
0 or 'DEFBUTTON1' if the first button should have focus,
256 or 'DEFBUTTON2' if the second button should have focus,
512 or 'DEFBUTTON3' if the third button should have focus,
768 or 'DEFBUTTON4' if the fourth button should have focus.

The function returns an integer that shows what button has been pressed by the user, according to:

1 for OK,
2 for Cancel,
3 for Abort,
4 for Retry,
5 for Ignore,
6 for Yes,
7 for No

The parameter 3, 4 and 5 will internally be added, so if numeric values other than the above mentioned ones are used, you may get an unexpected combination of icons and buttons.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The message box function returns NULL if the dialog cannot be shown.

Example:

```
Load
MsgBox('Message 2', 'msgbox', 'OKCANCEL',
'ICONASTERISK') as x,
2 as r
autogenerate 1;
```

File Functions

FileBasename( )

Returns a string containing the name of the text file currently being read without path and extension.

Example:

```
Load *, filebasename() as X from
C:\UserFiles\abc.txt;
```

will return 'abc' in field X in each record.

FileDir( )

Returns a string containing the path to the directory of the text file currently being read.

Example:

```
Load *, filedir() as X from
C:\UserFiles\abc.txt;
```

will return 'C:\UserFiles' in field X in each record.

FileExtension( )

Returns a string containing the extension of the text file currently being read.

Example:

```
Load *, fileextension() as X from
C:\UserFiles\abc.txt;
```

will return 'txt' in field X in each record.

FileName( )

Returns a string containing the name of the text file currently being read without path but with extension.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Load *, filename() as X from
C:\UserFiles\abc.txt;
```

will return 'abc.txt' in field X in each record.

FilePath( )

Returns a string containing the full path to the text file currently being read.

Example:

```
Load *, filepath() as X from
C:\UserFiles\abc.txt;
```

will return 'C:\UserFiles\abc.txt' in field X in each record.

FileSize(*[filename]* **)**

Returns an integer containing the size in bytes of the file *filename* or if no *filename* is specified of the text file currently being read.

Examples:

filesize('xyz.xls' **)** will return the size of the file xyz.xls.

```
Load *, filesize() as X from abc.txt;
```

will return the size of the specified file (abc.txt) as an integer in field X in each record read.

FileTime(*[filename]* **)**

Returns a timestamp for the date and time of the last modification of the file *filename*. If no *filename* is specified, the function will refer to the currently read text file.

Examples:

filetime('xyz.xls' **)** will return the timestamp of the last modification of the file xyz.xls.

```
Load *, filetime() as X from abc.txt;
```

will return the date and time of the last modification of the file abc.txt as a timestamp in field X in each record read.

ConnectString( )

Returns the active connect string for ODBC or OLEDB connection. Returns an empty string if no **Connect** statement has been executed or after a **Disconnect** statement.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

QvdCreateTime(*filename* **)**

Returns the XML-header time stamp from a QVD file if any (otherwise NULL).

Filename is name of a QVD file including path, if needed.

Examples:

QvdCreateTime('MyFile.qvd' **)**

QvdCreateTime('C:\MyDir\MyFile.qvd' **)**

QvdNoOfRecords(*filename* **)**

Returns the number of records currently in a QVD file.

Filename is name of a QVD file including path, if needed.

Examples:

QvdNoOfRecords('MyFile.qvd' **)**

QvdNoOfRecords('C:\MyDir\MyFile.qvd' **)**

QvdNoOfFields(*filename* **)**

Returns the number of fields in a QVD file.

Filename is name of a QVD file including path, if needed.

Examples:

QvdNoOfFields('MyFile.qvd' **)**

QvdNoOfFields('C:\MyDir\MyFile.qvd' **)**

QvdFieldName(*filename* **)**

Returns the name of field number *field_no*, if it exists in a QVD file (otherwise NULL).

Filename is name of a QVD file including path, if needed.

Fieldno is the number of the field (0 based) within the table contained in the QVD file.

Examples:

QvdFieldName('MyFile.qvd' 3 **)**

QvdFieldName('C:\MyDir\MyFile.qvd' 5 **)**

QvdTableName(*filename* **)**

Returns the name of the table contained in a QVD file.

Filename is name of a QVD file including path, if needed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

QvdTableName('MyFile.qvd' 3 **)**

QvdTableName('C:\MyDir\MyFile.qvd' 5 **)**

Table Functions

NoOfRows(*'TableName'***)**

Returns the number of rows (records) in a previously loaded input table. If the function is used within a **load** statement, it must not reference the table currently being loaded.

Examples:

```
tab1:
Load * from abc.csv;
Let a = NoOfRows('tab1');
```

NoOfFields(*'TableName'***)**

Returns the number of fields in a previously loaded input table. If the function is used within a **load** statement, it must not reference the table currently being loaded.

Examples:

```
tab1:
Load * from abc.csv;
Let a = NoOfFields('tab1');
```

FieldNumber(*field ,'TableName'***)**

Returns the number of a specified field within a previously loaded input table. If the function is used within a **load** statement, it must not reference the table currently being loaded.

Examples:

```
tab1:
Load * from abc.csv;
LET a = FieldNumber('Customer','tab1');
```

FieldName(*nr ,'TableName'***)**

Returns the name of the field with the specified number within a previously loaded input table. If the function is used within a **load** statement, it must not reference the table currently being loaded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

```
tab1:
Load * from abc.csv;
LET a = FieldName(4,'tab1');
```

NoOfTables()
Returns the number of tables previously loaded.

TableName(*table_number***)**
Returns the name of the table with the specified number.

TableNumber(*table_name***)**
Returns the number of a specified table.

Document Functions

ReportComment(*report_number***)**
Returns the comment of the report with the specified number within the active document.

ReportName(*report_number***)**
Returns the name of the report with the specified number within the active document.

ReportID(*report_number***)**
Returns the id of the report with the specified number within the active document.

ReportNumber(*report_id_or_name***)**
Returns the number of the report with the specified id or name within the active document.

NoOfReports()
Returns the number of reports in the active document.

Date and Time Functions

In the following examples, the default date format YYYY-MM-DD (ISO standard) is assumed. See further on page 280 for a description of date and time formats in QlikView.

day(*date* **)**
Day. The result is a number.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Example:

day(Date **)** where Date = 1971-10-30 returns 30.

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. To solve this problem, you can either change the settings or use the **date#** interpretation function (see under "Number Interpretation Functions" on page 457). For further information about date and time functions see page 280.

week(*date* **)**

Week number. The result is a number.

Example:

week(Date **)** where Date = 1971-10-30 returns 43.

A week begins on Monday. Week #1 is the first week with four or more days in the new year.

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

month(*date* **)**

Month. The result is a text string, but can be formatted as a number.

Example:

month(Date **)** where Date = 1971-10-30 returns Oct.

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

year(*date* **)**

Year. The result is a number.

Example:

year(Date **)** where Date = 1971-10-30 returns 1971.

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

weekday(*date* **)**

Week day. The result is a number between 0-6, where 0 indicates Monday.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

weekday(Date **)** where Date = 1971-10-30 returns 5.

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

weekyear(*date* **)**

The year to which the week number belongs. The week number ranges between 1 and approximately 52. Some years week #1 starts in December, e.g. December 1997. Other years start with week #53 of previous year, e.g. January 1999. For those few days when the week number belongs to another year, the functions **year** and **weekyear** will return different values.

Examples:

weekyear(Date **)** where Date = 1996-12-30 returns 1997.
weekyear(Date **)** where Date = 1997-01-02 returns 1997.
weekyear(Date **)** where Date = 1997-12-30 returns 1997.
weekyear(Date **)** where Date = 1999-01-02 returns 1998.

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

MakeDate(*YYYY [, MM [, DD]]* **)**

Returns a date calculated from the year *YYYY*, the month number *MM* and the day number *DD*. If no month number is stated, 1 (January) is assumed. If no day number is stated, 1 (the 1st) is assumed.

Examples:
(date format YYYY-MM-DD assumed)

makedate(1999 **)** returns 1999-01-01
makedate(99 **)** returns 0099-01-01
makedate(1992, 12 **)** returns 1992-12-01
makedate(1999, 2, 14 **)** returns 1999-02-14

MakeWeekDate(*YYYY , WW [, D]* **)**

Returns a date calculated from the year *YYYY*, the week number *WW* and the day-of-week *D*, where 0 denotes Monday and 6 denotes Sunday. Week number 1 is the first week containing four days or more of the year. If no day-of-week is stated, 0 (Monday) is assumed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
(date format YYYY-MM-DD assumed)

makeweekdate(1999,6,6 **)** returns 1999-02-14
makeweekdate(99,6 **)** returns 0099-02-02

MakeTime(*hh [, mm [, ss [.fff]]]* **)**

Returns a time calculated from the hour *hh*, the minute *mm* and the second *ss* with fraction *fff* down to a millisecond. If no minute is stated, 00 is assumed. If no second is stated, 00 is assumed. If no fraction of seconds is stated, .000 is assumed.

Examples:
(time format hh:mm:ss assumed)

maketime(22 **)** returns 22:00:00
maketime(22, 17 **)** returns 22:17:00
maketime(22, 17, 52 **)** returns 22:17:52

hour(*expr* **)**

Returns an integer representing the hour when the fraction of *expr* is interpreted as a time according to the standard number interpretation.

Examples:
(time format hh:mm:ss assumed)

hour(time **)** returns 9 when time='09:14:36'
hour(0.5555 **)** returns 13 (0.5555 = 13:19:55)

minute(*expr* **)**

Returns an integer representing the minute when the fraction of *expr* is interpreted as a time according to the standard number interpretation.

Examples:
(time format hh:mm:ss assumed)

minute(time **)** returns 14 when time='09:14:36'
minute(0.5555 **)** returns 19 (0.5555 = 13:19:55)

second(*expr* **)**

Returns an integer representing the second when the fraction of *expr* is interpreted as a time according to the standard number interpretation.

Examples:
(time format hh:mm:ss assumed)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

second(time **)** returns 36 when time='09:14:36'
second(0.5555 **)** returns 55 (0.5555 = 13:19:55)

now(*[timer_mode]* **)**

Returns a timestamp from the system clock. The *timer_mode* may have the following values:

0 Time at script run
1 Time at function call
2 Time when the document was opened

Default *timer_mode* is 1. The *timer_mode=1* should be used with caution, since it polls the operating system every second and hence could slow down the system.

today(*[timer_mode]* **)**

Returns the date from the system clock. The *timer_mode* may have the following values:

0 Date at script run
1 Date at function call
2 Date when the document was opened

Default *timer_mode* is 2. The *timer_mode=1* should be used with caution, since it polls the operating system every second and hence could slow down the system.

LocalTime(*[timezone [, ignoreDST]]* **)**

Returns a timestamp of the current time from the system clock for a specified time zone. The *timezone* is specified as a string containing any of the geographical places listed under Time Zone in the Windows Control Panel for Date and Time or as a string in the form 'GMT+hh:mm'. If no *timezone* is specified the local time will be returned. If *ignoreDST* is true daylight savings time will be ignored.

Examples:
localtime ('Paris'**)**
localtime ('GMT+01:00'**)**
localtime ('Paris', true**)**
localtime ()

YearToDate(*date [, yearoffset [, firstmonth [, todaydate]]]* **)**

Returns true if *date* falls within the year to date, else false. If none of the optional parameters are used, the year to date means any date

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

within one calendar year from January 1 up to and including the date of the last script execution.

By specifying a *yearoffset* (0 if omitted), the function can be transposed to return true for the same period in another year. Negative *yearoffset* indicates previous years while a positive value indicates coming years. Last year to date is achieved by specifying *yearoffset*= -1.

By specifying a *firstmonth* between 1 and 12 (1 if omitted), the beginning of the year may be moved forward to the first day of any month. If you e.g. want to work with a fiscal year starting May 1, you may specify *firstmonth* = 5.

By specifying a *todaydate* (time of last script execution if omitted), you may move the day used as the upper boundary of the period.

Examples:
assume last reload time = 1999-11-18

yeartodate('1998-11-18' **)** returns false
yeartodate('1999-02-01' **)** returns true
yeartodate('1999-11-18' **)** returns true
yeartodate('1999-11-19' **)** returns false
yeartodate('1998-11-18', -1 **)** returns true
yeartodate('1999-11-18', -1 **)** returns false
yeartodate('1999-04-30', 0, 5 **)** returns false
yeartodate('1999-05-01', 0, 5 **)** returns true

DayNumberOfYear(*date[,firstmonth]***)**

Returns the day number of the year according to a timestamp with the first millisecond of the first day of the year containing *date*.

The function always uses years based on 366 days.

By specifying a firstmonth between 1 and 12 (1 if omitted), the beginning of the year may be moved forward to the first day of any month. If you e.g. want to work with a fiscal year starting March 1, you may specify *firstmonth* = 3.

Examples:
DayNumberOfYear(date**)** returns the day number counted from the first of the year.
DayNumberOfYear(date,3**)** returns the number of the day as counted from the first of March.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

DayNumberOfQuarter(*date[,firstmonth]***)**

Returns the day number of the quarter according to a timestamp with the first millisecond of the first day of the quarter containing *date*.

The function always uses years based on 366 days.

By specifying a firstmonth between 1 and 12 (1 if omitted), the beginning of the year may be moved forward to the first day of any month. If you e.g. want to work with a fiscal year starting March 1, you may specify *firstmonth* = 3.

Examples:
DayNumberOfQuarter(Date) returns the day number of the quarter counted from the first day of the first quarter.
DayNumberOfQuarter(Date,3**)** returns the day number of the quarter counted from the first of March

AddMonths(*startdate, n [, mode]*)

Returns the date occurring *n* months after *startdate* or, if *n* is negative, the date occurring *n* months before *startdate*.

By specifying a *mode* (0 if omitted) the date is set to either the unmodified day of the specified month (mode=0) or the calculated day as derived from the end of the month (mode=1).

Examples:

addmonths ('2003-01-29',3**)**	returns '2003-04-29'
addmonths ('2003-01-29',3,0**)**	returns '2003-04-29'
addmonths ('2003-01-29',3,1**)**	returns '2003-04-28'
addmonths ('2003-01-29',1,0**)**	returns '2003-02-28'
addmonths ('2003-01-29',1,1**)**	returns '2003-02-26'
addmonths ('2003-02-28',1,0**)**	returns '2003-03-28'
addmonths ('2003-02-28',1,1**)**	returns '2003-03-31'

YearStart(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the first date of the year containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the year which contains *date*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:
yearstart ('2001-10-19' **)** returns '2001-01-01' with an underlying numeric value corresponding to '2001-01-01 00:00:00.000'
yearstart ('2001-10-19', -1 **)** returns '2000-01-01' with an underlying numeric value corresponding to '2000-01-01 00:00:00.000'
yearstart ('2001-10-19', 0, 4 **)** returns '2001-04-01' with an underlying numeric value corresponding to '2001-04-01 00:00:00.000'

YearEnd(*date [, shift = 0 [, first_month_of_year = 1]*] **)**

Returns a value corresponding to a timestamp with the last millisecond of the last date of the year containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the year which contains *date*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Example:
yearend ('2001-10-19' **)** returns '2001-12-31' with an underlying numeric value corresponding to '2001-12-31 23:59:59.999'
yearend ('2001-10-19', -1) returns '2000-12-31' with an underlying numeric value corresponding to '2000-12-31 23:59:59.999'
yearend ('2001-10-19', 0, 4) returns '2002-03-31' with an underlying numeric value corresponding to '2002-03-31 23:59:59.999'

YearName(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a four-digit year as display value with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the year containing *date*. *Shift* is an integer, where the value 0 indicates the year which contains *date*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*. The display value will then be a string showing two years.

Examples:
yearname ('2001-10-19'**)** returns '2001' with an underlying numeric value corresponding to '2001-01-01 00:00:00.000'
yearname ('2001-10-19', -1 **)** returns '2000' with an underlying numeric value corresponding to '2000-01-01 00:00:00.000'
yearname ('2001-10-19', 0, 4 **)** returns '2001-2002' with an underlying numeric value corresponding to '2001-04-01 00:00:00.000'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

QuarterStart(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the quarter containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the quarter which contains *date*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

quarterstart ('2005-10-29' **)** returns '2005-10-01' with an underlying numeric value corresponding to '2005-10-01 00:00:00.000'
quarterstart ('2005-10-29', -1 **)** returns '2005-07-01' with an underlying numeric value corresponding to '2005-07-01 00:00:00.000'
quarterstart ('2005-10-29', 0, 3 **)** returns '2005-09-01' with an underlying numeric value corresponding to '2005-09-01 00:00:00.000'

QuarterEnd(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the quarter containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the quarter which contains *date*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

quarterend ('2005-10-29' **)** returns '2005-12-31' with an underlying numeric value corresponding to '2005-12-31 23:59:59.999'
quarterend('2005-10-29', -1 **)** returns '2005-09-30' with an underlying numeric value corresponding to '2005-09-30 23:59:59.999'
quarterend ('2005-10-29', 0, 3 **)** returns '2005-11-30' with an underlying numeric value corresponding to '2005-11-30 23:59:59.999'

QuarterName(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a display value showing the months of the quarter (formatted according to the MonthNames script variable) and year with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the quarter. *Shift* is an integer, where the value 0 indicates the quarter which contains *date*. Negative values in *shift* indicate preceding quarters and positive values

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:

quartername ('2005-10-29' **)** returns 'Oct-Dec 2005' with an underlying numeric value corresponding to '2005-10-01 00:00:00.000'

quartername ('2005-10-29', -1 **)** returns 'Jul-Sep 2005' with an underlying numeric value corresponding to '2005-07-01 00:00:00.000'

quartername ('2005-10-29', 0, 3 **)** returns 'Sep-Nov 2005' with an underlying numeric value corresponding to '2005-09-01 00:00:00.000'

MonthStart(*date [, shift = 0]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the first date of the month containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the month which contains *date*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:

monthstart ('2001-10-19' **)** returns '2001-10-01' with an underlying numeric value corresponding to '2001-10-01 00:00:00.000'

monthstart ('2001-10-19', -1 **)** returns '2001-09-01' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'

MonthEnd(*date [, shift = 0]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the last date of the month containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the month which contains *date*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:

monthend ('2001-02-19' **)** returns '2001-02-28' with an underlying numeric value corresponding to '2001-02-28 23:59:59.999'

monthend ('2001-02-19', -1 **)** returns '2001-01-31' with an underlying numeric value corresponding to '2001-01-31 23:59:59.999'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

MonthName(*date [, shift = 0]* **)**

Returns a display value showing the month (formatted according to the MonthNames script variable) and year with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the month. *Shift* is an integer, where the value 0 indicates the month which contains *date*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:
monthname ('2001-10-19' **)** returns 'Oct 2001' with an underlying numeric value corresponding to '2001-10-01 00:00:00.000'
monthname ('2001-10-19', -1 **)** returns 'Sep 2001' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'

MonthsStart(*n, date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the *n* month period (starting from January 1st) containing *date*. The default output format will be the DateFormat set in the script. N must be (1), 2, (3), 4 or 6. *Shift* is an integer, where the value 0 indicates the period which contains *date*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
monthsstart (4, '2001-10-19' **)** returns '2001-09-01' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'
monthsstart (4, '2001-10-19', -1 **)** returns '2001-05-01' with an underlying numeric value corresponding to '2001-05-01 00:00:00.000'
monthsstart (4, '2001-10-19', 0, 2 **)** returns '2001-10-01' with an underlying numeric value corresponding to '2001-10-01 00:00:00.000'

MonthsEnd(*n, date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the *n* month period (starting from January 1st) containing *date*. The default output format will be the DateFormat set in the script. N must be (1), 2, (3), 4 or 6. *Shift* is an integer, where the value 0 indicates the period which contains *date*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

monthsend (4, '2001-07-19' **)** returns '2001-08-31' with an underlying numeric value corresponding to '2001-08-31 23:59:59.999'

monthsend (4, '2001-10-19', -1 **)** returns '2001-08-31' with an underlying numeric value corresponding to '2001-08-31 23:59:59.999'

monthsend (4, '2001-10-19', 0, 2 **)** returns '2002-01-31' with an underlying numeric value corresponding to '2002-01-31 23:59:59.999'

MonthsName(*n, date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a display value showing the months of the period (formatted according to the MonthNames script variable) and year with an underlying numeric value corresponding to a timestamp with the first millisecond of the n month period (starting from January 1st) containing *date*. N must be (1), 2, (3), 4 or 6. *Shift* is an integer, where the value 0 indicates the period which contains *date*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

monthsname (4, '2001-10-19' **)** returns 'Sep-Dec 2001' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'

monthsname (4, '2001-10-19', -1 **)** returns 'May-Aug 2001' with an underlying numeric value corresponding to '2001-05-01 00:00:00.000'

monthsname (4, '2001-10-19', 0, 2 **)** returns 'Oct-Jan 2002' with an underlying numeric value corresponding to '2001-10-01 **00:00:00.000'**

WeekStart(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the first date (Monday) of the calendar week containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the week which contains *date*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Mon-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



day, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
weekstart ('2006-01-12' **)** returns '2006-01-09' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'
weekstart ('2006-01-12', -1 **)** returns '2006-01-02' with an underlying numeric value corresponding to '2006-01-02 00:00:00.000'
weekstart ('2006-01-12', 0, 1 **)** returns '2006-01-10' with an underlying numeric value corresponding to '2006-01-10 00:00:00.000'

WeekEnd(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the last date (Sunday) of the calendar week containing *date*. The default output format will be the DateFormat set in the script.. *Shift* is an integer, where the value 0 indicates the week which contains *date*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
weekend ('2006-01-12' **)** returns '2006-01-15' with an underlying numeric value corresponding to '2006-01-15 23:59:59.999'
weekend ('2006-01-12', -1 **)** returns '2006-01-08' with an underlying numeric value corresponding to '2006-01-08 23:59:59.999'
weekend ('2006-01-12', 0, 1 **)** returns '2006-01-16' with an underlying numeric value corresponding to '2006-01-16 23:59:59.999'

WeekName(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a display value showing the year and week number with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the week containing *date*. *Shift* is an integer, where the value 0 indicates the week which contains *date*. Negative values in period indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
weekname ('2006-01-12' **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

weekname ('2006-01-12', -1 **)** returns '2006/01' with an underlying numeric value corresponding to '2006-01-02 00:00:00.000'
weekname ('2006-01-12', 0, 1 **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-10 00:00:00.000'

LunarweekStart(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the lunar week (consecutive 7 day periods starting on January 1st each year) containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the lunar week which contains *date*. Negative values in *shift* indicate preceding lunar weeks and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
lunarweekstart ('2006-01-12' **)** returns '2006-01-08' with an underlying numeric value corresponding to '2006-01-08 00:00:00.000'
lunarweekstart ('2006-01-12', -1 **)** returns '2006-01-01' with an underlying numeric value corresponding to '2006-01-01 00:00:00.000'
lunarweekstart ('2006-01-12', 0, 1 **)** returns 2006-01-09' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'

LunarweekEnd(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the lunar week (consecutive 7 day periods starting on January 1st each year) containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the lunar week which contains *date*. Negative values in *shift* indicate preceding lunar weeks and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
lunarweekend ('2006-01-12' **)** returns '2006-01-14' with an underlying numeric value corresponding to '2006-01-14 23:59:59.999'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

lunarweekend ('2006-01-12', -1 **)** returns '2006-01-07' with an underlying numeric value corresponding to '2006-01-07 23:59:59.999'
lunarweekend ('2006-01-12', 0, 1 **)** returns '2006-01-15' with an underlying numeric value corresponding to '2006-01-15 23:59:59.999'

LunarWeekName(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a display value showing the year and week number with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the lunar week (consecutive 7 day periods starting on January 1st each year)containing date. *Shift* is an integer, where the value 0 indicates the lunar week which contains date. Negative values in period indicate preceding lunar weeks and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in weekoffset. This may be given as a real number indicating days and/or fractions of a day.

Examples:
lunarweekname ('2006-01-12' **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-08 00:00:00.000'
lunarweekname ('2006-01-12', -1 **)** returns '2006/01' with an underlying numeric value corresponding to '2006-01-01 00:00:00.000'
lunarweekname ('2006-01-12', 0, 1 **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'

DayStart(*timestamp [, shift = 0 [, dayoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the day contained in *timestamp*. The default output format will be the TimestampFormat set in the script. *Shift* is an integer, where the value 0 indicates the day which contains *date*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in *dayoffset*, e.g 0.125 to denote 3am.

Examples:
daystart ('2006-01-25 16:45' **)** returns '2006-01-25 00:00:00' with an underlying numeric value corresponding to '2006-01-25 00:00:00.000'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

daystart ('2006-01-25 16:45', -1 **)** returns '2006-01-24 00:00:00' with an underlying numeric value corresponding to '2006-01-24 00:00:00.000'
daystart ('2006-01-25 16:45', 0, 0.5 **)** returns '2006-01-25 12:00:00' with an underlying numeric value corresponding to '2006-01-25 12:00:00.000'

DayEnd(*timestamp [, shift = 0 [, dayoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the day contained in *timestamp*. The default output format will be the TimestampFormat set in the script. *Shift* is an integer, where the value 0 indicates the day which contains *date*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in *dayoffset*, e.g 0.125 to denote 3am.

Examples:

dayend ('2006-01-25 16:45' **)** returns '2006-01-25 23:59:59' with an underlying numeric value corresponding to '2006-01-25 23:59:59.999'
dayend ('2006-01-25 16:45', -1 **)** returns '2006-01-24 23:59:59' with an underlying numeric value corresponding to '2006-01-24 23:59:59.999'
dayend ('2006-01-25 16:45', 0, 0.5 **)** returns '2006-01-26 11:59:59' with an underlying numeric value corresponding to '2006-01-26 11:59:59.999'

DayName(*timestamp [, shift = 0 [, dayoffset = 0]]* **)**

Returns a display value showing the date with an underlying numeric value corresponding to a timestamp with the first millisecond of the day containing *timestamp*. *Shift* is an integer, where the value 0 indicates the day which contains date. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in *dayoffset*, e.g 0.125 to denote 3am.

Examples:

dayname ('2006-01-25 16:45') returns '2006-01-25' with an underlying numeric value corresponding to '2006-01-25 00:00:00.000'
dayname ('2006-01-25 16:45', -1) returns '2006-01-24' with an underlying numeric value corresponding to '2006-01-24 00:00:00.000'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

dayname ('2006-01-25 16:45', 0, 0.5) returns '2006-01-25' with an underlying numeric value corresponding to '2006-01-25 12:00:00.000'

setdateyear (*timestamp, year***)**

returns a timestamp based on *timestamp* but with the year replaced with *year*.
timestamp is a standard QlikView timestamp (often just a date).
year is a four-digit year.

Examples:
setdateyear('2005-10-29', 2006) returns '2006-10-29'
setdateyear('2005-10-29 04:26', 2006) returns '2006-10-29 04:26'

setdateyearmonth (*timestamp, year, month***)**

returns a timestamp based on *timestamp* but with the year replaced with *year* and the month replaced with *month*.
timestamp is a one- or two-digit month.
year is a four-digit year.
month is a one- or two-digit month.

Examples:
setdateyearmonth('2005-10-29', 2006, 3**)** returns '2006-03-29'
setdateyearmonth('2005-10-29 04:26', 2006, 3**)** returns '2006-03-29 04:26'

InYear (*date, basedate , shift [, first_month_of_year = 1]* **)**

returns true if *date* lies inside the year containing *basedate*. The year can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the year which contains *basedate*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inyear ('2006-01-25', '2006-01-01', 0 **)** returns true
inyear ('2005-01-25', '2006-01-01', 0 **)** returns false
inyear ('2006-01-25', '2006-01-01', -1 **)** returns false
inyear ('2005-01-25', '2006-01-01', -1 **)** returns true
inyear ('2006-01-25', '2006-07-01', 0, 3 **)** returns false
inyear ('2006-03-25', '2006-07-01', 0, 3 **)** returns true

InYearToDate (*date, basedate , shift [, first_month_of_year = 1]* **)**

returns true if *date* lies inside the part of year containing *basedate* up until and including the last millisecond of *basedate*. The year can

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

be offset by *shift*. *Shift* is an integer, where the value 0 indicates the year which contains *basedate*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inyeartodate ('2006-01-25', '2006-02-01', 0 **)** returns true
inyeartodate ('2006-01-25', '2006-01-01', 0 **)** returns false
inyeartodate ('2005-01-25', '2006-02-01', -1 **)** returns true

InQuarter (*date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the quarter containing *basedate*. The quarter can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the quarter which contains *basedate*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inquarter ('2006-01-25', '2006-01-01', 0 **)** returns true
inquarter ('2006-01-25', '2006-04-01', 0 **)** returns false
inquarter ('2006-01-25', '2006-01-01', -1 **)** returns false

inquarter ('2005-12-25', '2006-01-01', -1 **)** returns true
inquarter ('2006-01-25', '2006-03-01', 0, 3 **)** returns false
inquarter ('2006-03-25', '2006-03-01', 0, 3 **)** returns true

InQuarterToDate (*date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the part of the quarter containing *basedate* up until and including the last millisecond of basedate. The quarter can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the quarter which contains *basedate*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inquartertodate ('2006-01-25', '2006-01-25', 0 **)** returns true
inquartertodate ('2006-01-25', '2006-01-24', 0 **)** returns false
inquartertodate ('2005-12-25', '2006-02-01', -1 **)** returns true

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

InMonth (*date, basedate , shift* **)**

returns true if *date* lies inside the month containing *basedate*. The month can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the month which contains *basedate*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:
inmonth ('2006-01-25', '2006-01-01', 0 **)** returns true
inmonth ('2006-01-25', '2006-04-01', 0 **)** returns false
inmonth ('2006-01-25', '2006-01-01', -1 **)** returns false
inmonth ('2005-12-25', '2006-01-01', -1 **)** returns true

InMonthToDate (*date, basedate , shift* **)**

returns true if *date* lies inside the part of month containing *basedate* up until and including the last millisecond of *basedate*. The month can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the month which contains *basedate*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:
inmonthtodate ('2006-01-25', '2006-01-25', 0 **)** returns true
inmonthtodate ('2006-01-25', '2006-01-24', 0 **)** returns false
inmonthtodate ('2006-01-25', '2006-02-28', -1 **)** returns true

InMonths (*n, date, basedate , shift [, first_month_of_year = 1]* **)**

returns true if *date* lies inside the *n* month period (aligned from January 1st) containing basedate. *N* must be (1), 2, (3), 4 or 6. The period can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the period which contains *basedate*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inmonths (4, '2006-01-25', '2006-01-01', 0 **)** returns true
inmonths (4, '2006-01-25', '2006-05-01', 0 **)** returns false
inmonths (4, '2006-01-25', '2006-01-01', -1 **)** returns false
inmonths (4, '2005-12-25', '2006-01-01', -1 **)** returns true
inmonths (4, '2006-01-25', '2006-03-01', 0, 3 **)** returns false
inmonths (4, '2006-04-25', '2006-03-01', 0, 3 **)** returns true

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

InMonthsToDate (*n, date, basedate , shift [, first_month_of_year = 1]* **)**

returns true if *date* lies inside the part of the *n* month period (aligned from January 1st) containing *basedate* up until and including the last millisecond of *basedate*. *N* must be (1), 2, (3), 4 or 6. The period can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the period which contains *basedate*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

inmonthstodate (4, '2006-01-25', '2006-04-25', 0 **)** returns true
inmonthstodate (4, '2006-04-25', '2006-04-24', 0 **)** returns false
inmonthstodate (4, '2005-11-25', '2006-02-01', -1 **)** returns true

InWeek (*date, basedate , shift [, weekstart]* **)**

returns true if *date* lies inside the week containing *basedate*. The week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the week which contains *basedate*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekstart*. This may be given as a real number indicating days and/or fractions of a day.

Examples:

inweek ('2006-01-12', '2006-01-14', 0 **)** returns true
inweek ('2006-01-12', '2006-01-20', 0 **)** returns false
inweek ('2006-01-12', '2006-01-14', -1 **)** returns false
inweek ('2006-01-07', '2006-01-14', -1 **)** returns true
inweek ('2006-01-12', '2006-01-09', 0, 3 **)** returns false

InWeekToDate (*date, basedate , shift [, weekstart]* **)**

returns true if *date* lies inside the part of week containing *basedate* up until and including the last millisecond of *basedate*. The week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the week which contains *basedate*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in weekstart. This may be given as a real number indicating days and/or fractions of a day.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Examples:
inweektodate ('2006-01-12', '2006-01-12', 0 **)** returns true
inweektodate ('2006-01-12', '2006-01-11', 0 **)** returns false
inweektodate ('2006-01-12', '2006-01-05', -1 **)** returns false

InLunarWeek (*date, basedate , shift [, weekstart]* **)**
returns true if *date* lies inside the lunar week (consecutive 7 day periods starting on January 1st each year) containing *basedate*. The lunar week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the lunar week which contains basedate. Negative values in *shift* indicate preceding lunar week s and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in week-start. This may be given as a real number indicating days and/or fractions of a day.

Examples:
inlunarweek ('2006-01-12', '2006-01-14', 0 **)** returns true
inlunarweek ('2006-01-12', '2006-01-20', 0 **)** returns false
inlunarweek ('2006-01-12', '2006-01-14', -1 **)** returns false
inlunarweek ('2006-01-07', '2006-01-14', -1 **)** returns true
inlunarweek ('2006-01-11', '2006-01-08', 0, 3 **)** returns false

InLunarWeekToDate (*date, basedate , shift [, weekstart]* **)**
returns true if *date* lies inside the part of lunar week (consecutive 7 day periods starting on January 1st each year) containing *basedate* up until and including the last millisecond of *basedate*. The lunar week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the lunar week which contains *basedate*. Negative values in *shift* indicate preceding lunar week s and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in week-start. This may be given as a real number indicating days and/or fractions of a day.

Examples:
inlunarweektodate ('2006-01-12', '2006-01-12', 0 **)** returns true
inlunarweektodate ('2006-01-12', '2006-01-11', 0 **)** returns false
inlunarweektodate ('2006-01-12', '2006-01-05', 1 **)** returns true

InDay (*timestamp, basetimestamp , shift [, daystart]* **)**
returns true if *timestamp* lies inside the day containing *basetimestamp*. The day can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the day which contains *basetimestamp*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in daystart, e.g 0.125 to denote 3am.

Examples:
inday ('2006-01-12 12:23', '2006-01-12 00:00', 0 **)** returns true
inday ('2006-01-12 12:23', '2006-01-13 00:00', 0 **)** returns false
inday ('2006-01-12 12:23', '2006-01-12 00:00', -1 **)** returns false
inday ('2006-01-11 12:23', '2006-01-12 00:00', -1 **)** returns true
inday ('2006-01-12 12:23', '2006-01-12 00:00', 0, 0.5 **)** returns false
inday ('2006-01-12 11:23', '2006-01-12 00:00', 0, 0.5 **)** returns true

InDayToTime (*timestamp, basetimestamp , shift [, daystart]***)**
returns true if *timestamp* lies inside the part of day containing *basetimestamp* up until and including the exact millisecond of *basetimestamp*. The day can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the day which contains *basetimestamp*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in daystart, e.g 0.125 to denote 3am.

Examples:
indaytotime ('2006-01-12 12:23', '2006-01-12 23:59', 0 **)** returns true
indaytotime ('2006-01-12 12:23', '2006-01-12 00:00', 0 **)** returns false
indaytotime ('2006-01-11 12:23', '2006-01-12 23:59', -1 **)** returns true

timezone ( )
returns the name of the current time zone as defined in Windows.

Example:
timezone ( )

GMT ( ) returns the current Greenwich Mean Time as derived from the system clock and Windows time settings.

Example:
gmt ( )

UTC() returns the current Coordinated Universal Time.

Example:
utc()

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

daylightsaving ( )

returns the current adjustment for daylight saving time as defined in Windows.

Example:
daylightsaving ( )

age(*timestamp, date_of_birth* **)**

Returns the age at the time of *timestamp* (in completed years) of someone born on *date_of_birth*.

Example:
age('2007-01-25', '2005-10-29'**)** returns 1
age('2007-10-29', '2005-10-29'**)** returns 2

networkdays(*start_date, end_date {, holiday}* **)**

Returns the number of working days (Monday-Friday) between and including *start_date* and *end_date* taking into account any optionally listed *holidays*. All parameters should be valid dates or timestamps.

Example:
networkdays ('2007-02-19', '2007-03-01'**)** returns 9
networkdays ('2006-12-18', '2006-12-31', '2006-12-25', '2006-12-26'**)** returns 8

firstworkdate(*end_date, no_of_workdays {, holiday}* **)**

Returns the latest starting date to acheive *number_of_workdays* (Monday-Friday) ending no later than *end_date* taking into account any optionally listed holidays. *End_date* and *number_of_workdays* should be valid dates or timestamps.

Example:
firstworkdate ('2007-03-01', 9**)** returns '2007-02-19'
firstworkdate ('2006-12-31', 8, '2006-12-25', '2006-12-26'**)** returns '2006-12-18'

lastworkdate(*start_date, no_of_workdays {, holiday}* **)**

Returns the earliest ending date to acheive *number_of_workdays* (Monday-Friday) if starting at *start_date* taking into account any optionally listed holidays. *Start_date* and *number_of_workdays* should be valid dates or timestamps.

Example:
lastworkdate ('2007-02-19', 9**)** returns '2007-03-01'
lastworkdate ('2006-12-18', 8, '2006-12-25', '2006-12-26'**)** returns '2006-12-29'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ConvertToLocalTime(*timestamp [, place [, ignore_dst=false]]]***)**

Converts a UTC or GMT timestamp to local time as a dual value. The place can be any of a number of cities, places and time zones around the world, e.g. Abu Dhabi, Adelaide, Alaska, Almaty, Amsterdam, Arizona, Astana, Athens, Atlantic Time (Canada), Auckland, Azores, Baghdad, Baku, Bangkok, Beijing, Belgrade, Berlin, Bern, Bogota, Brasilia, Bratislava, Brisbane, Brussels, Bucharest, Budapest, Buenos Aires, Cairo, Canberra, Cape Verde Is., Caracas, Casablanca, Central America, Central Time (US & Canada), Chennai, Chihuahua, Chongqing, Copenhagen, Darwin, Dhaka, Eastern Time (US & Canada), Edinburgh, Ekaterinburg, Fiji, Georgetown, Greenland, Greenwich Mean Time : Dublin, Guadalajara, Guam, Hanoi, Harare, Hawaii, Helsinki, Hobart, Hong Kong, Indiana (East), International Date Line West, Irkutsk, Islamabad, Istanbul, Jakarta, Jerusalem, Kabul, Kamchatka, Karachi, Kathmandu, Kolkata, Krasnoyarsk, Kuala Lumpur, Kuwait, Kyiv, La Paz, Lima, Lisbon, Ljubljana, London, Madrid, Magadan, Marshall Is., Mazatlan, Melbourne, Mexico City, Mid-Atlantic, Midway Island, Minsk, Monrovia, Monterrey, Moscow, Mountain Time (US & Canada), Mumbai, Muscat, Nairobi, New Caledonia, New Delhi, Newfoundland, Novosibirsk, Nuku'alofa, Nuku´alofa, Osaka, Pacific Time (US & Canada), Paris, Perth, Port Moresby, Prague, Pretoria,Quito, Rangoon, Riga, Riyadh, Rome, Samoa, Santiago, Sapporo, Sarajevo, Saskatchewan, Seoul, Singapore, Skopje, Sofia, Solomon Is., Sri Jayawardenepura, St. Petersburg, Stockholm, Sydney, Taipei, Tallinn, Tashkent, Tbilisi, Tehran, Tijuana, Tokyo, Ulaan Bataar, Urumqi, Warsaw, Wellington, West Central Africa, Vienna, Vilnius, Vladivostok, Volgograd, Yakutsk, Yerevan or Zagreb. Also GMT, GMT-01:00, GMT+04:00 etc. are valid places.

The resulting time is adjusted for daylight savings time, unless the third parameter is set to 1 or true().

Examples:
ConvertToLocalTime(’2007-11-10 23:59:00’,’Paris’**)** returns ’2007-11-11 00:59:00’ and the corresponding internal timestamp representation.

ConvertToLocalTime(UTC(), ‘GMT-05:00’**)** returns the time for the North American east coast, e.g. New York.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Number Interpretation Functions

The number interpretation functions are a set of functions to interpret a field content or an expression. With these functions it is possible to state the data type, decimal separator, thousand separator etc. used.

If no interpretation functions are used, QlikView interprets the data as a mix of numbers, dates, times, time stamps and strings, using the default settings for number format, date format and time format defined by script variables and by the operating system.

In order to understand the examples in this section, you should first study the chapter “number formats” on page 273.

Note For reasons of clarity, all number representations are given with decimal point as decimal separator.

num#(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **num#** function evaluates the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291. Decimal separator and thousand separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the default number format set by script variables or in the operating system is used.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
number format	# ##0,#	#,##0.#

num#(*A*,*'#'*) where A=35,648.375 returns

Setting 1		Setting 2	
string	number	string	number
35,648.375	-	35648.375	35648.375

num#(*A*, *'#.#'* , *'.'* , *','*) where A=35,648.375 returns

Setting 1 and 2	
string	number
35,648.375	-35648.375

num#(*A*, *'#,#'* , *','* , *'.'*) where A=35648.375 returns

Setting 1 and 2		
string	number	Note!
35648.375	35648375	The number represent.!

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

num#(*A,'abc#,#'*) where A=abc123,4 returns

Setting 1		Setting 2	
string	number	string	number
abc123,4	123.4	abc123,4	1234

money#(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **money#** function evaluates the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291. Decimal separator and thousand separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the default number format set by script variables or in the operating system is used.

The **money#** function generally behaves just like the **num#** function but takes its default values for decimal and thousand separator from the script variables for money format or the system settings for currency.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
money format	kr # ##0,00	$ #,##0.00

money#(*A,'# ##0,00 kr'*) where A=35 648,37 kr returns

Setting 1		Setting 2	
string	number	string	number
35 648.37 kr	35648.37	35 648.37 kr	3564837

money#(*A, '$#' , '.' , ',')* where A=$35,648.37 returns

Setting 1 and 2	
string	number
$35,648.37	35648.37

date#(*expression [, format-code]* **)**

The **date#** function evaluates the *expression* as a date according to the string given as *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the default date format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	**Default setting 2**
date format	YY-MM-DD	M/D/YY

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

date#(*A*) where A=8/6/97 returns

Setting 1		Setting 2	
string	number	string	number
8/6/97	-	8/6/97	35648

date#(*A,'YYYY.MM.DD'*) where A=1997.08.06 returns

Setting 1 and 2	
string	number
1997.08.06	35648

time#(*expression [, format-code]* **)**

The **time#** function evaluates the *expression* as a time according to the string given as *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the default time format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
time format	hh:mm:ss	hh.mm.ss

time#(*A*) where A=09:00:00 returns

Setting 1		Setting 2	
string	number	string	number
09:00:00	0.375	09:00:00	-

time#(*A,'hh.mm'*) where A=09.00 returns

Setting 1 and 2	
string	number
09.00	0.375

timestamp#(*expression [, format-code]* **)**

The **timestamp#** function evaluates the *expression* as a date and a time according to the string given as *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the default date and time formats set in the operating system are used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

time format hh:mm:ss hh:mm:ss

timestamp#(*A*) where A=8/6/97 09:00:00 returns

Setting 1	
string	number
8/6/97 09:00:00	-

Setting 2	
string	number
8/6/97 09:00:00	35648.375

timestamp#(*A,'YYYY-MM-DD hh_mm'*) where A=1997 08-06 09_00 returns

Setting 1 and 2	
string	number
1997-08-06 09_00	35648.375

interval#(*expression [, format-code]* **)**

The **interval#** function evaluates the *expression* as a time interval according to the string given as a *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the time format set in the operating system is used.

The **interval#** function generally behaves just like the **time#** function but while times can never be greater than 23:59:59 (numeric value 0.99999) or smaller than 00:00:00 (numeric value 0.00000) an interval may have any value.

Examples:

The examples below assume the following operating system settings:

short date format YY-MM-DD
time format hh:mm:ss
number decimal format .

interval#(*A,'D hh:mm'*)where A=1 09:00 returns

string	number
1 09:00	1.375

interval#(*A-B*) where A=97-08-06 09:00:00 and B=97-08-05 00:00:00 returns

string	number
1.375	1.375

text(*expr* **)**

The **text** function forces the *expression* to be treated as text, even if a numeric interpretation is possible.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

text(*A*) where A=1234 returns

string	number
1234	-

text(*pi()* **)** returns

string	number
3.1415926535898	-

Formatting Functions

The formatting functions are a set of functions to set the display format of a field or an expression. With these functions it is possible to set decimal separator, thousand separator etc. The easiest way to format numbers, times and dates is however in the number format dialog, see page 285.

In order to understand the examples in this section, you should first study the chapter “number formats” on page 273.

Note For reasons of clarity all number representations are given with decimal point as decimal separator.

num(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **num** function formats the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291. Decimal separator and thousand separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the number format set in the operating system is used.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
number format	# ##0,#	#,##0.#

num(*A , '0.0'*) where A=35648.375 returns

Setting 1		Setting 2	
string	number	string	number
35 648 375	35648375	35648.375	35648.375

num(*A , '#,##0.##' , '.' , ','*) where A=35648 returns

Setting 1 and 2	
string	number
35,648.00	35648

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

num(*pi() , '0,00'*) returns

Setting 1		Setting 2	
string	number	string	number
3,14	3.141592653	003	3.141592653

money(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **money** function formats the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291. Decimal separator and thousand separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the number format set in the operating system is used.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
money format	kr # ##0,00	$ #,##0.00

money(*A*) where A=35648 returns

Setting 1		Setting 2	
string	number	string	number
kr 35 648,00	35648.00	$ 35,648.00	35648.00

money(*A , '#,##0 -' , '.' , ','*) where A=3564800 returns

Setting 1 and 2	
string	number
3,564,800 -	3564800

date(*expression [, format-code]* **)**

The **date** function formats the *expression* as a date according to the string given as *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the date format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY

date(*A*) where A=35648 returns

Setting 1		Setting 2	
string	number	string	number
97-08-06	35648	8/6/97	35648

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

date(*A, 'YY-MM-DD'*) where A=35648 returns

Setting 1 and 2

string	number
97-08-06	35648

date(*A, 'DD.MM.YYYY'*) where A=35648.375 returns

Setting 1 and 2

string	number
06.08.1997	35648.375

date(*A,'YY.MM.DD'*) where A=8/6/97 returns

Setting 1		Setting 2	
string	number	string	number
<NULL>	(nothing)	97.08.06	35648

time(*expression [, format-code]* **)**

The **time** function formats the *expression* as a time according to the string given as *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the time format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
time format	hh:mm:ss	hh.mm.ss

time(*A*) where A=0.375 returns

Setting 1		Setting 2	
string	number	string	number
09:00:00	0.375	09.00.00	0.375

time(*A*) where A=35648.375 returns

Setting 1		Setting 2	
string	number	string	number
09:00:00	35648.375	09.00.00	35648.375

time(*A,'hh-mm'*) where A=0.99999 returns

Setting 1 and 2

string	number
23-59	0.99999

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

timestamp(*expression [, format-code]* **)**

The **timestamp** function formats the *expression* as a date and a time according to the string given as *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the date and time formats set in the operating system are used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY
time format	hh:mm:ss	hh:mm:ss

timestamp(*A*) where A=35648.375 returns

Setting 1		Setting 2	
string	number	string	number
97-08-06 09:00:00	35648.375	8/6/97 09:00:00	35648.375

timestamp(*A,'YYYY-MM-DD hh.mm'*) where A=35648 returns

Setting 1 and 2	
string	number
1997-08-06 00.00	35648

interval(*expression [, format-code]* **)**

The **interval** function formats the *expression* as a time interval according to the string given as a *format-code*. For a description of the format-code, see page 291. If the format code is omitted, the time format set in the operating system is used.

Intervals may be formatted as a time, as days or as a combination of days, hours, minutes, seconds and fractions of seconds.

Examples:

The examples below assume the following operating system settings:

short date format	YY-MM-DD
time format	hh:mm:ss
number decimal format	.

interval(*A*) where A=0.375 returns

string	number
09:00:00	0.375

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

interval(*A*) where A=1.375 returns

string	number
33:00:00	1.375

interval(*A, 'D hh:mm'*) where A=1.375 returns

string	number
1 09:00	1.375

interval(*A-B, 'D hh:mm'*) where A=97-08-06 09:00:00 and B=96-08-06 00:00:00 returns

string	number
365 09:00	365.375

dual(*s* , *x* **)**

Forced association of an arbitrary string representations with a given number representation *x*. In QlikView, when several pieces of data read into one field have different string representations but the same valid number representation, they will all share the first string representation encountered. The **dual** function is typically used early in the script, before other data is read into the field concerned, in order to create that first string representation, which will be shown in list boxes etc.

Example:

```
load dual(string,numrep) as DayOfWeek
inline [string,numrep
Monday,0
Tuesday,1
Wednesday,2
Thursday,3
Friday,4
Saturday,5
Sunday,6];
load Date, weekday(Date) as DayOfWeek from
afile.csv;
```

The script example will generate a field *DayOfWeek* with the week-days written in clear text. QlikView will for all purposes regard the field as a numeric field.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Color Functions

colormix1(*Value, ColorZero, ColorOne* **)**

returns an RGB color representation from a gradient between two colors based on a value between 0 and 1. If the value is equal to zero the first color will be returned. If it is 1, the second color is returned and if it is in between the appropriate intermediate shading is returned.

Value is a real number between 0 and 1.

ColorZero is a valid RGB color representation for the color to be associated with the low end of the interval.

ColorOne is a valid RGB color representation for the color to be associated with the high end of the interval.

Example:
colormix1(x, **black** (), **red**()**)**

colormix2(*Value, ColorMinusOne, ColorOne [,ColorZero]* **)**

returns an RGB color representation from a gradient between two colors based on a value between -1 and 1 with the possibility to specify an intermediate color for the center position. If the value is equal to -1 the first color will be returned. If it is 1, the second color is returned and if it is in between the appropriate intermediate shading is returned.

Value is a real number between -1 and 1.

ColorMinusOne is a valid RGB color representation for the color to be associated with the high end of the interval.

ColorOne is a valid RGB color representation for the color to be associated with the high end of the interval.

ColorZero is a optional valid RGB color representation for the color to be associated with the center of the interval.

Examples:
colormix1(x, **red** (), **green**()**)** returns colors from red to green via brown

colormix1(x, **red** (), **green**(), **black**()**)** returns colors from red to green via black

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

26 DATA STRUCTURES

26.1 Data Loading Statements

Data is loaded by **load** or **select** statements. Each of these statements generates an input table. A table can always be seen as a list of something, each record (row) then being a new instance of the object type and each field (column) being a specific attribute or property of the object.

Rules:

QlikView does not make any difference between tables generated by a **load** or a **select** statement. Hence, if several tables are loaded, it does not matter whether the tables are loaded by **load** or **select** statements or by a mix of the two.

The order of the fields in the statement or in the original table in the database is arbitrary to the QlikView logic.

Field names are used in the further process to identify fields and making associations. These are case sensitive. It is thus often necessary to rename fields in the script. See “Renaming Fields” on page 472 .

26.2 System Fields

When extracting fields from a data source, QlikView also produces a number of system fields:

$Table	Names of all logical tables loaded by the script.
$Field	Names of the fields that are read from the tables. This field was called *$Variable* in earlier versions of QlikView.
$Fields	Number of fields in different tables.
$FieldNo	Position of the fields in the tables.
$Rows	Number of rows in the tables.
$Info	Names of info tables included in the document.

The system fields can be displayed as list boxes in a QlikView document. With the help of these list boxes, you can easily understand the underlying structure of the application.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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When a single table is selected in the list box *$Table*, an information symbol is shown in the title bar of the list box. By clicking here, you may view the table (if it is a text file).

By setting the *$Field* list box to **Show Frequency** in the **General** page of the **List Box Properties** dialog, it is easy to see which fields are associating the different tables.

Another very useful tool is a pivot table with the two dimensions *$Field* and *$Table* and the expression only(*$Field*). Put the *$Field* dimension to the left and the *$Table* dimension on the top. Sort both dimensions by load order. You will now have an excellent system table showing the relations of tables and fields.

You create a System table by choosing **New Sheet Object**, **System Table** from the **Layout** menu.

26.3 Logical Tables

Each **load** or **select** statement generates a table. Normally, QlikView treats the result of each one of these as *one logical table*. However, there are a couple of exceptions from this rule:

- If two or more statements result in tables with identical field names, the tables are concatenated and treated as *one logical table*.
- If a **load** or **select** statement is preceded by any of the following qualifiers, data is altered or treated differently:

concatenate

this table is added (concatenated) to the last previously created logical table.

crosstable

this table is converted from crosstable format to column format.

generic

this table is split into several other logical tables.

info

this table is loaded not as a logical table, but as an information table containing links to external info such as files, sounds, URLs, etc.

intervalmatch

the table (which must contain exactly two columns) is interpreted as numeric intervals, which are associated with discrete numbers in a specified field.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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join this table is joined by QlikView with the previously created logical table, over the fields in common.

mapping
this table (which must contain exactly two columns) is read as a mapping table, which is never associated with other tables.

semantic
this table is loaded not as a logical table, but as a *semantic table* containing relationships that should not be joined, e.g. predecessor, successor and other references to other objects of the same type.

When the data has been loaded, the logical tables are associated.

26.4 Associations between Logical Tables

Data Associations

A database can have many tables. Each table can be considered as a list of something, i.e. each record in the list represents an instance of an object of some type.

If two tables are lists of different things, e.g. if one is a list of customers and the other a list of invoices, and the two tables have a field in common, e.g. the customer number, this is usually a sign that there is a relationship between the two tables. In standard SQL query tools the two tables should almost always be *joined*.

The tables defined in the QlikView script are called logical tables. QlikView makes *associations* between the tables based on the field names, and performs the joins when a selection is made, i.e. when the user clicks on a list box item.

Hence, a QlikView association is almost the same thing as a QlikView join (see below). The only difference is that the join is performed when the script is executed - the logical table is usually the result of the join. The association

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

is made after the logical table is created - associations are always made between the logical tables.

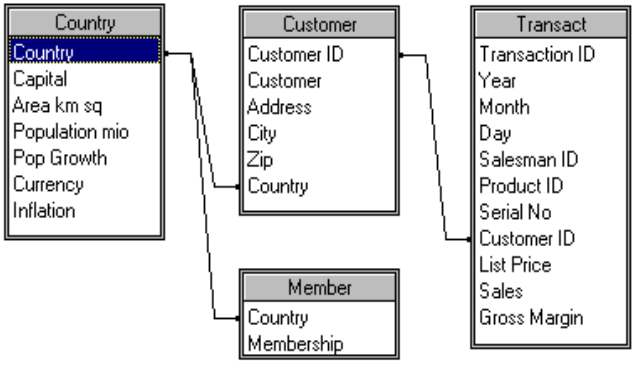


Figure 87. Four tables: a list of countries, a list of customers, a list of transactions and a list of memberships, which are associated with each other through the fields Country and CustomerID.

A QlikView association has approximately the same effect as a SQL natural outer join. The QlikView association is however more general: an outer join in SQL is usually a one way projection of one table on another. A QlikView association always results in a full (bidirectional) natural outer join.

Frequency Information in Associating Fields

There are some limitations in the use of most associating fields, i.e. fields which are common between two or more tables. When a field occurs in more than one table, QlikView has a problem knowing which of the tables it should use for calculating data frequencies.

QlikView analyzes the data to see if there is a non-ambiguous way to identify a main table to count in (sometimes there is) but in most cases the program can only make a guess. Since an incorrect guess could be fatal (QlikView would appear to make a calculation error) the program has been designed not to allow certain operations when the data interpretation is ambiguous for associating fields.

For associating fields the following limitations normally apply:

1 You cannot display frequency information in a list box showing the field. The **Show Frequency** option in the **List Box Properties** (**General** page) is dimmed.

2 Statistics boxes for the field show n/a for most statistical entities.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 In charts it is not possible to create expressions containing functions depending on frequency information (sum, count functions, average etc.) on the field, unless the **Distinct** modifier is turned on. If you try, an error message will appear. After each reload, QlikView will scan all chart expressions to see if any ambiguities have occurred as a result of changes in data structures. If ambiguous expressions are found, a warning dialog will be shown and the expression will be disabled. It will not be possible to enable the expression until the problem has been corrected. If a log file is enabled, all ambiguous expressions will be listed in the log.

There is a simple way to overcome these limitations. Load the field an extra time under a new name from the table where frequency counts should be made. Then use the new field for a list box with frequency, for a statistics box or for calculations in your charts.

Synthetic Keys

When two or more input tables have two or more fields in common, this implies a composite key relationship. QlikView handles this through synthetic keys. These keys are anonymous fields that represent all occurring combinations of the composite key. When the number of composite keys increases, depending on data amounts, table structure and other factors, QlikView may or may not handle them gracefully. QlikView may end up using excessive amount of time and/or memory. Unfortunately the actual limitations are virtually impossible to predict, which leaves only trial and error as a practical method to determine them.

Therefore we recommend an overall analysis of the intended table structure by the application designer. Typical tricks include:

- Forming your own non-composite keys, typically using string concatenation inside an **AutoNumber** script function.
- Making sure only the necessary fields connect. If you for example use a date as a key, make sure you do not load e.g. *year*, *month* or *day_of_month* from more than one input table.

Circular References ("Loops")

If there are circular references ("loops") in a data structure, the tables are associated in such a way that there is more than one path of associations between two fields.

This type of data structure should normally be avoided as much as possible, since it might lead to ambiguities in the interpretation of data. Unfortunately,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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circular structures are quite common in the real world. In some cases they are a result of poor database design, but in certain cases they may be unavoidable.

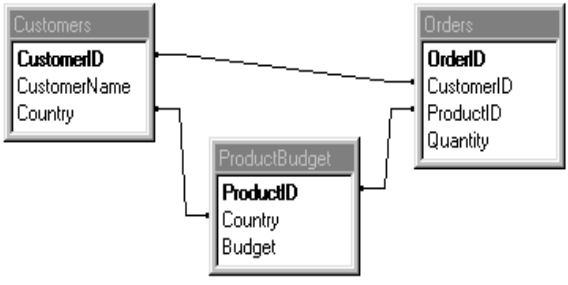


Figure 88. Three tables with a circular reference.

QlikView solves the problem of circular references by breaking the loop with a loosely coupled table. When QlikView finds circular data structures while executing the load script, a warning dialog will be shown and one or more tables will be set as loosely coupled. QlikView will typically attempt to loosen the longest table in the loop, as this is often a transaction table, which normally should be the one to loosen. If you do not like QlikView's default choice of table to set as loosely coupled, it is possible to declare a specific table as loosely coupled via a **loosen table** statement in the script. It is also possible to change the settings for loosely coupled tables interactively in the **Tables** page of **Document Properties** after the script has been executed. See chapter "Loosely Coupled Tables" on page 159 ff, for more information on loosely coupled tables.

26.5 Renaming Fields

Sometimes it is necessary to rename fields in order to obtain the correct associations.

It could be that two fields are named differently although they denote the same thing, e.g. *ID* in a table *Customers* and *CustomerID* in a table *Orders*. Obviously they both denote a specific customer identification code and should both be named *CustomerID* or something similar.

It could also be that two fields have the same name but denote different things, e.g. *Date* in the table *Invoices* and *Date* in the table *Orders*. These should preferably be renamed *InvoiceDate* and *OrderDate* or something similar.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

There could also be plain misspellings in the database or different conventions on upper and lower case letters. (Since QlikView differs between upper and lower case letters it is important that such things are corrected.)

Fields can be renamed in the script, so there is no need to change the original data. There are two ways of renaming fields:

- The **load** or **select** statement can be preceded by an **alias** statement.

  Example:

  ```
  Alias ID as CustomerID;
  Load * from Customer.csv;
  ```

- The **load** or **select** statement can contain the **as** specifier (automatically generated if the file wizard is used).

  Example:

  ```
  Load ID as CustomerID, Name, Address, Zip, City,
  State from Customer.csv;
  ```

Finally it is also possible to rename list boxes and other sheet objects, without changing the logical associations defined by the field names. Choose **Properties** from the object menu of the sheet object.

26.6 Concatenating Several Tables into One

Automatic Concatenation

If the field names and the number of fields of two or more loaded tables are exactly the same, QlikView will automatically concatenate the content of the different statements into one table.

Example:

```
load a, b, c from table1.csv;
load a, c, b from table2,csv;
```

The resulting logical table has the fields a, b and c. The number of records is the sum of the numbers of records in table 1 and table 2.

Rules:

•The number and names of the fields must be exactly the same.

•The order of the two statements is arbitrary.

Forced Concatenation

If two or more tables do not have exactly the same set of fields, it is still possible to force QlikView to concatenate the two tables. This is done with the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

concatenate prefix in the script, which concatenates a table with another named table or with the last previously created logical table.

Example:

```
load a, b, c from table1.csv;
concatenate load a, c from table2,csv;
```

The resulting logical table has the fields a, b and c. The number of records in the resulting table is the sum of the numbers of records in table 1 and table 2. The value of field b in the records coming from table 2 is NULL.

Rules:

- The names of the fields must be exactly the same.
- Unless a table name of a previously loaded table is specified in the **concatenate** statement the **concatenate** prefix uses the last previously created logical table. The order of the two statements is thus *not* arbitrary.

26.7 Join and Keep

It is possible to join tables already in the script. The QlikView logic will then not see the separate tables, but rather the result of the join, which is a single logical table. Sometimes this is preferable, sometimes even necessary, but most of the time it is not advisable, since:

- The loaded tables often become larger, and QlikView works slower.
- Some information may be lost: the frequency (number of records) within the original table may no longer be available.

The **keep** functionality, which has the effect of reducing one or both of the two tables to the intersection of table data before the tables are stored in QlikView, has been designed to reduce the number of cases where you need to use explicit joins. For an illustration of the difference between **join** and **keep**, see the examples under “Join and Keep” on page 474.

Note In this manual the term join is usually used for joins made before the logical tables are created. The *association*, made after the logical tables are created, is however essentially also a join.

Joins Within an SQL Select Statement

With some ODBC drivers it is possible to make a join within the **select** statement. This is almost equivalent to making a join using the **join** prefix.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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However, most ODBC drivers are not able to make a full (bidirectional) outer join. They are only able to make a left or a right outer join. A left (right) outer join only includes combinations where the joining key exists in the left (right) table. A full outer join includes any combination. QlikView automatically makes a full outer join.

Further, making joins in **select** statements is far more complicated than making joins in QlikView.

Example:

```
SELECT DISTINCTROW
[Order Details].ProductID, [Order Details].
UnitPrice, Orders.OrderID, Orders.OrderDate,
Orders.CustomerID
FROM Orders
RIGHT JOIN [Order Details] ON Orders.OrderID =
[Order Details].OrderID;
```

This **select** statement joins a table containing orders to a fictive company, with a table containing order details. It is a right outer join, meaning that all the records of *OrderDetails* are included, also the ones with an *OrderID* that does not exist in the table *Orders*. Orders that exist in *Orders* but not in *OrderDetails* are however not included.

Join

The simplest way to make a join is with the **join** prefix in the script, which joins the input table with the last previously created logical table. The join will be an outer join, creating all possible combinations of values from the two tables.

Example:

```
load a, b, c from table1.csv;
join load a, d from table2.csv;
```

The resulting logical table has the fields a, b, c and d. The number of records differs depending on the field values of the two tables.

Rules:

- The names of the fields to join over must be exactly the same.
- The number of fields to join over is arbitrary. Usually the tables should have one or a few fields in common. No field in common will render the cartesian product of the tables. All fields in common is also possible, but usually makes no sense.
- Unless a table name of a previously loaded table is specified in the **join** statement the **join** prefix uses the last previously created logical table. The order of the two statements is thus *not* arbitrary.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Keep

The explicit **join** prefix in the QlikView script language performs a full join of the two tables. The result is one table. In many cases such joins will results in very large tables. One of the main features of QlikView is its ability to make associations between tables instead of joining them, which reduces space in memory, increases speed and gives enormous flexibility. The **keep** functionality has been designed to reduce the number of cases where you need to use explicit joins.

The **keep** prefix between two **load** or **select** statements has the effect of reducing one or both of the two tables to the intersection of table data before they are stored in QlikView. The **keep** prefix must always be preceded by one of the keywords **inner**, **left** or **right**. The selection of records from the tables is made in the same way as in a corresponding join. However, the two tables are not joined and will be stored in QlikView as two separately named tables.

Inner

The **join** and **keep** prefixes in the QlikView script language can be preceded by the prefix **inner**.

If used before **join**, it specifies that the join between the two tables should be an inner join. The resulting table contains only combinations between the two tables with a full data set from both sides.

If used before **keep**, it specifies that the two tables should be reduced to their common intersection before being stored in QlikView.

Example:

Table1

A	B
1	aa
2	cc
3	ee

Table2

A	C
1	xx
4	yy

```
QVTable:
Select * from Table1;
inner join select * from Table2;
```

QVTable

A	B	C
1	aa	xx

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
QVTab1:
Select * from Table1;
QVTab2:
inner keep select * from Table2;
```



The two tables in the keep example are of course associated via the field A.

Left

The **join** and **keep** prefixes in the QlikView script language can be preceded by the prefix **left**.

If used before **join**, it specifies that the join between the two tables should be a left join. The resulting table only contains combinations between the two tables with a full data set from the first table.

If used before **keep**, it specifies that the second table should be reduced to its common intersection with the first table before being stored in QlikView.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

Table1

A	B
1	aa
2	cc
3	ee

Table2

A	C
1	xx
4	yy

```
QVTable:
Select * from Table1;
left join select * from Table2;
```

QVTable

A	B	C
1	aa	xx
2	cc	-
3	ee	-

```
QVTab1:
Select * from Table1;
QVTab2:
left keep select * from Table2;
```

QVTab1

A	B
1	aa
2	cc
3	ee

QVTab2

A	C
1	xx

The two tables in the keep example are of course associated via the field A.

Right

The **join** and **keep** prefixes in the QlikView script language can be preceded by the prefix **right**.

If used before **join**, it specifies that the join between the two tables should be a right join. The resulting table only contains combinations between the two tables with a full data set from the second table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If used before **keep**, it specifies that the first table should be reduced to its common intersection with the second table before being stored in QlikView.

Example:

Table1

A	B
1	aa
2	cc
3	ee

Table2

A	C
1	xx
4	yy

```
QVTable:
Select * from Table1;
right join select * from Table2;
```

QVTable

A	B	C
1	aa	xx
4	-	yy

```
QVTab1:
Select * from Table1;
QVTab2:
right keep select * from Table2;
```

QVTab1

A	B
1	aa

QVTab2

A	C
1	xx
4	yy

The two tables in the **keep** example are of course associated via the field A.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

27 EVALUATING THE LOADED DATA



27.1 Generic Databases

A generic database is a table in which the field names are stored as field values in one column, while the field values are stored in a second. Generic databases are usually used for attributes of different objects.

Generic database		
object	attribute	value
ball	color	red
ball	diameter	10 cm
ball	weight	100 g
box	color	black
box	height	16 cm
box	lenght	20 cm
box	weight	500 g
box	width	10 cm

Consider the example to the right. It is a generic database containing two objects, a ball and a box. Obviously some of the attributes, like color and weight, are common to both the objects, while others, like diameter, height length and width are not.

This is a typical generic database. On one hand it would be awkward to store the data in a way giving each attribute a column of its own, since many of the attributes are not relevant for a specific object.

On the other hand, it would look messy displaying it in a way that mixed lengths, colors and weights.

object
ball
box

attribute
color
diameter
height
length
weight
width

value
black
red
10 cm
16 cm
20 cm
100 g
500 g

QlikView solves this problem in an elegant way. If data is stored in the compact way shown above, you can choose between the two different ways of displaying the data. QlikView automatically creates several logical tables from the generic database.

If this table is loaded the standard way, we can get three different list boxes on the screen. However, if the table is loaded as a generic database, QlikView will split up column two and three into different list boxes. QlikView will then generate one field for each unique value of the second column.

object
ball
box

color
black
red

weight
100 g
500 g

diameter
10 cm

length
20 cm

width
10 cm

height
16 cm

The syntax for doing this is simple:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:

```
Generic select * from GenericTable;
```

It does not matter whether a **load** or **select** statement is used to load the generic database.

27.2 Cross Tables

A cross table is a common type of table featuring a matrix of values between two orthogonal lists of header data. It could look like the table below.

Example 1:

ex1.csv

Year	Jan	Feb	Mar	Apr	May	Jun
1991	45	65	78	12	78	22
1992	11	23	22	22	45	85
1993	65	56	22	79	12	56
1994	45	24	32	78	55	15
1995	45	56	35	78	68	82

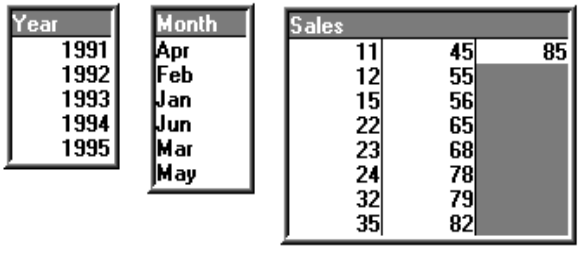
If this table is simply loaded into QlikView, the result will be one field for *Year* and one field for each of the months. This is generally not what you would like to have. One would probably prefer to have three fields generated, one for each header category (*Year* and *Month*) and one for the data values inside the matrix.

This can be achieved by adding the **crosstable** prefix to your **load** or **select** statement.

The statement for loading this cross table could be:

```
crosstable (Month, Sales) load * from ex1.csv;
```

The result in QlikView would be as follows:



The cross table is often preceded by a number of regular columns, which should be read in a straightforward way. This is the case in example 2:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example 2:

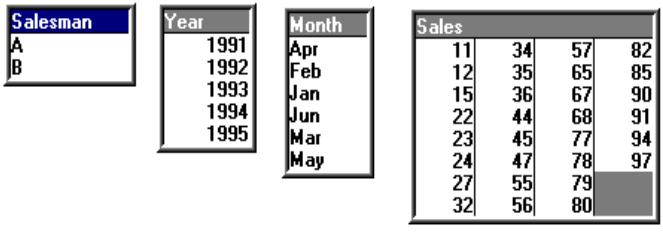
ex2.csv

Salesman	Year	Jan	Feb	Mar	Apr	May	Jun
A	1991	45	65	78	12	78	22
A	1992	11	23	22	22	45	85
A	1993	65	56	22	79	12	56
A	1994	45	24	32	78	55	15
A	1995	45	56	35	78	68	82
B	1991	57	77	90	24	90	34
B	1992	23	35	34	34	57	97
B	1993	77	68	34	91	24	68
B	1994	57	36	44	90	67	27
B	1995	57	68	47	90	80	94

In this case there are two regular columns to the left, followed by the matrix columns. The number of regular columns can be stated as a third parameter to the **crosstable** prefix as follows:

```
crosstable (Month, Sales, 2) load * from ex2.csv ;
```

The result in QlikView would be:



For a description of the syntax see page 301.

27.3 Matching Intervals to Discrete Data

The **intervalmatch** prefix to a **load** or **select** statement is used to link discrete numeric values to one or more numeric intervals. This is a very powerful feature which can be used e.g. in production environments as shown in the example below.

Example:

Look at the two tables below. The first table shows the start and end of production of different orders. The second table shows some discrete events. How can we associate

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

the discrete events with the orders, so that we know e.g. which orders were affected by the disturbances and which orders were processed by which shifts?

OrderLog:

START	END	ORDER
01:00	03:35	A
02:30	07:58	B
03:04	10:27	C
07:23	11:43	D

EventLog:

TIME	EVENT	COMMENT
00:00	0	Start of shift 1
01:18	1	Line stop
02:23	2	Line restart 50%
04:15	3	Line speed 100%
08:00	4	Start of shift 2
11:43	5	End of production

First load the two tables as usual and then link the field *Time* to the intervals defined by the fields *Start* and *End*:

```
Select * from OrderLog;
Select * from EventLog;
Intervalmatch (Time) select Start,End from OrderLog;
```

A table box in QlikView could now be created as below:

Time	Event	Comment	Order	Start	End
00:00	0	Start of shift 1	-	-	-
01:18	1	Line stop	A	01:00	03:35
02:23	2	Line restart 50%	A	01:00	03:35
04:15	3	Line speed 100%	B	02:30	07:58
04:15	3	Line speed 100%	C	03:04	10:27
08:00	4	Start of shift 2	C	03:04	10:27
08:00	4	Start of shift 2	D	07:23	11:43
11:43	5	End of production	D	07:23	11:43

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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We can now easily see that mainly order *A* was affected by the line stop but that the reduced line speed affected also order *B* and *C*. Only the orders *C* and *D* were partly handled by shift *2*.

Please note the following points when using **intervalmatch**:

- Before the **intervalmatch** statement, the field containing the discrete data points (*Time* in the example above) must already have been read into QlikView. The **intervalmatch** statement does not read this field from the database table!
- The table read in the **intervalmatch load** or **select** statement must always contain exactly two fields (*Start* and *End* in the example above). In order to establish a link to other fields you must read the interval fields together with additional fields in a separate **load** or **select** statement (the first **select** statement in the example above).
- The intervals are always closed, i.e. the end points are included in the interval. A lower or upper limit denoted by a NULL value is considered to be minus infinity and infinity, respectively. Other non-numeric limits render the interval to be disregarded.
- The intervals may be overlapping and the discrete values will be linked to all matching intervals.

27.4 Using the Extended IntervalMatch Syntax to Resolve Slowly Changing Dimension Problems.

The extended **intervalmatch** syntax can be used for handling of the well-known problem of slowly changing dimensions in source data.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Sample script:

```
SET NullInterpret='';
IntervalTable:
Load Key, ValidFrom, Team from IntervalTable.xls;
NullAsValue FirstDate,LastDate;
Key:
Load
   Key,
   ValidFrom as FirstDate,
   date(if(Key=previous(Key),
   previous(ValidFrom) - 1)) as LastDate,
   Team
resident IntervalTable order by Key, ValidFrom desc;
drop table IntervalTable;
Transact:
Load Key, Name, Date, Sales from Transact.xls;
inner join intervalmatch (Date,Key) load FirstDate,
LastDate, Key resident Key;
```

Comments to the example above:

The statement

```
SET NullInterpret='';
```

is only required when reading data from a table file since missing values are defined as empty strings instead of nullvalues.

Loading the data from IntervalTable would result in the following table:

Table1

Key	FirstDate	Team
000110		Northwest
000110	2001-01-21	Southwest
000120		Northwest
000120	2003-01-06	Southeast
000120	2003-03-05	Northwest

The **nullasvalue** statement allows null values to map to the listed fields.

Create *Key*, *FirstDate*, *LastDate*, (attribute fields) by using **previous** and **order by** and thereafter the IntervalTable is dropped having been replaced by this key table.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Loading the data from Transact would result in the following table:

Table2

Key	Name	Date	Sales
000110	Spengler Aaron	1999-08-18	100
000110	Spengler Aaron	1999-12-25	200
000110	Spengler Aaron	2001-02-03	300
000110	Spengler Aaron	2001-05-05	400
000120	Ballard John	2001-06-04	500
000120	Ballard John	2003-01-20	600
000120	Ballard John	2003-03-10	700
000120	Ballard John	2003-03-13	800
000120	Ballard John	2003-09-21	900

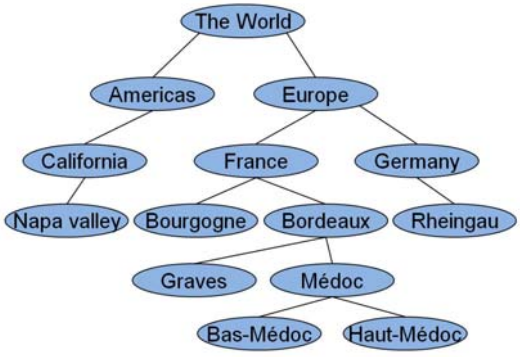
The **intervalmatch** statement preceeded by the **inner join** replaces the key above with a synthetic key that connects to the Transact table resulting in the following table:

Table3

Key	Team	Name	FirstDate	LastDate	TransactDate	Sales
000110	Northwest	Spengler Aaron		2001-01-20	1999-08-18	100
000110	Northwest	Spengler Aaron		2001-01-20	1999-12-25	200
000110	Southwest	Spengler Aaron	2001-01-21		2001-02-03	300
000110	Southwest	Spengler Aaron	2001-01-21		2001-05-05	400
000120	Northwest	Ballard John		2003-01-05	2001-06-04	500
000120	Northwest	Ballard John	2003-03-05		2003-03-10	700
000120	Northwest	Ballard John	2003-03-05		2003-03-13	800
000120	Northwest	Ballard John	2003-03-05		2003-09-21	900
000120	Southeast	Ballard John	2003-01-06	2003-03-04	2003-01-20	600

27.5 Hierarchies

Unbalanced *n*-level hierarchies are often used to represent e.g. geographical or organizational dimensions in data. These types of hierarchies are usually stored in an adjacent nodes table, i.e. in a table where each record corresponds to a node and has a field that contains a reference to the parent node.



NodeID	ParentID	NodeName
1	-	The World
2	1	Europe
3	2	France
4	3	Bordeaux
5	4	Medoc
6	5	Bas-Médoc
7	5	Haut-Médoc
8	4	Graves
9	3	Bourgogne
10	2	Germany
11	10	Rheingau
12	1	Americas
13	12	California
14	13	Napa valley

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

In such a table the node is stored on one record only but can still have any number of children. The table may of course contain additional fields describing attributes for the nodes.

An adjacent nodes table is optimal for maintenance, but difficult to use in everyday work. Instead, in queries and analysis, other representations are used. The expanded nodes table is one common representation, where each level in the hierarchy is stored in a separate field. The levels in an expanded nodes table can easily be used e.g. in a pivot table or a in a tree structure. The **hierarchy** keyword can be used in the QlikView script to transform an adjacent nodes table to an expanded nodes table. See “Hierarchy” on page 309 for more information.

NodeID	ParentID	NodeName	Level0	Level1	Level2	Level3	Level4	Level5
1	-	The World	The World	-	-	-	-	-
2	1	Europe	The World	Europe	-	-	-	-
3	2	France	The World	Europe	France	-	-	-
4	3	Bordeaux	The World	Europe	France	Bordeaux	-	-
5	4	Medoc	The World	Europe	France	Bordeaux	Medoc	-
6	5	Bas-Médoc	The World	Europe	France	Bordeaux	Medoc	Bas-Médoc
7	5	Haut-Médoc	The World	Europe	France	Bordeaux	Medoc	Haut-Médoc
8	4	Graves	The World	Europe	France	Bordeaux	Graves	-
9	3	Bourgogne	The World	Europe	France	Bourgogne	-	-
10	2	Germany	The World	Europe	Germany	-	-	-
11	10	Rheingau	The World	Europe	Germany	Rheingau	-	-
12	1	Americas	The World	Americas	-	-	-	-
13	12	California	The World	Americas	California	-	-	-
14	13	Napa valley	The World	Americas	California	Napa valley	-	-

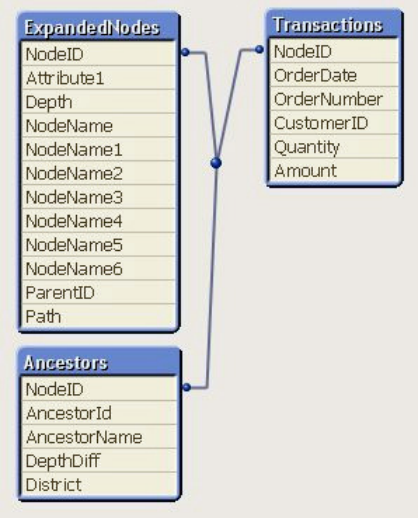
A problem with the expanded nodes table is that you cannot easily use the level fields for searches or selections, since you need à priori knowledge about which level you should search or select in. The ancestors table is a different representation that solves this problem. This representation is also called a bridge table.

NodeID	NodeName	AncestorID	AncestorName
1	The World	1	The World
2	Europe	1	The World
2	Europe	2	Europe
3	France	1	The World
3	France	2	Europe
3	France	3	France
4	Bordeaux	1	The World
4	Bordeaux	2	Europe
4	Bordeaux	3	France
4	Bordeaux	4	Bordeaux
5	Medoc	1	The World
5	Medoc	2	Europe
5	Medoc	3	France
5	Medoc	4	Bordeaux

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The ancestors table contains one record for every child-ancestor relation found in the data. It contains keys and names for the children as well as for the ancestors. I.e. every record describes which node a specific node belongs to. The **hierarchybelongsto** keyword can be used in the QlikView script to transform an adjacent nodes table to an ancestors table. See “HierarchyBelongsTo” on page 310 for more information.

A good QlikView solution for a hierarchy needs both an expanded nodes table and an ancestors table. The former is needed to create pivot tables and generally describe the nodes; the latter to allow selection of entire trees. The two are linked through the node key, e.g. **NodeID**, which also links to a possible transaction table.



IV

27.6 Semantic Links

Normally selections are made explicitly by clicking on the field values that are interesting. There is, however, also a way to make selections indirectly through semantic links. These are similar to field values, but with the difference that they describe the relations between the objects rather than the objects themselves. They appear as a list of buttons.

When you click on a semantic link, a selection is made in an other field.

Rules for Semantic Tables

Semantic links are created by loading tables containing the relations between the objects.

- The table must contain exactly three or four columns.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- A semantic table must either contain relations between field values of different fields or between field values of the same field. A mixture between the two is not accepted.
- The **load** or **select** statement loading a semantic table must be preceded by a **semantic** qualifier to show that it is not a logical table.

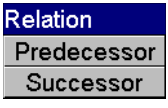
Normally four columns are used, the first one containing the field values that have a relation to some other field value and the third one containing the related field value. The second column must contain the names of the relations, and finally, the fourth one must contain the names of the inverse relations.



If three columns are used, no explicit names for the inverse relations can be given. The names given in the second column are used both for the relation and the inverse relation. The names are then preceded or followed by arrows.

If the relations are between field values of *the same* field, the first and third columns must have the same name. Also the names of the second and fourth column, i.e. the type of the relations, must be the same. However, if the relations are between field values of *different* fields, all columns must have different names.

Example: Extracting a semantic table from data



The semantic table does not always have to exist as a table outside QlikView. It is more flexible to extract this table from the existing table of objects through a separate **load** statement. In the *presidents* example in the QlikView examples directory, the script to generate the links *Predecessor* and *Successor* could be:

```
Directory presidents;
Load * from presdnts.csv (ansi, txt, delimiter
is ',', embedded labels);
Semantic Load
   No -1 as No,
   'Successor' as Relation,
   No,
   'Predecessor' as Relation
from presdnts.csv (ansi, txt, delimiter is ',',
embedded labels) where No > 1;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The second **load** statement results in a table that looks like the one to the right, and this table is loaded as a semantic table. The **where** clause is used to omit the first record since this would link the first president to the nonexistent 0:th president.

Semantic table

No	Relation	No	Relation
1	Successor	2	Predecessor
2	Successor	3	Predecessor
3	Successor	4	Predecessor
4	Successor	5	Predecessor
5	Successor	6	Predecessor
6	Successor	7	Predecessor
7	Successor	8	Predecessor
8	Successor	9	Predecessor
9	Successor	10	Predecessor
10	Successor	11	Predecessor

Note also that this **load** statement contains two fields labeled *No* and two fields labeled *Relation*. Such a **load** statement would cause a script execution error if used to load a logical table since the load procedure for one single logical table demands that none of the fields have the same name. The corresponding **select** statement is also not possible, since most ODBC drivers also demand this. Instead, the following structure should be used if the presidents table is in a database:

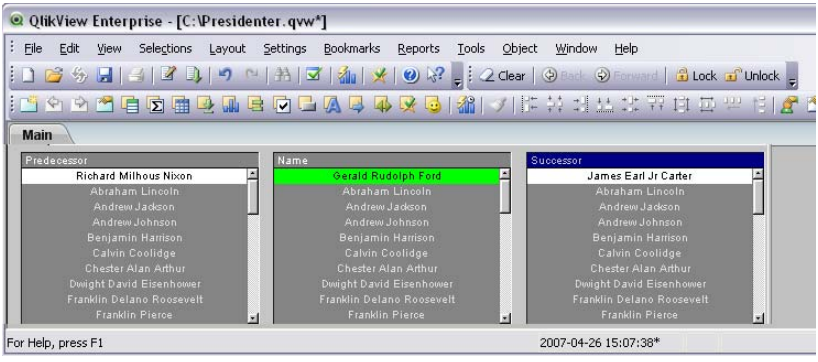
```
Connect to DataBase;
Select * from presdnts;
Alias No2 as No, Relation2 as Relation;
Semantic Select
   No -1 as No,
   'Successor' as Relation,
   No as No2,
   'Predecessor' as Relation2
from presdnts where No > 1;
```

The presidents example is just one simple example of how to use semantic links. These can also be used in genealogy, where the semantic links can be e.g. *cousin*, *sibling*, *grandmother*, etc. or for people in companies where the semantic links can be e.g. *superior*, *reports to*, *secretary*, etc.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example: Using the related values as relation names

Sometimes it is more descriptive to use the related field value as name of the relation. In the case of the presidents, you may want all the predecessors in one column and all the successors in another:



To create these links, you would need the following script:

```
Load
   No as DuplicateOfNo,
   FirstName & ' ' & LastName as Name,
   *
from presdnts.csv;

Semantic Load
   No -1 as No,
   FirstName & ' ' & LastName as Successor,
   No as DuplicateOfNo,
   'Dummy1'
from presdnts.csv where No > 1;

Semantic Load
   No +1 as No,
   FirstName &' ' & LastName as Predecessor,
   No as DuplicateOfNo,
   'Dummy2'
from presdnts.csv;
```

When a semantic link is clicked, a selection is made in the field of the third column, *DuplicateOfNo*, which in the semantic table is always the number of the president shown on the semantic link.

It may not be obvious at first, but the inverse relations in the above construction are almost useless. They would show a name of a president and, when

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

clicked, select the predecessor/successor of the shown president. This is why they are called *Dummy1* and *Dummy2* and only the first relation (column two) is used.

Since we do not want the dummy relations to appear in the list boxes, we must treat the second and fourth columns as different types of relations. This means that the first and third columns must have different field names. This is the reason why we have two columns containing the number of the president, *No* and *DuplicateOfNo*.

Two different **semantic** statements are needed since we want two different list boxes with relations.

This example can also be made with three-column semantic tables, but then the list boxes with the inverse relations will most likely confuse the user.

27.7 Linking Information to Field Values

Information in the form of text files, images or external application files can be associated to data in a QlikView document. To use this feature you will have to create tables describing what information file is to be linked to which field value, and tell QlikView to treat these tables as information tables. How this is done is explained below.

Information tables must consist of two columns, the first one headed by a field name and containing a list of values belonging to the field, the second one headed by an arbitrary name and containing the information (if text) or references to the files containing the information (images, applications). See Figure 89 below.

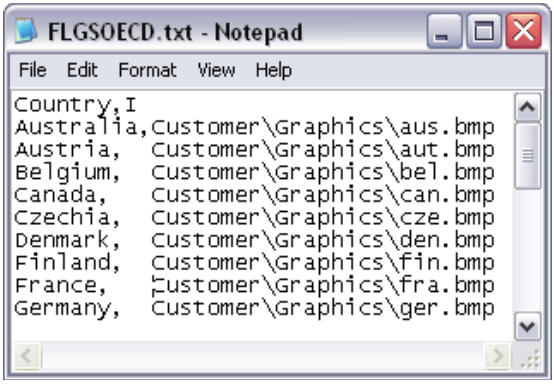


Figure 89. The information table defining the files linked to specific field values.

The statement for loading this table as an information table would be as follows:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
Info Load Country, I from Flagsoecd.csv (ansi, txt,
delimiter is ',', embedded labels);
```

When a list box or multi box item linked to information is selected, an information icon appears beside the field name to show that information is available. A click on the icon will show the information or load the application file. It is possible to turn off the information icon on the **Layout** page of the **List Box Properties** dialog.

If a text is entered in the second column, the text is shown in an internal text viewer.

To mark a new line in this text, the carriage return cannot be used. Instead, the symbol "\n" is used in the info file.

- If a name of an image file (e.g. extension bmp) is entered in the second column, the image is shown in an internal image viewer.
- If a name of a sound file (extension wav) is entered in the second column, the sound is played.
- If a name of an executable file is entered in the second column, the file is executed.
- If a name of any other file is entered in the second column, the associated program is used to open the file.
- If a URL is entered in the second column, e.g. an Internet address, the registered Internet browser is used to access the address.

An info file cannot contain the star symbol. A symbol defined as **OtherSymbol** (see page 497), however, is allowed.

27.8 Data Cleansing

When loading data from different tables, you'll note that field values denoting the same thing are not always consistently named. Since this lack of consistency is not only annoying, but also hinders associations, you need to solve the problem. This can be done in an elegant way by creating a mapping table for the comparison of field values.

Mapping Tables

Tables loaded via **mapping load** or **mapping select** are treated differently from other tables. They will be stored in a separate area of the memory and

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

used only as mapping tables during script execution. After the script execution they will be automatically dropped.

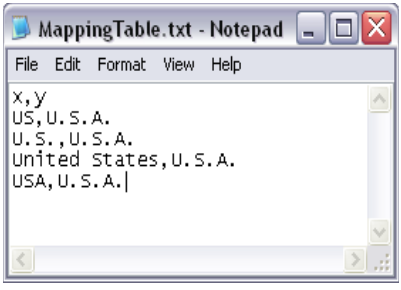


Figure 90. Example of a mapping table

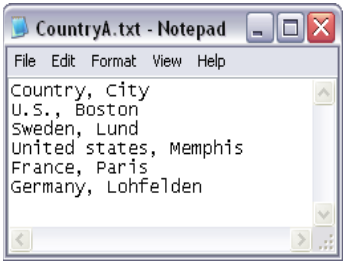
Rules:

•A mapping table must have two columns, the first one containing the comparison values and the second the desired mapping values.

•The two columns must be named, but the names have no relevance in themselves. The column names have no connection to field names in regular input tables.

Using a Mapping Table

When loading several tables listing countries, you may find that one and the same country has several different names. In this example, the U.S.A. are listed as US, U.S., and United States.



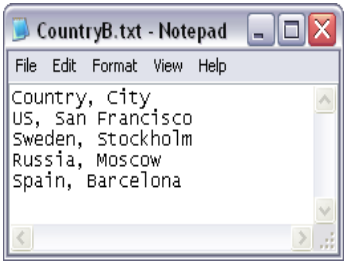


Figure 91.

To avoid the occurrence of three different records denoting the United States in the concatenated table, you can create a table similar to that in Figure 90 and load it as a mapping table.

The entire script should have the following appearance:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
CountryMap:
Mapping Load x,y from MappingTable.txt
   (ansi, txt, delimiter is ',', embedded
   labels);
Map Country using CountryMap;
Load Country,City from CountryA.txt
   (ansi, txt, delimiter is ',', embedded labels);
Load Country, City from CountryB.txt
   (ansi, txt, delimiter is ',', embedded labels);
```

The **mapping** statement (for a detailed description of the syntax see page 328) loads the file *MappingTable.txt* as a mapping table with the label *CountryMap*.

The **map** statement (for a detailed description of the syntax see page 329) enables mapping of the field *Country* using the previously loaded mapping table *CountryMap*.

The **load** statements load the tables *CountryA* and *CountryB*. These tables, which will be concatenated due to the fact that they have the same set of fields (see the section on concatenation on page 473), include the field *Country*, whose field values will be compared with those of the first column of the mapping table. The field values *U.S.*, *United States* and *US* will be found and replaced by the values of the second column of the mapping table, i.e. *USA*.

The automatic mapping is done last in the chain of events that leads up to the field being stored in the QlikView table. For a typical **load** or **select** statement the order of events is roughly as follows:

1 Evaluation of expressions

2 Renaming of fields by as

3 Renaming of fields by alias

4 Qualification of table name, if applicable

5 Mapping of data if field name matches

This means that the mapping is not done every time a field name is encountered as part of an expression but rather when the value is stored under the field name in the QlikView table.

To disable mapping, use the **unmap** statement (see page 350).

For mapping on expression level, use the **applymap** function (see “Mapping Functions” on page 420).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

For mapping on substring level, use the **mapsubstring** function (see “Mapping Functions” on page 420).

27.9 Wild Cards in the Data

It is also possible to use wild cards in the data. Two different wild cards exist: the star symbol, interpreted as all values of this field, and an optional symbol, interpreted as *all remaining values* of this field.

The Star Symbol

The star symbol is interpreted as all (listed) values of this field, i.e. a value listed elsewhere in this table. If used in one of the system fields (*UserID*, *Password* or *Serial*) in a table loaded in the access section of the script, it is interpreted as all (also not listed) possible values of this field.

The star symbol is not allowed in information files. Also, it cannot be used in key fields, i.e. fields used to join tables.

There is no star symbol available unless explicitly specified. For information on how to make a **star** statement in the script, see page 345.

OtherSymbol

In many cases you need a way to represent all other values in a table, i.e. all values that were not explicitly found in the loaded data. This is done with a special macro variable called **OtherSymbol**. To define the **OtherSymbol** to be treated as ‘all other values’, use the following syntax:

```
SET OTHERSYMBOL=<sym>;
```

before a **load**/**select** statement. <sym> may be any string.

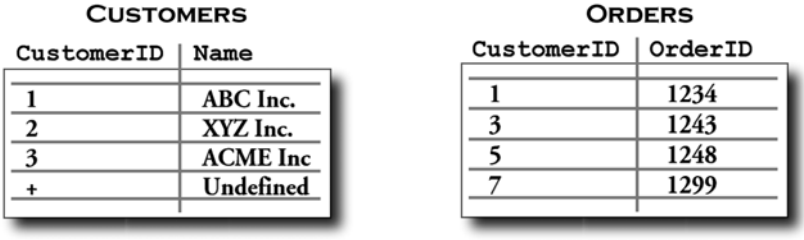
The appearance of the defined symbol in an input table will cause QlikView to define it as all values not previously loaded in the field where it is found. Values found in the field after the appearance of the **OtherSymbol** will thus be disregarded.

In order to reset this functionality use:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
SET OTHERSYMBOL=;
```

Example:



CUSTOMERS

CustomerID	Name
1	ABC Inc.
2	XYZ Inc.
3	ACME Inc
+	Undefined

ORDERS

CustomerID	OrderID
1	1234
3	1243
5	1248
7	1299

Insert the following statement in the script before the point where the first table above is loaded:

```
SET OTHERSYMBOL=+;
```

All references to *CustomerID*s other than 1, 2 or 3, e.g. as when clicking on *OrderID 1299* will result in *Undefined* under *Name*.

Note In QlikView version 2.0 and earlier the plus symbol (normally +) could be used to represent all other values in a table. The plus symbol could be set with a **Plus is** statement. In version 3.0 the **Plus is** statement was replaced by **OtherSymbol**.

Note **OtherSymbol** is not intended to be used for creating outer joins between tables!!

27.10NULL Value Handling in QlikView

When no data can be produced for a certain field as a result of a database query and/or a join between tables, the result is normally NULL values.

The QlikView logic treats the following as real NULL values:

- NULL values returned from an ODBC connection
- NULL values created as a result of a forced concatenation of tables in the QlikView script
- NULL values created as a result of a **join** statement made in the QlikView script
- NULL values created as a result of the generation of field value combinations to be displayed in a table box or exported by an export button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Normally it is impossible to use these NULL values for associations and selections. However, it is possible to manipulate NULL values at field level, using the **nullasvalue** statement. See “NullAsNull” on page 332. Furthermore, NULL values from ODBC, can be manipulated using **nulldisplay** (see below).

Text files per definition cannot contain NULL values.

Associating/Selecting NULL Values from ODBC

It is possible to associate and/or select NULL values from an ODBC data source. For this purpose a script macro variable has been defined. By using the syntax:

```
SET NULLDISPLAY=<sym>;
```

the symbol <sym> will substitute all NULL values from the ODBC data source on the lowest level of data input. <sym> may be any string.

In order to reset this functionality to the default interpretation, use:

```
SET NULLDISPLAY=;
```

Note The use of **NULLDISPLAY** only affects data from an ODBC data source!

In QlikView version 2.0 and earlier, NULL values returned from an ODBC connection were interpreted as an empty string. The empty string was treated as any other value and thus made the association and selection of NULL values possible. If you wish to have the QlikView logic with regard to NULL values from ODBC work in this manner, assign an empty string to the **NULLDISPLAY** variable in the following way (two single quotation marks without anything in between):

```
SET NULLDISPLAY='';
```

The assignment must be made before any **select** statement in the script.

Creating NULL Values from Text Files

It is possible to define a symbol, which when it occurs in a text file or an **inline** clause will be interpreted as a real NULL value. Use the following statement:

```
SET NULLINTERPRET=<sym>;
```

where <sym> is the symbol to be interpreted as NULL. <sym> may be any string.

In order to reset this functionality to the default interpretation, use:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
SET NULLINTERPRET=;
```

Note The use of **NULLINTERPRET** only affects data from text files and **inline** clauses!

Propagation of NULL Values in Expressions

NULL values will propagate through an expression according to a few logical and quite reasonable rules.

Functions

The general rule is that functions return NULL when the parameters fall outside the range for which the function is defined.

Examples:

asin(2)	returns	NULL
log(-5)	returns	NULL
round(A,0)	returns	NULL

As a result of the above follows that functions generally return NULL when any of the parameters necessary for the evaluation are NULL.

Examples:

sin(NULL)	returns	NULL
chr(NULL)	returns	NULL
if(NULL, A, B)	returns	B
if(TRUE, NULL, A)	returns	NULL
if(TRUE, A, NULL)	returns	A

The exception to the second rule are logical functions testing for type.

Examples:

isnull(NULL)	returns	TRUE (-1)
isnum(NULL)	returns	FALSE (0)

Arithmetic and String Operators

If NULL is encountered on any side of these operators NULL is returned, except in the case of string concatenation.

Examples:

A + NULL	returns	NULL

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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A - NULL	returns	NULL
A / NULL	returns	NULL
A * NULL	returns	NULL
NULL / A	returns	NULL
NULL / A	returns	NULL
0 /NULL	returns	NULL
0 * NULL	returns	NULL
A&NULL	returns	A

Relational Operators

If NULL is encountered on any side of relational operators, special rules apply.

Examples:

NULL rel.op. NULL	returns	NULL
A <>NULL	returns	TRUE (-1)
A< NULL	returns	FALSE (0)
A <= NULL	returns	FALSE (0)
A = NULL	returns	FALSE (0)
A >=NULL	returns	FALSE (0)
A > NULL	returns	FALSE (0)

27.11Character Sets

By default QlikView assumes that the character set used in Windows is **ansi**. However, sometimes files with other character sets are used, e.g. when text files are transferred from other computers. The most common character set, apart from **ansi**, is the **oem** character set. This is used in DOS, OS/2 etc. By using the **oem** file specifier in the **load** statement, QlikView will use the **oem** character set to interpret the data. QlikView can also recognize and use the MacOs-specific character set **mac**. See also the script syntax on page 325.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

28 QVD FILES

28.1 About QVD Files

A QVD (QlikView Data) file is a file containing a table of data exported from QlikView. QVD is a native QlikView format. It can only be written to and read from QlikView. The file format is optimized for speed when reading data from a QLikView script but it is also very compact. Reading data from a QVD file is typically 10-100 times faster than reading from other data sources.

28.2 The QVD file Format

A QVD file is an attempt to strike a compromise between excellent QlikView performance both reading and writing the files and a compact representation. A QVD file contains exactly one table. Conceptually it is quite similar to any typed file (e.g. csv, dif, biff or fix). A QVD file consists of three parts:

1. A well formed XML header (in UTF-8 char set) describing the fields in the table, the layout of the subsequent information and some other meta-data.
2. Symbol tables in a byte stuffed format.
3. Actual table data in a bit-stuffed format.

A QVD file holds exactly one data table.

28.3 What are QVD files good for?

QVD files can be used for many purposes. At least four major uses can be easily identified. In many cases two or more of them will be applicable at the same time. They are:

Increasing Load Speed

By buffering non-changing or slowly-changing parts of input data in QVD files, script execution can become considerably faster for large data sets. For large data sets it will thus be easier to meet reload time-window limitations. When developing applications it is often necessary to run the script repeatedly. By using QVD buffering in such situations repeated waiting times can be reduced significantly even if the data set is not that large.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Decreasing Load on Database Servers

By buffering non-changing or slowly-changing parts of input data in QVD files, the amount of data fetched from external data sources can be greatly reduced. This reduces load on external databases and network traffic. When several QlikView scripts share the same data it is only necessary to load it once from the source database. The other applications can make use of the data from a QVD file.

Consolidating Data from Multiple QlikView Applications

Consolidation of data from multiple QlikView applications is possible with the help of QVD files. With the Binary script statement you can only load data from only one single QlikView application into another. With QVD files a QlikView script can combine data from any number of QlikView applications. This opens up possibilities e.g. for applications consolidating similar data from different business units etc.

Incremental Load

In many common cases the QVD functionality can be used to facilitate incremental load, i.e. only loading new records from a growing database.

28.4 How Fast Is It?

Reading data from a QVD file will always be faster than reading from other sources. A factor of ten to a hundred times faster will not be uncommon. The exact speed in terms of record/second throughput will depend on a number of factors, the most important being:

- number of fields in record
- type of data in fields (field width, number of distinct values etc.)
- speed of hard disk
- speed of computer CPU

QVD files can be read in two modes, standard (fast) and super-fast. Which mode is used is determined automatically by the QlikView script engine. Super-fast mode can be used only when all fields or a subset thereof are read without any transformations (formulas acting upon the fields). Renaming of fields is allowed. Whenever transformations are applied the standard (fast) mode will be used.

28.5 Creation of QVD Files

QVD files can be created in three manners:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1 Explicitly created and named from script by means of the **store** command. You simply state in the script that you want a previously read table or part thereof to be exported to an explicitly named filename at a location that you choose. See technical details below.

2 Automatically created and maintained from script. By preceding a **load** or **select** statement with the new **buffer** prefix QlikView will automatically create a QVD file which later, if certain conditions are met will be used instead of the original data source when reloading data. The QVD file will have a cryptic name based on a hash of the load/select statement and normally reside in the Windows Application data folder. See technical details below.

3 Explicitly named and created from layout or via Automation. Data exported from the QlikView layout via GUI commands or Automation macros. In the GUI you will find QVD as one of the possible export formats under the **Export...** command, found on the object menu of most sheet objects.

Manual Creation from Script

A QVD file can be created by an **store** statement in the script. This is the statement that will create an explicitly named QVD file. The syntax is:

STORE *[***(*|***<***field_list***>)** *FROM] <table> INTO <file_name>;*

The <table> is a script labeled, already loaded, table. The <file_name> is interpreted similar to names in **load** statements, i.e. the **directory** statements apply. Fields in the fields list may be renamed using standard **as** syntax.

Examples:

```
STORE mytable INTO xyz.qvd;
STORE * FROM mytable INTO xyz.qvd;
STORE Name, RegNo FROM mytable INTO xyz.qvd;
STORE Name as a, RegNo as b FROM mytable INTO xyz.qvd;
```

The two first statements have identical function.

Buffering - Automatic Creation from Script

QVD files can be created and maintained automatically via the **buffer** prefix. This prefix can be used on most **load** and or **select** statements in script. It indicates that a QVD file is used to cache/buffer the result of the statement.

Some limitations exist, the most notable is that there must be either a file load or a **select** statement in “the bottom”.

The name of the QVD file is a *calculated* name (a 160-bit hash of statement and other discriminating info, as hex) and is typically stored in the APP-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

DATA folder (C:\Document and Settings\%user%\Application Data\QlikTech\QlikView).

The syntax of the prefix is:

BUFFER *[(option [,option])]* **LOAD …**

or

BUFFER *[(option [,option])]* **SELECT …**

where an option is either of the following:

incremental
this enables the ability to read only part of an underlying file. Previous size of the file is stored in the XML header in the QVD file. This is particularly useful with log files. All records loaded at a previous occasion are read from the QVD file whereas the following new records are read from the original source and finally an updated QVD file is created.

stale (after) *amount* **[(days | hours)]**
This is typically used with DB sources where there is no simple timestamp on the original data. Instead one specifies how old the QVD snapshot can be to be used.

Examples:

```
BUFFER SELECT * FROM MyTable;
BUFFER (stale after 7 days) SELECT * FROM MyTable;
BUFFER (incremental) LOAD * FROM MyLog.log;
```

Manual Creation from Layout

Export from sheet objects into QVD files is possible from the existing **Export** commands and via Automation.

28.6 Reading data from QVD files

Use of a QVD file as explicit data source

QVD files can be referenced by a load statement in the QlikView script just like any other type of text file (csv, fix, dif, biff etc.). The standard **Table Files Wizard** works with QVD files just like any other table file.

```
LOAD * FROM xyz.qvd (qvd);
LOAD Name, RegNo FROM xyz.qvd (qvd);
LOAD Name as a, RegNo as b FROM xyz.qvd (qvd);
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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When no transformations are applied on the fields read (apart from renaming fields) the super-fast reading mode will be used.

Automatic use of buffered QVD files

When using the buffer prefix on load or select statements, no explicit statements for reading are necessary. QlikView will determine to which extent to use data from the QVD file or acquire data via the original load or select statement.

New script functions

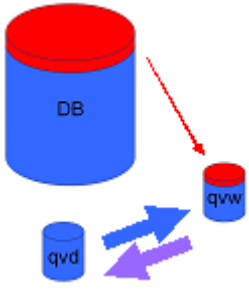
A number of new script functions have been added for access to the data found in the XML header of a QVD file. These functions are described under “File Functions” on page 429 in this book.

28.7 Using QVD files for incremental load

Incremental load is a very common task in relation to data bases. It is defined as loading only the new or changed records from the database. The rest should already be available, one way or another.

With the help of QVD files it is possible to perform incremental load in most cases. The basic process goes like follows:

1. Load new data from Database table (slow, but few records)
2. Load old data from QVD file (many records, but fast)
3. Create new QVD file
4. Repeat procedure for each table



The actual complexity of the solution depends on the conditions of the source database, but can be broken down into a few basic cases, as outlined below.

1. Append only (Logfiles)
2. Insert only (No Update or Delete)
3. Insert and Update (No Delete)
4. Insert, Update and Delete.

Below you will find outlined solutions for each of these cases.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Case 1: Append only

The simplest case is the one of log files, which are only appended to. The conditions are as follows:



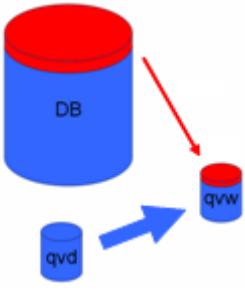
- The database must be a log file contained in a text file (no ODBC/OLEDB)
- QlikView keeps track of how many records have been read previously and loads only records added in the end of the file.

Script example:

```
Buffer (Incremental) Load * From LogFile.txt (ansi,
txt, delimiter is '\t', embedded labels);
```

Case 2: Insert only. (No Update or Delete)

If the data resides in a database other than a simple log file the case 1 approach will not work. The problem can however still be solved with a small amount of extra work. The conditions are as follows:



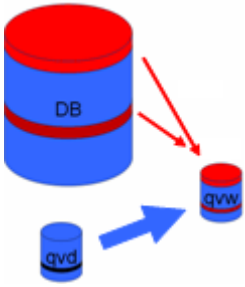
- The data source an be any database
- QlikView loads records inserted in the database after the last script execution
- A field ModificationDate (or similar) is required for QlikView to know which records are new.

Script example:

```
QV_Table:
SQL SELECT PrimaryKey, X, Y FROM DB_TABLE
WHERE ModificationTime >= #$(LastExecTime)#
   AND ModificationTime < #$(BeginningThisExecTime)#;
Concatenate
LOAD PrimaryKey, X, Y FROM File.QVD;
STORE QV_Table INTO File.QVD;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Case 3: Insert and Update. (No Delete)



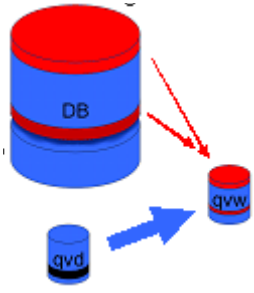
The next case is when data in previously loaded records may have been changed between script executions. The conditions are as follows:

- The data source an be any database
- QlikView loads records inserted into the database or updated in the database after the last script execution
- A field ModificationDate (or similar) is required for QlikView to know which records are new.
- A primary key field is required for QlikView to sort out updated records from the QVD file.
- This solution will make the reading of the QVD file to be made in the standard mode rather than the super-fast mode. The end result will however still be considerably faster than if the entire database had to be read.

Script example:

```
QV_Table:
SQL SELECT PrimaryKey, X, Y FROM DB_TABLE
WHERE ModificationTime >= #$(LastExecTime)#;
Concatenate
LOAD PrimaryKey, X, Y FROM File.QVD
WHERE NOT Exists(PrimaryKey);
STORE QV_Table INTO File.QVD;
```

Case 4: Insert, Update and Delete



The most difficult case to handle is when records are actually deleted from the source database between script executions. The conditions are as follows:

- The data source an be any database
- QlikView loads records inserted into the database or updated in the database after the last script execution
- QlikView removes records deleted from the database after the last script execution

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- A field ModificationDate (or similar) is required for QlikView to know which records are new.
- A primary key field is required for QlikView to sort out updated records from the QVD file.
- This solution will make the reading of the QVD file to be made in the standard mode rather than the super-fast mode. The end result will however still be considerably faster than if the entire database had to be read.

Script example:

```
Let ThisExecTime = Now();
QV_Table:
SQL SELECT PrimaryKey, X, Y FROM DB_TABLE
WHERE ModificationTime >= #$(LastExecTime)#
       AND ModificationTime < #$(ThisExecTime)#;

Concatenate LOAD PrimaryKey, X, Y FROM File.QVD
WHERE NOT EXISTS(PrimaryKey);

Inner Join SQL SELECT PrimaryKey FROM DB_TABLE;

If ScriptErrorCount = 0 then
   STORE QV_Table INTO File.QVD;
   Let LastExecTime = ThisExecTime;
End If
```

28.8 Reading Data from QVD files

Use of QVD file as explicit data source

QVD files can be referenced by a load statement in the QlikView script just like any other type of text file (csv, fix, dif, biff etc.). The standard Table Files Wizard works with QVD files just like any other table file.

```
LOAD * FROM xyz.qvd (qvd);
LOAD Name, RegNo FROM xyz.qvd (qvd);
LOAD Name as a, RegNo as b FROM xyz.qvd (qvd);
```

When no transformations are applied on the fields read (apart from renaming fields) the super-fast reading mode will be used.

Automatic Use of Buffered QVD Files

When using the **buffer** prefix on **load** and **select** statements, no explicit statements for reading are necessary. QlikView will determine to which

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

extent to use data from the QVD file or acquire data via the original **load** or **select** statement.

New Script Functions

A number of new script functions have been added for access to the data found in the XML header of a QVD file. These functions are described under “File Functions” on page 429 in this book.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

29 LIMITED SCRIPTING IN QLIKVIEW PROFESSIONAL

With QlikView Developer you can make scripts without any restrictions. With QlikView Professional you are only allowed limited scripting towards desktop data sources. Desktop data sources are essentially defined as text files. ODBC, OLEDB and custom data sources are not allowed.

Scripting from QlikView Professional can be made under the following conditions:

1) In a new script you may:

a) Add any number of **load** statements as long as

- none of them returns more than 65536 records and
- the total added number of records is less than 1 million

b) Start the script with a **binary** statement pointing at any QVW document (regardless of size of data and contents of script) and then, if you wish, add **load** statements under the same provisions as under 1a above. It is the number of records added after the **binary** that are counted.

2) In an existing script which does not

- contain any connect or select statements or
- contain any load statements returning more than 65536 records or
- contain load statements which combined return more than 1 million records

you may:

a) Add any number of **load** statements as long as

- none of them returns more than 65536 records and
- the total number of records returned by all **load** statements combined is less than 1 million

b) Provided that the script doesn't already have a **binary** statement at the top add a **binary** statement pointing at any QVW document (regardless of size of data and contents of script). You may then, if you wish, add **load** statements under the same provisions as under 2a above. It is the number of records added after the **binary** that are counted.

Under all other conditions, changes or additions to a script will render it illegal for execution in QlikView Professional. You will not be warned when typing the script. The failure will occur after script execution.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

These limitations are part of the product specification and not bugs of any kind. For those needing to exceed the limits set above there is only one product option: QlikView Developer!

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

30 SECURITY



It is important that information is distributed only to those who have rights to see it. Since QlikView makes the previously cumbersome process of retrieving information a very simple task, it is obvious that a mechanism that handles security issues is necessary. Such a mechanism can be set up in two different ways: It can either be built into the QlikView document script, or it can be set up through the use of QlikView Publisher.

Further, it may also be important to lock the layout for normal users, or prevent them from editing or running the script, etc. This can also be done through the access restriction built into the QlikView file.

30.1 Authentication and Authorization

Authentication is any process by which you verify that someone is who they claim they are. QlikView can either let the Windows operating system do the authentication, or prompt for a User ID and Password (different from the Windows User ID and Password) or use the QlikView license key as a simple authentication method.

Authorization is finding out if the person, once identified, is permitted to have the resource. QlikView can either let the Windows operating system do the authorization or do the authorization itself. For the latter, a security table must be built into the script.

30.2 Security using the QlikView Publisher

If the QlikView Publisher is set up to handle security, then each QlikView file will be split up into several files, each containing the data pertaining to the relevant user or user group. These files will be stored in folders with the correct OS security settings, i.e. QlikView lets the operating system handle Authentication and Authorization.

There is, however, *no security built into the file itself*, so there is no protection on a downloaded file.

The file sizes will usually be smaller, since one single file will be split into several and the user only opens the file with his own data. However, this also means that a QlikView Server can potentially use more memory than if all data are kept in one file, since several files containing the same data sometimes will be loaded.

For further information, see the QlikView Publisher documentation.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

30.3 Security using the Section Access in the QlikView script

If the Section Access in the QlikView script is set up to handle security, then one single file can be made to hold the data for a number of users or user groups. QlikView will use the information in the Section Access for Authentication and Authorization and dynamically reduce the data, so that the user only sees his own data.

The security is built into the file itself, so also a downloaded file is to some extent protected. However, if the security demands are high, downloads of files and offline use should be prevented. The files should be published by the QlikView Server only.

Since all data are kept in one file, the size of this file can potentially be very large.

All information below refers to the security method of using Section Access in the QlikView script.

30.4 Sections in the Script



Access control is managed via one or several security tables loaded in the same way as QlikView normally loads data. It is thus possible to store these tables in a normal database. The script statements managing the security tables are given within the access section, which in the script is initiated by the statement **section access**, see page 339.

If an access section is defined in the script, the part of the script loading the "normal" data must be put in a different section, initiated by the statement **section application**.

Example:

```
Section Access;
Load * inline
   [ACCESS,USERID,PASSWORD
   ADMIN, A,X
   USER,U,Y  ];
Section Application;
Load... … from... …
```

30.5 Access Levels in Section Access

Access to QlikView documents can be authorized to specified users or groups of users. In the security table, users can be assigned the access levels ADMIN or USER. If no access level is assigned, the user cannot open the QlikView document. For clar-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ity, it is often useful to use a third access level, e.g. NONE, which of course will be interpreted as “no access”.

A person with ADMIN access can change everything in the document. Using the Security page in the Document Properties (“Security” on page 39) and Sheet Properties (“Security” on page 81) dialogs, a person with ADMIN access can limit the users’ possibilities of modifying the document. A person with USER privileges cannot access the Security pages.

Example:

```
Section Access;
Load * inline
   [ACCESS,USERID,PASSWORD
   ADMIN, A,X
   USER,U,Y  ];
Section Application;
Load... … from... …
```

30.6 Section Access system fields

The access levels are assigned to users in one or several tables loaded within the **section access**. These tables can contain several different user-specific system fields, typically USERID and PASSWORD, and the field defining the access level, ACCESS. All Section Access system fields will be used for authentication or authorization. The full set of **section access** system fields are described below. Other fields like e.g. GROUP or ORGANISATION may be added to facilitate the administration, but QlikView does not treat these fields in any special way.

None, all, or any combination of the security fields may be loaded in the access section. However, if the ACCESS field is not loaded, all the users will have ADMIN access to the document and the **access** section will really not be meaningful.

It is thus not necessary to use USERID – an authorization can be made using other fields, e.g. serial number only.

ACCESS	A field that defines what access the corresponding user should have.
USERID	A field that should contain an accepted user ID. QlikView will prompt for a User ID and compare to the value in this field. This user ID is not the same as the Windows user ID.
PASSWORD	A field that should contain an accepted password. QlikView will prompt for a Password and compare to the value in this field. This password is not the same as the Windows password.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

SERIAL	A field that should contain a number corresponding to the QlikView serial number. Example: 4900 2394 7113 7304. QlikView will check the serial number of the user and compare it to the value in this field.
NTNAME	A field that should contain a string corresponding to a Windows NT Domain user name or group name. QlikView will fetch the logon information from the OS and compare it to the value in this field.
NTDOMAINSID	A field that should contain a string corresponding to a Windows NT Domain SID. Example: S-1-5-21-125976590-467238106-1092489882 QlikView will fetch the logon information from the OS and compare it to the value in this field.
NTSID	A field that should contain a Windows NT SID. Example: S-1-5-21-125976590-467238106-1092489882-1378 QlikView will fetch the logon information from the OS and compare it to the value in this field.
OMIT	A field that should contain a list of fields that should be omitted for this specific user. Wildcards may be used and the list may be empty.

QlikView will compare the QlikView serial number with the field SERIAL, the Windows NT User name and groups with NTNAME, the Windows NT Domain SID with NTDOMAINSID and the Windows NT SID with NTSID. It will further prompt for User ID and Password and compare these with the fields USERID and PASSWORD.

If the found combination of user ID, password and environment properties is also found in the **section access** table, then the document is opened with the corresponding access level. If not, QlikView will deny the user access to the document. If the User ID and/or the Password are not entered correctly within three attempts the entire log-on procedure must be repeated.

Since the same associative logic that is the hallmark of QlikView is used also in the access section, the security fields may be put in different tables. (It is thus possible for a system manager to make a QlikView document out of the security tables. In this case a correct serial number, password etc. is simulated by a click on the corresponding field value. For an example, see the Tutorial.)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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In the logon procedure, QlikView will first check SERIAL, NTNAME, NTDOMAINSID and NTSID to see if this information is enough to grant the user access to the document. If so, QlikView will open the document without prompting for User ID and Password.

If only some of the access fields are loaded, the appropriate of the above requirements are used.

All the fields listed in **Load** or **Select** statements in the **section access** must be written in UPPER CASE. Any field name containing lower case letters in the database will be converted to upper case before being read by the Load or Select statement. However the user ID and the password entered by the end-user opening the QlikView documents are case insensitive.

Example 1:

Only serial number is checked. One specific computer gets ADMIN access. Everyone else gets USER access. Note that a star can be used to mark “any serial number”. For this, however, the statement “Star is *;” must precede the loading of this table.

ACCESS	SERIAL
ADMIN	4900 2394 7113 7304
USER	*

Example 2:

The administrator and the server on which QlikView runs as a batch job get ADMIN access. Everyone else in the Domain gets USER access when entering “USER” as user ID and password.

ACCESS	SERIAL	NTDOMAINSID	USERID	PASSWORD
ADMIN	*	S-1-5-21-125976590-467238106-1092489882	ADMIN	ADMIN
ADMIN	4900 2394 7113 7304	*	*	*
USER	*	S-1-5-21-125976590-467238106-1092489882	USER	USER

30.7 Restrictions on QlikView functionality

The controls found on the **Security** page of the **Document Properties** dialog (see page 39 in Book II) and the **Security** page of the **Sheet Properties** dialog (see

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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page 81 in Book II) makes it possible to disallow the access to certain menu items and prohibit changes in the layout. If these settings are to be used as a truly protective measure, it is important that the document users are logged in as USER. Anyone logged in as ADMIN can change the security settings at any time.

A user that has opened the document with USER rights does not have the **Security** pages in the Properties dialogs.

30.8 Dynamic Data Reduction

QlikView and QlikView Server support a feature by which some of the data in a document can be hidden from the user based on the **section access** login.

First of all, fields (columns) can be hidden by the use of the system field **OMIT**.

Secondly, records (rows) can be hidden by linking the **Section Access** data with the real data: The selection of values to be shown/excluded is controlled by means of having one or more fields with common names in **section access** and **section application**. After user login QlikView will attempt to copy the selections in fields in **section access** to any fields in **section application** with exactly the same field names (the field names must be written in UPPER CASE). After the selections have been made, QlikView will permanently hide all data excluded by these selections from the user.

In order for this procedure to take place, the option **Initial Data Reduction Based on Section Access** on the **Opening** page of the **Document Properties** dialog must be selected. If this feature is used in documents that are to be distributed by other means than via QlikView Server, the option **Prohibit Binary Load** on the same page of the Document Properties must be selected in order to maintain data protection.

Note All field names used in the transfer described above and all field values in these fields must be upper case, since all field names and field values are by default converted to upper case in **section access**.

Example:

Study the following script:

```
section access;
load * inline
   [ACCESS, USERID,DEPT, OMIT
   ADMIN, John,FINANCE,
   USER, Ann,IS,Salary
   USER, Peter,SALES,Salary
   USER, Ben,TECH,Salary];
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
section application;
star is *;
load * inline
    [DEPT,CostCenter
    FINANCE,*
    IS,5020
    SALES,5030
    TECH,5040];
```

The field DEPT now exists with the same UPPER_CASE name in both **section access** and **section application** (all field values are also UPPER_CASE). The two fields would normally be totally different and separated, but if the **Initial Data Reduction Based on Section Access** option has been selected, the result will be as follows:

John can see data connected to all cost centers. Furthermore, he is the only one who can see the field “Salary”.

Ann can see only data connected to cost center 5020.

Peter can see only data connected to cost center 5030.

Ben can see only data connected to cost center 5040.

30.9 Inherited Access Restrictions

A **binary** load will cause the access restrictions to be inherited by the new QlikView document. A person with ADMIN rights to this new document may change the access rights of this new document by adding a new **access** section. A person with USER rights can execute the script and change the script, thus adding own data to the binary loaded file. A person with USER rights cannot change the access rights. This makes it possible for a database administrator to control the user access also to binary loaded QlikView documents.

30.10Encryption

The communication between a QlikView Server and a QlikView Windows client is encrypted. If, however, the Java client or the AJAX client is used, the communication is not encrypted.

In addition, all QlikView documents are scrambled which makes the information unreadable with viewers, debuggers etc.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

INDEX

Symbols

! (forced exclusion) 153
? (single character wildcard) 147
@ (field number specifier) 322
* (load all fields) 322
* (star symbol) 499
& (string concatenation) 368

A

Access Restriction 517–523
acos
    function in script 406
Add statement 296
AddMonths
    function in script 441
age
    function in script 457
Aggregation functions
    in script expressions 370
Alerts 195–201
Alias statement 297
alt
    function in script 426
an alert 195
Analyzer 16
and
    logical operator in script 369
And-mode 152–153
applymap, function in script 422
As clause 323
asin
    function in script 406
Associating tables 471–474
atan
    function in script 406
atan2
    function in script 406
Autogenerate 324
autonumber
    function in script 415
autonumberhash256
    function in script 416
avg
    statistical aggregation function in script 375

B

Batch Execution 70
biff 327
Binary statement 297
bitand
    bit operator in script 370
bitcount
    function in script 399
bitnot
    bit operator in script 370
bitor
    bit operator in script 370
bitxor
    bit operator in script 370
BlackAndSchole
    function in script 409
Bookmarks 165–174
Bookmarks menu 88
Buffer statement 298
Bundle keyword 299

C

Calculation memory settings 141
Call statement 300
capitalize
    function in script 418
CD
    variable in script 356
ceil
    function in script 397
Character set 327
chi2test_chi2
    statistical test function in script ...384
chi2test_df
    statistical test function in script ...384
chi2test_p
    statistical test function in script ...383
chidist
    statistical distribution function in script 406
chiinv

statistical distribution function in script 407
chr
function in script 416
Circular references 473
avoiding 160
class
function in script 428
combin
function in script 399
Command line
switches 67
syntax 67
Comment in script 329, 336
Compatibility
file 73
ComputerName
function in script 429
concat
string aggregation function in script 374
Concatenate statement 301
Concatenation
automatic 475
forced 475
Conditional functions
in script expressions 426
Configuring
ODBC data sources 63
toolbar 102
Connect 252
Connect statement 302
ConnectString
function in script 432
ConvertToLocalTime
function in script 458
correl
statistical aggregation function in script 377
cos
function in script 406
cosh
function in script 406
count
counter aggregation function in script 374
Counter functions
in script expressions 413
Create
QVD files 506
Creating 195
Cross tables 484
Crosstable statement 303
Current selections 155

D

Data
cleansing 496
source 242
Data Link Properties 242
date
formatting function
in script 464
interpretation function
in script 460
Date functions
in script expressions 435
DateFormat
variable in script 359
day
function in script 435
DayEnd
function in script 450
daylightsaving
function in script 457
DayName
function in script 450
DayNames
variable in script 360
DayStart
function in script 449
DecimalSep
variable in script 358
delimiter in text file 328
Developer, Enterprise 16
dif 327
Directory statement 303
Disconnect statement 304
Distinct predicate 321
div
function in script 396
Do..loop statement 304
Dollar-sign Expansions 362
Drop field statement in script 305
Drop table statement in script 305
dual, formatting function in script 467

E

e, base of natural logarithms 413

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Edit menu 80
Error Variables 360
ErrorMode
function in script 360
Evaluate
loaded data 483
evaluate
function in script 421
evaluating 483
even
function in script 399
Exclusion 153
Execute statement 306
exists
function in script 424
Exit script statement 306
exp
function in script 405
Exponential functions
in script expressions 405
Expression Syntax 367
Expressions
in script 367–468

F

fabs
function in script 398
fact
function in script 398
false
function in script 413
Favorites 76
fdist
statistical distribution function in script 408
fieldindex
function in script 425
FieldName
function in script 434
FieldNr
function in script 434
fieldvalue
function in script 425
fieldvaluecount
function in script 416
File
compatibility 47, 73
menu 75
File functions
in script expressions 431
FileBasename
function in script 431
FileDir
function in script 431
FileExtension
function in script 431
FileName
function in script 431
FilePath
function in script 432
FileSize
function in script 432
FileTime
function in script 432
Financial functions
in script expressions 409
findoneof
function in script 421
finv
statistical distribution function in script 408
First statement 307
firstsortedvalue
basic aggregation function in script ... .372
FirstValue
string aggregation function in script ... .373
firstworkdate
function in script 457
fixed record length 327
floor
function in script 397
Floppy
variable in script 356
fmod
function in script 396
follows
relational operator in script 369
For each..next statement 308
For..next statement 307
Force statement 310
Formatting functions
in script expressions 463
frac
function in script 397
fractile
statistical aggregation function in script 376
From clause 323

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

FTP file browser dialog 250
Function in script expressions
Range 400
Functions in script expressions
aggregation 370
conditional 426
counter 413
date and time 435
exponential 405
file 431
financial 409
formatting 463
hyperbolic 406
interpretation 459
inter-record 423
logarithmic 405
logical 428
mapping 422
mathematical constants 413
null 428
numeric 396
statistical distribution 406
string 416
system 429
table 434
trigonometric 406
Fuzzy 147
fv
function in script 410

G

Generic
databases 483
statement 311
GetRegistryString
function in script 429
Group by clause 324

H

hash128
function in script 415, 422
hash160
function in script 422
hash256
function in script 422
Having clause 342
Header size in text file 329
Help menu 92
Hidden script 238
HidePrefix
variable in script 356
HideSuffix
variable in script 357
Hierarchy statement 311
HierarchyBelongsTo statement 312
hour
function in script 438
Hyperbolic functions
in script expressions 406

I

if
function in script 426
If..then..elseif..else..end if statement ...313
Image_size statement 314
Include
variable in script 356
InDay
function in script 455
InDayToTime
function in script 456
index
function in script 417
Info statement 314
Inline clause 323
InLunarWeek
function in script 455
InLunarWeekToDate
function in script 455
InMonth
function in script 453
InMonths
function in script 453
InMonthsToDate
function in script 454
InMonthToDate
function in script 453
Inner keyword in script 315
Input
function in script 429
Inputfield statement 315
InQuarter
function in script 452
InQuarterToDate
function in script 452
Installing
ODBC .....61–??
OLE DB .....61–??
QlikView 55–59

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

QlikView on a client computer 61
Interface Language 111
Internal 217
Interpretation functions
in script expressions 459
Inter-record functions
in script expressions 423
interval
formatting function
in script 466
interpretation function
in script 462
IntervalMatch 485
IntervalMatch statement 316
InWeek
function in script 454
InWeekToDate
function in script 454
InYear
function in script 451
InYearToDate
function in script 451
irr
financial aggregation function in script 382
IsNum
function in script 428
IsText
function in script 428
IterNo function in script 414

J

Join and Keep 476
Join statement 319
Joining tables 476–477

K

Keep statement in script 319, 478
KeepChar
function in script 418
Keywords 293–354
kurtosis
statistical aggregation function in script 376

L

Label
field 328
table 354
LastValue
string aggregation function in script 373
lastworkdate
function in script 457
Layout 84
LEF file 58
left
function in script 416
Left keyword in script 320
len
function in script 416
Let statement 321
License 58
License Enabler File 58
Limited Scripting
in QlikView Professional 515
linest_b
statistical aggregation function in script 378
linest_df
statistical aggregation function in script 380
linest_f
statistical aggregation function in script 381
linest_m
statistical aggregation function in script 377
linest_r2
statistical aggregation function in script 378
linest_seb
statistical aggregation function in script 379
linest_sem
statistical aggregation function in script 379
linest_sey
statistical aggregation function in script 380
linest_ssreg
statistical aggregation function in script 381
linest_ssresid
statistical aggregation function in script 382
Linking information 495–496
Load statement 321

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

LocalTime 439
function in script 439
Locations page 135
Locking selections 153
log
function in script 405
log10
function in script 405
Logarithmic functions
in script expressions 405
Logical functions
in script expressions 428
Logical tables 470
LongDaynames
variable in script 360
LongMonthNames
variable in script 360
lookup
function in script 426
Loops 473
Loosely Coupled Tables 159
Loosen Table
statement in script 329
lower
function in script 418
ltrim
function in script 418
LunarweekEnd
function in script 448
LunarWeekName
function in script 449
LunarweekStart
function in script 448

M

MakeDate
function in script 437
MakeTime
function in script 438
MakeWeekDate
function in script 437
Map..using statement in script 331
Mapping
statement in script 330
Mapping functions in script expressions ... .422
mapsubstring, function in script 423
match
function in script 427
Mathematical constants
in script expressions 413
max
basic aggregation function in script ... .371
MaxString
string aggregation function in script ... .373
median
statistical aggregation function in script 376
Memory
settings 141
Menu commands
Bookmarks menu 88
Edit menu 80
File menu 75
Help menu 92
Layout menu 84
Object menu 90
Reports menu 89
Selections menu 83
Settings menu 87
Tools menu 90
View menu 82
Window menu 91
mid
function in script 417
min
basic aggregation function in script ... .371
MinString
string aggregation function in script ... 373
minute
function in script 438
MissingCount
counter aggregation function in script 375
mixmatch
function in script 427
mod
function in script 396
mode
basic aggregation function in script ... 372
money
formatting function
in script 464
interpretation function
in script 460

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

MoneyDecimalSep
variable in script 359
MoneyFormat
variable in script 359
MoneyThousandSep
variable in script 359
month
function in script 436
MonthEnd
function in script 444
MonthName
function in script 445
MonthNames
variable in script 359
MonthsEnd
function in script 445
MonthsName
function in script 446
MonthsStart
function in script 445
MonthStart
function in script 444
MsgBox
function in script 429
Multiple selection 146

N

Naming
tables 354
Network 57
networkdays
function in script 457
Noconcatenate statement in script 333
nodata 67
NoOfFields
function in script 434
NoOfReports
function in script 435
NoOfRows
Function in Script 434
NoOfTables
function in script 435
normdist
statistical distribution function in script 407
norminv
statistical distribution function in script 407
not
logical operator in script 369
Notational conventions 15
not-selection 153
now
function in script 439
nper
function in script 411
npv
financial aggregation function in script 383
Null functions
in script expressions 428
NULL value handling 500–503
NullAsNull statement in script 334
NullAsValue statement in script 333
NullCount
counter aggregation function in script 375
NullDisplay variable in script 357
NullInterpret variable in script 358
NullValue
variable in script 358
num
formatting function
in script 463
interpretation function
in script 459
Number interpretation variables 358
Numeric functions
in script expressions 396
Numeric search 148
NumericCount
counter aggregation function in script 374

O

Object menu 90
ODBC .....61–??
data sources 63
odd
function in script 399
OLE DB .....61–??
only
basic aggregation function in script 372
OpenUrlTimeout variable in script 357
Operators in script expressions
bit 370
logical 369
numeric 368

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

relational 369
string 368
or
logical operator in script 369
ord
function in script 416
Order by clause 342
OSuser
function in script 429
OtherSymbol 499
variable in script 358
Outer keyword in script 335

P

Path
relative 236
peek
function in script 424
permut
function in script 399
pi 413
pick
function in script 427
pmt
function in script 411
pow
function in script 406
precedes
relational operator in script 370
Preceding Load 246
previous
function in script 423
Professional 16
PurgeChar
function in script 419
pv
function in script 412

Q

QlikView
documents 73
starting from command line 67
versions 73
qlikviewversion
function in script 429
Qualify statement 335
QuarterEnd
function in script 443
QuarterName
function in script 443
QuarterStart
function in script 443
Quotation marks 364
QVD Files 505–513
QvdCreateTime
function in script 433
QvdFieldName
function in script 433
QvdNoOfFields
function in script 433
QvdNoOfRecords
function in script 433
QvdTableName
function in script 433
QVPath
variable in script 356
QVRoot
variable in script 356
QVuser
function in script 429
QVWorkPath
variable in script 356
QVWorkRootPath
variable in script 356

R

rand
function in script 413
rangeavg
function in script 400
rangecount
function in script 400
rangefractile
function in script 402
rangeirr
function in script 403
rangekurtosis
function in script 401
rangemax
function in script 401
rangemaxstring
function in script 403
rangemin
function in script 401
rangeminstring
function in script 403
rangemissingcount
function in script 402

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangemode
function in script 402
rangenpv
function in script 404
rangenullcount
function in script 402
rangenumericcount
function in script 402
rangeonly
function in script 403
rangeskew
function in script 401
rangestdev
function in script 401
rangesum
function in script 400
rangetextcount
function in script 402
rangexirr
function in script 404
rangexnpv
function in script 405
rate
function in script 412
RecNo
function in script 413
Record length in text file 329
Relative path 236
ReloadTime
function in script 429
Rem statement 336
Rename Field statement 337
Renaming fields 474
repeat
function in script 418
replace
function in script 419
Replace statement 338
ReportComment
function in script 435
ReportID
function in script 435
ReportName
function in script 435
ReportNumber
function in script 435
Reports 175–193
Remove Item 183
reports 175
Reports menu 89
Resident clause 323
right
function in script 417
Right keyword in script 339
round
function in script 397
RowNo
function in script 413
rtrim
function in script 418

S

Sample statement 340
Save 77
Script
Edit Script dialog box 229
expressions 367–468
keywords 293–354
quotation marks 364
statements 293–354
syntax 293–365
variables 355–361
ScriptError
function in script 360
ScriptErrorCount
function in script 361
ScriptErrorDetailed
function in script 361
ScriptErrorList
function in script 362
second
function in script 438
Section statement 341
Select statement 341
Selection 157
Selections 83, 145–146
current 155
indicator 106
locking 153
moving 151
multiple 146
unlocking 153
Semantic
links 491–495
statement 344
tables 491
Serialization 56
Set statement 344
setdateyear
function in script 451

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

setdateyearmonth
function in script 451
Settings menu 87
Show 245
sign
function in script 398
sin
function in script 406
sinh
function in script 406
skew
statistical aggregation function in script 376
Sleep
statement in script 344
Special Variables 356
SQL statement 345
SQLCOLUMNS statement in script ...345
SQLTABLES statement in script 346
SQLTYPES statement in script 346
sqr
function in script 406
sqrt
function in script 405
Star
statement 347
symbol 499
Starting QlikView
from command line 67
Statements 293–354
Statistical 383
Statistical distribution functions
in script expressions 406
Status bar 106
stdev
statistical aggregation function in script 376
sterr
statistical aggregation function in script 377
steyx
statistical aggregation function in script 377
Store
statement 348
String functions
in script expressions 416
StripComments
variable in script 357
Sub..end sub statement 349
subfield
function in script 419
substringcount
function in script 422
Sum
basic aggregation function in script ... .371
Support 17
Switch..case..default..end switch statement 350
Synthetic Keys 473
System Fields 469
System functions
in script expressions 429
System variables 469

T

Table
labels 354
logical 470
naming of 354
Table file wizard 259–292
TableName
function in script 435
TableNumber
function in script 435
tan
function in script 406
tanh
function in script 406
tdist
statistical distribution function in script 408
text file 327
Text search 146
text, function in script 462
textbetween
function in script 419
TextCount
counter aggregation function in script 375
The XML File Wizard 287
ThousandSep
variable in script 358
time
formatting function
in script 465
interpretation function
in script 461

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Time functions
in script expressions 435
TimeFormat
variable in script 359
timestamp
formatting function
in script 466
interpretation function
in script 461
TimestampFormat
variable in script 359
tinv
statistical distribution function in script 408
today
function in script 439
Toolbar
Bookmark 101
configuration 102
Design 99
Main 95
Sheet 101
Tools menu 90
Trace
statement in script 351
Trigonometric functions
in script expressions 406
trim
function in script 418
Troubleshoot 58
true
function in script 413
TTest_df
statistical test function in script ...385
TTest_dif
statistical test function in script ...385
TTest_lower
statistical test function in script ...386
TTest_sig
statistical test function in script ...385
TTest_sterr
statistical test function in script ...385
TTest_t
statistical test function in script ...384
TTest_upper
statistical test function in script ...386
TTest1_conf
statistical test function in script ...390
TTest1_df
statistical test function in script ...389
TTest1_dif
statistical test function in script ...389
TTest1_lower
statistical test function in script ...390
TTest1_sig
statistical test function in script ...389
TTest1_sterr
statistical test function in script ...389
TTest1_t
statistical test function in script ...388
TTest1_upper
statistical test function in script ...390
TTest1w_conf
statistical test function in script ...392
TTest1w_df
statistical test function in script ...391
TTest1w_dif
statistical test function in script ...391
TTest1w_lower
statistical test function in script ...392
TTest1w_sig
statistical test function in script ...391
TTest1w_sterr
statistical test function in script ...391
TTest1w_t
statistical test function in script ...390
TTest1w_upper
statistical test function in script ...392
TTestw_conf
statistical test function in script ...388
TTestw_df
statistical test function in script ...387
TTestw_dif
statistical test function in script ...387
TTestw_lower
statistical test function in script ...388
TTestw_sig
statistical test function in script ...387
TTestw_sterr
statistical test function in script ...387
TTestw_t
statistical test function in script ...386
TTestw_upper
statistical test function in script ...388
txt 327

U

Union operator 343
Unless statement 351
Unlocking

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

selections 153
Unmap statement in script 352
Unqualify statement 352
upper
function in script 417
User Preferences ..... 107–??
UTC 456

V

Value Handling Variables 357
variable 211
Variables
in script 355–361
Verbatim
variable in script 357
View menu 82

W

week
function in script 436
weekday
function in script 436
WeekEnd
function in script 447
WeekName
function in script 447
WeekStart
function in script 446
weekyear
function in script 437
When statement 353
Where clause 324
While clause 324
Wild cards
in data 499–500
wildmatch
function in script 427
Window menu 91
WinPath
variable in script 356
WinRoot
variable in script 356
Working Set Limits % 111

X

xirr
financial aggregation function in script
.....382
XML File Wizard 286
XML Page 289
xnpv
financial aggregation function in script
.....383
xor
logical operator in script 369

Y

year
function in script 436
YearEnd
function in script 442
YearName
function in script 442
YearStart
function in script 441
yeartodate
function in script 439

Z

ZTest_conf
statistical test function in script ...393
ZTest_dif
statistical test function in script ...393
ZTest_sig
statistical test function in script ...393
ZTest_sterr
statistical test function in script ...393
ZTest_z
statistical test function in script ...392
ZTestw_conf
statistical test function in script ...395
ZTestw_dif
statistical test function in script ...394
ZTestw_sig
statistical test function in script ...394
ZTestw_sterr
statistical test function in script ...394
ZTestw_z
statistical test function in script ...394

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

QlikView

Reference Manual

Book II: Layout, Number Formats and Macros

Version 8.5 for Microsoft Windows®

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Authored by QlikTech International AB /HIC/KHN/JNN/MSJ/CEN

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OVERVIEW BOOK II

SHEETS AND SHEET OBJECTS I

NUMBER FORMATS II

MACROS AND AUTOMATION III

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

6

CONTENT

PART I: SHEETS AND SHEET OBJECTS

1 DOCUMENT PROPERTIES 15
- 1.1 General 16
- 1.2 Opening 26
- 1.3 Sheets 28
- 1.4 Server 31
- 1.5 Variables 35
- 1.6 Security 39
- 1.7 Macros 42
- 1.8 Groups 46
- 1.9 Tables 49
- 1.10 Sort 52
- 1.11 Presentation 54
- 1.12 Number 56
- 1.13 Scrambling 57
- 1.14 Font 58
- 1.15 Layout 59
- 1.16 Caption 65

2 THE SHEET 69
- 2.1 Creation 69
- 2.2 Navigation 69
- 2.3 Object Menu for Sheets 70
- 2.4 Sheet Properties 71
- 2.5 Tabrow Properties 85

3 SHEET OBJECTS 87
- 3.1 Local Objects and Server Objects 87
- 3.2 Creation 87
- 3.3 Navigation 88
- 3.4 Object Menu for Sheet Objects 88
- 3.5 Sheet Object Properties 88
- 3.6 Minimized and Maximized Sheet Objects 89
- 3.7 The Server Objects Dialog 89

4 THE LIST BOX 93
- 4.1 Creation 93

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

4.2 List Box Object Menu 93
4.3 List Box Properties 97

5 THE STATISTICS BOX 119
5.1 Creation 119
5.2 Statistics Box Object Menu 120
5.3 Statistics Box Properties 122

6 THE CHART 129
6.1 About QlikView Charts 129
6.2 Creation 131
6.3 Chart Object Menu 132
6.4 Chart Properties 132
6.5 Fast Chart Type Change 132
6.6 Sizing and Moving Chart Components 133

7 THE MULTI BOX 135
7.1 Creation 135
7.2 Multi Box Object Menu 135
7.3 Multi Box Properties 138

8 THE TABLE BOX 153
8.1 Creation 153
8.2 Using the Table Box 153
8.3 Table Box Object Menu 154
8.4 Custom Format Cell Dialog 158
8.5 Table Box Properties 160

9 THE CURRENT SELECTIONS BOX 171
9.1 Creation 171
9.2 Current Selections Box Object Menu 171
9.3 Current Selections Box Properties 174

10 THE INPUT BOX 179
10.1 Creation 179
10.2 Using the Input Box 179
10.3 Input Box Object Menu 180
10.4 Input Box Properties 182

11 THE BUTTON 191
11.1 Creation 191
11.2 Button Object Menu 191
11.3 Button Properties 193

12 THE TEXT OBJECT 205
12.1 Creation 205

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

12.2 Text Object Menu 205
12.3 Text Object Properties 207

13 THE LINE/ARROW OBJECT 213
13.1 Creation 213
13.2 Line/Arrow Object Menu 213
13.3 Line/Arrow Object Properties 215

14 THE SLIDER/CALENDAR OBJECT 219
14.1 Using a Slider/Calendar Object 219
14.2 Creation 220
14.3 Slider/Calendar Object Menu 220
14.4 Slider/Calendar Object Properties 222

15 THE BOOKMARK OBJECT 231
15.1 Creation 231
15.2 Bookmark Object Menu 231
15.3 Bookmark Object Properties 233

16 CUSTOM OBJECT 237
16.1 Creation 237
16.2 Object Menu of the Custom Object 237
16.3 Custom Object Properties 238

17 SERVER COLLABORATION 241
17.1 The Collaboration Pane 241
17.2 The Server Objects Dialog 242

18 EXPORTING AND PRINTING 247
18.1 Print 247
18.2 Print Sheet 255
18.3 Print Preview 255
18.4 Copy Mode 256
18.5 Export to File 257

19 LAYOUT THEMES 259
19.1 About QlikView Layout Themes 259
19.2 Applying Themes in the Layout 260
19.3 Making Themes with the Theme Maker Wizard 262

20 OBJECTS CLIENT PAGE GENERATOR 271

PART II: NUMBER FORMATS

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

21 DATA TYPES IN QLIKVIEW 275
21.1 Data Representation inside QlikView 275
21.2 Number Interpretation 275
21.3 Dates and Times 280

22 NUMBER FORMAT DIALOGS 285
22.1 Document Properties 285
22.2 List Box, Multi Box, Table Box and Input Box 287
22.3 Chart 288

23 FORMAT CODES 291
23.1 Numbers 291
23.2 Dates 292
23.3 Times 293
23.4 Time Stamps 294

PART III: MACROS AND AUTOMATION

24 USING AUTOMATION AND MACROS WITH QLIKVIEW 297
24.1 The QlikView Automation Interface 297
24.2 How Automation and Macros Can Control QlikView 297

25 INTERNAL MACRO INTERPRETER AND MACROS 299
25.1 Edit Module Dialog 299
25.2 Macro debugger 303
25.3 Invoking Macros 305
25.4 Examples of Macros 310
25.5 Special library functions for JScript 312

26 GETTING HOLD OF A QLIKVIEW DOCUMENT 313
26.1 Accessing QlikView Documents from the Outside 313
26.2 Accessing QV Documents from the Internal Macro Interpreter 313

27 VBSCRIPT FUNCTION CALLS FROM SCRIPT 315
27.1 Transfer of Parameters 317

28 THE VISUAL BASIC PROGRAMMING LANGUAGE 319
28.1 About Visual Basic 319
28.2 Differences Between VB, VBA and VBS 319
28.3 Note About Parameters to Methods and Properties 320
28.4 Getting Hold of the System from VBScript 321

29 USING MACROS IN QV DOCUMENTS ON THE QV SERVER 323

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

29.1 Macros on QlikView Server 323
29.2 Macro functionality limitations 323
29.3 Macro trigger limitations 324
29.4 VBScript functions 324
29.5 Server Side Export 325

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

12

PART I: SHEETS AND SHEET OBJECTS

- **Document Properties**
- **Sheets**
- **Sheet objects**
- **Printing and exporting**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

14

1 DOCUMENT PROPERTIES



Document properties are settings that are stored in the document file.

The **Document Properties** dialog is opened by choosing **Document Properties** from the **Settings** menu or by choosing the **Document Properties** button from the toolbar.



When the properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.1 General

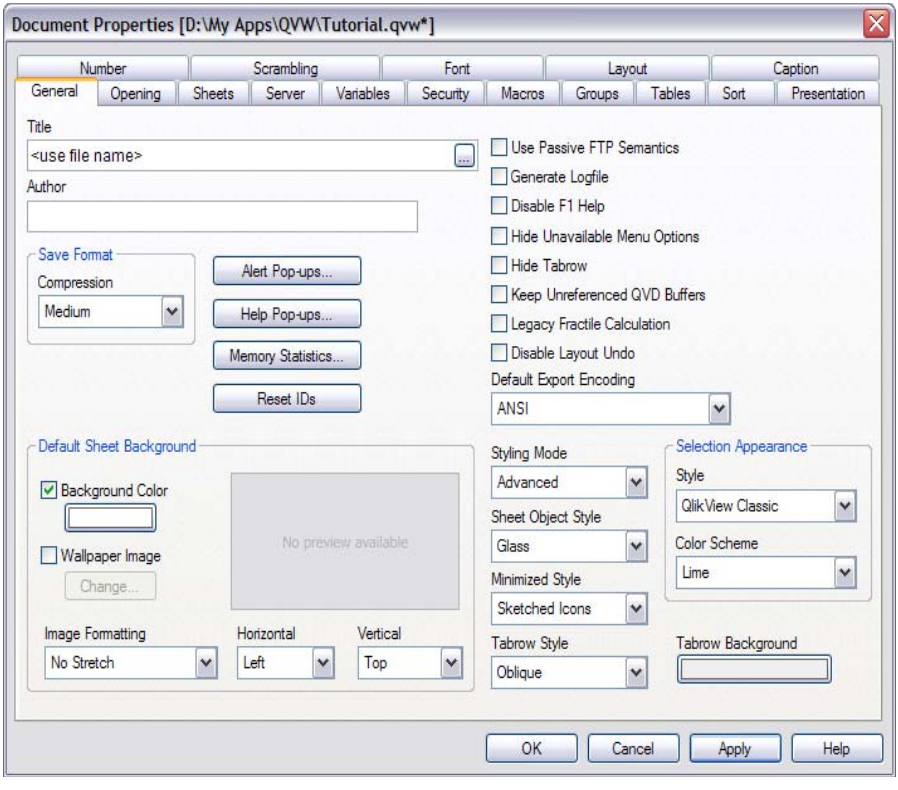


Figure 1. The General page in the Document Properties dialog

Title By entering a text in the **Title** box, it is possible to set the window name for the document. By clicking the **...** button the full **Edit Expression** dialog for easier editing of long formulas will open.

Author Here you specify the author of the QlikView file. For new files, the name of the registered QlikView license holder will be used as default.

Save Format

QlikView versions 6, 7 and 8 share the same file format. This means that documents can be opened and saved by all these versions without the need to bother about file formats. In order to open files from earlier versions you must first install QlikView 6.0x, open the document and save it in the 6.0x format.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Compression

This drop-down specifies the save compression mode for the document. By using compression the size of the file will be reduced by typically 60-80% (actual results will vary with the document). When using compression, document save times will be slightly increased. With **Medium** compression all parts of the document except table data (which is already stored quite compressed inside QlikView) will undergo compression. With **High** compression (default) also table data will undergo compression, saving some space but further increasing save and load times. By choosing **None** all data is saved without compression. To set a default compression for all new files, change the **Preferred Save Format** setting in the **User Preferences** dialog, **General** page (page 113 in Book I).

Alert Pop-ups

Click this button to open the **Pop-up Window Settings** dialog where the appearance of help pop-up messages in the document can be set. See page 21 in Book II for details on this dialog.

Help Pop-ups

Click this button to open the **Pop-up Window Settings** dialog where the appearence of help pop-up messages in the document can be set. See page 21 in Book II for details on this dialog.

Memory Statistics

This button lets you create a text file containing memory usage statistics for the current QlikView document. This file can be read e.g. by QlikView for an analysis of memory requirements for different parts of the document.

Reset IDs

This button enables you to make a complete renumbering of all sheet, sheet object, alert, report and bookmark IDs. The first sheet will be assigned SH01, the first chart CH01 etc. Before performing the operation, QlikView will prompt you for confirmation. Note that this command will break all macros which reference objects via their IDs.

Default Sheet Background

In the **Default Sheet Background** group, it is possible to set a background for the document. This is used on all sheets, which do not have a setting of their own (see page 73). A preview pane indicates current settings.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Background Color

Mark this check box and click the color button to set a background color for all the sheets in the document. The color can be defined as a solid color or a gradient via the **Color Area** dialog (see page 23) that opens when clicking the button.

Wallpaper Image

Mark this check box to have a background image, a wallpaper, for the document. Click the **Change** button if you want to change the wallpaper.

Image Formatting

Sets properties for image formatting when image background is used.

No Stretch

If this option is selected, the image will be shown as is, without any stretching. This may cause parts of the picture to be invisible or only part of the sheet to be filled.

Fill If this option is selected, the image will be stretched to fit the sheet without bothering about keeping the aspect ratio or the image.

Keep Aspect

If this option is selected, the image will be stretched as far as possible to fill the sheet while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the image will be stretched to fill the sheet in both directions while keeping the aspect ratio. This typically results in cropping of the image in one direction.

Tile If this option is selected, the image will be tiled as many times as space allows.

Horizontal

Sets horizontal alignment for image when image background is used.

Vertical

Sets vertical alignment when image background is used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Use Passive FTP Semantics

If this check box is marked, passive FTP semantics will be used in the document.

Generate Log file

Generates a log file in the QlikView directory.

Disable F1 Help

Mark this check box if you do not wish to invoke help when pressing F1.

Hide Unavailable Menu Options

If this check box is selected, object menu items made unavailable by security settings will be removed from the menu rather than grayed.

Hide Tabrow

If this check box is selected, the QlikView sheet tabrow will not be shown.

Keep Unreferenced QVD Buffers

Normally all automatically created QVD buffers (created via buffered prefix on **load** and **select** statements) will be removed by QlikView when no longer used by the document that created them. After a successful script execution (non partial reload) QlikView will scan all QVD buffers currently residing in the default folder for QVD buffers (see “user preferences” on page 107 in Book I). Any buffer created by the current document and not referenced in the just finished reload will be removed. By marking this check box this purge will not occur. Note that this is not recommended and may cause unnecessary use of hard disk space.

Legacy Fractile Calculation

When marking this check box, QlikView will use discrete values as results from the fractile aggregation function. When this option is deselected QlikView will use an interpolated value, as known from the Percentile function in Microsoft Excel. QlikView versions before 7.5 only had support for the discrete value algorithm.

Disable Layout Undo

When this check box is marked the layout undo buffer will be suspended. This may be useful to prevent unnecessary memory consumption when deploying certain QlikView documents. Each time a user or a macro changes the layout a chunk of data is normally added to the layout undo buffer. In extreme cases, the accumulated buffer data may cause problems when deploying documents on a QlikView Server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Default Export Encoding

Sets the default character set for export from the document. You may choose between ANSI, Unicode and UTF-8.

Styling Mode

In this drop-down menu you can choose the object style for all your sheet objects.

Advanced mode makes it possible to configure most settings, such as the **Sheet Object Style** and the type of border to be used. These individual settings are configured on the **Layout** page of the objects.

Simplified mode also gives you the choice of **Sheet Object Style**, but configures most settings automatically. It sets such things as scrollbars and borders. Some settings can still be changed on the **Layout** page of the objects.

Sheet Object Style

Select one of the available styles for sheet object captions in this dropdown. The style selected will be used for all sheet objects with captions in the document.

Minimized Style

Select one of the available styles for minimized object icons in this drop-down. The style selected will be used for all minimized sheet objects in the document.

Tabrow Style

Select one of the available styles for the tabrow appearance in this drop-down. The style selected will be used for all tabs in the document.

Tabrow Background

Click this button to select a custom color for the area behind the sheet tabs.

Selection Appearance

QlikView supports several different ways of presenting data and making selections in list boxes and multi boxes. The **QlikView Classic, Corner Tag, LED and Tube** styles all use color coding for indication of selected, possible and excluded values. The **Windows Check Boxes** style mimics the standard Windows interface with check boxes at each value. By choosing a specific style in this control, you may force the document to appear in one style or another wherever opened. More information about the selection styles can be found on page 157 in Book I.

When using the selection styles based on color, there are a number of different color schemes available. The basic colors (green for

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selected, blue for locked etc.) cannot be changed, but variations of tone and intensity are possible.

Style Sets the selection style for the document. Select between the available alternatives in the drop-down list. By choosing **<user default>** the document will always be opened with the selection style set as preferred by the user under **User Preferences** (see page 107 in Book I) on the computer where it is opened.

Color Scheme

Sets the selection color scheme for the document. Select between the available alternatives in the drop-down list. By choosing **<user default>** the document will always be opened with the selection color scheme set as preferred by the user under **User Preferences** (see page 107 in Book I) on the computer where it is opened.

Pop-up Window Settings

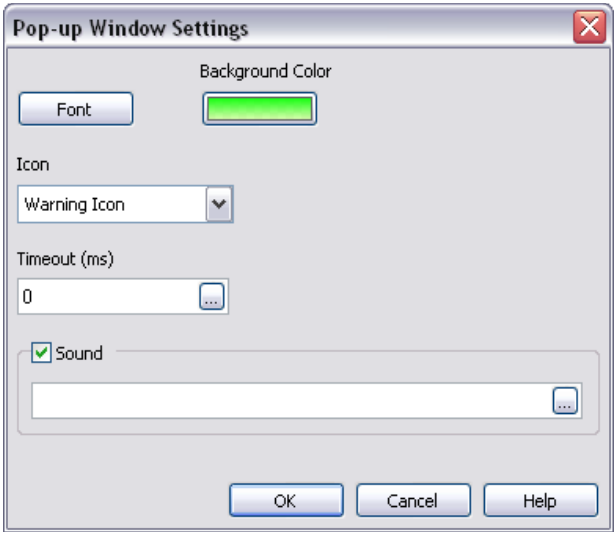


Figure 2. The Pop-up Window Settings dialog

This dialog is used to customize the pop-up messages appearing in various parts of the layout.

Font Opens the **Font** dialog where you may set the font to be used for the pop-up message.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Background Color

Opens the **Color Area** dialog where you may set the background to be used for the pop-up message.

Icon In this drop-down you can select an icon to be shown in the pop-up.

Time-outtime-out (ms)

Here you may enter a time in milliseconds after which the pop-up will automatically disappear from the screen. By setting the time-out to 0 the pop-up will stay on the screen until the user clicks it away.

Sound Mark the check box to use a sound with the pop-up. The edit box below should contain a valid path to a .wav sound file. This may be an external path (e.g. c:\mysound.wav) or a path to a bundled QlikView sound (e.g. qmem://<bundled>/sounds/qv_ok.wav). For a list of bundled sounds see “Bundled Sounds” on page 220 in Book I).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Color Area

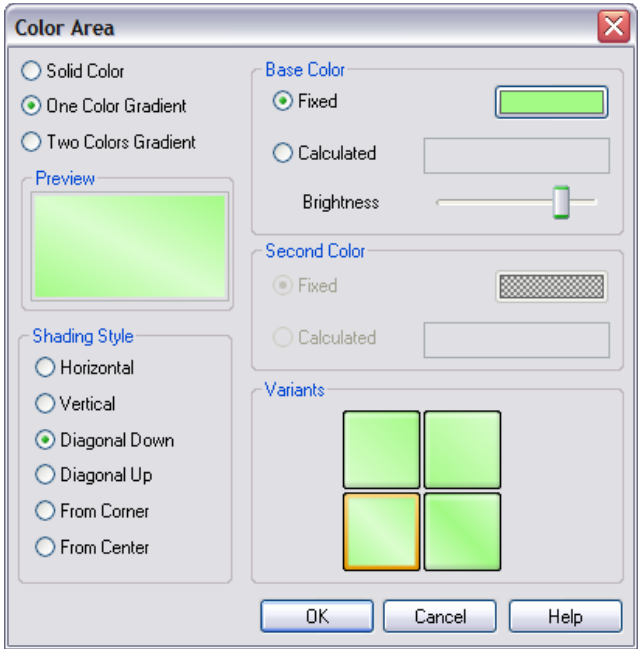


Figure 3. The Color Area dialog

Most colored surfaces in a QlikView layout can be formatted either with a solid color covering the entire area or with a gradient effect. Color(s) can be fixed or defined by a calculated expression dynamic update. All these settings are made in the **Color Area** dialog described below. This dialog is referenced from numerous places throughout this book.

Preview

As you make selections in the dialog this pane offers you a preview of how the colored surface will look in the layout.

Solid Color

Select this basic option to have one single color covering the entire surface to be formatted. The color can be fixed or calculated as specified in the **Base Color** group described below.

One Color Gradient

Select this basic option to have surface formatted with a gradient based on varying brightness of one color. The color can be fixed or calculated as specified in the **Base Color** group described below.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Two Color Gradient

Select this basic option to have surface formatted with a gradient between two selected colors. The colors can be fixed or calculated as specified in the **Base Color** and **Second Color** groups described below.

Base Color

This group is used to determine the color for solid surfaces and the base color for gradients.

Fixed If you want a fixed color, select this radio button. Click the colored button to select color.

Calculated

If you want a calculated color, select this radio button. Enter an expression formula in the edit box. The expression must evaluate to a valid color representation (a number representing the Red, Green and Blue components), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. The color may contain an alpha factor for transparency.

Brightness

This control is only available for one-color gradients. It sets the relative brightness of the opposite end of the gradient. The center position will render the surface as if a solid color was selected. Set to the left of the center the gradient will go towards a darker shading of the base color. To the right the gradient will go towards a lighter shading.

Second Color

This group is used to determine the second color for two-color gradients.

Fixed If you want a fixed second color select this radio button. Click the colored button to select color.

Calculated

If you want a calculated second color select this radio button. Enter an expression formula in the edit box. The expression must evaluate to a valid color representation (a number representing the Red, Green and Blue components), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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used. The color may contain an alpha factor for transparency.

Shading Style

In this group you select the direction of the gradient when one of the gradient options is used.

Horizontal

Select this radio button for a horizontally oriented shading pattern.

Vertical

Select this radio button for a vertically oriented shading pattern.

Diagonal Down

Select this radio button for a diagonally oriented shading pattern reaching from the upper left to the lower right.

Diagonal Up

Select this radio button for a diagonally oriented shading pattern reaching from the lower left to the upper right.

From Corner

Select this radio button for a shading pattern reaching from a selected corner.

From Center

Select this radio button for a shading pattern reaching from the center.

Variants

This group allows you to choose between a number of variants based on the **Shading Style** selected above.

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1.2 Opening

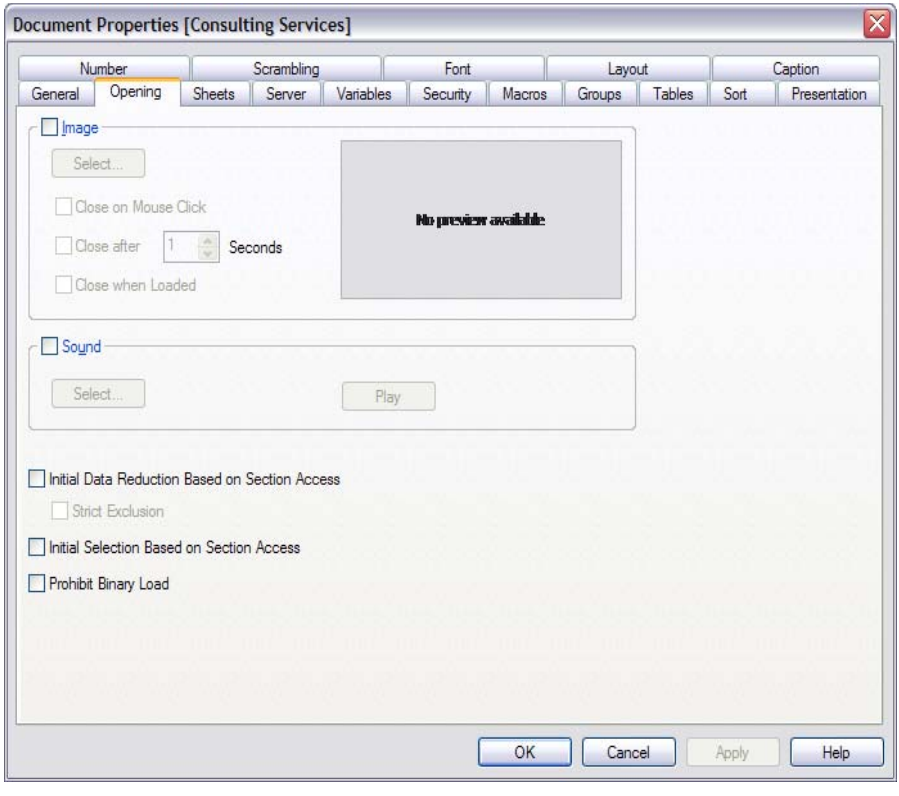


Figure 4. The Opening page in the Document Properties dialog

In this page it is possible to customize the opening of a document.

Image

Mark this check box to have an opening image for the document.

Select...

Click this button to open the **Select Opening Image** dialog where you can select an image (bmp, jpg, jpeg, or png).

Close on Mouse Click

Lets the user close the opening picture by clicking it. Either this check box or the one below must be marked.

Close after N Seconds

Closes the opening picture automatically. Either this check box or the one above must be marked.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Close when Loaded

Closes the opening picture when the file has been loaded.

Sound Mark this check box to have an opening sound for the document. The **Select Opening Sound** dialog will open.

Initial Data Reduction Based on Section Access

If this option is selected, QlikView will perform a procedure on opening the document (or on establishing a new session on QlikView Server) which permanently hides certain data from the user based on the identity with which the user has logged on to the document. See page 515 in Book I for details. When this feature is used on a document not run exclusively on a QlikView Server it should always be combined with the **Prohibit Binary Load** option (see below) in order to maintain data access security. This setting is mutually exclusive with **Initial Selection Based on Section Access**.

Strict Exclusion

If this check box is marked in combination with **Initial Data Reduction Based on Section Access**, strict exclusion will be used when reducing the data. This means that access to the document will be denied whenever the field values in the section access reduction fields lack matches in their corresponding section application field. This, however, does not apply for users with Admin status, who instead will see the unreduced data set if there are no matches. This setting is turned on by default in documents created with QlikView 7.02 and later and is recommended for maximum access security.

Initial Selection Based on Section Access

If this option is marked, QlikView will perform a procedure on opening the document (or on establishing a new session on QlikView Server) which shows the selection based on the identity with which the user has logged on to the document. See page 515 in Book I for details. When this feature is used on a document not run exclusively on a QlikView Server it should always be combined with the **Prohibit Binary Load** option (see below) in order to maintain data access security. This setting is mutually exclusive with **Initial Data Reduction Based on Section Access.**

Prohibit Binary Load

If this option is selected it will not be possible to load data from the document's qvw file via a binary statement in another QlikView document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.3 Sheets

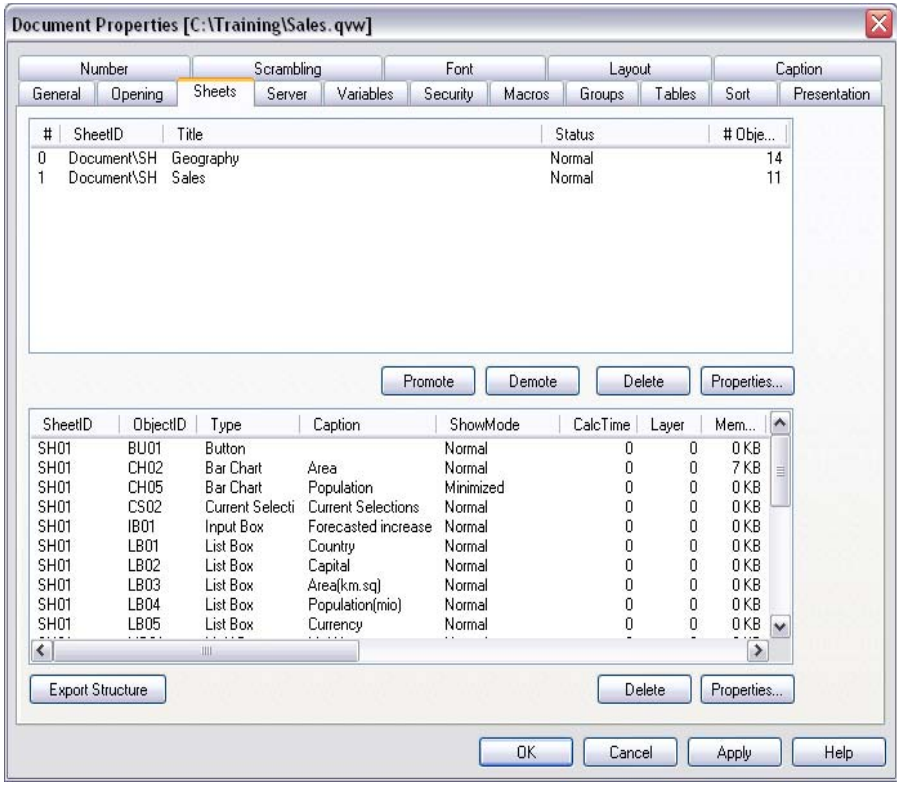


Figure 5. The Sheets page in the Document Properties dialog

This page shows two lists. The **Sheets** list at the top shows all sheets of the QlikView document. The columns are as follows:

The number (position) of the sheet starting with 0.

SheetID The unique ID of the sheet.

Title The text currently shown in the sheet tab.

Status The current status of the sheet. Indicates if the sheet has a show condition and if it is visible (Normal) or hidden.

Objects
The current number of sheet objects on the sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The list can be sorted on any column by clicking on the column header. You may also select a specific sheet by clicking on it in the list. The following options then become available as buttons below the list:

Promote
Promotes the selected sheet one step to the left (up the list). The sheet immediately moves in the list but the actual promote will not take place until you select **OK** or **Apply**.

Demote
Demotes the selected sheet one step to the right (down the list). The sheet immediately moves in the list but the actual demote will not take place until you select **OK** or **Apply**.

Delete
Deletes the selected sheet from the document. The sheet immediately disappears from the list but the actual delete will not take place until you select **OK** or **Apply**.

Properties
Opens the **Properties** dialog for the selected sheet.

The **Sheet Objects** list at the bottom of the page shows all sheet objects of the QlikView document or, if one sheet has been selected in the list above, the sheet objects of that sheet. The columns are as follows:

SheetID
The unique ID of the sheet containing the sheet object.

Object ID
The unique object ID of the sheet object.

Type The type of the sheet object.

Caption
The text currently shown in the caption of the sheet object.

ShowMode
The current status of the sheet object. Indicates if the object is minimized, maximized, hidden or has a show condition.

CalcTime
The amount of time in milliseconds needed for the last recalculation of the object's contents. This information is only relevant for charts, tables and objects containing one or more formulas.

Layer The current layout layer of the sheet object. The layers are set on the **Layout** page of sheet object properties dialog (**Bottom**, **Normal, Top** and **Custom**), where **Bottom**, **Normal** and **Top** correspond to the numbers -1, 0 and 1. Choose **Custom** to enter a value of your choice. Valid layer numbers are -127 to 127.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Memory
The amount of memory in kBytes needed for the last recalculation of the object's contents. This information is only relevant for charts, tables and objects containing one or more formulas.

Left The current horizontal position of the left edge of the sheet object, expressed in pixels.

Top The current vertical position of the top edge of the sheet object, expressed in pixels.

Right The current horizontal position of the right edge of the sheet object, expressed in pixels.

Bottom The current vertical position of the bottom edge of the sheet object, expressed in pixels.

Width The current width of the sheet object, expressed in pixels.

Height The current height of the sheet object, expressed in pixels.

Left (Min)
The current horizontal position of the left edge of the sheet object's minimized icon, expressed in pixels.

Top (Min)
The current vertical position of the top edge of the sheet object's minimized icon, expressed in pixels.

Right (Min)
The current horizontal position of the right edge of the sheet object's minimized icon, expressed in pixels.

Bottom (Min)
The current vertical position of the bottom edge of the sheet object's minimized icon, expressed in pixels.

Width (Min)
The current width of the sheet object's minimized icon, expressed in pixels.

Height (Min)
The current height of the sheet object's minimized icon, expressed in pixels.

Export Structure
By pressing this button you can export the sheet and sheet object structure of the document to a set of text files. These text files, one for the sheets (*filename*.Sheets.tab), and one for the sheet objects (*filename*.Objects.tab) can easily be read back into QlikView for further analysis with the full power of the QlikView logic. A dialog will appear where you can choose the target folder for the export.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The default is to put the files in the same folder as the QlikView document.

The list can be sorted on any column by clicking on the column header. You may also select a specific sheet object by clicking on it in the list. The following two options then become available as buttons below the list:

Delete Deletes the selected sheet object from the sheet. The object immediately disappears from the list but the actual delete will not take place until you select **OK** or **Apply**.

Properties
Opens the **Properties** dialog for the selected sheet object.

1.4 Server

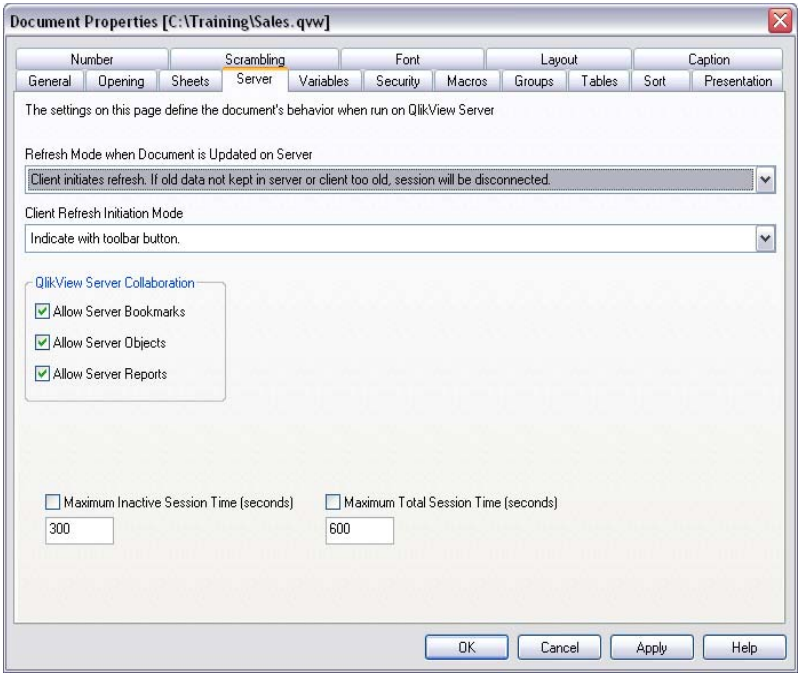


Figure 6. The Server page of the Document Properties dialog

On this page you define certain aspects of the document's behavior when run on a QlikView Server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Refresh Mode when Document is Updated on Server

This setting defines how an updated document on the QlikView Server will be handled.

Client initiates refresh. If old data not kept in server or client too old, session will be disconnected

This is the option to choose if you never want the server to initiate a refresh of data in the client automatically. When a new version of the document becomes available on the server, the client will be offered to refresh according to the preferenced set under **Client Refresh Initiation Mode** below. If this is not possible, either because the client is too old (pre version 8) or if the server is set with **Allow only one copy of document in memory** enabled in the QlikView server control panel, the session will simply be terminated.

Client initiates refresh. If old data not kept in server or client too old, refresh will be performed automatically

This is the option to choose if you prefer to let the client initiate a refresh of data in the client when possible but will allow server to initiate a refresh automatically if necessary. When a new version of the document becomes available on the server, the client will be offered to refresh according to the preferences set under Client Refresh Initiation Mode below. If this is not possible, either because the client is too old (pre version 8) or if the server is set with **Allow only one copy of document in memory** enabled in the QlikView server control panel, the refresh will be performed automatically by the server.

Server performs refresh automatically, without client action

This is the option to choose if you prefer to always let the server initiate a refresh of data in the client automatically. When a new version of the document becomes available on the server, the data in the client will be refreshed.

Client Refresh Initiation Mode

This setting defines how the client should be notified of the availability of new data on the server and initiate a refresh. This setting is only valid when client initiated refresh has been selected in **Refresh Mode when Document is Updated on Server** above.

Indicate with toolbar button

The availability of new data is indicated by the **Refresh** button in the toolbar turning green and being enabled (and

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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the corresponding **File** menu command being enabled). The refresh is performed at a time of the user's choice by clicking the toolbar button or by means of the **File** menu **Refresh** command.

Prompt with dialog

In addition to the **Refresh** button in the toolbar turning green the availability of new data will be indicated by a prompt dialog. In the dialog the user may choose between immediate refresh or wait, in which case the refresh can be performed at any later time of the user's choice by clicking the toolbar button or by means of the **File** menu **Refresh** command.

Just do it, but tell the user it's happening

The refresh will be initiated as soon as the server indicates that new data is available. A dialog will be shown to indicate that the refresh is taking place.

Just do it

The refresh will be initiated as soon as the server indicates that new data is available. No dialog will be shown to indicate that the refresh is taking place. The user will experience a document "freeze" lasting from fractions of a second up to minutes depending on server settings and size of document.

QlikView Server Collaboration

The settings in this group make it possible to disable the clients' ability to create and share certain entities when running the document on QlikView Server. Please note that it is possible to disable all types of collaboration objects for all documents on a server by disabling the **Allow Server Collaboration** setting in the QlikView Server control panel. That setting overrides the settings below.

Allow Server Bookmarks

This check box must be enabled, if remote clients are to be allowed to create and share bookmarks with this document on the QlikView Server.

Allow Server Objects

This check box must be enabled, if remote clients are to be allowed to create and share sheet objects with this document on the QlikView Server.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Allow Server Reports

This check box must be enabled, if remote clients are to be allowed to create and share reports with this document on the QlikView Server.

QlikView Server Time-outs

If a document is published on a QlikView Server, it could be a good idea to set a maximum session time for security purposes and have the server terminate sessions that are inactive or too long. The settings at the bottom of this page allow you to do this on a document level. Hence, it is possible to have harder restrictions for documents with sensitive data than for other documents.

Corresponding settings are also found on the server side, valid for all published documents. The more restrictive of the two settings will be used.

Maximum Inactive Session Time (seconds)

This check box enables an inactive session time-out, i.e. that the server will terminate a session where the user has not clicked in a given time. The length of the inactive session time-out is set in seconds.

Maximum Total Session Time (seconds)

This check box enables a total session time-out, i.e. that the server will terminate a session after a given time, independently of whether the user has clicked or not. The length of the total session time-out is set in seconds.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.5 Variables

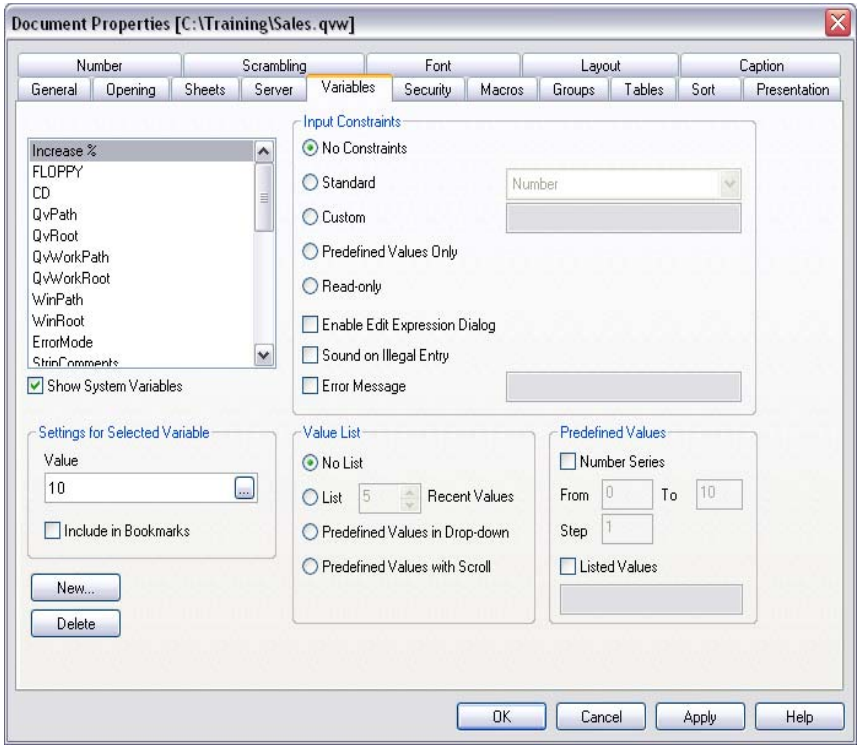


Figure 7. The Variables page in the Document Properties dialog

In this page settings can be made for the QlikView variables. For more information on variables, see page 353 in Book I.

Variables

Shows a list of all the variables in the current document. When a variable name in the list is selected the properties of that variable can be modified.

Show System Variables

If this check box is selected the system variables created by the script will be shown in the list.

Settings for Selected Variable

In this group you can make settings for a variable selected in the list above.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Value Shows the current value of the selected variable, which can also be edited.

Include in Bookmarks
Variables are normally not included in bookmarks. Select this check box if you want the variable to be included in bookmarks.

New Opens the **New Variable** dialog, where a new variable can be defined.

Delete Deletes the selected variable.

Input constraints
In the **Input constraints** group you can specify constraints against which all values entered by the user into an input box variable will be checked. If a value does not meet the constraints specified, it will be rejected and an error message may be shown.

No Constraints
As default no constraints are selected, i.e. all values can be entered into the variable.

Standard
Input values will be checked against one of a number of common standard constraints, which can be selected in the drop-down box. The standard constraints are: **Integer**, **Number**, **Positive Integer**, **Positive Number** and **Single Character**. As default no constraint at all is selected, i.e. any value can be entered into the variable.

Custom
Input values will be checked against a constraint formula specified by the user. The constraint is entered in the edit box and should be expressed as a QlikView expression returning true (a non-zero value) if the input value is acceptable. The input value is referenced as a dollar sign, $in the expression (Example: $>0 will cause the variable to accept only positive numbers). The previous value of the variable can be referenced by the variable name (Example: $>=abc+1 as a constraint on a variable named abc will accept only numeric entries with a value of the old value plus 1).

Predefined Values Only
Input values will be checked against a list of values defined in the **Predefined Values** group (see below). Only input values found in the list will be accepted.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Read-only

Marks the variable as read only. No values can be entered.

Enable Edit Expression Dialog

Mark this check box to enable expansion of the input box edit window to the full **Edit Expression** dialog by means of a **...** button.

Sound on Illegal Entry

If this check box is selected, QlikView will issue a sound warning when the user attempts to enter a value which falls outside of the constraints.

Error Message

Normally, if the user attempts to enter a value which falls outside of the constraints, it will just be rejected leaving the present variable value in place. By selecting this check box it is possible to specify an error message, which will be presented to the user in case of incorrect entries. The error message is typed in the corresponding edit box. It may be defined as a calculated formula (see page 439) for dynamic update.

Value List

In the **Value List** group you can specify constraints against which all values entered into a variable will be checked. If a value does not meet the constraints specified, it will be rejected and an error message may be shown.

No List

No list of values previously used in the variable is maintained. No drop-down with previous values or predefined values will be available to the user for the selected variable in input boxes.

List N Recent Values

A list of values previously used in the variable is maintained. A drop-down list with the most recently used values will be available to the user for the selected variable in the input box. The number of previous values to store can be set in the edit box.

Predefined Values in Drop-down

A drop-down list with predefined values (see **Predefined Values** below) will be available to the user for the selected variable in input boxes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Predefined Values with Scroll

A scroll control will be available to the user for the selected variable in input boxes. The scrolling will be made between the predefined values (see **Predefined Values** below).

Predefined Values

In the **Predefined Values** group you can specify a list of predefined values which can be presented to the user in a drop-down list in input boxes and/or used to define acceptable variable values.

Number Series

If this check box is selected a list of predefined numeric values will be generated based on a lower limit, an upper limit and a step value. This option can be used alone or in combination with **Listed values** (see below).

From Defines the lower limit for the number series. Must be a real number.

To Defines the higher limit for the number series. Must be a real number.

Step Defines the step between values in the number series. Must be a real number.

Listed Values

By selecting this check box it is possible to specify a list of arbitrary predefined values. The values can be numeric or alphanumeric. Alphanumeric values should be enclosed in quotes (e.g. 'abc'). Each value should be separated by a semicolon ; (e.g. 'abc';45;14.3;'xyz'). This option can be used alone or in combination with **Number series** (see above).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.6 Security

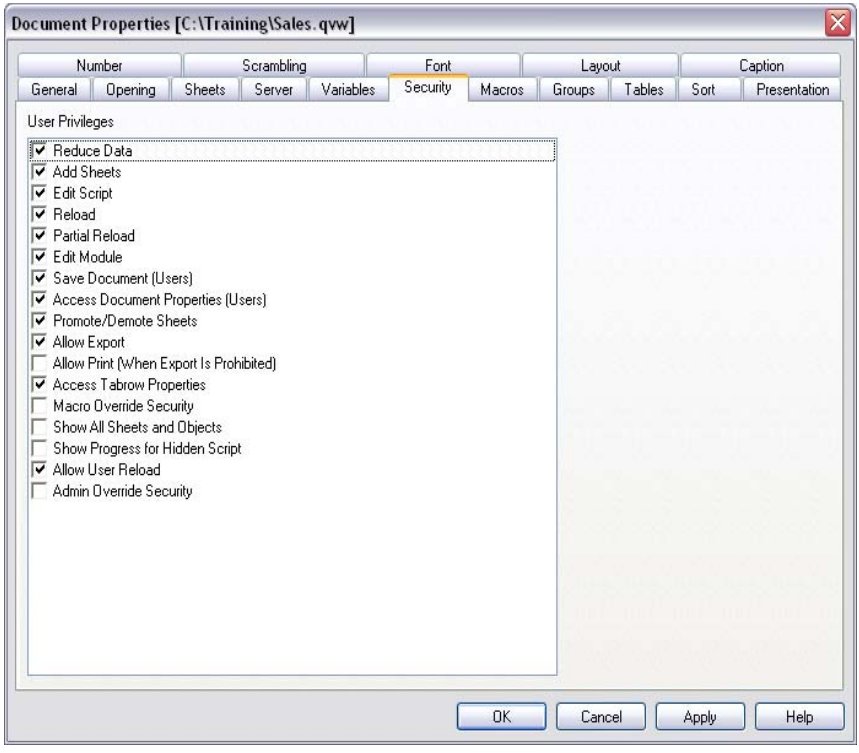


Figure 8. The Security page in the Document Properties dialog

This page is useful for documents with access restriction (for more information see page 515 and forward in Book I). By deselecting an option in the list, the ADMIN user inactivates that particular command, thus preventing unwanted changes. The **Security** page is not available for people with USER privileges. By default, all the options except **Macro Override Security, Show All Sheets and Objects** and **Admin Override Security** are selected, i.e. active.

Reduce Data

If this check box is left unchecked, the **Reduce Data** command in the **File** menu (see page 79 in Book I) becomes inactive.

Add Sheets

If this check box is left unchecked, the **Add Sheet** command in the **Layout** menu (see page 84 in Book I) becomes inactive.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Edit Script

If this check box is deselected, the **Edit Script** command in the **File** menu (see page 79 in Book I) and in the toolbar becomes inactive.

Reload

If this check box is deselected, the **Reload** command in the **File** menu (see page 79 in Book I) and in the toolbar becomes inactive.

Partial Reload

If this check box is deselected, the **Partial Reload** command in the **File** menu (see page 79 in Book I) becomes inactive.

Edit Module

If this check box is deselected, the **Edit Module** command in the **File** menu (see page 90 in Book I) becomes inactive.

Save Document (Users)

If this check box is deselected, the **Save** command in the **File** menu (see page 75 in Book I) becomes inactive for persons with USER privileges.

Access Document Properties (Users)

If this check box is deselected, the **Document Properties** command in the **Settings** menu (see page 87 in Book I) becomes inactive for persons with USER privileges.

Promote/Demote Sheets

If this check box is deselected the **Promote Sheet** and **Demote sheet** commands in the **Layout** menu (see page 84 in Book I) become inactive.

Allow Export

If this check box is deselected all **Export, Print** and **Copy to Clipboard** commands become unavailable.

Allow Print (When Export Is Prohibited)

Although the check box **Allow Export** above is deselected all **Print** commands remain available if this check box is selected.

Access Tabrow Properties

If this check box is deselected the **Tabrow Properties** (see page 85) can no longer be accessed.

Macro Override Security

If this check box is selected, it is possible to override all security settings by means of macros and commands via the Automation API.

Show All Sheets and Objects

If this check box is selected all conditional display of sheets and sheet objects is overruled, so that all sheets and sheet objects

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

become visible. This functionality can be toggled by pressing CTRL+SHIFT+S.

Show Progress for Hidden Script

If this check box is selected the script progress dialog will be shown also while executing hidden script.

Allow User Reload

If this check box is deselected ity will not be possible to reload the script when the document is opened in USER mode, even if the **Reload** check box above is selected..

Admin Override Security

If this check box is selected all security settings for the document and sheets will be disregarded while in ADMIN mode.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.7 Macros

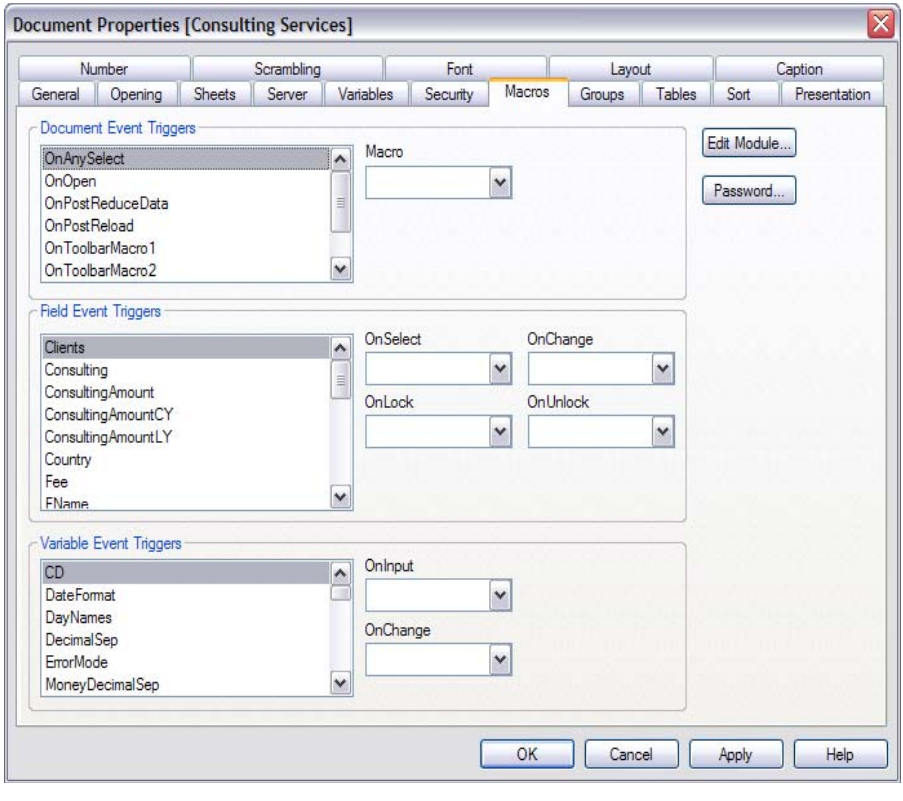


Figure 9. The Macros page in the Document Properties dialog

On the **Macros** page, you can set macros to be invoked on document events, variable events and field events, as well as for the toolbar macro buttons. For more information on macros, see “macros and automation” on page 295 ff.

Note There are limitations as to the behavior of certain macro triggers when working with documents on QlikView Server. Please study the special section "Considerations when using macros in QV documents on the QlikView Server" in the QlikView Server reference manual before designing server documents with macro triggers.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Document Event Triggers

In the **Document Event Triggers** group you can set macros to trigger on selected events in the document. You must select an event in the list before you can assign macros to it.

OnAnySelect

Select this event to assign a macro to be executed each time a selection has been made in any field of the QlikView document.

OnOpen

Select this event to assign a macro to be executed each time the QlikView document is opened.

OnPostReduceData

Select this event to assign a macro to be executed after each time the **Reduce Data** command has been executed.

OnPostReload

Select this event to assign a macro to be executed each time the script has been re-executed.

OnToolbarMacro1

Select this event to assign a macro to be executed when the predefined toolbar macro button 1 is depressed.



OnToolbarMacro2

Select this event to assign a macro to be executed when the predefined toolbar macro button 2 is depressed.



OnToolbarMacro3

Select this event to assign a macro to be executed when the predefined toolbar macro button 3 is depressed.



Macro

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the selected document event occurs.

Field Event Triggers

In the **Field Event Triggers** group you can set macros to trigger on changes in the logical state of a specified field in the document. You must first select a field in the list before you may assign macros to trigger on events in it.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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OnSelect

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time a selection has been made in the specified field.

OnLock

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the field is locked.

OnChange

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time a selection has been made in any field which is logically associated with the specified field.

OnUnlock

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the field is unlocked.

Variable Event Triggers

In the **Variable Event Triggers** group you can set macros to trigger on changes in the contents of a specified variable in the document. You must first select a variable in the list before you may assign macros to trigger on events in it.

OnInput

In this drop-down list you can select from existing macro names or type any name which you later create a macro for in the **Edit Module** dialog. The macro (if it exists) will be executed each time a new value is directly entered in the selected variable

OnChange

In this drop-down list you can select from existing macro names or type any name which you later create a macro for in the **Edit Module** dialog. The macro (if it exists) will be executed each time the value of the selected variable changes as a result of changes in other variables or the logi-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



cal state of the document. This typically applies when the variable contains a formula.

Edit Module

By clicking on this button the **Edit Module** dialog is opened (see further on page 299).

Password

Allows you to set a password for entering the **Edit Module** dialog. To change the password, click the **Password** button again. After entering the password, the **Module Password** dialog is opened and the password can be reset. The password cannot be removed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.8 Groups

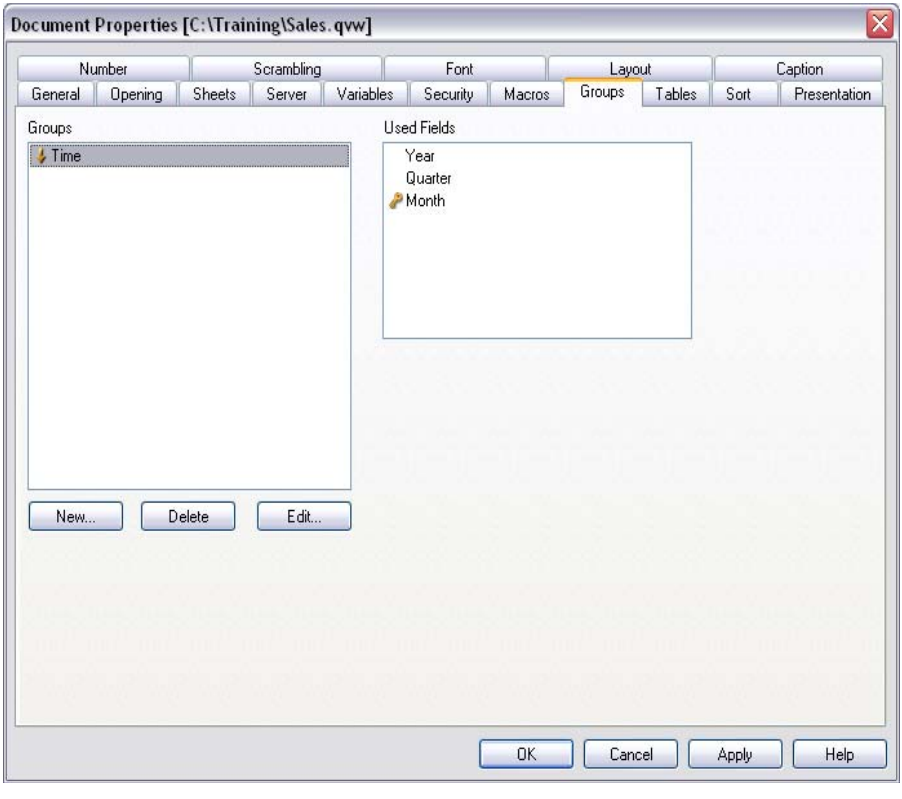


Figure 10. The Groups page in the Document Properties dialog

In this page it is possible to create drill-down or cyclic field groups. For more information on how to use groups, see page 441.

A list shows all groups in the document. An icon to the left of each group name indicates whether it is a drill-down group or a cyclic group. A group can be selected by clicking in the list. The selected groups are shown in the **Used Fields** area.

New Clicking this button opens the **Group Settings** dialog where you define a new field group. Select the fields to include in the group from the list appearing under **Available Fields**.

Delete Deletes the selected group.

Edit Opens the **Group Settings** dialog for the selected group.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Group Settings dialog

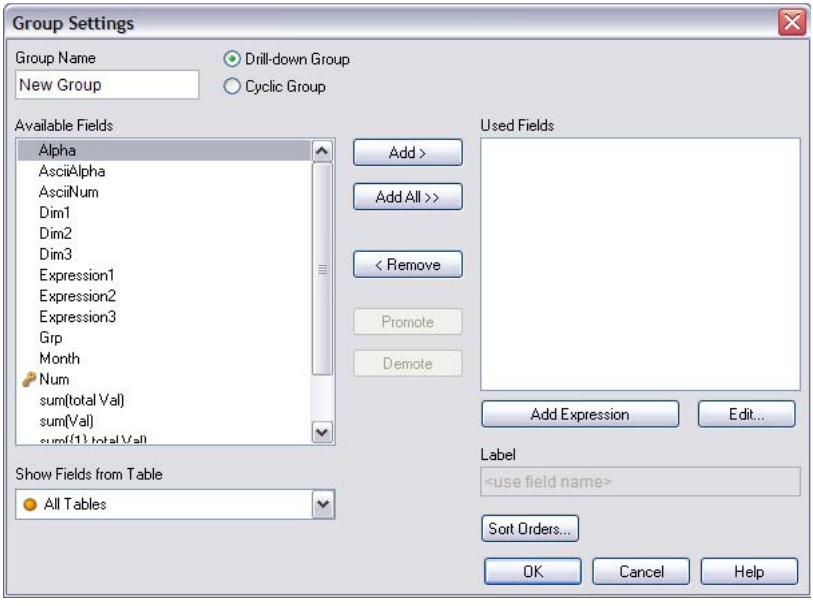


Figure 11. The Group Settings dialog

Group Name

Change the name by entering the name you would like to attribute to your field group.

Drill-down Group

Select this option to create the group as a drill-down group.

Cyclic Group

Select this option to create the group as a cyclic group.

Available Fields

Available fields are listed in this column. Select the fields you wish to include in your group.

Used Fields

Fields included in the current group are listed in this column. Initially this column is empty.

Add > Moves the selected fields from the column of available fields to the column of used fields.

Add All >>

Moves all the fields in the column of available fields to the column of used fields.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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< Remove

Moves the selected fields listed in the column of used fields to the column of available fields.

Select the fields to be used/removed by clicking them. Use the **Add >** or the **< Remove** button to move them to the desired column.

Promote

Moves the selected field one step further up in the list of used fields.

Demote

Moves the selected field one step further down in the list of used fields.

Add Expression

Opens the **Edit Expression** dialog for easy editing of long formulas.

Edit

Opens the **Edit Expression** dialog for editing the selected formula in the **Used Fields** area.

Label An alternative name for the displayed field can be entered here. It will be used as dimension name in the chart. The label may be defined as a calculated formula (see page 439) for dynamic update.

Sort Orders...

Clicking on this button opens the **Group Sort Orders** dialog in which a separate sort order can be set for each field in the group.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.9 Tables

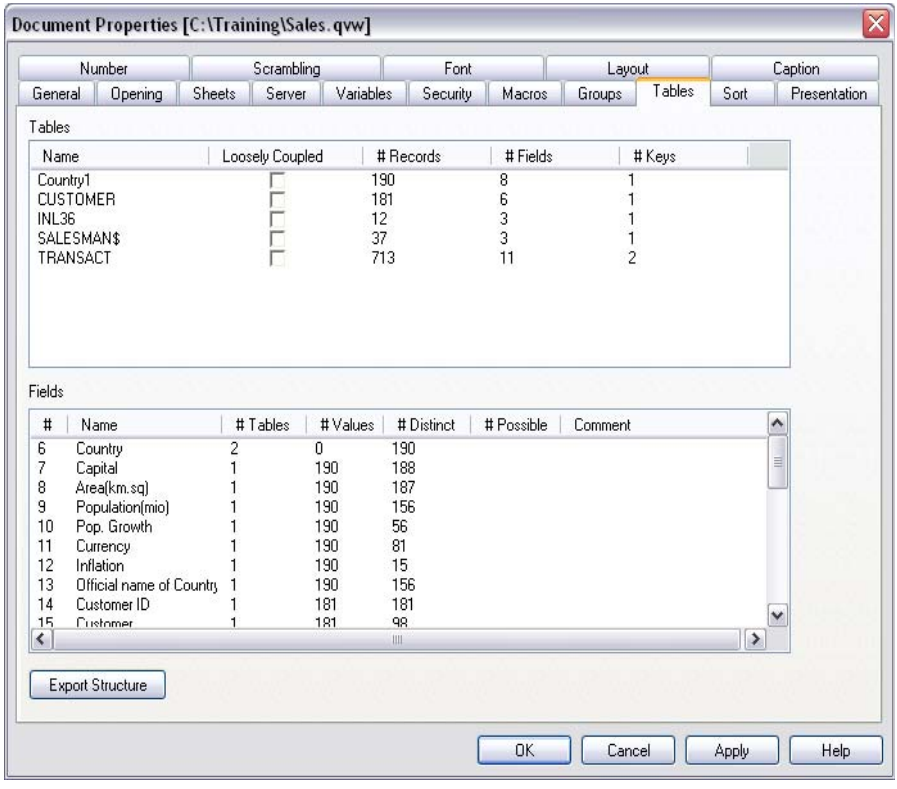


Figure 12. The Tables page in the Document Properties dialog

This page shows two lists. The **Tables** list at the top shows all input tables of the QlikView document. The columns are as follows:

Name The name of the input table

Loosely Coupled

In this list you see all tables of the QlikView document. One or more of the tables can be made loosely coupled by marking the check box to the left of the table name. A loosely coupled table is one where the normal QlikView associative logic has been disconnected internally. This means that selections in one field do not propagate through to the other fields in the table. This can e.g. be useful for avoiding circular references in the data structure. For more exam-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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ples of how this feature can be used, please see “Loosely Coupled Tables” on page 159 in Book I.

Records
The number of records (rows) in the input table.

Fields
The number of fields (columns) in the input table.

Keys
The number of fields (columns) in the input table which are keys, i.e. appear also in other input tables.

The list can be sorted on any column by clicking on the column header. You may also select a specific sheet by clicking on it in the list.

The **Fields** list at the bottom of the page shows all fields of the QlikView document or, if one input table has been selected in the list above, the fields of that table. The columns are as follows:

The internal number of the fields. Numbers 0 to 5 are used for the QlikView system fields, which are not shown in the list.

Name The name of the field.

Tables
The number of tables in which the field appears.

Values
The total number of values in the field, disregarding selections. This value is not defined for certain key fields (see “Frequency Information in Associating Fields” on page 470 in Book I).

Distinct
The total number of values in the field, disregarding selections.

Possible
The current number of possible (non-excluded by selections) values in the field.

Comment
Shows an indicator for any special status of the field, such as Semantic, AndMode, AlwaysOneSelected, Info, Locked or Hidden. (See “HidePrefix” and “HideSuffix” on page 355 in Book I).

The list can be sorted on any column by clicking on the column header.

Export Structure
By pressing this button you can export the table structure of the document to a set of text files. These text files, one for the tables (*filename*.Tables.tab), one for the fields (*filename*.Fields.tab) and one for mapping in between (*filename*.Mappings.tab) can easily be read

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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back into QlikView for further analysis with the full power of the QlikView logic. A dialog will appear where you can choose the target folder for the export. The default is to put the files in the same folder as the QlikView document.

Tables can be made loosely coupled interactively from this dialog or via macros. There is however also a possibility to declare loosely coupled tables explicitly in the script via the **Loosen Table** script statement (see page 327 in Book I). Tables declared as loosely coupled by such a script statement will behave somewhat differently from those made loosely coupled interactively. The **Loosen Table** script statement will prevent the formation of synthetic keys in the table and the loosely coupled status of that table will not be possible to change interactively via this dialog.

As long as the fields in the document remain the same after script execution, the settings for loosely coupled tables made interactively will survive reload. If any changes occur in the field set as a result of script execution, all settings for loosely coupled tables made before the script execution will be disregarded.

When QlikView finds circular references in the data structure which cannot be broken by tables declared loosely coupled interactively or explicitly in the script one or more additional table will be forced loosely coupled until no circular references remain. When this happens you will be warned by the **Loop Warning** dialog. This will also occur if you attempt to change the loosely coupled setting of a table interactively, thereby creating a circular reference.

Note Making one or more tables loosely coupled can radically change the behavior of your document. Use this feature only when you understand what you are doing!

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.10 Sort

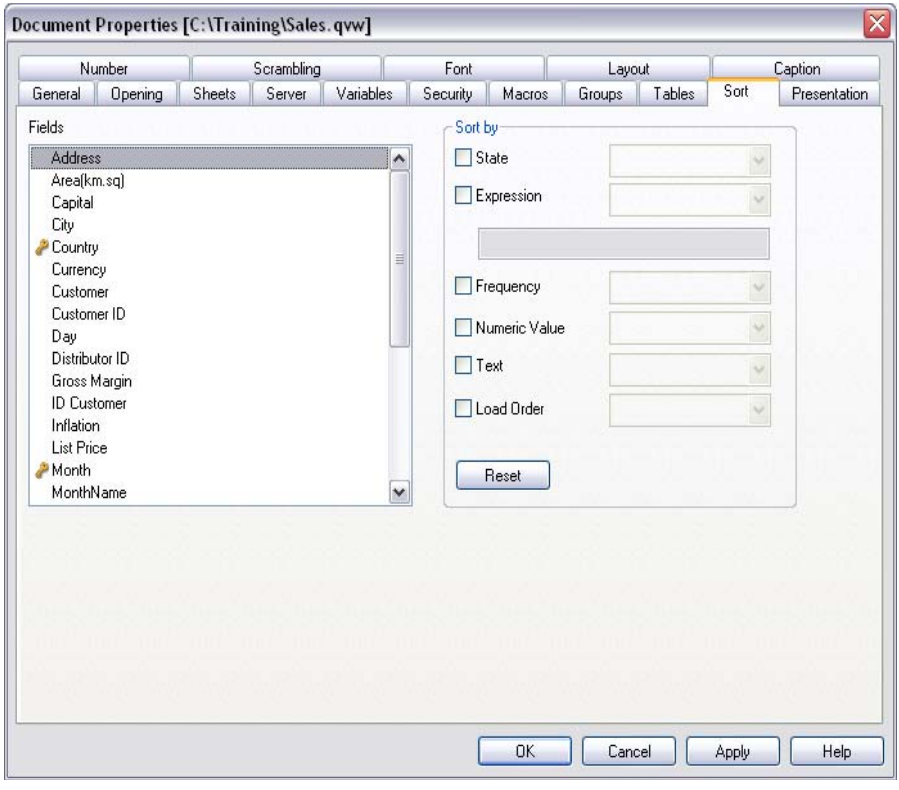


Figure 13. The Sort page in the Document Properties dialog

In this page it is possible to set the default sort order of the fields. The settings are used when creating new sheet objects.

Fields In this group it is possible to select one or several fields for which the sort order is to be set.

Sort by In this group, the default sort order of the field values in the sheet objects can be set. Changes made in this group will affect fields in sheet objects created after the change. Previously created sheet objects will not be affected.

State Sorts the field values according to their logical state (selected, optional, or excluded).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Expression
Sorts the field values according to the expression entered into the text edit box below this sort option.

Frequency
Sorts the field values by frequency (number of occurrences in the table).

Numeric Value
Sorts the field values by their numeric values.

Text Sorts the field values in alphabetical order.

Load order
Sorts the field values by the initial load order.

Reset Sets the default sort order.

The order of priority is **State**, **Expression**, **Frequency**, **Numeric Value**, **Text** and **Load Order**. Each of these sort criteria can be set to ascending or descending.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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1.11 Presentation

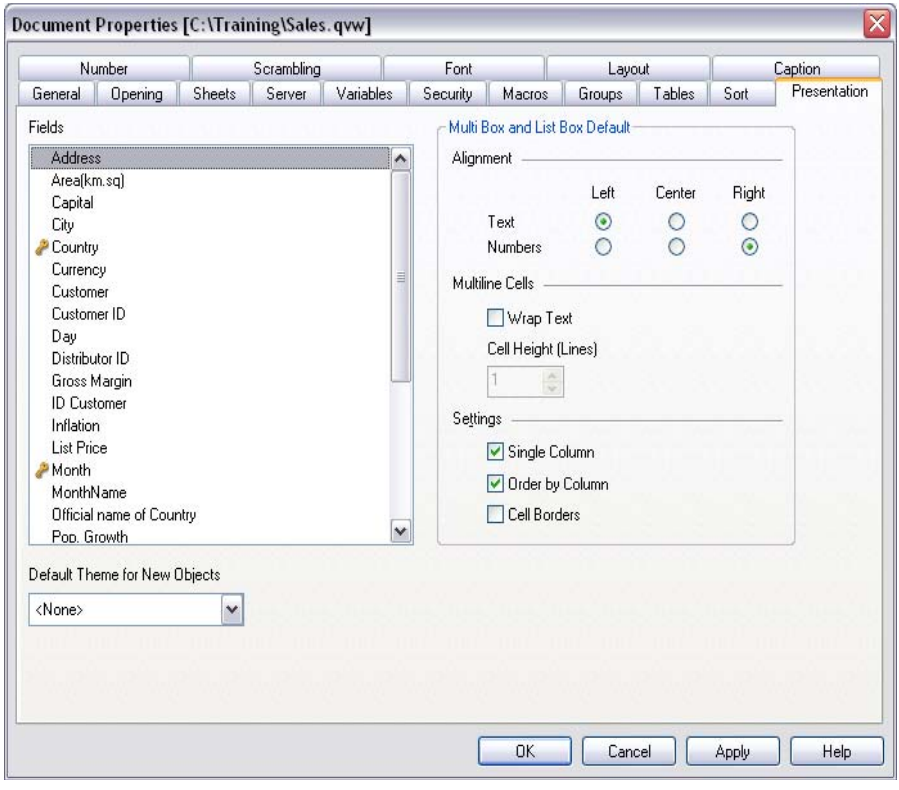


Figure 14. The Presentation page in the Document Properties dialog

In this page it is possible to set the default presentation settings of the field values, which are used when creating new list boxes and when opening multi boxes.

Fields In this group you select one or several fields for which the different properties are to be set.

Multi Box and List Box Default

Alignment

In this group, the default alignment of your field values can be set. **Text** and **Numbers** can be individually set to left-adjusted, centered or right-adjusted. Changes made in this group will affect fields in sheet objects created after the change. Furthermore, they will affect lists in multi boxes

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

when these are opened. Previously created sheet objects, however, are not affected.

Multiline Cells

In this group you can set the default display of multiple line cells for the selected fields.

Wrap Text

If this check box is marked, the contents of the cell will be wrapped in two or more lines.

Cell Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the cell should have.

Single Column

Marking this check box will force single column mode.

Order by Column

If this check box is marked, a multiple column presentation will be ordered by columns instead of rows.

Cell Borders

Mark this check box to get horizontal border lines between the different field values in the selected fields.

Default Theme for New Objects

Here you may select a QlikView theme which will be applied to all newly created sheets and sheet objects in the document. The selected theme must be accessible from disc at all times in order to be used. It is also important that the theme used is defined for all types of objects that may occur in a QlikView document. At the bottom of the drop-down list there is a **Browse...** command in case your theme resides in another location than in the default QlikView theme catalog. If no default theme is used, each new sheet object will inherit the properties of the last created or changed object.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.12 Number

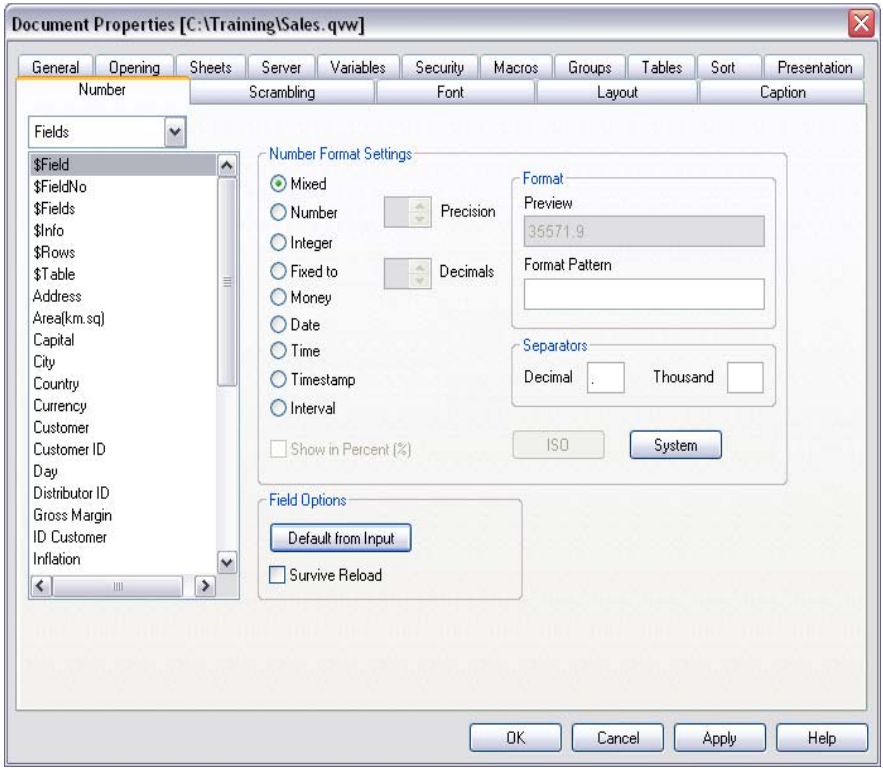


Figure 15. The Number page in the Document Properties dialog

This page is used to set the default number format for fields and variables in the QlikView document.

The list to the left shows either all **Fields** or all **Variables** depending on your selection in the drop-down box above. Select one or more fields/variables and then use the number format controls to set the desired number format.

Some of the number format controls - collected in the **Field Options** group - only apply to fields.

For an explanation of each of the number format controls, see page 285.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.13 Scrambling

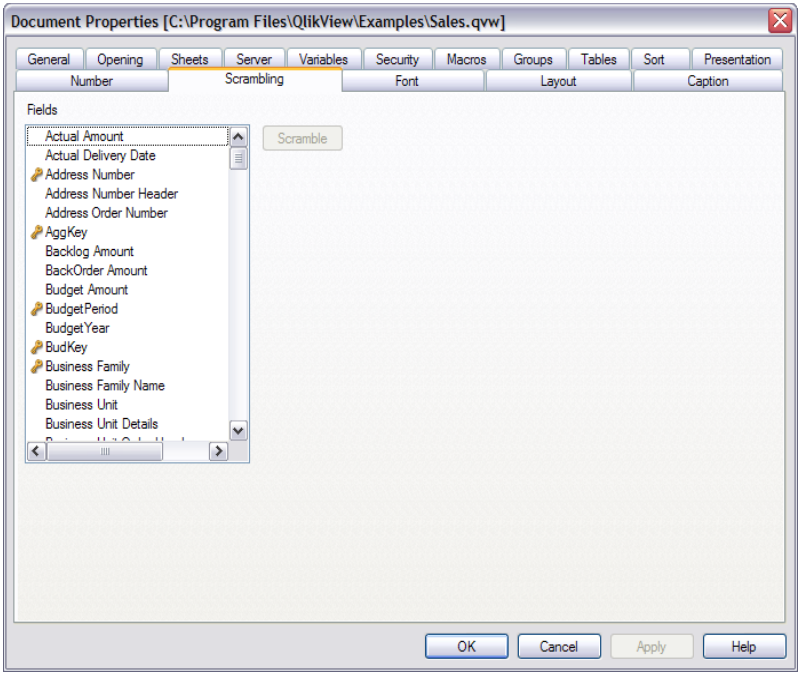


Figure 16. The Scrambling page of the Document Properties dialog.

This page is only available when working with a QlikView document in ADMIN mode. It provides the possibility to scramble the data in one or more fields.

Fields This is a list of all fields in the document. Select one or more fields for scrambling.

Scramble

Press this button to perform a random scrambling of the contents of selected field(s). Numbers are scrambled to numbers and text to text (spaces are kept). Once scrambled, the data cannot be recreated in its original form by QlikTech or anyone else. If you reexecute the script, the scrambling will however be lost.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.14 Font

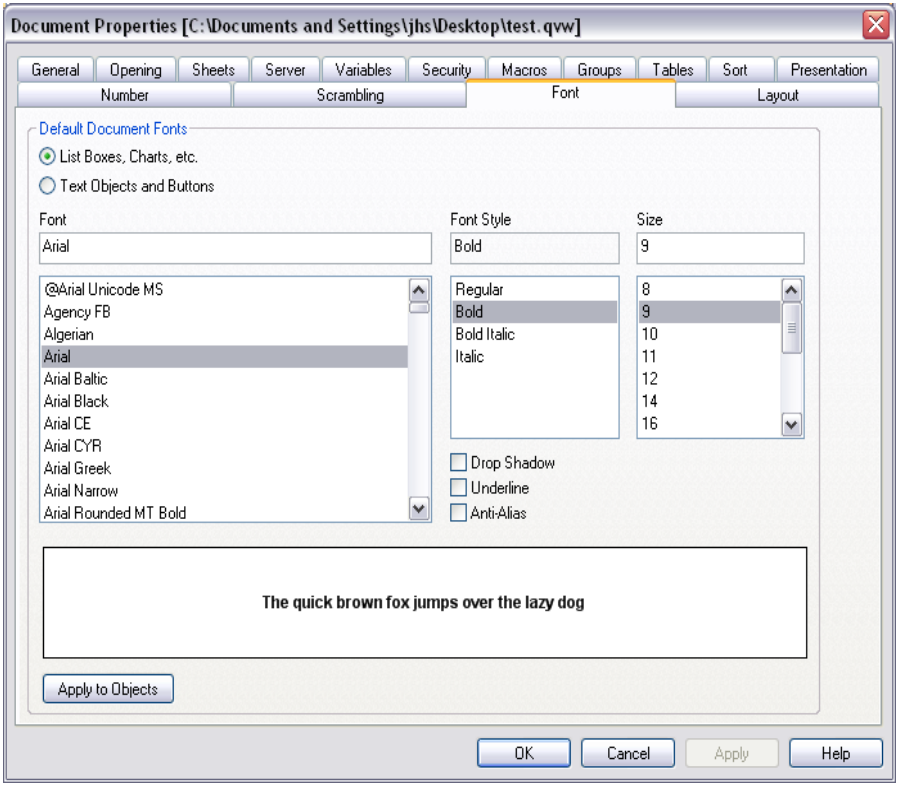


Figure 17. The Font page in the Document Properties dialog

In the **Font** page, you can change one or both of the default fonts of the document. The first default font is used for most objects, including list boxes and charts. The second default font is used for buttons and text boxes, which are objects that usually need a larger font. The fonts chosen will be used for all new objects.

Drop Shadow

If this check box is marked a drop shadow will be added to the text.

Underline

If this check box is marked the text will be underlined.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Anti-Alias

If this check box is marked anti-aliasing will be applied to the text, making it fit more smoothly with the background. This option may degrade drawing speed on very slow computers.

By using the **Apply to Objects** button, you can also set the font of all the sheet objects in the document at one single time. The font chosen will be applied to all text contained in all sheet objects except where overridden by table styles.

1.15 Layout

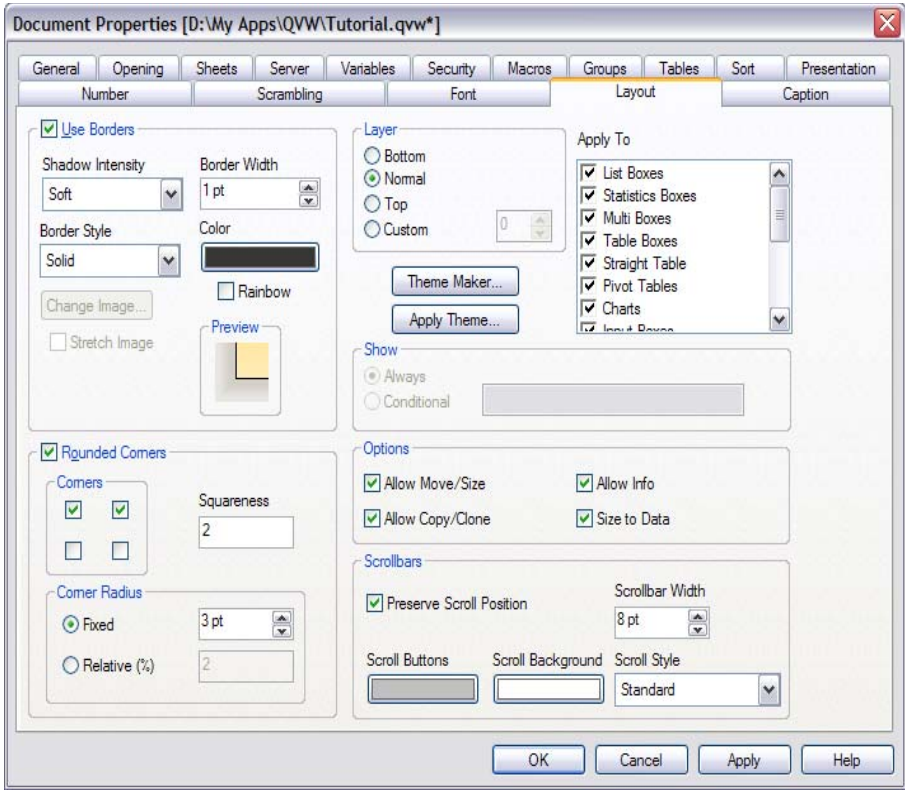


Figure 18. The Layout page in the Document Properties dialog

In the **Layout** page you can specify how the sheet objects should appear on the layout. This includes settings for shape, border and the layer on which they should

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

reside. When changing settings on this page they will apply to all sheet objects in the document.

Use Borders

Mark this check box in order to use a border around the sheet object. You specify the type of border by selecting in the drop-down menu. The **Shadow Intensity** drop-down menu makes it possible to set the intensity of the shadow that surrounds the sheet objects. There is also the choice of **No Shadow**.

Border Width

Here you can set the width of the border. Available for all border types. When setting the width of image borders, make sure the width corresponds to the corner width defined in the image. The width can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Border Style

There are the following predefined border types:

Solid A solid unicolored border.

Depressed
Border giving the impression of depressing the sheet object from the background.

Raised Border giving the impression of raising the sheet object from the background.

Walled Border giving the impression of a wall around the sheet object.

Image Border specified by custom image.

Change Image

If the **Image** border type is selected, you can click this button to set the image you wish to use.

Stretch Image

If the **Image** border type is used and this check box is marked, the image pattern will be stretched out to fit to the entire space between the corners. If it is not marked, as many copies as possible of the pattern will be displayed, tiled.

Most of the border types can be specified further with the help of the following settings:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Color Click this button to open a dialog in which you can choose an appropriate base color from the color palette for all border types except **Image**.

Rainbow

Creates a rainbow colored border for all border types except **Image**. The rainbow will start with the selected base color on top of the sheet object.

When **Simplified** is the chosen **Styling Mode**, there is no choice of border type, there is only the **Shadow Intensity** drop-down menu and the **Border Width** setting.

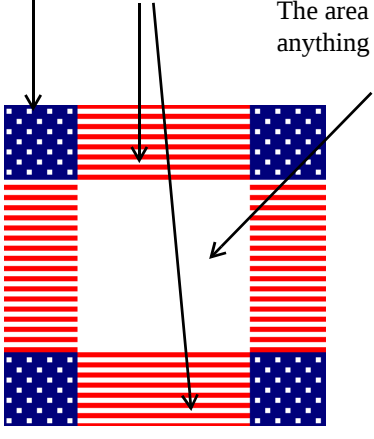
Example of an image border definition file:

An image border is defined by a single image file containing the following elements:

The four corners must form a square of pixels. In the case below each corner is 15 pixels by 15 pixels. The corners may be identical or different, but must all be drawn separately.

The areas between the corners describe the top, bottom, left and right borders between the corners. You only need to define a minimum of pixels which are then extended to fill the space needed by means of stretching or repeating the pattern. See **Stretch image** above.

The area in the middle has no function and may contain anything or nothing.



The number of pixels in the corner square must be correctly stated in the **Width** box above if the border is to come out correctly. It is good practice to name the file in a way that lets the user know about its parameters, e.g. StarsStripes_15_stretch.bmp.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Rounded Corners

In the **Rounded corners** group, settings can be made for the general shape of the sheet object. If the check box is marked, it is possible to use rounded shapes for the corners of the sheet object. It is possible to achieve shapes from rectangular via super elliptic to elliptic/circular.

Corners

By marking each of these four check boxes the rounding options are turned on for the respective corners of the sheet object. Corners for which the check box remain unmarked will be drawn rectangular.

Squareness

A number between 2 and 100 setting the general shape of the rounded corners. The number 2 corresponds to a perfect ellipse (or circle for a 1:1 aspect ratio) whereas higher numbers move over super elliptic shapes towards a rectangle.

Corner Radius

This setting determines the radius of the corners in fixed distance or as a percent of the total quadrant. This setting lets you control the extent to which the corners will be affected by the underlying general shape set under **Squareness**. A fixed distance can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Layer In the **Layer** group, all the sheet objects in the document can be assigned one of three layers on the sheet.

Bottom A sheet object with the **Bottom** layer property can never obscure sheet objects in the **Normal** and **Top** layers. It can only be placed on top of other sheet objects in the **Bottom** layer.

Normal When created, sheet objects reside in the normal (middle) layer. A sheet object in the **Normal** layer can never be obscured by sheet objects in the **Bottom** layer and can never obscure sheet objects in the **Top** layer.

Top A sheet object in the **Top** layer can never be obscured by sheet objects in the **Normal** and **Bottom** layers. Only other sheet objects in the **Top** layer can be placed on top of it.

Custom

The **Top**, **Normal** and **Bottom** layers correspond to internally numbered layers 1, 0 and -1 respectively. In fact all

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

values between -127 and 127 are accepted. Choose this option to enter a value of your choice.

Apply To

In the **Apply To** scroll list you mark the types of sheet objects to which the current settings should be applied.

Theme Maker...

Opens the **Theme Maker** dialog (see page 259) for definition of layout themes.

Apply Theme...

Opens a file browser dialog for opening a QlikView layout theme file to be applied to the document. See page 259 for more information on QlikView layout themes.

Show In the **Show** group, it is possible to specify a condition under which all the sheet objects are to be shown.

Always The sheet objects will always be shown.

Conditional

The sheet objects will be shown or hidden depending on a condition expression which will be evaluated each time the sheet objects are to be drawn. The sheet objects will only be visible when the condition returns true. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas (see page 439).

Options

In the **Options** group, it is possible to disallow moving/resizing of the sheet object.

Allow Move/Size

If this check box is deselected it will become impossible for the user to move or resize the sheet object.

Allow Copy/Clone

If this check box is deselected it will become impossible for the user to copy or clone the sheet object. Note that sheet objects can only be copied/cloned by users of QlikView Developer and QlikView Professional.

Allow Info

By default, an info icon will appear in the top right corner of the sheet object if information is linked to the selected field value. Deselect this check box if you do not wish the icon to be displayed. This option is available only for list and multi boxes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Size to Data

Normally the borders around all table sheet objects in QlikView will shrink when selections cause the size of the table to be less than allocated size for the sheet object. By deselecting this check box this automatic adjustment of size will be turned off leaving any surplus space blank.

Scroll bars

In this group you can set the appearance of scroll bars in the QlikView sheet object.

Scroll Background

Sets the scroll bar background color. Select a color by clicking the button. Note that medium gray tones often render the best results for scroll bars.

Scroll Buttons

Sets the scroll button color. Select a color by clicking the button. Note that medium gray tones often render the best results for scroll bars.

Scroll Bar Width

Sets the scroll bar width. The width can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Scroll Style

Sets the scroll bar style. Select a style in the drop-down control. The **Classic** scroll bar style corresponds to QlikView 4/5 scroll bars. The **Standard** scroll bar style gives a more modern look. The third style is **Light**, which is a thinner, lighter bar.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.16 Caption

Caption

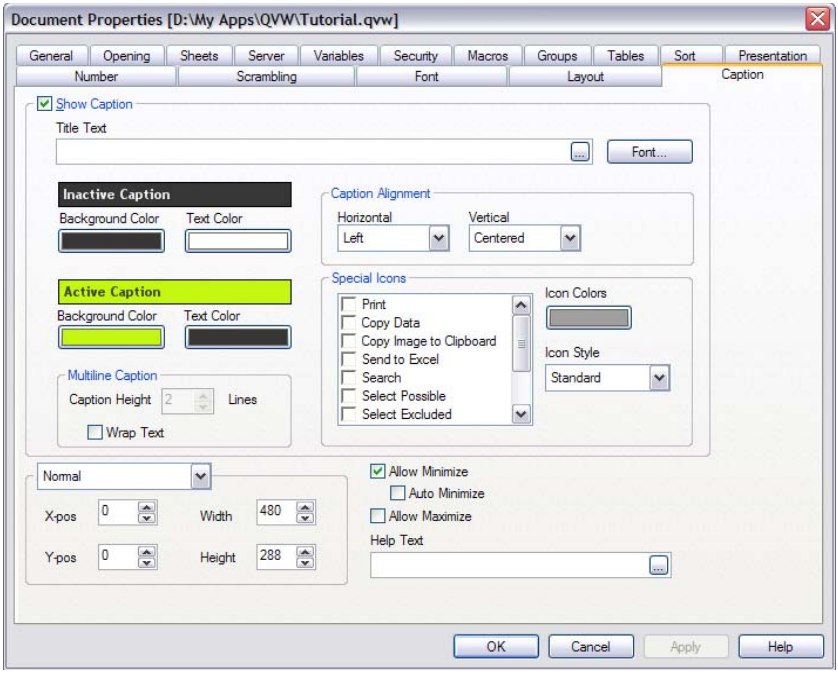


Figure 19. The Caption page in the Document Properties dialog

In the **Caption** page, advanced settings can be made for the caption. Background and foreground text color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction.

Show Caption

If this check box is marked, a caption will be drawn at the top of the sheet object. List boxes and other "box objects" will have caption turned on by default, whereas buttons, text areas and line/arrow objects will have it turned off.

Font Opens the **Font Dialog** where you may set the font used in the caption.

Title Text

The text to be displayed in the sheet object caption. This setting is identical to the **Windows Title** setting found in the **General** page of

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

the properties dialogs of a number of sheet objects. However, for objects such as the text objects, this is the only place where the caption text can be edited. The **Font...** button opens the **Font Dialog** where the font of the caption text an be set.

Inactive Caption / Active Caption

In this group you can set the colors of the caption in its different states. A preview pane shows the current settings of the selected state.

Background Color

Sets the background color. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the color button.

Text Color

Click the colored button to select a color.

Multiline Caption

In this group you can specify multiple line captions.

Caption Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the caption should have.

Wrap Text

If this check box is marked, the caption will be wrapped in two or more lines.

Normal/Minimized Size/Position

In this group you can set exact pixel size and position of the QlikView sheet object in its normal or minimized state. Select state in the drop-down control.

X-pos Sets the horizontal position of the left side of the sheet object in relation to the sheet's left edge. The setting is made in pixels.

Y-pos Sets the vertical position of the top side of the sheet object in relation to the sheet's upper edge. The setting is made in pixels.

Width Sets the width of the QlikView sheet object in pixels.

Height Sets the height of the QlikView sheet object in pixels.

Caption Alignment

In this group you set text alignment for caption text.

Horizontal

Sets the horizontal alignment of the caption text. The options are **Left**, **Center** and **Right**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Vertical

Sets the vertical alignment of the caption text. The options are **Top**, **Center** and **Bottom**. This setting is only relevant when **Multiline Caption** is used.

Special Icons

Many of the object menu commands of the sheet objects can be configured as caption icons. Select commands to be shown as caption icons by marking the check box to the left of each command in the list.

Icon Colors

Sets the background color of the caption icons. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the color button. This setting applies to all icons in the sheet object, not only the special caption icons.

Icon Style

Sets the icon style. Select a style in the drop-down control. This setting applies to all icons in the sheet object, not only the special caption icons.

Note Use the special caption icons with care. One or two of them may provide great help for the end-user while too many may create a “Christmas tree” that severely degrades usability.

Allow Minimize

If this check box is marked, it is possible to turn the sheet object into an icon. The minimize icon will appear in the sheet object caption.

Auto Minimize

This setting, which makes it possible to toggle between sheet objects, should be applied to several sheet objects (preferably positioned on top of each other) on one and the same sheet. Only one of the sheet objects will have its full size at any given time: as soon as you restore a minimized sheet object with auto minimize set, all other sheet objects with auto minimize set will turn into icons. This option is designed mainly for charts and tables, but may be applied to all sheet objects except buttons, text objects and line/arrow objects.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Allow Maximize

If this check box is marked, it is possible to enlarge the sheet object to fill the sheet. The maximize icon will appear in the sheet object caption.

Help Text

Opens a text box in which you can type an optional help message. The text will be displayed when you position the cursor on the help icon in the top right corner of the sheet object. The text may be a calculated formula. This option is not available on document level.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

2 THE SHEET

A QlikView document can have one or several sheets on which the sheet objects are placed. Each sheet can contain many sheet objects. The sheets have no connection with the logic - if two fields are logically connected, it does not matter if they are put on the same sheet or on different sheets. The logical result when making selections will still be the same.

2.1 Creation

New sheets are created by choosing **Add Sheet** from the **Layout** menu or by clicking the **Add Sheet** button in the toolbar.



2.2 Navigation

All sheets have tabs attached to them on which the sheet name is printed. By clicking on a tab, one activates the sheet attached to it. If the **Sheets** toolbar is active you may also activate a sheet by selecting it in the toolbar drop-down.

By right-clicking on a tab you open a float menu containing the following commands:

Tabrow Properties...
: Opens a dialog in which you can choose a font for the tab. Only Truetype fonts may be used. See further on page 85.

Sheet Properties...
: Selects the sheet and opens the **Sheet Properties** dialog. Here sheet specific parameters such as the sheet background, the fields to display, the default font and the object look etc. can be specified. This alternative is only available when clicking on the tab belonging to the currently active sheet.

Promote (<-) Tab
: Moves the tab one step further to the left.

Demote (->) Tab
: Moves the tab one step further to the right.

Help Opens context-specific help.

Remove
: Makes the sheet active, then removes it.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If the tab on which you click belongs to a sheet that is currently active, the float menu also contains the commands **Select fields...** and **New sheet object**. For a description of these commands, see below.

On the sheet tabs you can sometimes see selection indicators, small beacons that will guide you to the selections made. These are shown on the tabs of hidden sheets on which you can see selections that are not visible on the active sheet.

2.3 Object Menu for Sheets

By clicking with the right mouse button on the sheet, you open the sheet **Object menu**.

Properties...

Opens the **Sheet Properties** dialog. Here sheet specific parameters such as the sheet background, the fields to display, the default font, the object look etc. can be specified.

Select Fields...



Opens the **Fields** page in the **Sheet Properties** dialog, where you can specify the fields you wish to display as list boxes on the sheet.

New Sheet Object

A cascade menu in which any of the sheet objects can be chosen. A wizard, that helps you create the chosen object, will open. The option **System Table** at the bottom of the cascade menu creates a system pivot table showing the relation of fields and logical tables in the current document.

Copy Sheet

Makes a complete copy of the entire sheet with all its sheet objects. The copy will be named “Copy of *Sheetname*“ and be positioned as the last sheet in the document.

Paste Sheet Object

Pastes a sheet object, previously copied to clipboard on the sheet. Equivalent to the keyboard shortcut CTRL+V.

Print...

Opens the **Print** dialog.

Copy Image to Clipboard

Copies an image of the sheet to the clipboard. The tabrow, the menu bar, the toolbars and the status bar will not be included.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Export Image to File
Opens a dialog for saving an image of the current sheet to file. The image can be saved as bmp, jpg, gif or png.

Help Opens context-specific help.

Remove
Removes the active sheet.

2.4 Sheet Properties



The sheet properties are set in the **Sheet Properties** dialog, which is opened either by choosing **Properties** from the sheet **Object** menu or by choosing **Sheet Properties** from the **Settings** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

General

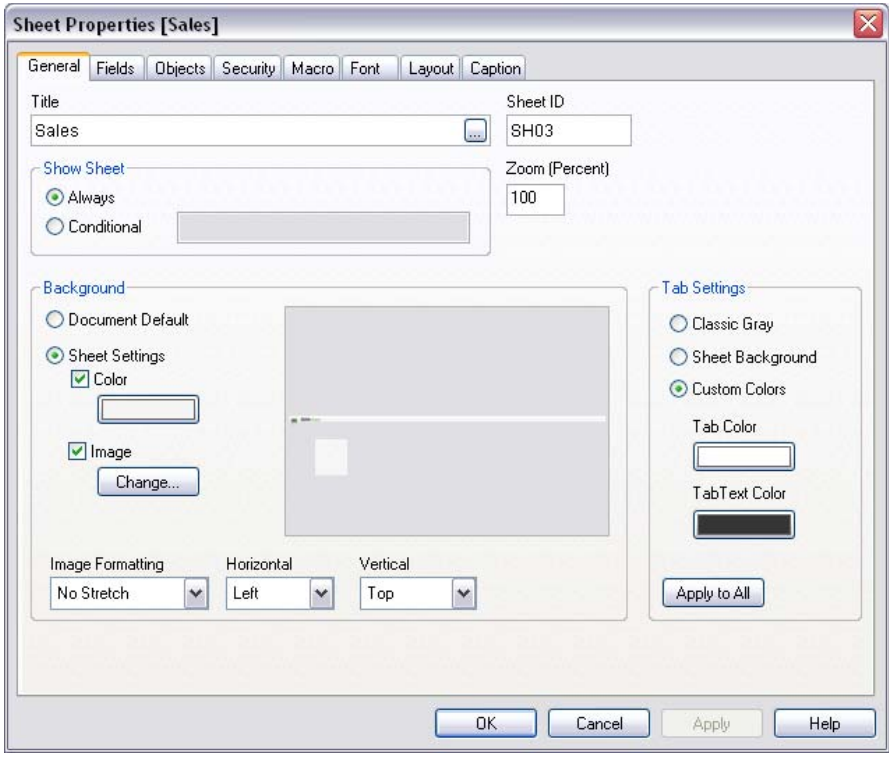


Figure 20. The General page in the Sheet Properties dialog

On the **General** page of the **Sheet Properties** dialog general settings (title, background color etc.) for the sheet are made.

Title Sets the title for the sheet. This name will be shown on the sheet tab. The title may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Sheet ID

The unique ID of the sheet. Upon creation, every sheet is assigned a unique ID for control via Automation. The first sheet of a document will be assigned the ID SH01. A sheet ID may be changed to any other string that is currently not used as ID for any other sheet, sheet object or bookmark in the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Show Sheet

In the **Show Sheet** group, it is possible to specify a condition under which the sheet is shown.

Always

The sheet will always be shown.

Conditional

The sheet will be shown or hidden depending on a condition expression which will be evaluated continuously depending on selections etc. The sheet will only be visible when the condition expression returns true.

When all sheets in a document are disabled due to show conditions, a message "No sheets available" will be displayed. Users with ADMIN privileges for the document can override all show conditions with the **Show All Sheets and Sheet Objects** in the **Security** page of **Document Properties** (see page 39). This functionality can be toggled by pressing CTRL+SHIFT+S.

Zoom The current zoom factor for the sheet in percent. The value must be an integer between 25 and 400.

Background

In the **Background** group, it is possible to set a background for the sheet.

Document Default

Select this option to use the background set in the **General** page of the **Document Properties** dialog.

Sheet Settings

Select this option to use a separate background for the sheet

Color Select this option to apply a specific background color to the current sheet. The color can be defined as a solid color or a gradient via the **Color Area** dialog (see page 23) that opens when clicking the button.

Image Mark this check box to set a background image, a wallpaper, for the sheet. Click the **Change** button to select the wallpaper.

Change

Opens the **Select Wallpaper** dialog, where it is possible to select an image (bmp, jpg, jpeg or png) file to be shown as wallpaper.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Image Formatting

Sets properties for image formatting when image background is used.

No Stretch

If this option is selected, the image will be shown as is, without any stretching. This may cause parts of the picture to be invisible or only part of the sheet to be filled.

Fill If this option is selected, the image will be stretched to fit the sheet without bothering about keeping the aspect ratio of the image.

Keep Aspect

If this option is selected, the image will be stretched as far as possible to fill the sheet while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the image will be stretched to fill the sheet in both directions while keeping the aspect ratio. This typically results in cropping of the image in one direction.

Tile If this option is selected, the image will be tiled as many times as space allows.

Horizontal

Sets horizontal alignment for image when image background is used.

Vertical

Sets vertical alignment when image background is used.

Tab Settings

In the **Tab Settings** group it is possible to set colors for the sheet tab.

Classic Grey

Select this option to use the classic gray tab coloring with black text from previous versions of QlikView.

Sheet Background

Select this option use the sheet's background color for the tab.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Custom Colors

Select this option to specify custom colors for tab background and text.

Tab Color

Click this button to select a custom color for the tab background. This option is only available when **Custom Colors** has been selected above.

Tab Text Color

Click this button to select a custom color for the tab text. This option is only available when Custom Colors or Sheet Background has been selected above.

Apply to All

Click this button to copy the tab color settings of the current sheet to all sheets in the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Fields

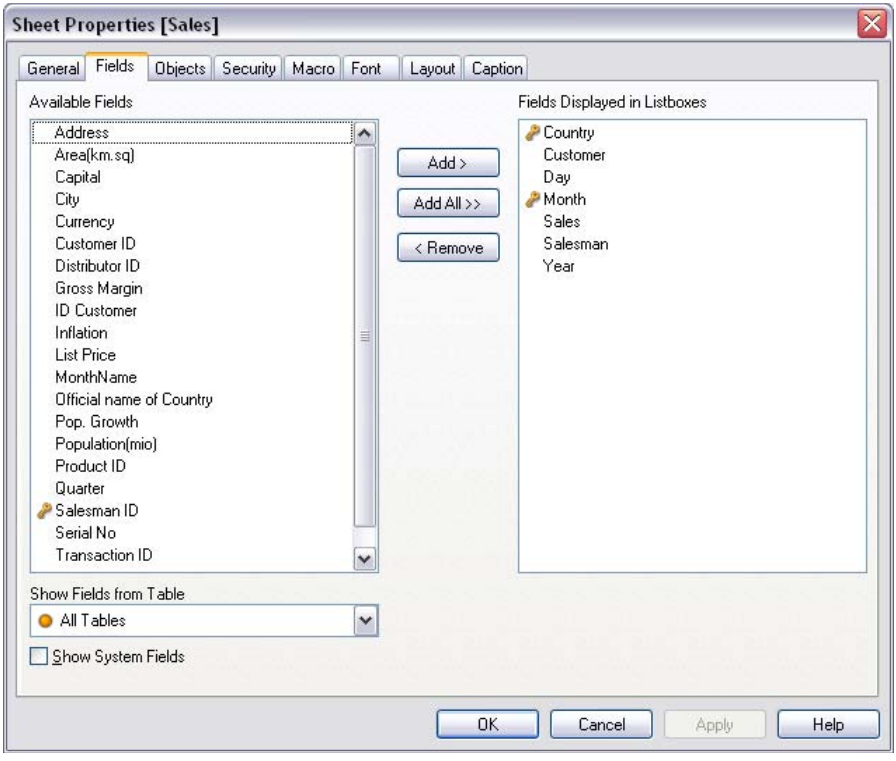


Figure 21. The Fields page in the Sheet Properties dialog

On the **Fields** page of the **Sheet Properties** dialog, you decide what fields to display as list boxes on the sheet.

Available Fields

Available fields are listed in this column. Also the system fields can be listed here.

Show System Fields

Check this box to make the system fields visible in the **Available Fields** column.

Show Fields from Table

You may choose to show only fields from a specified input table in the **Available Fields** list by selecting a table name in this drop-down.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Fields Displayed in List Boxes
: Displayed fields are listed in this column. Initially this column is empty.

Add > Moves the selected fields from the column of available fields to the column of displayed fields.

Add All >>
: Moves all the fields in the column of available fields to the column of displayed fields.

< Remove
: Moves the selected fields listed in the column of displayed fields to the column of available fields.

Select the fields to be used/removed by clicking on them. Use the **Add >** or **< Remove** buttons to move them to the desired column. You can also move fields by double-clicking them. All the fields shown in both columns are included in the QlikView logic. However, only the ones in the **Fields Displayed in List Boxes** column will be shown on the current tabbed sheet.

In this dialog box it is not possible to select additional fields from the data source. In order to do this, you need to change the script.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Objects page

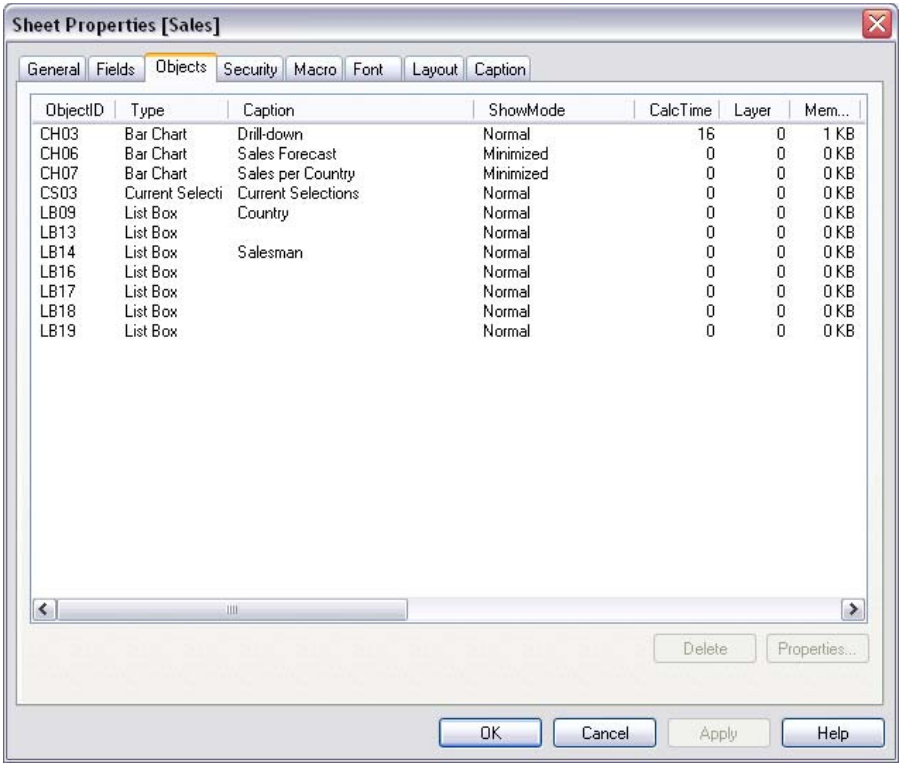


Figure 22. The Objects page in the Sheet properties dialog

This page contains a list of all sheet objects on the current sheet. The columns are as follows:

Object ID
: The unique object ID of the sheet object.

Type
: The type of the sheet object.

Caption
: The text currently shown in the caption of the sheet object.

ShowMode
: The current status of the sheet object. Indicates if the object is minimized, maximized, hidden or has a show condition.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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CalcTime
The amount of time in milliseconds needed for the last recalculation of the object's contents. This information is only relevant for charts, tables and objects containing one or more formulas.

Layer The current layout layer of the sheet object. The layers are set on the **Layout** page of sheet object properties dialog (**Bottom**, **Normal, Top** and **Custom**), where **Bottom**, **Normal** and **Top** correspond to the numbers -1, 0 and 1. Choose **Custom** to enter a value of your choice. Valid layer numbers are -127 to 127.

Memory
The amount of transient memory needed for the last recalculation of the objects's contents. This information is only relevant for charts, tables and objects containing one or more formulas. The list can be sorted on any column by clicking on the column header. You may also select a specific sheet object by clicking on it in the list. The following two options then become available as buttons below the list:

Left The current horizontal position of the left edge of the sheet object, expressed in pixels.

Top The current vertical position of the top edge of the sheet object, expressed in pixels.

Right The current horizontal position of the right edge of the sheet object, expressed in pixels.

Bottom
The current vertical position of the bottom edge of the sheet object, expressed in pixels.

Width The current width of the sheet object, expressed in pixels.

Height The current height of the sheet object, expressed in pixels.

Left (Min)
The current horizontal position of the left edge of the sheet object's minimized icon, expressed in pixels.

Top (Min)
The current vertical position of the top edge of the sheet object's minimized icon, expressed in pixels.

Right (Min)
The current horizontal position of the right edge of the sheet object's minimized icon, expressed in pixels.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Bottom (Min)

The current vertical position of the bottom edge of the sheet object's minimized icon, expressed in pixels.

Width (Min)

The current width of the sheet object's minimized icon, expressed in pixels.

Height (Min)

The current height of the sheet object's minimized icon, expressed in pixels.

Delete Deletes the selected sheet object from the sheet. The object immediately disappears from the list but the actual delete will not take place until you select **OK** or **Apply**.

Properties

Opens the **Properties** dialog for the selected sheet object.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Security

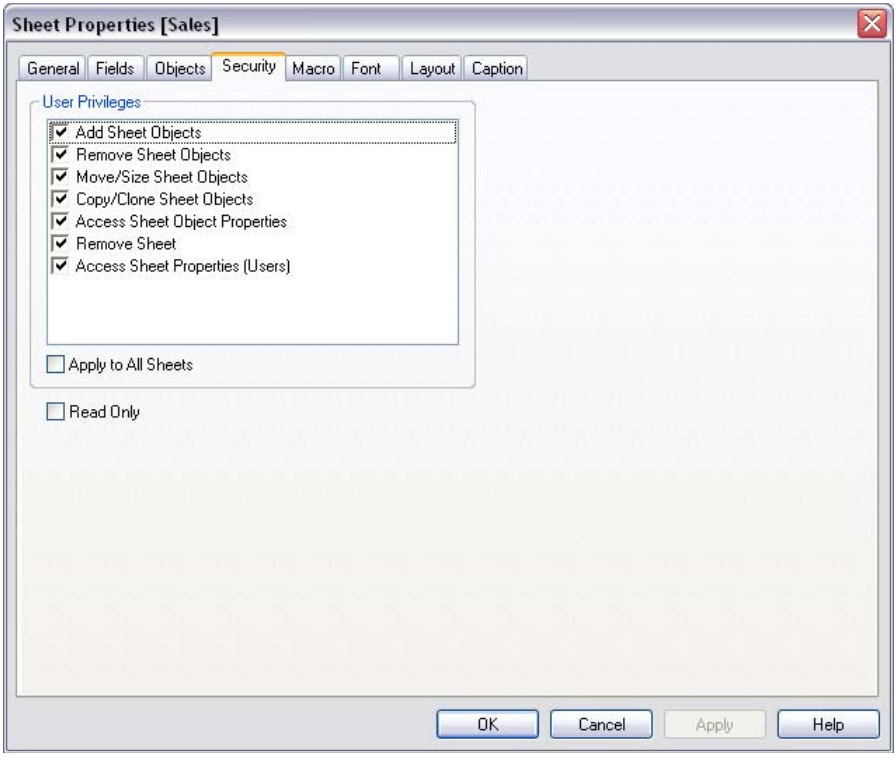


Figure 23. The Security page in the Sheet Properties dialog

This page is useful for documents with access restriction (for more information, see page 515 in Book I). By deselecting an option in the list, the ADMIN user inactivates that particular command or function, thus preventing unwanted changes. The Security page is not available for people with USER privileges. By default, all the options are selected, i.e. all the commands are active.

Add Sheet Objects
: If this option is deselected, no sheet objects can be added to the current sheet.

Remove Sheet Objects
: If this option is deselected, the sheet objects on the current sheet cannot be removed.

Move/Size Sheet Objects
: If this option is deselected, the sheet objects on the current sheet cannot be sized nor moved.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Access Sheet Object Properties

If this option is deselected, it is not possible to access the **Properties** dialogs of the sheet objects on the current sheet.

Remove Sheet

If this option is deselected, the current sheet cannot be removed.

Access Sheet Properties (Users)

If this option is deselected, a person with USER privileges cannot access the **Properties** dialog of the current sheet.

Apply to All Sheets

If you mark this check box before choosing **Apply** or **OK**, the options above will be applied to all the sheets of the document.

Read Only

If you mark this check box no changes can be made to the current sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Macro

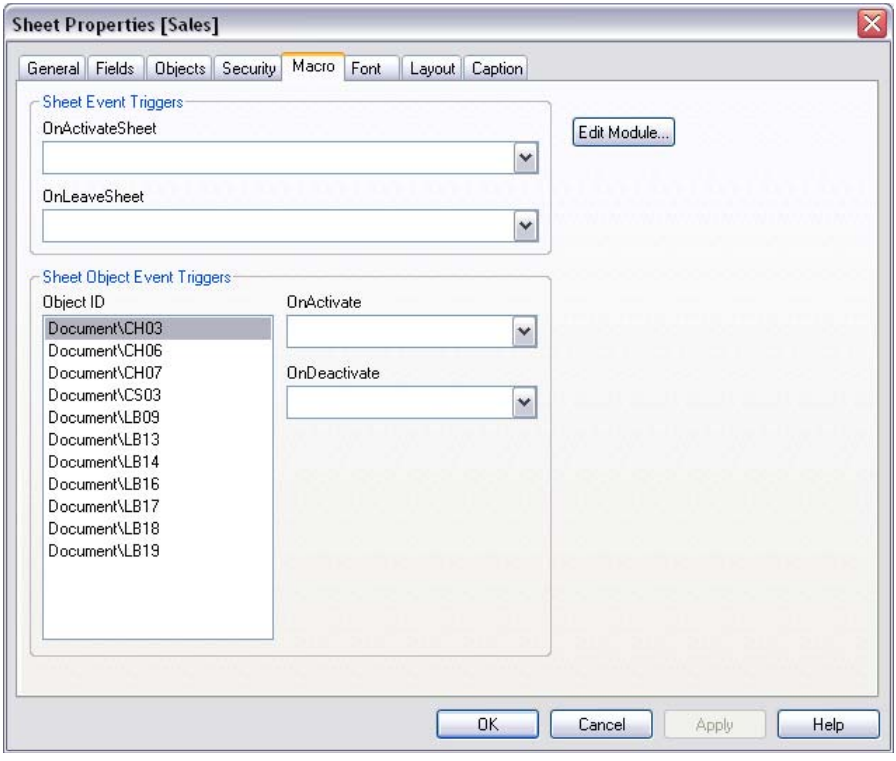


Figure 24. The Macro page of the Sheet properties dialog

On the **Macro** page, you can specify macros to be invoked on sheet and sheet object events. For more information on macros, see “macros and automation” on page 295.

Note There are limitations as to the behavior of certain macro triggers when working with documents on QlikView Server. Please study the special section "Considerations when using macros in QV documents on the QlikView Server" in the QlikView Server reference manual before designing server documents with macro triggers.

Sheet Event Triggers

In the **Sheet Event Triggers** group you can set macros to trigger on change of active sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

OnActivateSheet

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet is activated.

OnLeaveSheet

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet is deactivated.

Sheet Object Event Triggers

In the **Sheet Object Event Triggers** group you can set macros to trigger on activation and deactivation of a specified sheet object on the sheet.

OnActivate

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet object is activated.

OnDeactivate

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet object is deactivated.

(D) (P) **Edit Module**

By clicking on this button the **Edit Module** dialog is opened.

Font

In the **Font** page (Figure 31 on page 108), you can change the font of the sheet objects.

You can specify the font, style and size of the text. The font chosen applies to the text contained in all sheet objects.

Layout

In the **Layout** page (Figure 18 on page 59), you can specify how the sheet objects on the active sheet should appear on the layout. This includes settings for shape, border and the layer on which all the sheet objects of the sheet should be placed.

Caption

On the **Caption** page (Figure 33 on page 114) advanced settings can be made for captions on the active sheet. Background and foreground (text) color can

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

2.5 Tabrow Properties

The properties of the tabrow are set in the **Tabrow Properties** dialog, which is opened from the sheet **Object** menu.

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Font In the **Font** page (see Figure 31 on page 108), you can change the font of the text on the tab.

You can specify the font, style and size of the text. The font chosen applies to the text on all the tabs.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

3 SHEET OBJECTS



There are thirteen types of sheet objects: list boxes, statistics boxes, multi boxes, table boxes, charts, input boxes, current selections boxes, buttons, text objects, line/arrow objects, slider/calendar objects, custom objects and bookmark objects.

3.1 Local Objects and Server Objects

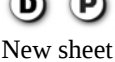
There are three different types of sheet objects:

Document Sheet Objects are stored inside the qvw document. They will always be available to whoever opens the document locally or from QlikView Server.

Personal Server Objects are only available when working with a document on QlikView Server and only to authenticated users. They are stored in a repository on the server and are accessible to the user from any computer where authenticated. Your personal server objects can be managed from the **My Server Objects** page of the **Server Objects** dialog accessible from the **Layout** menu (see below) or through the **Collaboration Pane**, accessible from the **View** menu.

Shared Server Objects are only availabe when working with a document on QlikView Server and only to authenticated users. Any user who has created a personal server object may flag this as shared. They will then become available to other users. Just like personal server objects, shared server sheet objects are stored in a repository on the server. Available shared server objects can be managed from the **Shared Server Objects** page of the **Server Objects** dialog that is accessible from the **Layout** menu (see below) or through the **Collaboration Pane**, accessible from the **View** menu.

3.2 Creation



New sheet objects can be created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu. Another alternative is to choose the button corresponding to the respective sheet object in the toolbar.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

3.3 Navigation

Active Object

There is normally one sheet object active. It is normally the one with a differently colored header (the active title bar color). You make a sheet object active by clicking on it. The TAB (SHIFT+TAB) key makes the next (previous) sheet object active. Also objects without caption, such as buttons can be active. Pressing F1 gives help on the object.

Activating Sheet Objects

You can activate more than one sheet object at the same time by holding down the SHIFT key while clicking on the headers of the objects. It is also possible to draw a rectangle around a number of sheet objects with the left mouse button depressed. All sheet objects fully surrounded by the rectangle will be activated. Finally, all sheet objects on the active sheet can be activated via the keyboard shortcut CTRL+A or the command **Activate All** on the **Edit** menu. Multiple active sheet objects can be moved, duplicated, aligned, sized, and removed as a group. Furthermore, it is possible to make a text search in all the active objects at the same time. Read more about text search on page 146 in Book I.

3.4 Object Menu for Sheet Objects

The **Object** menu for the sheet object can be opened from the menu bar, by clicking with the right mouse button on the sheet object.

Under some circumstances, e.g. when a sheet does not yet contain any sheet objects, the **Object** menu for the sheet is found as **Object** menu in the menu bar.

When no sheet object is active, the **Object** menu in the menu bar does not open. If there is more than one active sheet object, the **Object** menu contains the commands common to the active objects.

3.5 Sheet Object Properties



Each sheet object has a dialog where its properties can be set. The dialog can be opened by choosing **Properties** from the **Object** menu for the sheet object. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

3.6 Minimized and Maximized Sheet Objects

All types of sheet objects have the options of being minimized to an icon or maximized to fill the whole sheet. These options can be individually turned on and off in the **Caption** page of the sheet object's **Properties** dialog. The default status of the settings varies with the type of object.

Changing the status of an object between normal, minimized and maximized mode can be done by clicking on icons in the sheet object caption, by double-clicking on the caption and for most sheet objects via commands on the object's context menu.

Minimized sheet object icons can be freely positioned on the sheet and sized within certain limits.

3.7 The Server Objects Dialog

The Server Objects dialog offers another more list-oriented way to manage your personal server objects and to select among other users' shared server objects. The dialog contains two pages:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

My Server Objects

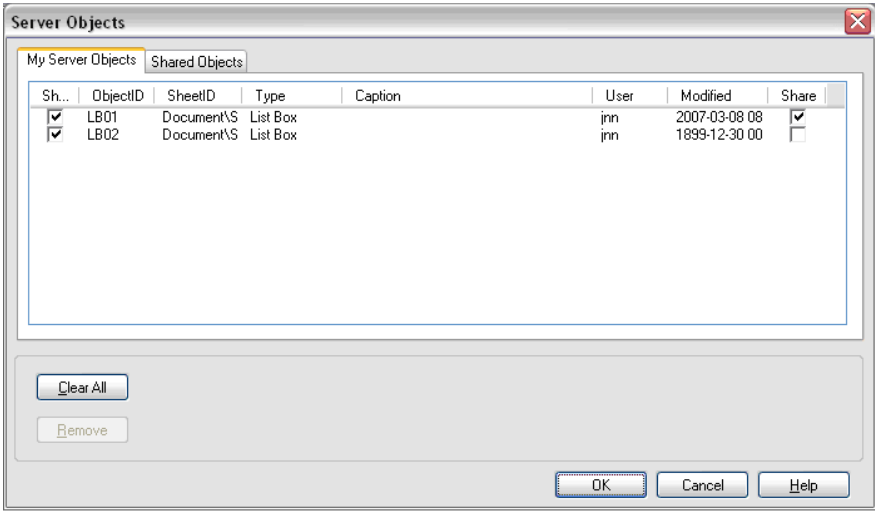


Figure 25. The My Server Objects page of the Server Objects dialog

In the **My Server Objects** page you can manage your own personal server objects and share them with other users.

At the top of the dialog you will find a list of all personal server objects currently defined for the QlikView document. The objects are described by, and may be sorted by several columns:

Show Mark this check box if you want the object to appear in the layout of the document. If the check box is left unchecked, the object will not appear, but will remain accessible via this dialog.

Object ID
The unique ID of the object.

Sheet ID
The ID of the sheet where the object will reside when shown.

Type The type of the object (e.g. list box).

Caption
The caption of the object (if defined).

User The Windows identity of the user who created the object (yourself).

Modified
A timestamp indicating when the object was last modified.

Share This check box is only available in the **My Server Objects** page. By marking it for one of your personal server objects, you will make

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

that object available to other authenticated users of the same server document in their **Shared Objects** page. The object will stay in your **My Server Objects** page and will not appear in your **Shared Objects** page. You may at any time revoke the sharing by deselecting the check box.

At the bottom of the dialog you will find buttons which can be used to perform actions with the objects in the list above.

Clear All
Removes all objects in the list.

Remove
Removes the selected object from the list.

Shared Objects

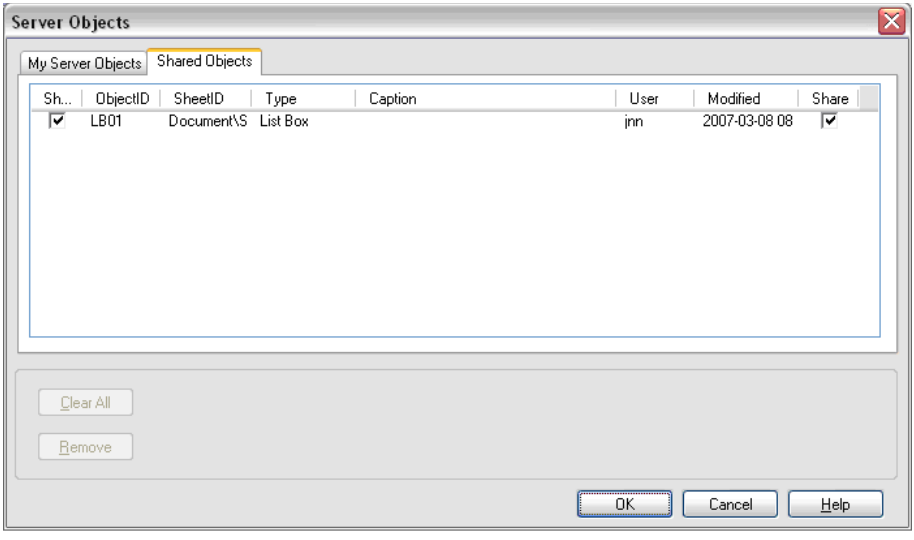


Figure 26. The Shared Objects page of the Server Objects dialog

In the **Shared Objects** page you can manage the display of other users' shared server objects.

At the top of the dialog you will find a list of all shared server objects currently defined for the QlikView document. The objects are described by, and may be sorted by several columns:

Show Mark this check box if you want the object to appear in the layout of the document. If the check box is left unchecked, the object will not appear, but will remain accessible via this dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Object ID
The unique ID of the object.

Sheet ID
The ID of the sheet where the object will reside when shown.

Type The type of the object (e.g. list box).

Caption
The caption of the object (if defined).

User The Windows identity of the user who created the object.

Modified
A timestamp indicating when the object was last modified.

Share This check box is only available in the **My Server Objects** page. By marking it for one of your personal server objects, you will make that object available to other authenticated users of the same server document in their **Shared Objects** page. The object will stay in your **My Server Objects** page and will not appear in your **Shared Objects** page. You may at any time revoke the sharing by deselecting the check box.

At the bottom of the dialog you will find buttons which can be used to perform actions with the objects in the list above.

Clear All
Removes all objects in the list.

Remove
Removes the selected object from the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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4 THE LIST BOX

This is the most basic object on the screen. It contains a list of all the possible values of a specific field. In a list box you often make selections, and look at logical connections and implications.



A list box may also contain a cyclic or drill-down group. If a drill-down group is used, selecting a single value in the list box will cause the list box to drill down and switch to the next underlying field in the group. Drilling back up can be accomplished by clicking the drill-up icon in the list box caption..

If a cyclic group is assigned to a list box it can be made to show the next field in the group by clicking on the cycle icon that appears in the list box caption. You may also go directly to any field in the group by using the **Cycle->** option on the list box object menu.

4.1 Creation

(D) (P)

The first thing to do after executing the script or after creating a new tabbed sheet is to select fields to be displayed as list boxes. This is done from the **Fields** page of the **Sheet Properties** dialog. Some or all of the fields retrieved from the database can be displayed as list boxes.

New list boxes can also be created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu, or by clicking the **Create List Box** button in the toolbar.



4.2 List Box Object Menu

The list box Object menu is found as the Object menu when a list box is active. It can also be opened as a float menu by clicking with the right mouse button on a list box. The menu contains the following commands:

(D) (P) **Properties...**

Opens the **List Box Properties** dialog box.

Search

Opens the text search window. The action is equal to that of just start typing in an active list box. The search window will contain

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

two wildcard characters (**) with the cursor placed in-between. As you type, all values which have an exact match with the search text will be shown in the list. If you hit ENTER all matching values in the list will be selected. This command can also be invoked via the keyboard shortcut CTRL+F.

Fuzzy Search

Opens the search window in fuzzy search mode. The search window will contain a tilde ~ with the cursor placed after it. As you type, all values will be sorted by the degree of resemblance to the search string with the best matches at the top of the list. If you hit ENTER the first value in the list will be selected.

Advanced Search

Opens the **Advanced Search** dialog. The dialog makes it possible to enter advanced search expressions. This command can also be invoked via the keyboard shortcut SHIFT+CTRL+F.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check boxcheck box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Change Value

Only available for list boxes displaying input fields. Sets the cell that has been clicked in input edit mode. Equivalent to clicking the input icon in the cell.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Restore Values

Only available for list boxes displaying input fields. Opens a cascade menu with three options.

Restore Single Value

Restores the value in the field value that has been clicked to its default value from the script.

Restore Possible Values

Restores the values of all possible field values to their default values from the script.

Restore All Values

Restores the values of all field values to their default values from the script.

Select Possible

Selects the possible (selected and optional) field values in the list box.

Select Excluded

Selects the currently excluded field values in the list box.

Select All

Selects all the field values in the list box.

Clear Deselects all the values in the list box. This command can also be invoked via the keyboard shortcut CTRL+D.

Clear Other Fields

Selects all possible values in the current list box, then clears the selections in all the other fields.

Lock Locks the selected values in the list box. This command can also be invoked via the keyboard shortcut CTRL+L.

Unlock

Unlocks the locked values in the list box. This command can also be invoked via the keyboard shortcut CTRL+U.

(D) (P) **Create QuickChart...**

Opens the QuickChart wizard, which helps you to create a one-dimensional chart in a quick and easy way.

(D) (P) **Create Time Chart**

Opens the Time Chart wizard to help you build charts where a given measure (expression) should be qualified and often compared by different time periods, e.g. current year, last year, year-to-date etc.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Create Statistics Box

When this command is chosen, a statistics box is opened. It shows selected statistical properties of the field, and is updated dynamically.

Print Possible...

Opens the standard **Print** dialog box (see page 247), allowing you to print the possible (selected and optional) values of the current list box.

Print possible as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports possible (including selected) values in the list box to Microsoft Excel. The values will appear as one column in a new Excel worksheet. For this functionality to work, Microsoft Excel 97 or later must be installed on the computer.

Export...

Opens a dialog where you can export the possible values in the list box to a file of your choice. The file formats offered include a range of delimited text file formats, HTML, XML, BIFF (native Excel format) and QVD (QlikView Data Files, see page 503 in Book I).

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Possible Values

Copies the possible (selected and optional) values to the clipboard.

Cell Value

Copies the text value of the list box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Cycle->

Only available when the list box is set to display a cyclic group. Opens a cascade menu with the fields in the group for direct selection of which field to show in the list box.

Minimize

Iconizes the list box. Clicking in the object caption (if shown) gives the same result. To restore the list box to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see page 114).

Restore

Restores a minimized or maximized list box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the list box to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the list box to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see page 114).

Help Opens context specific help.

(D) (P) **Remove**

Removes the current list box from the sheet.

4.3 List Box Properties

(D) (P)

The **List Box Properties** dialog box (Figure 4 on page 26) is opened by selecting **Properties** from the list box **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The **List Box Properties** dialog box contains several pages:

General

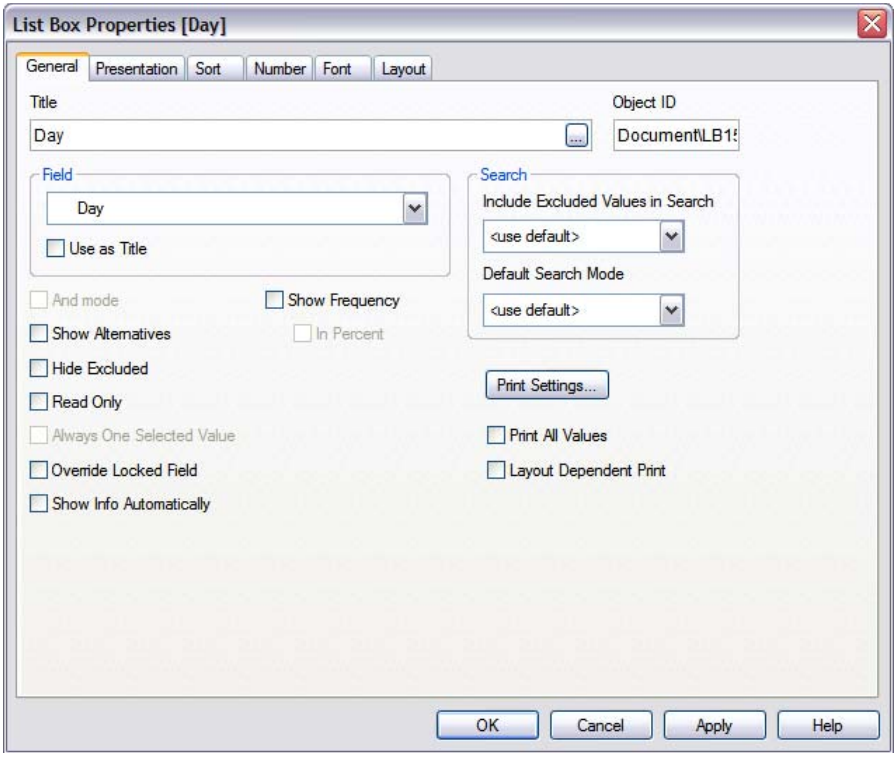


Figure 27. The General page in the List Box Properties dialog

The **General** page contains some general settings for the list box:

Title An alternative name for the list box can be entered here. It will be used as window title for the sheet object. Note that this name does not affect the logical evaluation based on the field names. The title may be defined as a calculated formula (see page 439) for dynamic update. If no title is stated, the name of the field shown in the list box will be used. This is indicated in the edit box as <use field name>.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Field The field to be shown in the list box. You may also select a cyclic or drill-down group for the list box. Only one field will be shown at a time though. Furthermore it is possible to display a calculated field in a list box. A calculated field does not come out of script execution, but is defined from an expression. The same rules as with calculated dimensions in charts apply (see chapter 18 on page 267 in Book III). If you want to use a calculated field in the list box, select <Expression> in the drop-down. This will open the **Edit Expression** dialog where you define the expression that describes the calculated field.

Use as Title

By selecting this check box, the field name will be used as **Title**. The text <use field name> will appear in the **Title** edit box.

Edit... This button is only available when <Expression> has been selected as field name. The button opens the Edit Expression dialog where the expression describing a calculated field can be defined.

Note When a calculated field is used some list box functionality will be different as compared to regular field list boxes. Some property options are not available (see below). Furthermore statistics boxes cannot be created from such list boxes.

Note A calculated field must always be a transformation of one or more normal fields. Purely synthetic calculated fields created via the **valuelist** and **valueloop** functions are not permitted. When making selections in a calculated field, you actually make selections in the underlying normal field(s). When using more than one field as base for a calculated field, the logical implications of selections in the base fields or the calculated field may be quite complex.

Note The use of calculated fields in list boxes may cause performance issues with very large data sets.

And mode

A multiple selection in a list box must be either of an *and* or an *or* type. By default the selection is of an *or* type. This switch toggles the logical mode in which multiple value selections are made. This menu option is disabled if the field does not satisfy certain condi-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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tions (see page 152 in Book I). This option is not available for calculated fields.

Show Alternatives

Toggles whether or not a selection in a list box should directly make the other values listed in the same list box gray. If the **Show Alternatives** option is on, the color of all the other values will be affected only by selections in other list boxes, even though they are logically excluded by the selection in the same list box. If the **Show Alternatives** option is off, all the other values will be gray. This option is not available for calculated fields.

Hide Excluded

Toggles whether or not the excluded values of the field should be shown. If this option is used, excluded values also become unselectable in the list box.

Read Only

Marking this check box makes selections in the list box impossible.

Always One Selected Value

If this check box is marked, the list box will always have one and only one value selected. This is useful when creating applications where one value always has to be selected in order for charts etc. to make sense. An example could be the selection of one currency rate. When this option is marked, it is not possible to select an excluded value in another list box. The option is available only when you have already selected exactly one value in the list box. This option is not available for calculated fields.

Override Locked Field

If this check box is marked, selections can be made in the field from the multi box even if the field is locked. The field will still be locked for logical changes stemming from selections in other fields.

Show Info Automatically

Toggles whether or not associated information should be shown automatically when a value is selected. If it is not shown automatically, the info symbol must be clicked.

Show Frequency

Toggles the status as to whether or not the frequency of a field value is shown. Frequency is here the number of records containing possible values of the current field. This option is normally not available for fields used for associations between tables (see page 470 in Book I). This option is not available for calculated fields.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

In Percent

Toggles the status as to whether or not the frequency should be shown in absolute numbers or as percentages of the total number of entries.

Object ID

The unique ID of the current list box. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first list box of a document will be assigned the ID LB01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

Include Excluded Values in Search

Specifies whether excluded values should be included in text searches. Three alternatives are given.

<use default>

The default as specified under **User Preferences** will apply. (See page 101 in Book I).

Yes Excluded values are always included in the text search.

No Excluded values are not included in text search. Only optional values are included.

Default Search Mode

Specifies the default search mode to be used in text searches. The mode can always be intermittently changed by typing * or ~ as part of the search string. Three alternatives are given.

<use default>

The default as specified under **User Preferences** will apply. (See page 111 in Book I).

Use Fuzzy Search

Fuzzy search is default when starting a text search.

No Normal search is default when starting a text search.

Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Print All Values

The normal print behavior for list boxes is to print only possible values. By marking this check box, all values (also excluded) will be printed.

Layout Dependent Print

By marking this check box, the list box will be printed as it appears on the screen in terms of multiple columns, selection color coding of cells etc. This may be useful e.g. when including list boxes in reports.

Presentation

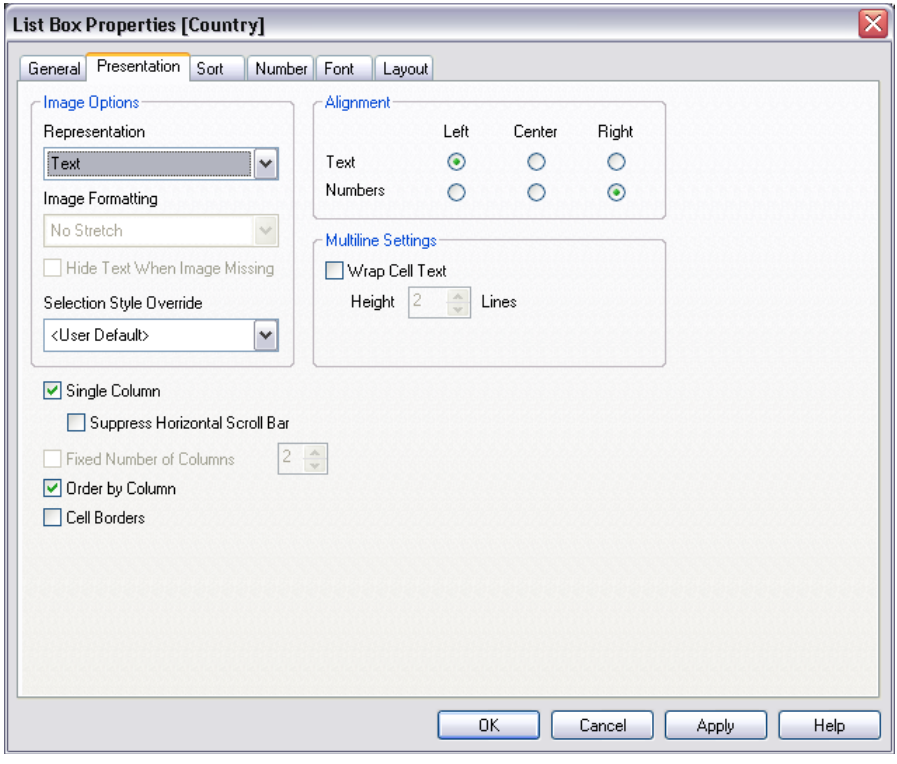


Figure 28. The Presentation page in the List Box Properties

The **Presentation** page contains layout options, e.g. the alignment.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Image Options

This group allows you to have a field value interpreted as a reference to an image in memory or on disk. The following settings are possible:

Representation

Three alternatives are given.

Text When selecting this option the field values will always be interpreted and displayed as text.

Image When selecting this option QlikView will try to interpret each field value as a reference to an image. The reference may be a path to an image file on disk (e.g. `C:\Mypic.jpg`) or inside the qvw document (e.g. `qmem://<Name>/<Peter>`). If QlikView cannot interpret a field value as a valid image reference, the value itself will be displayed.

Info as Image

When selecting this option QlikView will display image info linked to the field value via info load/ select in the script. If no image is available for the field value, the value itself will be displayed.

Image Formatting

Only available when one of the image options has been selected above. This setting describes how QlikView formats the image to fit in the cell. There are four alternatives.

No Stretch

If this option is selected, the image will be shown as is, without any stretching. This may cause parts of the picture to be invisible or only part of the cell to be filled.

Fill If this option is selected, the image will be stretched to fit the cell without bothering about keeping the aspect ration of the image.

Keep Aspect

If this option is selected, the image will be stretched as far as possible to fill the cell while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the image will be stretched to fill the cell in both directions while

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

keeping the aspect ratio. This typically results cropping of the image in one direction.

Hide Text When Image Missing

If this option is selected, QlikView will not display the field value text if interpretation as an image reference fails for some reason. The cell will then be left blank.

Selection Style Override

When images are shown instead of text it may be necessary to use another selection style than the document default so that the logical state of the field values becomes visible. Use the drop-down to select a suitable selection style, e.g. Corner Tags. This option is only available when image representation of some form has been selected under **Representation**.

Alignment

In this group, the alignment within the list box can be set. **Text** and **Numbers** can be individually set to left-adjusted, centered or right-adjusted.

Multiline Settings

In this group you can set the default display of multiple line cells.

Wrap Cell Text

If this check box is marked, the contents of the cell will be wrapped in two or more lines.

Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the cell should have.

Single Column

Marking this check box will force single column mode. If it is not marked, you will automatically get several columns when sizing it by dragging its border.

Suppress Horizontal Scroll Bar

Mark this check box to suppress horizontal scroll bar in list box when field values are too wide to be displayed in their entirety.

Fixed Number of Columns

If this check box is marked you may select a fixed number of columns for the list box. The item is only available when **Single Column** is deselected.

Order by Column

If this check box is marked, a multiple column list box will be ordered by columns instead of rows.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Cell Borders

Mark this check box to get horizontal border lines between the different field values. Cell borders are automatically turned on when **Wrap Text** is selected, but can subsequently be turned off.

Sort

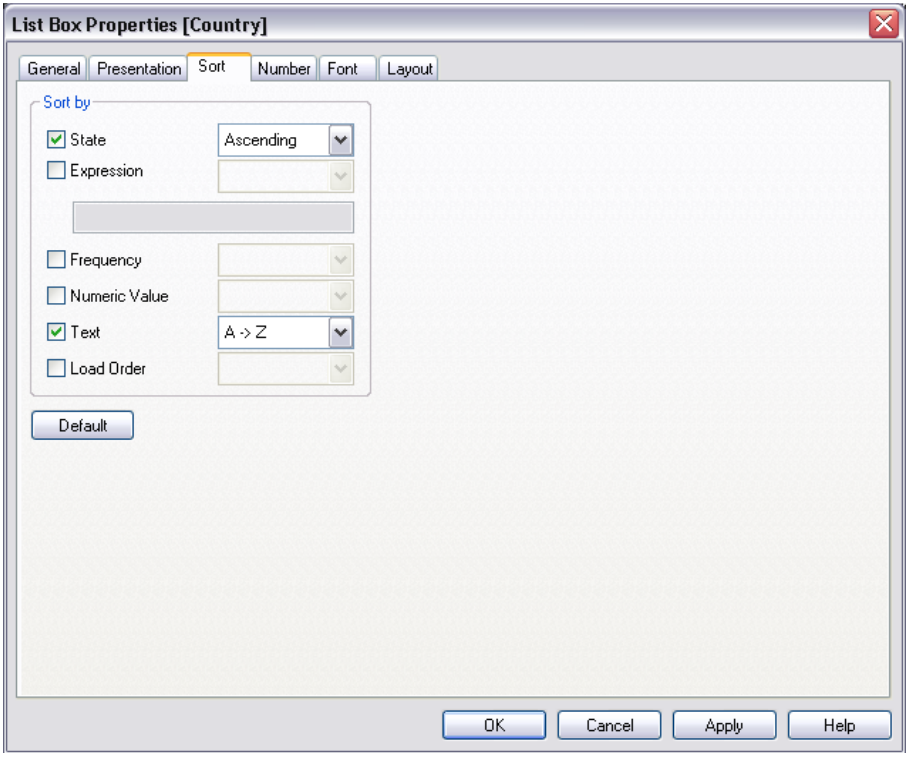


Figure 29. The Sort page in the List Box Properties dialog

The third page, the **Sort** page, contains options to set the sort order within the list box:

Sort by

In this group, the sort order of the field values in the list box can be set.

State Sorts the field values according to their logical state (selected, optional or excluded). Each time you resize the list box, the program verifies if the total number of values is displayed. If it is not, the **State** sort order will be switched

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

on automatically. If all the values are displayed, the **State** sort order will be switched off.

Expression
Sorts the field values according to the expression entered into the text edit box below this sort option.

Frequency
Sorts the field values by frequency (number of occurrences in the table).

Numeric Value
Sorts the field values by their numeric values.

Text Sorts the field values in alphabetical order.

Load order
Sorts the field values by the initial load order.

Default
Sets the default sort order.

The order of priority is **State**, **Expression**, **Frequency**, **Numeric Value**, **Text** and **Load Order**. Each of these sort criteria can be set to ascending or descending.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Number

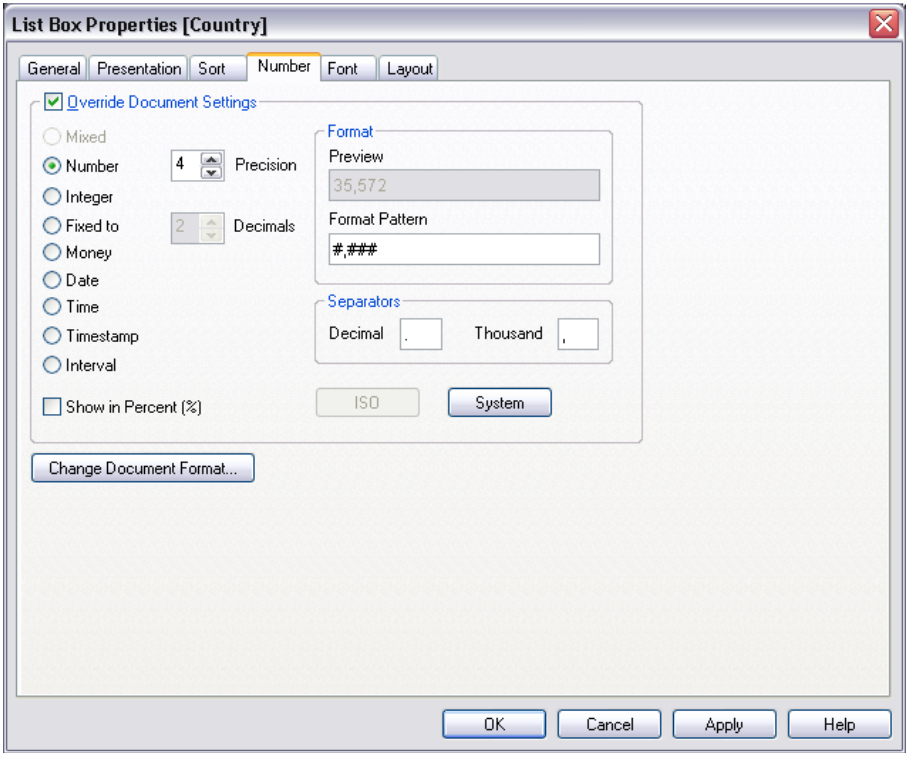


Figure 30. The Number page in the List Box Properties dialog

In the **Number** page, it is possible to set the number format for the list box.

Override Document Settings

Each field has a number format which can be set on the **Number** page of the **Document Properties** dialog. Normally this is the number used when displaying field values in a list box. It is however possible to use a separate number format in an individual list box. To do this, mark this check box and specify a number format in the group control below. For an explanation of the controls, see the number format section, page 285.

Change Document Format

Opens the **Number** page of the **Document Properties** dialog, where you can change the underlying number format in the field.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Font

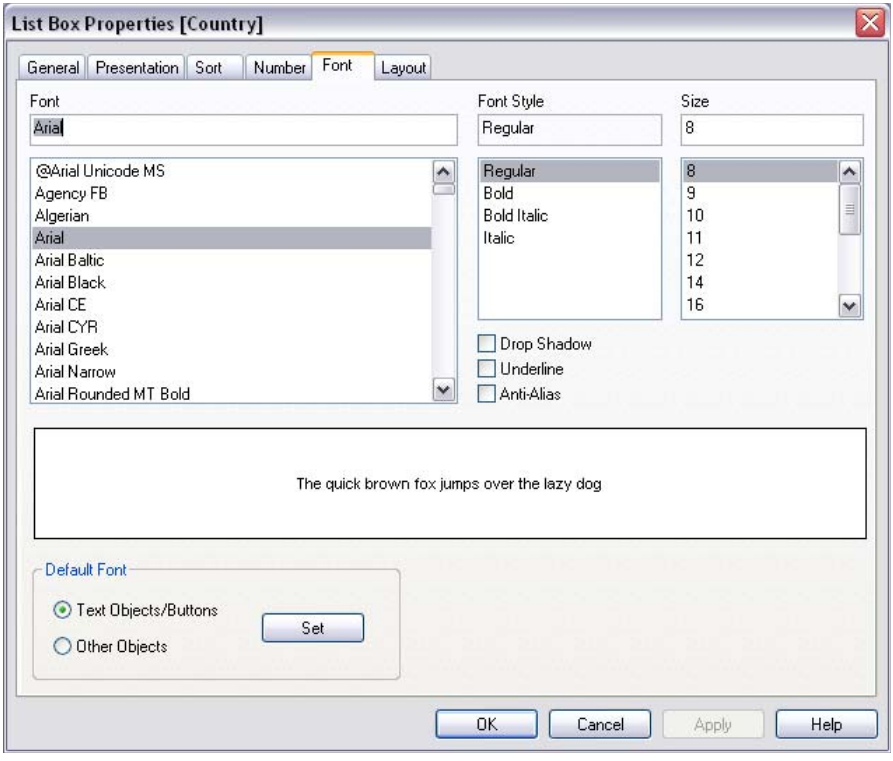


Figure 31. The Font page in the List Box Properties dialog

In the **Font** page, you can change the font of the text in the list box.

The font chosen will be applied to all text contained in the list box. You can specify the font, style and size of the text. Additional settings are:

Drop Shadow
: If this check box is marked a drop shadow will be added to the text.

Underline
: If this check box is marked the text will be underlined.

Anti-Alias
: If this check box is marked anti-aliasing will be applied to the text, making it fit more smoothly with the background. This option may degrade drawing speed on very slow computers.

By using the **Set** button under **Default Font**, you can also set the default font for the object type.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Layout

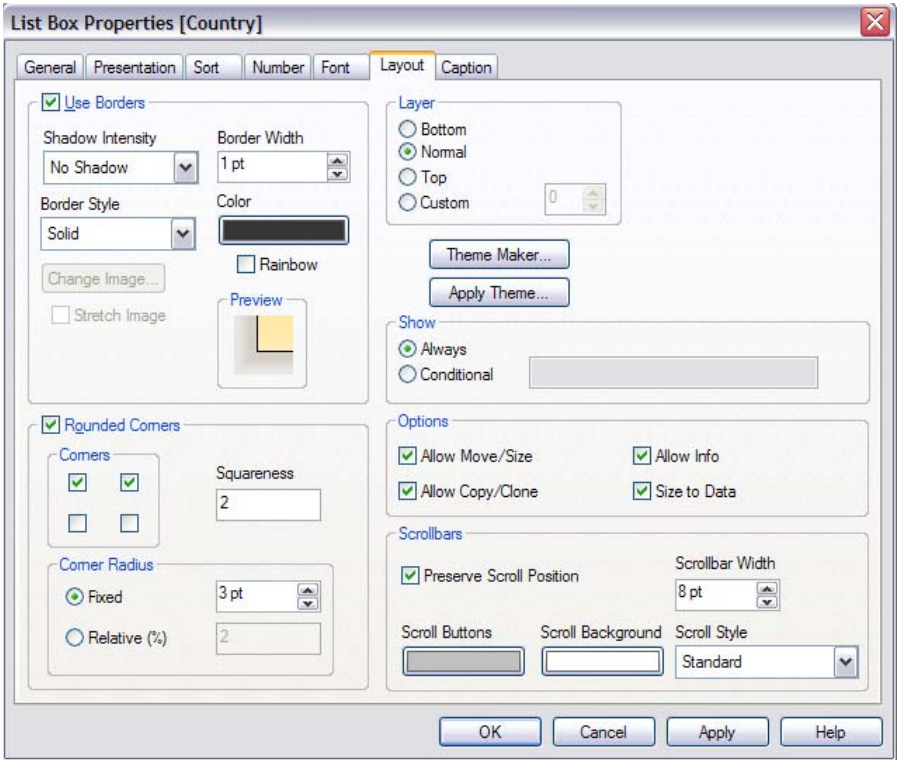


Figure 32. The Layout page in the List Box Properties dialog

In the **Layout** page, you can specify how the list box should appear on the layout. This includes settings for shape, border, and the layer on which it should reside.

The **Layout** page is common to all sheet objects, although the use of some settings is restricted to certain types of sheet objects. The list box is therefore referred to as the sheet object below.

Use Borders

Mark this check box in order to use a border around the sheet object. You specify the type of border by selecting in the drop-down menu. The **Shadow Intensity** drop-down menu makes it possible to set the intensity of the shadow that surrounds the sheet objects. There is also the choice of **No Shadow**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Border Width

Here you can set the width of the border. Available for all border types. When setting the width of image borders, make sure the width corresponds to the corner width defined in the image. The width can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Border Style

There are the following predefined border types:

Solid A solid unicolored border.

Depressed
Border giving the impression of depressing the sheet object from the background.

Raised Border giving the impression of raising the sheet object from the background.

Walled Border giving the impression of a wall around the sheet object.

Image Border specified by custom image.

Change Image

If the **Image** border type is selected, you can click this button to set the image you wish to use.

Stretch Image

If the **Image** border type is used and this check box is marked the image pattern will be stretched to fit to the entire space between the corners. If it is not marked, as many copies as possible of the pattern will be displayed, tiled.

Most of the border types can be specified further with the help of the following settings:

Color Click this button to open a dialog in which you can choose an appropriate base color from the color palette for all border types except **Image**.

Rainbow

Creates a rainbow colored border for all border types except **Image**. The rainbow will start with the selected base color on top of the sheet object.

When **Simplified** is the chosen **Styling Mode**, there is no choice of border type, there is only the **Shadow Intensity** drop-down menu and the **Border Width** setting.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

For an example of creating an image border see page 59.

Rounded Corners

In the **Rounded Corners** group, settings can be made for the general shape of the sheet object. Mark this check box to use rounded shapes for the corners of the sheet object. It is possible to achieve shapes from rectangular via super elliptic to elliptic/circular.

Corners

By marking each of these four check boxes the rounding options are turned on for the respective corners of the sheet object. Corners for which the check box remain unmarked will be drawn rectangular.

Squareness

A number between 2 and 100 setting the general shape of the rounded corners. The number 2 corresponds to a perfect ellipse (or circle for a 1:1 aspect ratio) whereas higher numbers move over super elliptic shapes towards a rectangle.

Corner Radius

This setting determines the radius of the corners in fixed distance or as a percent of the total quadrant. This setting lets you control the extent to which the corners will be affected by the underlying general shape set under **Squareness**. A fixed distance can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Layer In the **Layer** group, the sheet object can be assigned one of three layers on the sheet.

Bottom A sheet object with the **Bottom** layer property can never obscure sheet objects in the **Normal** and **Top** layers. It can only be placed on top of other sheet objects in the **Bottom** layer.

Normal When created, sheet objects reside in the normal (middle) layer. A sheet object in the **Normal** layer can never be obscured by sheet objects in the **Bottom** layer and can never obscure sheet objects in the **Top** layer.

Top A sheet object in the **Top** layer can never be obscured by sheet objects in the **Normal** and **Bottom** layers. Only other sheet objects in the **Top** layer can be placed on top of it.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Custom

The **Top**, **Normal** and **Bottom** layers correspond to internally numbered layers 1, 0 and -1 respectively. In fact all values between -127 and 127 are accepted. Choose this option to enter a value of your choice.

Theme Maker...

Invokes the **Theme Maker Wizard** for creation of a new theme or editing an existing theme. See chapter chapter 19 on page 259 for details on QlikView layout themes.

Apply Theme...

Opens a file browser dialog for opening a QlikView layout theme file to be applied to the sheet object. See “layout themes” on page 259.

Show In the **Show** group, it is possible to specify a condition under which the sheet object is shown.

Always

The sheet object will always be shown.

Conditional

The sheet object will be shown or hidden depending on a condition expression which will be evaluated each time the sheet object is to be drawn. The sheet object will only be visible when the condition returns true.

Users with Admin privileges for the document can override all show conditions with the **Show All Sheets and Sheet Objects** in the **Security** page of **Document Properties** (see page 39). This functionality can be toggled by pressing CTRL+SHIFT+S.

Options

In the **Options** group, it is possible to disallow moving/resizing of the sheet object.

Allow Move/Size

If this check box is deselected, it will be impossible for the user to move or resize the sheet object.

Allow Copy/Clone

If this check box is deselected it will become impossible for the user to copy or clone the sheet object. Note that sheet objects can only be copied/cloned by users of QlikView Developer and QlikView Professional.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Allow Info

By default, an info icon will appear in the top right corner of the sheet object if information is linked to the selected field value. Deselect this check box if you do not wish the icon to be displayed. This option is available only for list boxes and multi boxes.

Size to Data

Normally the borders around all table sheet objects in QlikView will shrink when selections cause the size of the table to be less than allocated size for the sheet object. By deselecting this check box this automatic adjustment of size will be turned off leaving any surplus space blank.

Scroll bars

In this group you can set the appearance of scroll bars in the QlikView sheet object.

Preserve Scroll Position

When marking this check box and the corresponding box in **User Preferences**, **Objects** page, QlikView will try to preserve the scroll position after a selection in table objects and charts with an x-axis scroll bar.

Scroll Bar Background

Sets the scroll bar background color. Select color by clicking the button. Note that medium gray tones often render the best results for scroll bars.

Scroll Buttons

Sets the scroll button color. Select color by clicking the button. Note that medium gray tones often render the best results for scroll bars.

Scroll Bar Width

Sets the scroll bar width. The width can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Scroll Style

Sets the scroll bar style. Select a style in the drop-down control. The **Classic** scroll bar style corresponds to QlikView 4/5 scroll bars. The **Standard** scroll bar style gives a more modern look. The third style is **Light**, which is a thinner, lighter bar.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Caption

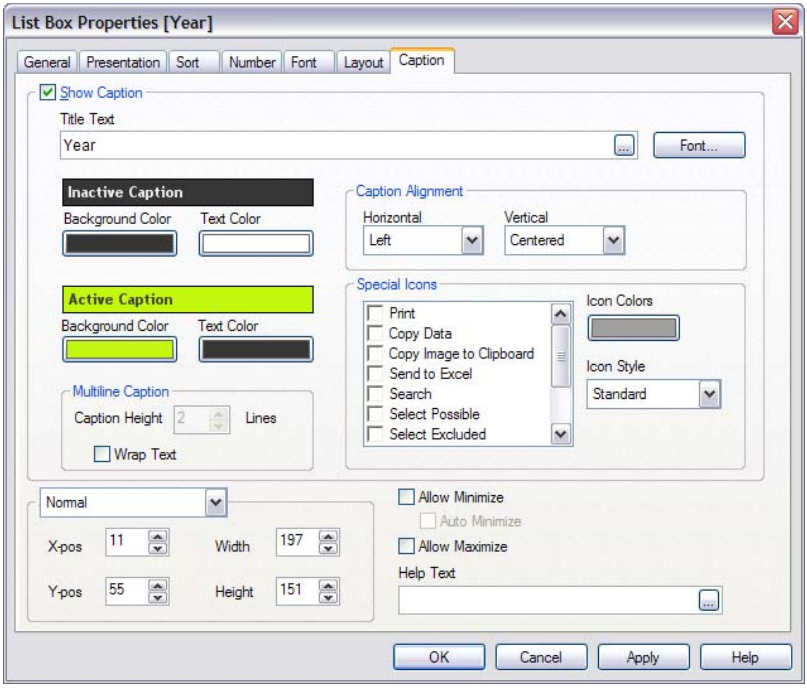


Figure 33. The Caption page in the List Box Properties dialog

In the **Caption** page, advanced settings can be made for the caption. Background and foreground text color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction.

Show Caption

If this check box is marked, a caption will be drawn at the top of the sheet object. List boxes and other "box objects" will have caption turned on by default, whereas buttons, text areas and line/arrow objects will have it turned off.

Title Text

The text to be displayed in the sheet object caption. This setting is identical to the **Windows Title** setting found in the **General** page of the properties dialogs of a number of sheet objects. However, for objects such as the text objects, this is the only place where the caption text can be edited. The **Font...** button opens the **Font Dialog** where the font of the caption text can be set.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Inactive Caption / Active Caption

In this group you can set the colors of the caption in its different states. A preview pane shows the current settings of the selected state.

Background Color

Sets the background color. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the color button.

Text Color

Click the colored button to select a color.

Multiline Caption

In this group you can specify multiple line captions.

Caption Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the caption should have.

Wrap Text

If this check box is marked, the caption will be wrapped in two or more lines.

Normal/Minimized Size/Position

In this group you can set exact pixel size and position of the QlikView sheet object in its normal or minimized state. Select state in the drop-down control.

X-pos Sets the horizontal position of the left side of the sheet object in relation to the sheet's left edge. The setting is made in pixels.

Y-pos Sets the vertical position of the top side of the sheet object in relation to the sheet's upper edge. The setting is made in pixels.

Width Sets the width of the QlikView sheet object in pixels.

Height Sets the height of the QlikView sheet object in pixels.

Caption Alignment

In this group you set text alignment for caption text.

Horizontal

Sets the horizontal alignment of the caption text. The options are **Left**, **Center** and **Right**.

Vertical

Sets the vertical alignment of the caption text. The options are **Top**, **Center** and **Bottom**. This setting is only relevant when **Multiline Caption** is used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Special Icons

Many of the object menu commands of the sheet objects can be configured as caption icons. Select commands to be shown as caption icons by marking the check box to the left of each command in the list.

Icon Colors

Sets the background color of the caption icons. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the color button. This setting applies to all icons in the sheet object, not only the special caption icons.

Icon Style

Sets the icon style. Select a style in the drop-down control. This setting applies to all icons in the sheet object, not only the special caption icons.

Note Use the special caption icons with care. One or two of them may provide great help for the end-user while too many may create a "Christmas tree" that severely degrades usability.

Allow Minimize

If this check box is marked, it is possible to turn the sheet object into an icon. The minimize icon will appear in the sheet object caption.

Auto Minimize

This setting, which makes it possible to toggle between sheet objects, should be applied to several sheet objects (preferably positioned on top of each other) on one and the same sheet. Only one of the sheet objects will have its full size at any given time: as soon as you restore a minimized sheet object with auto minimize set, all other sheet objects with auto minimize set will turn into icons. This option is designed mainly for charts and tables, but may be applied to all sheet objects except buttons, text objects and line/arrow objects.

Allow Maximize

If this check box is marked, it is possible to enlarge the sheet object to fill the sheet. The maximize icon will appear in the sheet object caption.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Help Text

Opens a text box in which you can type an optional help message. The text will be displayed when you position the cursor on the help icon in the top right corner of the sheet object. The text may be a calculated formula (see page 439).0

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

5 THE STATISTICS BOX

NetSales	
Sum	$1,565,525
Average	$721
Min	$2
Max	$32,075

Figure 34. The Statistics box

For some fields, it is rarely interesting to look at the individual field values, e.g. the invoice amount in a list of invoices. The sum or average could be very interesting to look at, though. For such fields it is better to use a statistics box than a list box.

Statistics boxes can show most types of statistical entities such as sum, average, minimum etc. of the possible values of a field. The calculations are made dynamically, i.e. the display changes instantaneously as selections are made in list boxes. The name of the statistics box is by default the same as that of the field to which the selected values belong. When no specific range of values is selected, QlikView treats all the possible values listed in the corresponding field list box as the statistical sample.

For fields used for association between tables, many of the statistical entities will be unavailable (n/a). See page 470 in Book I for more detailed information.

Selections can also be made by clicking some of the statistical quantities, e.g. Min, Max and Median. The selection is then marked in the list box, and not in the statistics box.

5.1 Creation

Statistics boxes can be created by choosing **Create Statistics Box** from the list box **Object** menu or by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu Another possibility is to click the **Create Statistics Box** button in the toolbar..



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

5.2 Statistics Box Object Menu

The statistics box **Object** menu is found as the **Object** menu when a statistics box is active. It can also be opened as a float menu by clicking with the right mouse button on a statistics box. The menu contains the following commands:

Properties...

Opens the **Statistics Box Properties** dialog box.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Select Possible

Selects possible field values of the statistics box.

Select Excluded

Selects the currently excluded field values of the statistics box.

Select All

Selects all the field values of the statistics box.

Clear Deselects all the values of the statistics box. This command can also be invoked via the keyboard shortcut CTRL+D.

Clear Other Fields

Selects all possible values in the field shown in the current statistics box, then clears the selections in all the other fields.

Lock Locks the selected values of the statistics box. This command can also be invoked via the keyboard shortcut CTRL+L.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Unlock

Unlocks the locked values of the statistics box. This command can also be invoked via the keyboard shortcut CTRL+U.

Print...

Opens the standard **Print** dialog box (see page 247), allowing you to print the contents of the statistics box.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the statistics box to Microsoft Excel, which is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Export...

Opens a dialog where you can export the statistics box as a table to a file of your choice. The file formats offered include a range of delimited text file formats: HTML, XML, BIFF (native Excel format) and QVD (QlikView Data Files, see page 503 in Book 1).

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Data Copies the data rows of the statistics box to the clipboard.

Cell Value

Copies the text value of the statistics box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Minimize

Iconizes the statistics box. Clicking in the object caption (if shown) gives the same result. To restore the statistics box to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized statistics box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the statistics box to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the list box to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the current list box from the sheet.

5.3 Statistics Box Properties

(D) (P)

The **Statistics Box Properties** dialog box (Figure 35) is opened by selecting **Properties** from the statistics box **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The **Statistics Box Properties** dialog box contains several pages:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

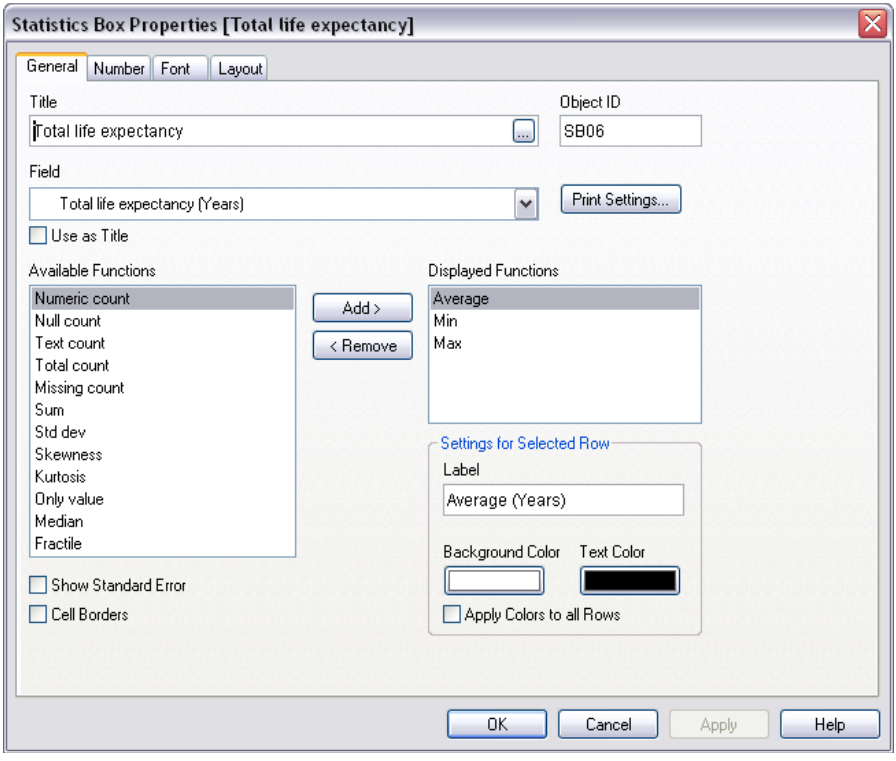


Figure 35. The General page in the Statistics Box Properties dialog

On this page it is possible to configure what statistical entities to show in the statistics box. When a statistics box is opened, *Total count*, *Sum*, *Average*, *Min* and *Max* are displayed by default. There is, however, a number of additional statistics that you can choose from.

The term sample used below is the *statistical sample*, i.e. the sample of possible, numeric values of a field. All numbers refer to the number of records in the first loaded table that contains the field in question.

Title An alternative name for the statistics box can be entered here. It will be used as window title for the sheet object. The title may be defined as a calculated label expression (see page 439) for dynamic update. If no title is stated, the name of the field shown in the statistics box will be used. This is indicated in the edit box as <use field name>.

Field The field to be shown in the statistics box.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Use as Title

By selecting this check box, the field name will be used as **Title**. The text <use field name> will appear in the **Title** edit box.

Object ID

The unique ID of the current statistics box. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first statistics box of a document will be assigned the ID SB01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Available Functions

Available statistical functions are listed in this column.

Displayed Functions

Displayed statistical functions are listed in this column.

Add > Moves the selected statistical functions from the column of available statistical functions to the column of displayed statistical functions.

< Remove

Moves the selected statistical functions listed in the column of displayed statistical functions to the column of available statistical functions.

Show Standard Error

Select this check box to display the standard error of the average and the standard deviation.

Cell Borders

Select this check box to get border lines between the cells displayed in the statistics box.

Settings for Selected Row

In this group individual settings can be made for the row selected in the **Displayed Functions** list above.

Label An alternative name for the selected statistical function can be entered here.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Background Color
Specifies the background color of the selected row. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Text Color
Specifies the text color of the selected row.

Apply Colors to All Rows
By selecting this check box before clicking **Apply** or **OK** the selected colors will be applied to all rows of the statistics box.

Select the statistical functions to be displayed/removed by clicking on them. Use the **Add >** or **< Remove** buttons to move them to the desired column.

The following statistical functions are available:

Numeric count
Sample size. (Number of numeric values among the possible values.)

Null count
Number of empty field values among the possible values.

Text count
Number of alphanumeric values among the possible values.

Total count
Total number of possible values. This is the same number as the frequency that can be shown in a list box. (Sum of the *Numeric count* and *Text count* described above.))

Missing count
Number of non-numeric values among the possible values. (Sum of *Null count* and *Text count*.)

Sum Sample sum.

Average
Sample arithmetic mean (average value).

Std dev Sample standard deviation.

Skewness
Sample skewness.

Kurtosis
Sample kurtosis.

Min Sample minimum.

Max Sample maximum.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Only value
Only possible numeric value.

Median Sample median.

Fractile Sample fractile.

Number

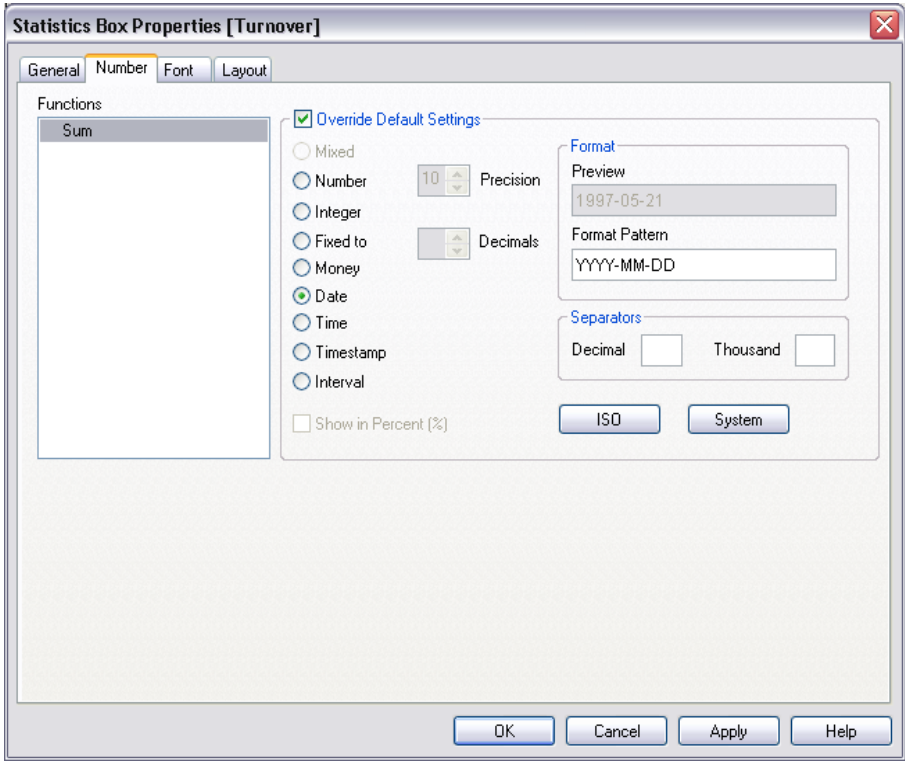


Figure 36. The Number page in the Statistics Box Properties dialog

Statistically correct number formats for the various statistical entities in a statistics box are automatically derived from the base field's data and number format. In the Number page, it is possible to set override number formats for the individual rows of the statistics box, if you disagree with these defaults.

Functions
A list showing all statistical functions currently shown in the statistics box. It is possible to select a function for which the date, time or number format is to be changed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Override Default Settings

In order to use a custom number format for a specific row, mark this check box and specify a number format section (see page 56).

Font

In the **Font** page (Figure 31 on page 108), you can change the font of the text in the statistics box.

You can specify the font, style and size of the text. The font chosen applies to all the text contained in the statistics box.

Layout

On the **Layout** page (Figure 32 on page 109) you can specify how the statistics box should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114) advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6 THE CHART



Charts and tables are sheet objects that can show numbers very compactly. You can e.g. show sums of money, distributed over different fields such as year, month, account number, etc. Numbers that are calculated using several records in the input tables (sums, averages, min, max) can only be shown in charts or statistics boxes.

Charts and tables can be set to display either the frequencies of different values of a field, or a calculated entity, e.g. the sum of the possible values of a field. In both cases, a certain field must be chosen as x-axis, i.e. this field will be used to label the slices of the pie, the different bars in the bar chart and the rows in the pivot table, respectively.

The chart types you can choose between are bar chart, line chart, combo chart, scatter chart, pie chart, radar chart, grid chart, block chart, gauge, funnel chart, pivot table and straight table.

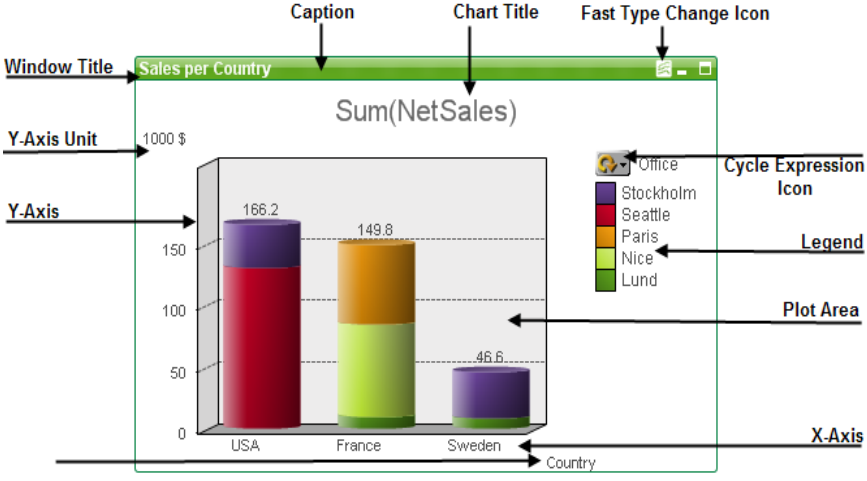
6.1 About QlikView Charts

QlikView charts can be divided into two major categories. The first, graph charts, consists of bar, line, combo, pie, scatter, radar, grid, block and gauge charts. The second category, table charts, consists of straight tables and pivot tables. These chart types are drawn as tables with cells in columns and rows. Please note that table boxes, although in many respects similar to table charts are not charts but a separate type of sheet objects.

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Graph Charts

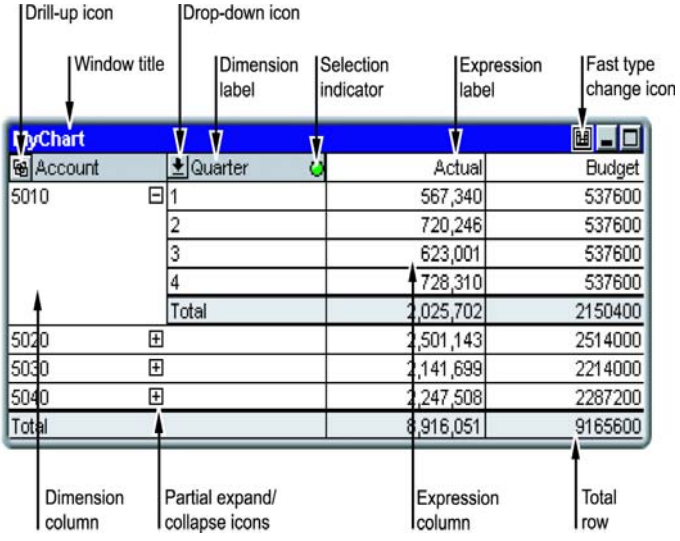
The bar chart below shows some of the more common components of a QlikView graph chart:



The position of the different components can in many cases be altered by the user. See chapter “Sizing and Moving Chart Components” on page 133 for details.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Table Charts:



The pivot table above shows some of the more common components of a QlikView table chart

6.2 Creation

Charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

If you want to create a simple chart and find the great number of different settings available overwhelming, choose **Create QuickChart** from the list box object menu or from the **Layout** menu, or click the **QuickChart** button in the toolbar. The wizard that appears will help you to create a chart in a quick and easy way. The result is however always a full-blown chart - it is only the creation process that has been simplified.

For a detailed description of the Quick Chart Wizard, see chapter “the quick chart wizard” on page 239 ff.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6.3 Chart Object Menu

The chart **Object** menu is found as the **Object** menu when a chart is active. It can also be opened as a float menu by clicking with the right mouse button on a chart. The chart object menu looks different depending on the active chart type. To find the commands that apply to the chart type you are working with, see the chapter on that specific chart.

6.4 Chart Properties



When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the new chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The regular chart wizard and the **Chart Properties** dialog are identical. However, the settings available on the different properties pages depend on the chart type you have chosen on the first page (**General** page). For detailed information on the **Chart Properties** dialog, we therefore refer to the part on charts (starting on page 13).

6.5 Fast Chart Type Change

The type of chart can be changed by the user without going via the **Chart Properties** dialog, provided that the **Fast Type Change** option has been selected on the **General** page of the **Chart Properties** dialog.



An icon showing the next available chart type (**Allowed Types** selected for fast type change) will appear in the chart. By left-clicking on the icon, the chart will change to the indicated type. By right-clicking on the icon you get a drop-down menu with all selected types.

The application designer can choose **Preferred Icon Position** of the fast type change icon. By choosing **In Caption** the icon will appear in the chart caption, provided that a caption is shown. By choosing **In Chart**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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the icon will appear inside the chart, provided that the chart is not a pivot table or straight table. If the preferred position is not available, QlikView will try to use the other option. In table charts without caption, no icon will be shown.

6.6 Sizing and Moving Chart Components



In QlikView's graphical charts many of the individual chart components can be sized or moved according to individual wishes. By pressing the SHIFT and CTRL keys simultaneously and keeping them depressed while a chart is active you will ENTER the chart layout edit mode. In this mode thin red rectangles will appear around those components of the chart, that can be sized or moved. You may then use the mouse drag and drop technique to move things around.

The following components can be changed:

The **Chart Title** can be both moved and sized. It can be docked to the top, bottom, left and right border of the chart and also be positioned free-floating anywhere you please within the chart.

The **Chart Legend** can be both moved and sized. It can be docked to the top, bottom, left and right border of the chart and also be positioned free-floating anywhere you please within the chart.

The area taken up by the **Chart Axes** and their labels can be sized.

A **Cycle Expression Icon** can be moved to a free-floating position anywhere you please within the chart.

Chart Texts can be moved to a any position in the chart and they can be sized.

A **Fast Chart Type Change Icon** can be moved to a free-floating position anywhere you please within the chart.

The **Plot Area** itself cannot be sized or moved but will be drawn in the space remaining between the axes and docked legend and title.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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7 THE MULTI BOX



Figure 37. The multi box

The multi box is a sheet object that shows several fields simultaneously.

For each field in the multi box, you will also find a selection indicator: a small beacon that will give you information on the content of the multi box. A green selection indicator shows that there are selected values, a white that there are optional values, and a gray that there are no possible values in the drop-down list.

7.1 Creation

Multi boxes are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu or by pressing the **Create Multi Box** button in the toolbar.



7.2 Multi Box Object Menu

The multi box **Object** menu is found as the **Object** menu when a multi box is active. It can also be opened as a float menu by clicking with the right mouse button on a multi box. The number of available commands differs depending on whether you right-click on the header of the multi box or on one of the fields. In the first case, the field-specific commands are not shown.

Properties...

Opens the **Multi Box Properties** dialog box.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front
Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back
Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward
Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward
Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Select Possible
Selects the possible field values of the field on which you click.

Select Excluded
Selects the currently excluded field values of the field on which you click.

Select All
Selects all the field values of the field on which you click.

Clear Deselects all the values of the field on which you click. This command can also be invoked via the keyboard shortcut CTRL+D.

Clear Other Fields
Selects all possible values in the current field, then clears the selections in all the other fields.

Lock Locks the selected values of the field on which you click. This command can also be invoked via the keyboard shortcut CTRL+L.

Unlock Unlocks the locked values of the field on which you click. This command can also be invoked via the keyboard shortcut CTRL+U.

Clear All Selections
Deselects the values of all the fields in the multi box.

Lock All Selections
Locks the values of all the fields in the multi box.

Unlock All Selections
Unlocks the values of all the fields in the multi box.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the multi box.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the multi box to Microsoft Excel, which is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Export...

Opens a dialog where you can export the multi box as a table to a file of your choice. The file formats offered include a range of delimited text file formats: HTML, XML, BIFF (native Excel format) and QVD (QlikView Data Files, see page in Book 1).

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Data Copies the data rows of the multi box to the clipboard.

Cell Value

Copies the text value of the multi box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the multi box. Clicking in the object caption (if shown) gives the same result. To restore the multi box to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized multi box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the multi box to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the multi box to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the current multi box from the sheet.

7.3 Multi Box Properties

(D) (P)

The **Multi Box Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

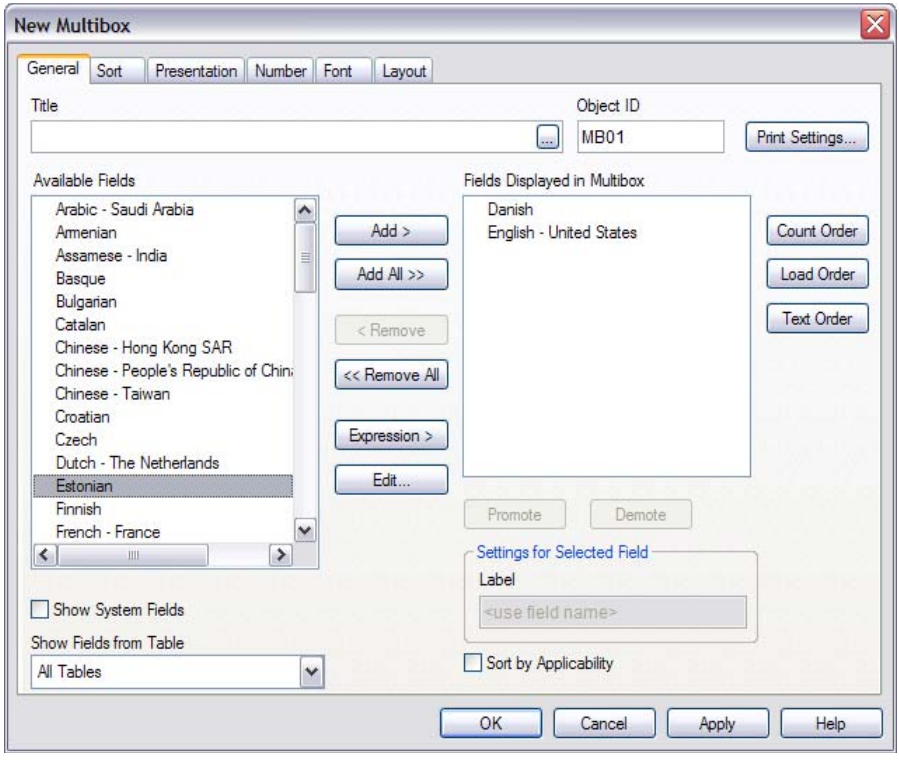


Figure 38. The General page in the Multi Box Properties dialog

The **General** page contains some general settings for the multi box:

Title Sets the title for the multi box. This name will be shown as window header. The title may be defined as a calculated formula (see page 439) for dynamic update.

Available Fields
The available fields (including the system fields, see above) are listed in this column.

Show System Fields
Check this box to make the system fields appear in the **Available Fields** column.

Show Fields from Table
Normally this drop-down shows the value **-All Tables-** and the **Available Fields/Groups** list contains all fields and groups of the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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document. By selecting a specific table name in the drop-down list you may limit the **Available Fields/Groups** list to only fields from that input table.

Finally you may select **-All Tables (Qualified) -** which will show all fields in the document qualified with their table name. A field will appear one time for each table it appears in.

Fields Displayed in Multi box

Displayed fields are listed in this column. Initially this column is empty.

Add >

Moves the selected fields from the column of available fields to the column of displayed fields.

Add All >>

Moves all the fields in the column of available fields to the column of displayed fields.

< Remove

Moves the selected fields listed in the column of displayed fields to the column of available fields.

Expression

Opens the **Edit Expression** dialog. Create an expression to be used as a displayed field in the Multi Box.

Edit...

Opens the **Edit Expression** dialog for the field chosen in the **Fields Displayed in Multibox**.

Select the fields to be used/removed by clicking on them. Use the **Add >** or **< Remove** buttons to move them to the desired column.

Count Order >>

Sorts the fields in the column of displayed fields according to the number of field values in each field. If you click twice, the order will be reversed.

Load Order >>

Sorts the fields in the column of displayed fields according to the load order of the fields. If you click twice, the order will be reversed.

Text Order >>

Sorts the fields in the column of displayed fields according to the alphabetical order of the fields. If you click twice, the fields will be sorted in reverse alphabetical order.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sort by Applicability

Sorts the fields in the multi box according to whether they contain possible field values or not. Fields lacking possible field values are dynamically moved down if this check box is marked.

Note The sort commands on this sheet affect the sort order of the fields, not the field values. The sort order for field values is set on the **Sort** page.

Promote

Moves the selected field one step up.

Demote

Moves the selected field one step down.

Object ID

The unique ID of the current multi box. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first multi box of a document will be assigned the ID MB01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Label An alternative name for the displayed field can be entered here. It will be used as field title in the multi box. The label may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sort

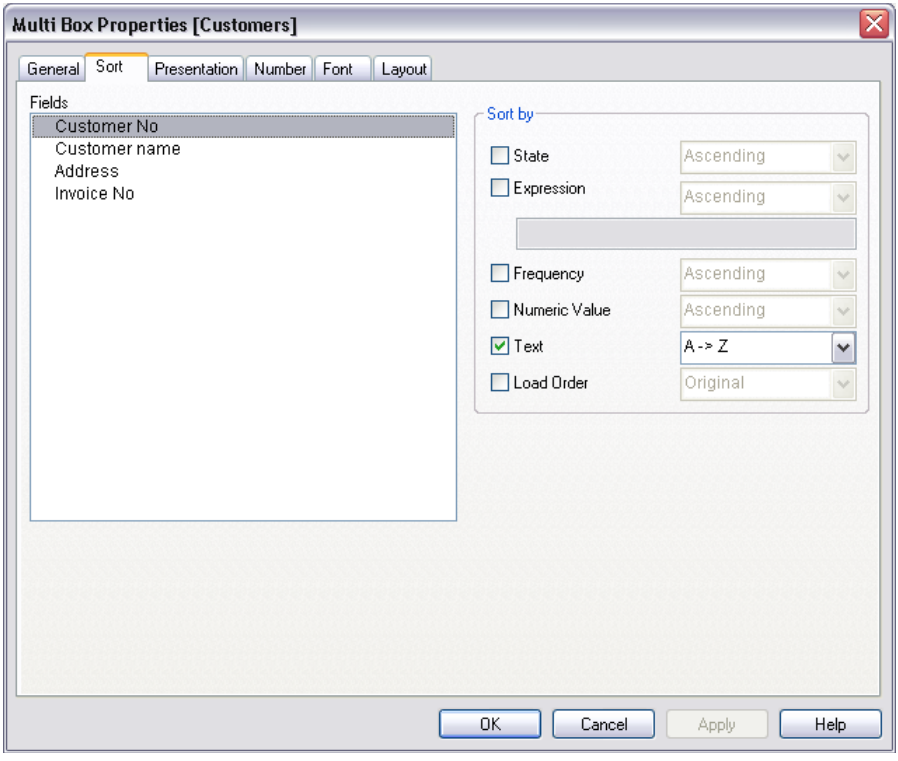


Figure 39. The Sort page in the Multi Box Properties dialog

In the **Sort** page the sort order of the field values can be set for each field in the multi box.

Fields In this group it is possible to select one or several fields for which the sort order is to be set.

Sort by

In this group, the sort order of the selected field's values can be set.

State Sorts the field values according to their logical state (selected, optional or excluded).

Expression

Sorts the field values according to the expression entered into the text edit box below this sort option. The label may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Expression dialog is opened for easier editing of long formulas.

Frequency
Sorts the field values by frequency (number of occurrences in the table).

Numeric Value
Sorts the field values by their numeric values.

Text Sorts the field values in alphabetical order.

Load order
Sorts the field values by the initial load order.

The order of priority is **State**, **Expression**, **Frequency**, **Numeric Value**, **Text** and **Load Order**. Each of these sort criteria can be set to ascending or descending. Note that the sort commands on this sheet affect the sort order of the field values, not of the fields themselves. The sort order for fields are set on the **General** page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Presentation

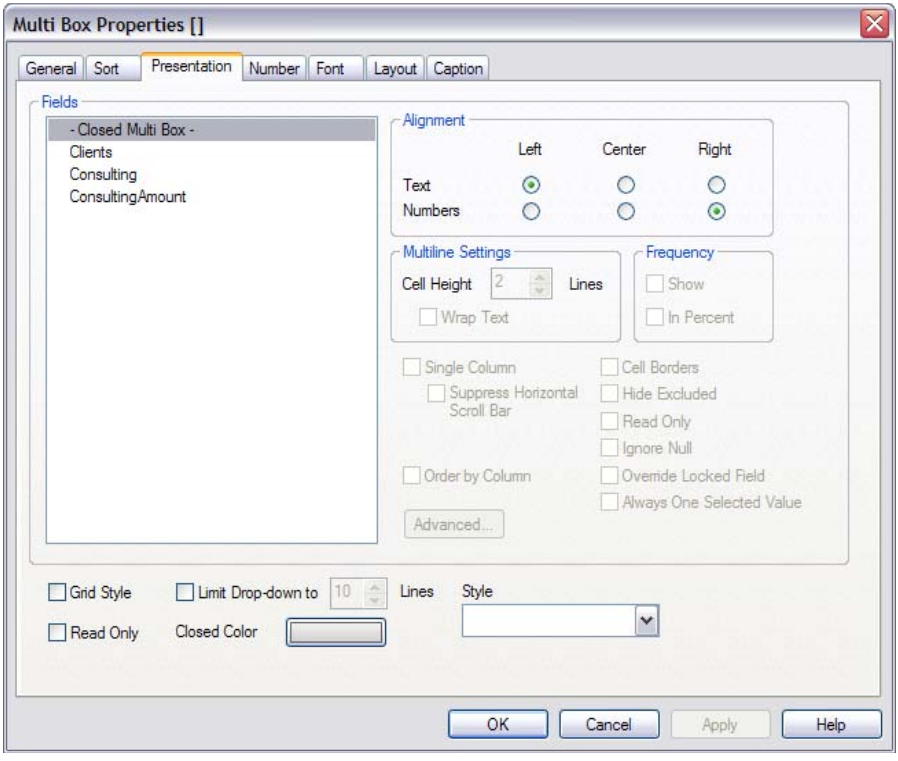


Figure 40. The Presentation page in the Multi Box Properties dialog

On the **Presentation** page it is possible to set properties concerning the presentation of data in the multi box.

Fields In this group you can select one or more fields for which you wish to change the presentation settings. In addition to the fields found in the multi box, the list contains the item ' **- closed multi box -**'. Select this item to change the settings of the closed multi box.

Alignment

In this group, the alignment of field values in the selected fields can be set. **Text** and **Numbers** can be individually set to left-adjusted, centered or right-adjusted.

Multiline Settings

In this group you can set the default display of multiple line cells for the selected fields.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Wrap Text

If this check box is marked, the contents of the cell will be wrapped in two or more lines.

Cell Height *n* Lines

If you have selected **Wrap Text**, this is where you set how many lines the cell should have.

Frequency

In the **Frequency** group you specify if and how frequency of a field value should be shown in selected fields.

Show Toggles the status as to whether or not the frequency of a field value is shown in selected fields. Frequency is here the number of records containing possible values of a field. This option is normally not available for fields used for associations between tables (see page 470 in Book I).

In Percent

Toggles the status as to whether or not the frequency should be shown in absolute numbers or as percentages of the total number of entries.

Single Column

Marking this check box will force single column mode in the selected fields. If it is not checked, you will automatically get several columns within the field value list.

Suppress Horizontal Scroll Bar

Mark this check box to suppress horizontal scroll bar in list box when field values are too wide to be displayed in their entirety.

Order by Column

If this check box is marked, a multiple column presentation will be ordered by columns instead of rows.

Cell Borders

Mark this check box to get horizontal border lines between the different field values in the selected fields.

Hide Excluded

Toggles whether or not the excluded values of the selected fields should be shown.

Read Only

Marking this check box makes selections in the multi box impossible for the selected fields.

Ignore NULL

The value in a specific row of the multi box will only be shown if there is exactly one possible value to show. When QlikView counts

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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possible values it will also count NULL values. If you want NULL values to be excluded in the count mark this check box. Incorrect use of this option may lead to the display of non-correlated data in the multi box.

Override Locked Field

If this check box is marked, selections can be made in the field from the multi box even if the field is locked. The field will still be locked for logical changes stemming from selections in other fields.

Advanced...

Opens the **Advanced Field Settings** dialog (see page 147) which offers settings for image representation of field values and special text search options.

Grid Style



Marking the **Grid Style** check box changes the appearance of the multi box (see the picture above).

Read Only

Marking this check box makes selections in the multi box impossible.

Limit Drop-down to *n* Lines

By marking this check box you can limit the length of opened drop-down list boxes in the multi box. Enter the maximum number of values to be shown in the edit box.

Closed Color

Specifies the color of the data column cells of a closed multi box. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Advanced Field Settings dialog

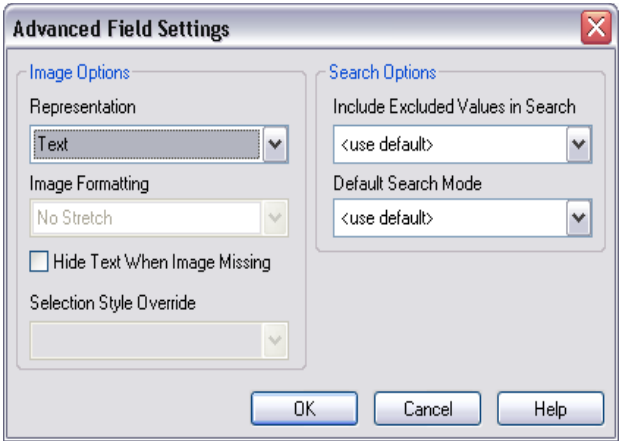


Figure 41. Advanced Field Settings

This dialog contains settings for image representation of field values and special text search options when using fields for text searches in drop-downs. The dialog can be called from the **Presentation** page of **Multi box Properties**, from the **Presentation** page of **Table Box Properties** and from the **Dimensions** page of **Chart Properties**.

Image Options

This group allows you to have a field value interpreted as a reference to an image in memory or on disk. The following settings are possible:

Representation

Three alternatives are given

Text When selecting this option the field values will always be interpreted and displayed as text.

Image When selecting this option QlikView will try to interpret each field value as a reference to an image. The reference may be a path to an image file on disk (e.g. `C:\Mypic.jpg`) or inside the qvw document (e.g. `qmem://<Name>/<Peter>`). If QlikView cannot interpret a field value as a valid image reference, the value itself will be displayed.

Info as Image

When selecting this option QlikView will display image info linked to the field value via info load/ select in the script. If no image info is available for

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

a field value, the value itself will be displayed. Option not available for bitmap charts.

Image Formatting

Only available when one of the image options has been selected above. This setting describes how QlikView formats the image to fit in the cell. There are four alternatives.

No Stretch

If this option is selected, the image will be shown as is, without any stretching. This may cause parts of the picture to be invisible or only part of the cell to be filled.

Fill If this option is selected, the image will be stretched to fit the cell without bothering about keeping the aspect ratio of the image.

Keep Aspect

If this option is selected, the image will be stretched as far as possible to fill the cell while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the image will be stretched to fill the cell in both directions while keeping the aspect ratio. This typically results in cropping of the image in one direction.

Hide Text When Image Missing

If this option is selected, QlikView will not display the field value text if interpretation as an image reference fails for some reason.

Selection Style Override

When images are shown instead of text it may be necessary to use another selection style than the document default so that the logical state of the field values becomes visible. Use the drop-down to select a suitable selection style, e.g. Corner Tags. This option is only available when image representation of some form has been selected under **Representation**.

Search Options

This group allows you to control certain aspects of text search applicable to opened multi boxes and drop-down select in tables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Include Excluded Values in Search

Specifies whether excluded values should be included in text searches. Three alternatives are given.

<use default>
The default as specified under **User Preferences** will apply. (See page 111 in Book I.)

Yes Excluded values are always included in text search.

No Excluded values are not included in text search. Only optional values are included.

Default Search Mode

Specifies the default search mode to be used in text search. The mode can always be intermittently changed by typing * or ~ as part of the search string. Three alternatives are given:

<use default>
The default as specified under **User Preferences** will apply. (See page 111 in Book I.)

Use Normal Search
Fuzzy search is default when starting a text search.

Use Fuzzy Search
Normal search is default when starting a text search.

Spacing

Mark this check box to insert extra empty spacing in tables wherever the value of the selected dimension changes. The setting can be made in the edit box in increments of 1/16 of current line height. The empty lines logically belong to the line above, to the effect that clicking on them will cause selection to appear in the preceding value. This check box is only available for table charts.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Number

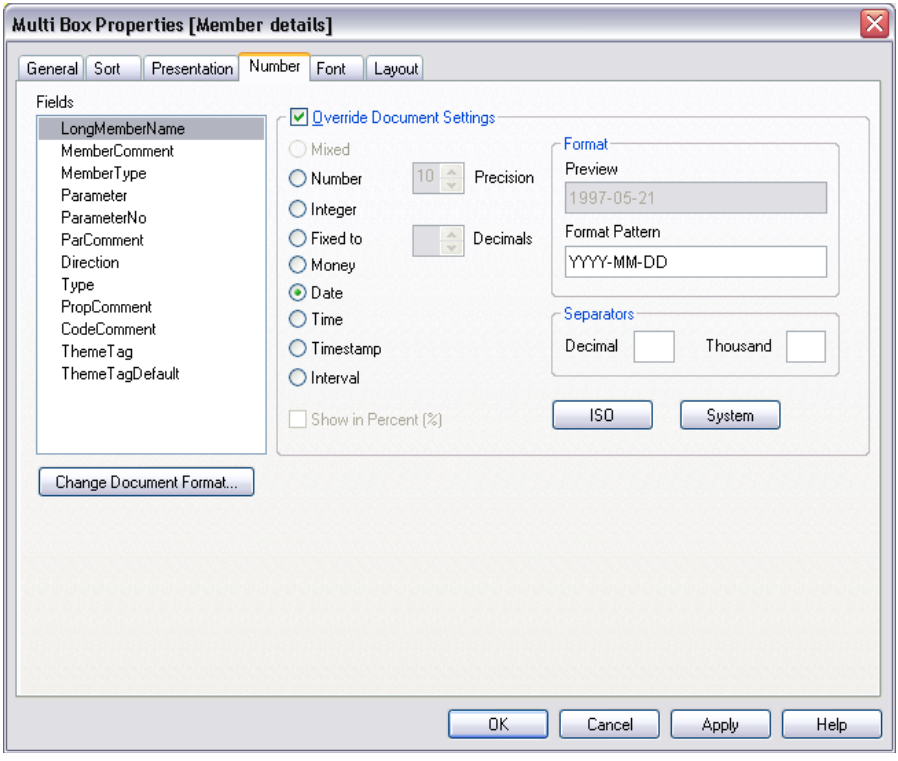


Figure 42. The Number page of the Multi box properties dialog

In the **Number** page, it is possible to set the number format for the different fields of the multi box.

Fields A list showing all fields currently shown in the multi box. It is possible to select a field for which the date, time or number format is to be changed.

Override Document Settings

Each field has a number format which can be set on the Number page of the Document Properties dialog. Normally this is the number format used when displaying field values in a multi box. To do this, mark this check box and specify a number format in the group control below. For an explanation of the controls, see the number format section, see page 285 in Book II.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Change Document Format...

Opens the **Number** page of the **Document Properties** dialog, where you can change the underlying number format of the fields.

Font

On the **Font** page (Figure 31 on page 108), you can change the font of the text in the multi box.

You can specify the font, style and size of the text. The font chosen applies to all text contained in the multi box.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the multi box should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

8 THE TABLE BOX



Suppliers		
Supplier	Category	Product
ABC	Baby Clothes	Mehmet-Napp
ABC	Baby Clothes	Mehmet-Skor
ABC	Baby Clothes	Mehmet-Tröja
Asin Fashion Ltd Co	Swimwear	Summer Shorts
Asin Fashion Ltd Co	Women's Clothes	Okkaba Skin Jackets
Asin Fashion Ltd Co	Women's Footwear	Walking Shoes
Austerlich	Children's Clothes	RDL Suit
Austerlich	Men's Clothes	Bow tie
Austerlich	Men's Footwear	Davenport Shoes

Figure 43. The table box

The table box is a sheet object that shows several fields simultaneously. The content is record-oriented in the same way as a normal table, i.e. the contents of one row are logically connected. The columns of the table box can be fetched from different input tables, which gives the user a possibility to create a new table with all the logically possible combinations of the values in the fields of the input tables.

8.1 Creation



Table boxes are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu, or by pressing the **Create Table Box** button in the toolbar.



8.2 Using the Table Box

Sorting

It is possible to sort the table box by any column: simply right-click on the column and choose **Sort** from the float menu. You can also double-click the caption of column you want to sort by.

Changing the Column Order

The order of the columns can be changed by means of the drag-and-drop-method. Point at the column title, then keep the mouse button depressed while dragging the column to its new position. You can disable this feature

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

by deselecting the **Allow Drag and Drop** check box in the **Table Box Properties** dialog, **Presentation** page.

8.3 Table Box Object Menu

The table box **Object** menu is found as the **Object** menu when a table box is active. It can also be opened as a float menu by clicking with the right mouse button on a table box. The number of available commands differs depending on whether you right-click on the header of the table box or on one of the columns. In the first case, field specific commands are not shown.



Properties...

Opens the **Table Box Properties** dialog box.

Fit Columns to Data

Adjusts the width of all columns in the tables to the widest data in each column. The header is included in the calculation.

Equal Columnwidth

Sets the columnwidth in the table equal to that of the column on which you clicked.

Sort Sorts the records by the field on which you click.

Custom Format Cell

Opens the **Custom Format Cell** dialog (see page 161) which lets you format cells in the column you clicked upon. The command is only available when design grid is turned on or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I).

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Bring Forward
Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward
Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Change Value
Only available for table box columns displaying input fields. Sets the cell that has been clicked in input edit mode. Equivalent to clicking the input icon in the cell.

Restore Values
Only available for table boxes displaying input fields. Opens a cascade menu with three options.

Restore Single Value
Restores the value in the field value that has been clicked to its default value from the script.

Restore Possible Values
Restores the values of all possible field values to their default values from the script.

Restore All Values
Restores the values of all field values to their default values from the script.

Select Possible
Selects the possible field values of the field on which you click.

Select Excluded
Selects the currently excluded field values of the field on which you click.

Select All
Selects all the field values of the field on which you click.

Clear All Selections
Clears selections in all fields displayed in the table box.

Clear Deselects all the values of the field on which you click.

Clear Other Fields
Selects all possible values in the current field, then clears the selections in all the other fields.

Lock Locks the selected values of the field on which you click.

Unlock
Unlocks the locked values of the field on which you click.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the table to Microsoft Excel, which is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work, Microsoft Excel 97 or later must be installed on the computer.

Export...

Exports the contents of the table to a file of your choice. The file formats offered include a range of delimited text file formats, HTML, XML, BIFF (native Excel format) and QVD (QlikView Data files, see page 503 in Book I).

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Full Table

Copies the table to the clipboard, complete with header and selection status.

Table Data Area

Copies only the values of the table to the clipboard.

Cell Value

Copies the text value of the table box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Minimize

Iconizes the table box. Clicking in the object caption (if shown) gives the same result. To restore the table box to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized table box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the list box to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the table box to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context specific help.

(D) (P) **Remove**

Removes the current table box from the sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

8.4 Custom Format Cell Dialog

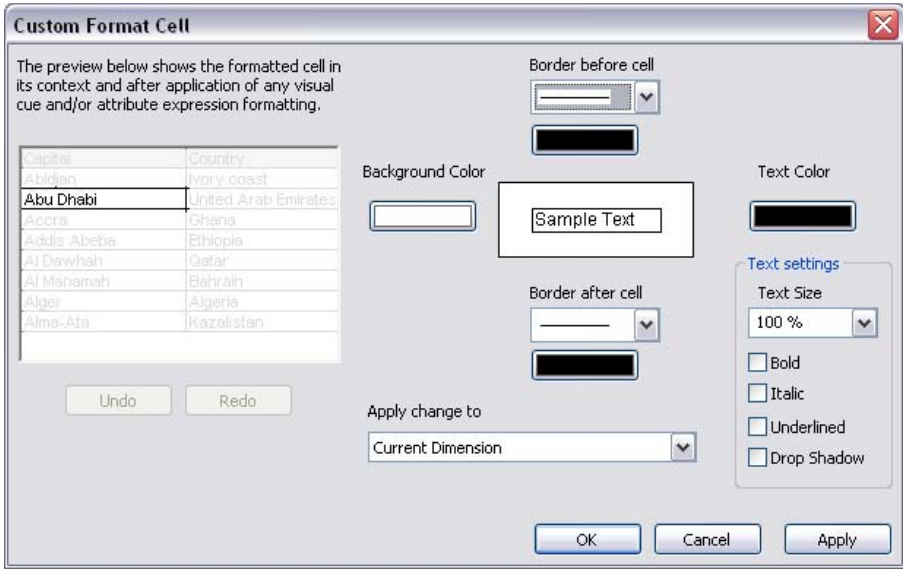


Figure 44. The Custom Format Cell dialog

This dialog lets you apply custom formats to one or more groups of table cells. It can be invoked from the object menus of a table box, a straight table or a pivot table, provided that the design grid is turned on or **Always Show Design Menu Items** is marked in **User Preferences** (see page 121 in Book I).

The group of cells to be affected by the formatting is determined by where you right-click in the table to invoke the command. The smallest group of cells to be formatted as a unit is one field (normally column) in a table box or one expression/dimension in a table chart. If striping is used, each stripe is formatted separately.

Whenever this dialog is used to custom format any part of a table, the **Style** as set in the **Style** page of the table's Properties dialog will be set to **[Custom]**. If you change the **Style** setting back to one of the pre-defined styles, the custom formatting will be lost.

Note Table styles in general will be superseded by any formatting resulting from attribute expressions.

Table Preview Pane

The preview pane shows format changes made to the group/groups of table cells. Unlike the smaller preview to the right, **Sample Text**,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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it shows the changes in context and after the application of visual cues and/or attribute expression formatting.

Within this pane it is possible to freely move about the table and apply formats to the different groups of cells. Just click in a cell to move formatting focus.

Undo The **Undo** button can be used for undoing the changes made within the **Custom Format Cell** dialog step by step.

Redo The **Redo** button can be used for reapplying changes previously undone with the **Undo** button within the **Custom Format Cell** dialog step by step.

After leaving the **Custom Format Cell** dialog all changes made in the dialog may be undone with just one click on the **Undo** button in the main toolbar.

Sample Text
This is the preview cell which shows the settings made.

Background Color
Defines the cell background color.

Text Color
Defines the cell text color.

Border Before Cell
Here you define the border to precede the cell. There is a drop-down for setting border style and a button to set border color. Note that cell borders will be merged between cells, which may cause the actual border in the table to look differently from the preview.

Border After Cell
Here you define the border to succeed the cell. There is a drop-down for setting border style and a button to set border color. Note that cell borders will be merged between cells, which may cause the actual border in the table to look differently from the preview.

Text Settings
In this group you fins a number of text modifiers applicable to the cell.

Size Use the drop-down to apply a size modification to the general font used in the table.

Bold Mark this check box for bold text.

Italic Mark this check box for italic text.

Underline
Mark this check box for underlined text.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Drop Shadow

Mark this check box for text with drop shadow.

Apply Change To

Changes are normally applied only to the expression, dimension or field (table boxes) in which you right-clicked to access the dialog. With the help of this drop-down you may choose to apply the same formatting to other expressions, dimensions or fields.

OK Applies the changes and closes the dialog.

Cancel Closes the dialog without applying changes.

Apply Applies the changes without closing the dialog.

8.5 Table Box Properties



The **Table Box Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

General

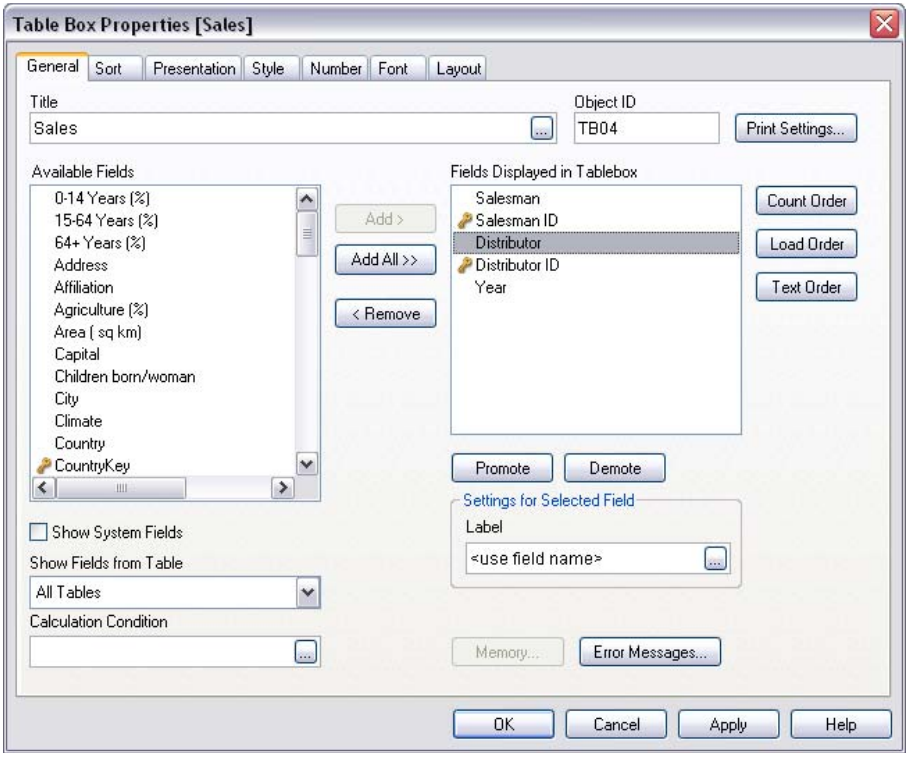


Figure 45. The General page in the Table Box Properties dialog

The **General** page contains some general settings for the Table box.

Title Sets the title for the table box. This name will be shown as window header. The title may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **... button** the full **Edit Expression** dialog is opened for easier editing of long formulas.

Available Fields

Available fields (including the system fields, see below) are listed in this column. Provided that the document script has been executed all fields which appear in more than one input table will be preceded with a key symbol.

Show Systems Fields

Check this box to get the system fields visible in the **Available Fields** column.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Show Fields from Table

Normally this drop-down shows the value **-All Tables-** and the **Available Fields/Groups** list contains all fields and groups of the document. By selecting a specific table name in the drop-down list you may limit the **Available Fields/Groups** list to only fields from that input table.

Finally you may select **-All Tables (Qualified) -** which will show all fields in the document qualified with their table name. A field will appear one time for each table it appears in.

Calculation Condition

Typing an expression in this text box sets a condition to be fulfilled for the table box to be calculated. If the condition is not fulfilled, the text 'Calculation condition unfulfilled' will be displayed in the table box.

Fields Displayed in Table box

Displayed fields (columns in the table box) are listed in this column. Initially this column is empty.

Add >

Moves the selected fields from the column of available fields to the column of displayed fields.

Add All >>

Moves all the fields in the column of available fields to the column of displayed fields.

< Remove

Moves the selected fields listed in the column of displayed fields to the column of available fields.

Select the fields to be used/removed by clicking on them. Use the **Add >** or **< Remove** buttons to move them to the desired column.

Count Order

Sorts the fields in the column of available fields according to the number of field values in each field. If you click twice, the order will be reversed.

Load Order

Sorts the fields in the column of displayed fields according to the load order of the fields. If you click twice, the order will be reversed.

Text Order

Sorts the fields in the column of displayed fields according to the alphabetical order of the fields. If you click twice, the order will be reversed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Note that the sort commands on this sheet affect the sort order of the fields, i.e. the column order, not the order of the records. The sort order for field values is set on the **Sort** page.

Promote
Moves the selected field one step to the left.

Demote
Moves the selected field one step to the right.

Object ID
The unique ID of the current table box. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first table box of a document will be assigned the ID TB01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

Print Settings...
By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Label An alternative name for the displayed field can be entered here. It will be used as column title in the table box. The label may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **... button** the full **Edit Expression** dialog is opened for easier editing of long formulas.

Error Messages
Opens a dialog in which you can define custom error messages to be displayed instead of the standard ones. See further on page 443.

Memory...
Opens the **Calculation Memory Settings** dialog (see further on page 141 in Book I), in which it is possible to increase the memory allocated to the table. This might be necessary for large tables. This button is not available when **Ignore Calculation Limits** has been selected in the **Objects** page of the **User Preferences** dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sort

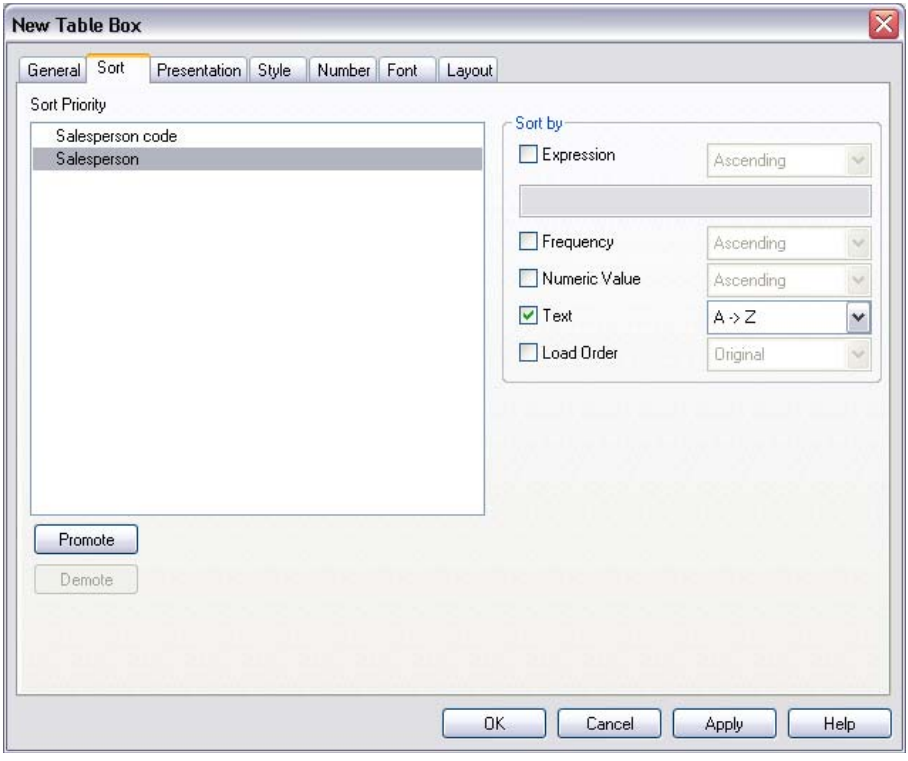


Figure 46. The Sort page in the Table Box Properties dialog

In the **Sort** page the sort order of the field values and of the records can be set. The order defined here is used also when the **Sort** command in the **Object** menu is chosen, or when you double-click in a column header.

Sort Priority

In this group it is possible to select one or several fields for which the sort order is to be set. The order of the fields in this column defines the order of priority when sorting the records.

Promote

Moves the selected field one step up in the **Fields** list.

Demote

Moves the selected field one step down in the **Fields** list.

Sort by

In this group the sort order of the selected fields can be set.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Expression
Sorts the field values according to the expression entered into the text edit box below this sort option.

Frequency
Sorts the field values by frequency (number of occurrences in the table).

Numeric Value
Sorts the field values by their numeric values.

Text Sorts the field values in alphabetical order.

Load Order
Sorts the field values by the initial load order.

The order of priority within a field is **Expression**, **Frequency**, **Numeric Value**, **Text** and **Load Order**. Each of these sort criteria can be set to ascending or descending. The order of priority between the fields is set by the order of the fields in the **Fields** list.

Note that the sort commands on this sheet affect the sort order of the field values, not the columns. The sort order for columns are set on the **General** page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Presentation

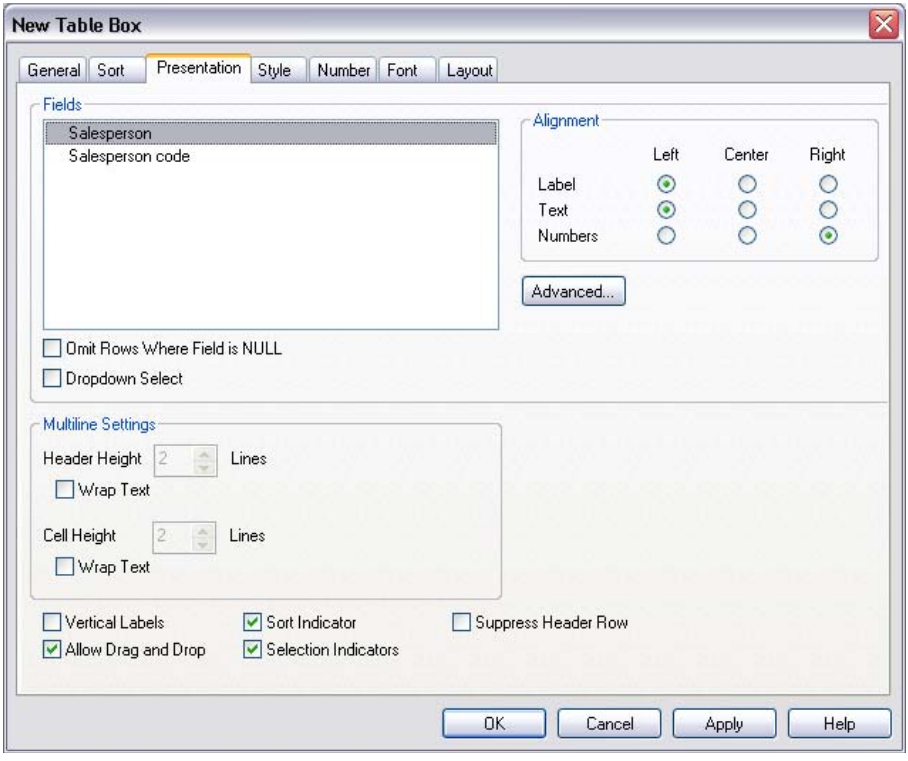


Figure 47. The Presentation page in the Table box Properties dialog

In the **Presentation** page it is possible to set properties concerning the presentation of data in the table box.

Fields In this group it is possible to select one or several fields for which the presentation properties are to be set.

Alignment

In the **Alignment** group, the alignment of field values of the selected fields can be set. **Label**, **Text** and **Numbers** can be individually set to left-adjusted, centered or right-adjusted.

Omit Rows where Field is NULL

Marking this check box will force the table to omit records in which the field value is missing. If it is not checked, you will see missing field values as gray cells.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Drop-down Select

If this check box is selected for a field column, a drop-down icon will appear to the left in the column header. By clicking on the icon a list box showing all field values of the field will be opened over the table. You may then make selections and searches in the same manner as if the field had been a row in a multi box.

Advanced

Opens the **Advanced Field Settings** dialog (see page 147) which offers settings for image representation of field values and special text search options.

Multiline Settings

In this group you can set the height of the table header and data row cells.

Wrap Header Text

If this check box is marked, the contents of the header row cells will be wrapped in two or more lines.

Header Height (Lines)

If you have selected **Wrap Header Text**, this is where you set how many lines the header cells should have.

Wrap Text

If this check box is marked, the contents of the data cells will be wrapped in two or more lines.

Vertical Labels

If this check box is marked, the column titles are displayed vertically.

Allow Drag and Drop

Deselect this check box to disable drag and drop moves within the column.

Sort Indicator

If this check box is selected, a sort indicator icon (arrow) will be shown in the header of the column, which is at the top of the current column sort order. The direction of the icon indicates whether the column is sorted ascending or descending.

Selection Indicators

If this check box is selected, selection indicators (beacons) will be shown in table columns containing fields with selections. For new tables this setting takes its default from the **Selection Indicators in Tables** on the **Objects** page of **User Preferences**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Suppress Header Row

If this check box is marked the table will be shown without header (label) row.

Style

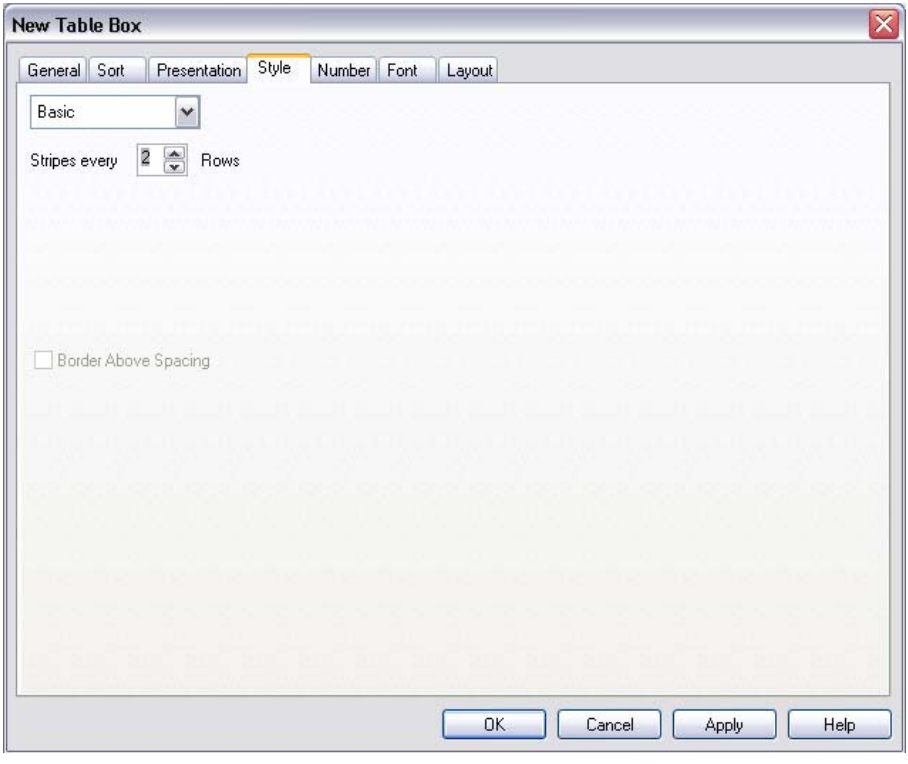


Figure 48. The Style page in the Table Box Properties dialog.

In the **Style** page, you make settings for the table formmatting style.

Current Style

You can choose an appropriate table style from the drop-down list. If the value [Custom] appears in the drop-down control a custom style has been applied to the table. If you change the setting back to one of the pre-defined styles, the custom formatting will be lost.

Stripes every n Rows

Here you can specify if and at how long intervals shaded stripes should appear.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Number

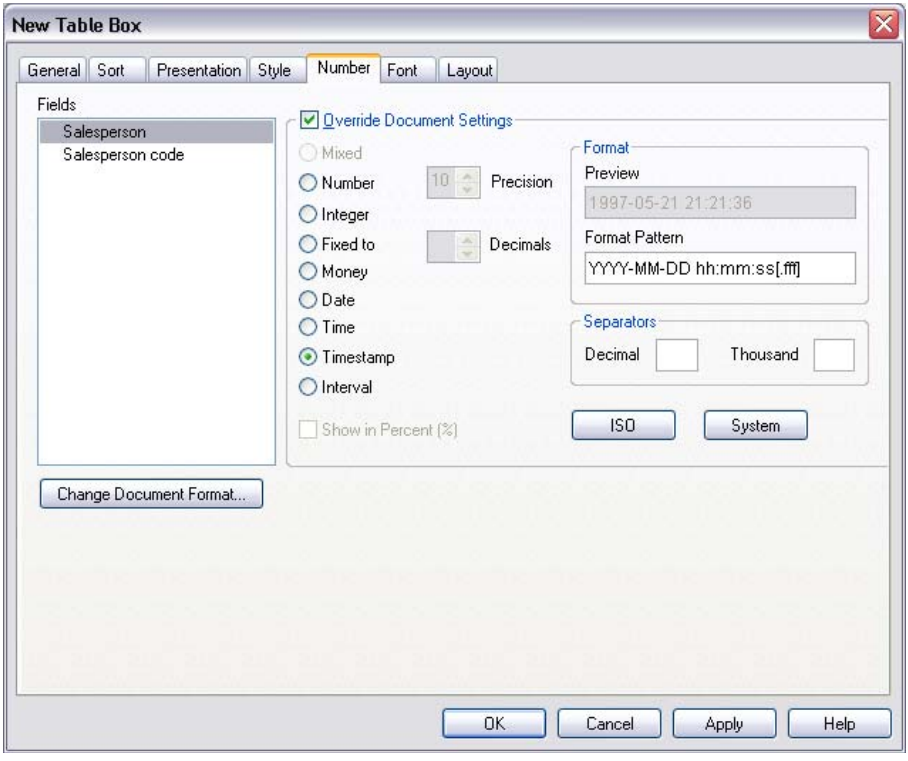


Figure 49. The Number page in the Table Box Properties dialog

In the **Number** page, it is possible to set the number format for the different fields of the table box.

Fields A list showing all fields currently shown in the table box. It is possible to select a field for which the date, time or number format is to be changed.

Override Document Settings

Each field has a number format which can be set on the **Number** page of the **Document Properties** dialog. Normally this is the number used when displaying field values in a table box. It is however possible to use a separate number format in an individual table box. To do this, mark this check box and specify a number format in the group control below. For an explanation of the controls, see the number format section, page 285 in Book II.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Change Document Format

Opens the **Number** page of the **Document Properties** dialog, where you can change the underlying number format of the fields.

Font

In the **Font** page (Figure 31 on page 108), you can change the font of the text in the table box.

You can specify the font and size of the text. The font chosen applies to all text contained in the table box. The style is chosen in the **Style** page (see above).

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the table box should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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9 THE CURRENT SELECTIONS BOX



Figure 50. The Current Selections box

The current selections box is a sheet object that shows selections in the fields and their logical status. The current selections box shows the same data as the free floating **Current Selections Window** (see page 155 in Book I) but can be positioned on the sheet as a sheet object.

9.1 Creation

Current selection boxes are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu, or by pressing the **Create Current Selections Box** button in the toolbar.



9.2 Current Selections Box Object Menu

The current selections box **Object** menu is found as the **Object** menu when a current selections box is active. It can also be opened as a float menu by clicking with the right mouse button on a current selections box. The number of available commands differs depending on whether you right-click on the header of the current selections box or on one of the fields. In the first case, the field-specific commands are not shown. In the second case commands relating to all fields are not shown. The menu contains the following commands:

Properties...

Opens the **Current Selections Box Properties** dialog.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front
Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back
Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward
Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward
Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Select Possible
Selects the possible field values of the field on which you click. This command is only available when you right-click on a specific field.

Select Excluded
Selects the currently excluded field values of the field on which you click. This command is only available when you right-click on a specific field.

Select All
Selects all the field values of the field on which you click. This command is only available when you right-click on a specific field.

Clear Deselects all the values of the field on which you click. This command is only available when you right-click on a specific field.

Clear Other Fields
Selects all possible values in the current field, then clears the selections in all the other fields. This command is only available when you right-click on a specific field.

Lock Locks the selected values of the field on which you click. This command is only available when you right-click on a specific field.

Unlock Unlocks the locked values of the field on which you click. This command is only available when you right-click on a specific field.

Clear All Selections
Clears the selections in all fields in the document. This command is not available when you right-click on a specific field.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Lock All Selections

Locks the selections in all fields in the document. This command is not available when you right-click on a specific field.

Unlock All Selections

Unlocks the selections in all fields in the document. This command is not available when you right-click on a specific field.

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the current selections box.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the text to Microsoft Excel, which is automatically launched if not already running. The text will appear in a single cell in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Export...

Opens a dialog where you can export the contents in the current selections to a file of your choice. The file formats offered include a range of delimited text file formats, HTML, XML, BIFF (native Excel format) and QVD (QlikView Data Files, see page 503 in Book I).

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Data Copies the data (selections) in the selected current selections box to the clipboard.

Cell Value

Copies the text value of the current selections box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the current selections box. Clicking in the object caption (if shown) gives the same result. To restore the current selections box to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page(see Figure 33 on page 114).

Restore

Restores a minimized or maximized current selections box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the list box to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the list box to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the active current selections box from the sheet.

9.3 Current Selections Box Properties

(D) (P)

The **Current Selections Box Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

General

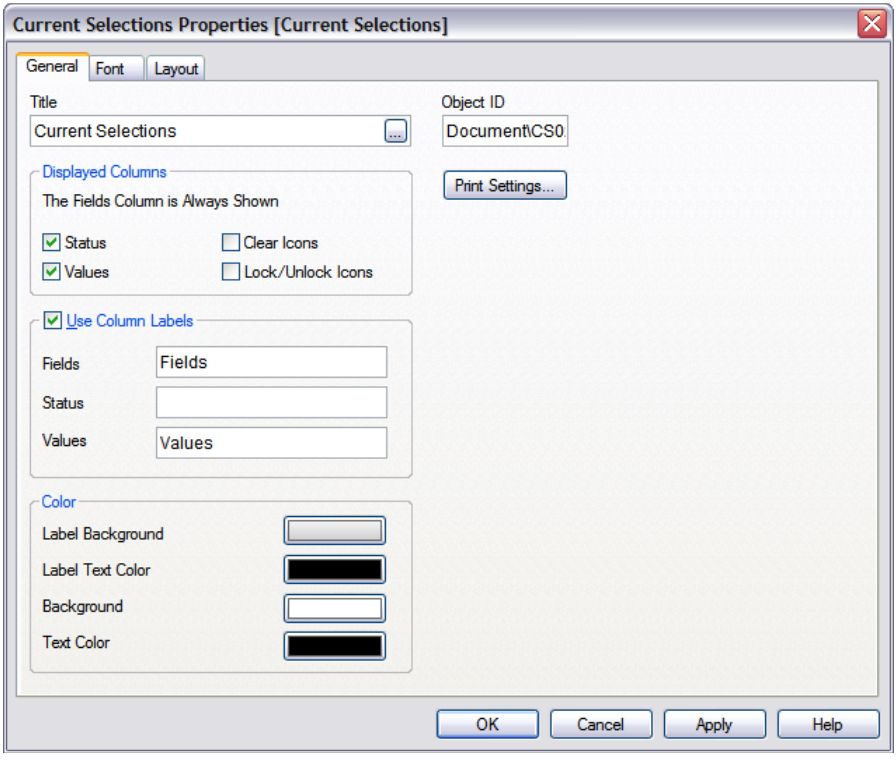


Figure 51. The General page in the Current Selections Box Properties dialog

In the **General** page settings for title and configuration of the Current Selections box can be made.

Title Sets the title for the current selections box. This name will be shown as window header. The title may be defined as a calculated formula (see page 439) for dynamic update. The default value is "Current Selections".

Displayed Columns

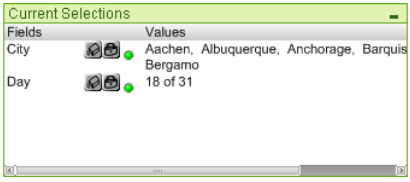
In this group you decide which columns should appear in the current selections box. The **Fields** column is always shown.

Status If this check box is marked, the current selections box will contain a **Status** column with colored beacons indicating the current logical status of the selections in the fields (e.g. locked).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Values If this check box is marked the current selections box will contain a **Values** column showing the values selected in the fields.

Clear Icons



If this check box is marked each field row in the current selections box will display a small clear icon. Clicking the clear icon will clear selections in the field. No clear icon will be shown for locked fields.

Lock/Unlock Icons

If this check box is marked each field row in the current selections box will display a small lock or unlock icon. Clicking the icon will lock or unlock selections in the fields.

Use Column Labels

If this check box is marked a header row will be shown in the current selections box. Labels can be edited in the group below.

Fields Here you may specify a label to be shown in the header row above the **Fields** column.

Status Here you may specify a label to be shown in the header row above the **Status** column.

Values Here you may specify a label to be shown in the header row above the **Values** column.

Colors In this group you may set the colors of the current selections box.

Label Background

Defines the background color of the label row.

Label Text Color

Defines the text color of the label row.

Background

Defines the background color of the display area.

Text Color

Defines the text color of the display area.

Object ID

Unique object identifier for the sheet object. Can be used for referencing the sheet object from Automation and macros. May be

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

changed to any name which is not already occupied by another sheet object, sheet or bookmark in the document.

Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Font

On the **Font** page (Figure 31 on page 108), you can change the font of the text in the current selections box.

You can specify the font, style and size of the text. The font chosen applies to all text contained in the current selections box.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the current selections box should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

10 THE INPUT BOX

D P A

The input box is a sheet object that is used to enter data into QlikView variables and to show their values.



Figure 52. The Input Box

10.1 Creation

D P

Input boxes are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu or by pressing the **Create Input Box** button in the toolbar.



10.2 Using the Input Box

An input box consists of three columns in a multi box like layout. The first column shows a list of variables. The second column equal signs '=' and the third column the values of the variables. It can contain one or many variables, each one on a separate row.

Variables in QlikView are named entities containing a single data value, unlike fields which can (and normally do) contain multiple values. Also, whereas fields get their values from **load** and **select** statements in the script, variables get their values from **let** and **set** statements in the script, via Automation calls, or by the help of input boxes in the layout. For more information on variables and fields, see chapter “variables and fields” on page 223 in Book I.

Variables can contain numeric or alphanumeric data. If the first character of a variable value is an equal sign '=' QlikView will try to evaluate the value as a formula (QlikView expression) and then display or return the result rather than the actual formula text.

In an input box the current value of the variable is shown. By clicking on a value in the input box, the cell will turn into edit mode, so that a new value can be entered or the old one modified. If the variable contains a formula, that will now be shown rather than its result. The cell in edit mode will normally contain a **...** button which

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

opens up a full editor window to facilitate creation of advanced formulas. The function of a variable value cell in an input box could very well be compared to that of a cell in a spreadsheet.

Sometimes the input box variable value cell will contain a drop-down icon, giving fast access to recently used values or predefined values. A variable may have input constraints attached to it, barring input of all values which do not meet certain criteria. In certain cases a variable in an input box may be read-only, in which case it is impossible to enter edit mode.

10.3 Input Box Object Menu

The input box **Object** menu is found as the **Object** menu when an input box is active. It can also be opened as a float menu by clicking with the right mouse button on an input box. The number of available commands differs depending on whether you right-click on the header of the input box or on one of the fields. In the first case, the field specific commands are not shown. In the second case, commands relating to all fields are not shown.

Properties...

Opens the input box Properties dialog box.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the input box.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the input box to Microsoft Excel, which is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Export...

Opens a dialog where you can export the contents of the input box to a file of your choice. The file formats offered include a range of delimited text file formats, HTML, XML, BIFF (native Excel format) and QVD (QlikView Data Files, see page 503 in Book I).

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Data Copies the data rows of the input box to the clipboard.

Cell Value

Copies the text value of the input box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the input box. Clicking in the object caption (if shown) gives the same result. To restore the input box to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized input box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the input box to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the input box to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page(see Figure 33 on page 114).

Help Opens context specific help.

Remove

Removes the current input box from the sheet.

10.4 Input Box Properties

The I**nput Box Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).
When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

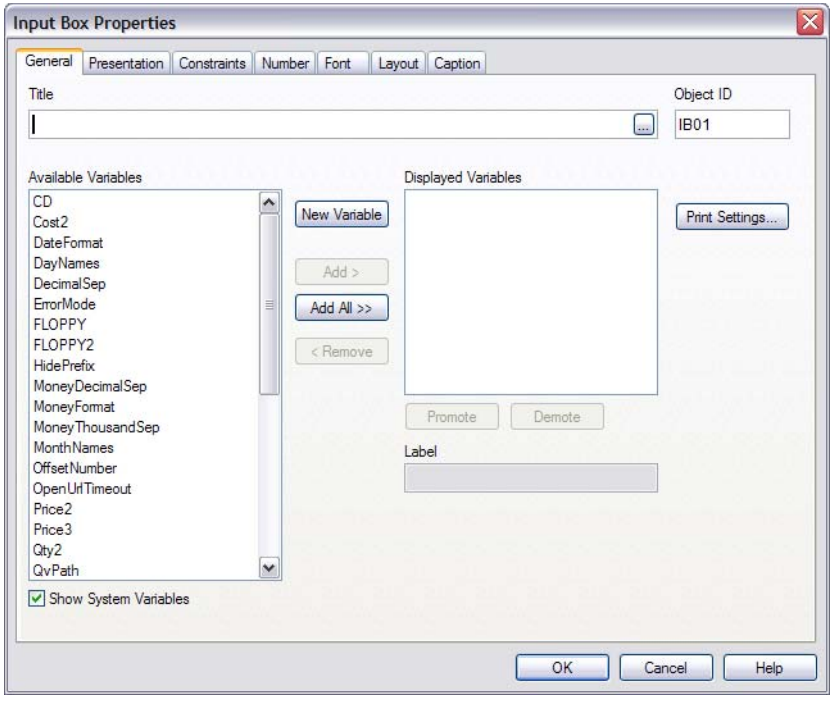


Figure 53. The General Page in the Input Box Properties dialog

In the **General** page you set a title for the input box and select what variables should be displayed.

Title Sets the title for the input box. This name will be shown as window header. The title may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Available Variables
The available variables (including the system variables, see above) are listed in this column.

Show System Variables
Check this box to make the system variables appear in the **Available Variables** column. System variables are typically created during script execution.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Displayed Variables

Variables to be displayed in the input box are listed in this column. Initially this column is empty.

New Variable

Opens a dialog for creating a new variable which is then placed in the column of displayed variables.

Add Moves the selected variables from the column of available variables to the column of displayed variables.

Add all>>

Moves all the variables in the column of available variables to the column of displayed variables.

< Remove

Moves the selected variables listed in the column of displayed variables to the column of available variables.

Select the variables to be used/removed by clicking on them. Use the **Add >** or **< Remove** buttons to move them to the desired column.

Promote

Moves the selected variable one step up in the column of displayed variables and thereby also in the order by which they are shown in the input box.

Demote

Moves the selected variable one step down in the column of displayed variables and thereby also in the order by which they are shown in the input box.

Label An alternative name for the displayed variable can be entered here. It will be used as variable title in the input box. The label may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full Edit Expression dialog is opened for easier editing of long formulas.

Object ID

The unique ID of the current input box. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first input box of a document will be assigned the ID IB01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Presentation

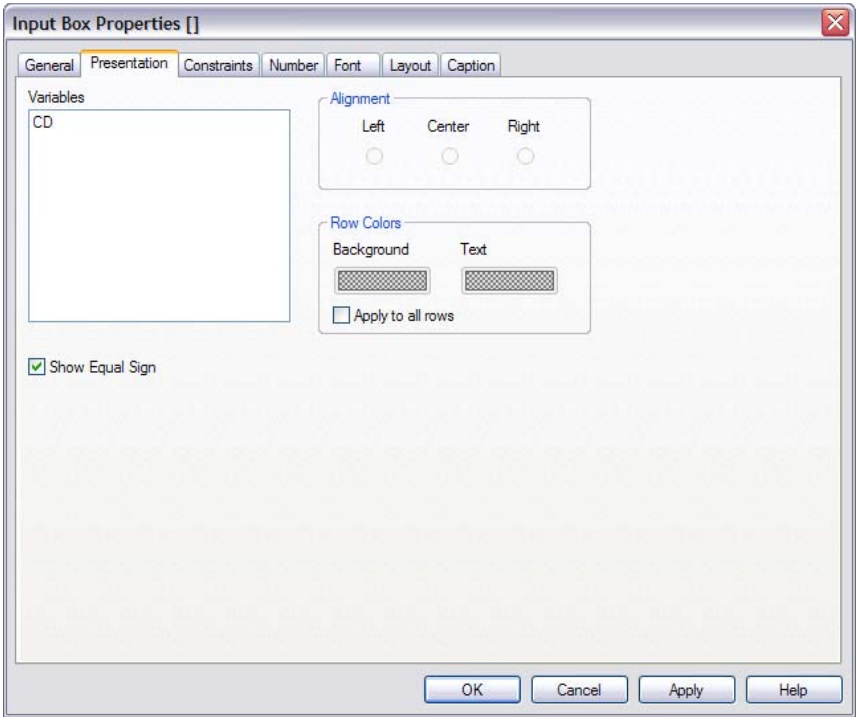


Figure 54. The Presentation page in the properties dialog.

Variables

Shows a list of all variables in the current input box. When a variable name in the list is selected the properties of that variable can be modified.

Show Equal Sign

Uncheck this box if you do not want the equal sign to be displayed in the Input Box. This setting is general for all variables.

Alignment

The alignment of the variables can be set. The variables can be individually set to left-adjusted, centered or right-adjusted.

Row Colors

In this group individual color settings can be made for the row selected in the **Displayed Variables** list to the left.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Background

Specifies the background color of the selected row. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Text Specifies the text color of the selected row.

Apply to All Rows

By selecting this check box before clicking **Apply** or **OK** the selected colors will be applied to all rows of the input box.

Constraints

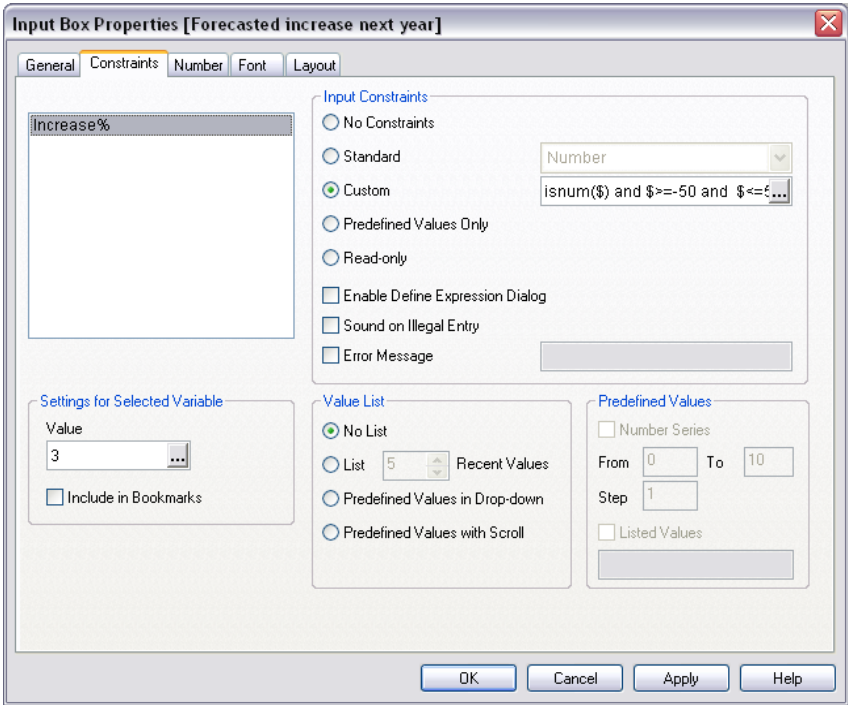


Figure 55. The Constraints page in the i Properties dialog

In the **Constraints** page advanced settings can be made for the variables in the input box. For more information on variables, see page 224 in Book I.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Variables

Shows a list of all variables in the current input box. When a variable name in the list is selected the properties of that variable can be modified.

Settings for Selected Variable

In this group you can make settings for a variable selected in the list above.

Value Shows the current value of the selected variable, which can also be edited.

Include in Bookmarks

Variables are normally not included in bookmarks. Mark this check box if you want the variable to be included in bookmarks.

Input constraints

In the **Input constraints** group you can specify constraints against which all values entered into an input box variable by the user will be checked. If a value does not meet the constraints specified, it will be rejected and an error message may be shown (see below).

No Constraints

By default no constraints are selected, i.e. all values can be entered into the variable.

Standard

Input values will be checked against one of a number of common standard constraints which can be selected in the drop-down box. By default no constraint at all is selected, i.e. any value can be entered into the variable.

Custom

Input values will be checked against a user specified constraint. The constraint is entered in the edit box and should be expressed as a QlikView expression returning true (non-zero value) if the input value is acceptable. The input value is referenced as a dollar sign, $ in the expression (Example : $>0 will cause the input box to accept only positive numbers in the selected variable). The previous value of the variable can be referenced by the variable name (Example: $>=abc+1 as a constraint on a variable named abc will cause the input box to accept only numeric entries with a value of the old value plus 1).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Predefined Values Only

Input values will be checked against a list of values defined in the **Predefined Values** group (see below). Only input values found in the list will be accepted.

Read-only

Marks the variable as read only. No values can be entered.

Enable Edit Expression Dialog

Mark this check box to enable expansion of the input box edit window to the full **Edit Expression** dialog by means of a **...** button.

Sound on Illegal Entry

If this check box is selected, QlikView will issue a sound warning when the user attempts to enter a value which falls outside of the constraints.

Error Message

Normally, if the user attempts to enter a value which falls outside of the constraints it will just be rejected leaving the present variable value in place. By selecting this check box it is possible to specify an error message which will be presented to the user in case of incorrect entries. The error message is typed in the edit box. It may be defined as a calculated formula (see page 439) for dynamic update.

Value List

In the **Value List** group you can specify constraints against which all values entered into an input box variable by the user will be checked. If a value does not meet the constraints specified, it will be rejected and an error message (see above) may be shown.

No List No list of values previously used in the variable is maintained. No drop-down list with previous or predefined values will be available to the user for the selected variable in the input box.

List N Recent Values

A list of values previously used in the variable is maintained. A drop-down list with the most recently used values will be available to the user for the selected variable in the input box. The number of previous values to store can be set in the edit box

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Predefined Values in Drop-Down

A drop-down list with predefined values (see **Predefined Values** below) will be available to the user for the selected variable in the input box.

Predefined Values with Scroll

A scroll control will be available to the user for the selected variable in the input box. The scrolling will be made between the predefined values (see **Predefined Values** below).

Predefined Values

In the **Predefined Values** group you can specify a list of predefined values which can be presented to the user in a drop-down list and/or used to define acceptable variable values.

Number Series

If this check box is selected a list of predefined numeric values will be generated based on a lower limit, an upper limit and a step value. This option can be used alone or in combination with **Listed values** (see below).

From Defines the lower limit for the number series. Must be a real number.

To Defines the upper limit for the number series. Must be a real number.

Step Defines the step between values in the number series. Must be a real number.

Listed Values

By selecting this check box it is possible to specify a list of arbitrary predefined values. The values can be numeric or alphanumeric. Alphanumeric values should be enclosed in quotes (e.g. 'abc'). Each value should be separated by a semicolon; (e.g. 'abc';45;14.3;'xyz'). This option can be used alone or in combination with **Number series** (see above).

Number

On the **Number** page the number format can be set for the variables in the input box. This dialog is very similar to its counterpart under **Document Properties** (see page 56).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Font On the **Font** page (Figure 31 on page 108), you can change the font of the text in the input box. You can specify the font, style and size of the text. The font chosen applies to all text contained in the input box.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the input box should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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11 THE BUTTON

D P A

Buttons can be used in QlikView to perform commands or actions, e.g. exporting data to files, launching other applications or executing macros. They can be moved and positioned anywhere on a sheet, just like any sheet object.

11.1 Creation

D P

Buttons are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu or by pressing the **Create Button** button in the toolbar.



11.2 Button Object Menu

The button **Object** menu is found as the **Object** menu when a button is active. It can also be opened as a float menu by clicking with the right mouse button on a button. The menu contains the following commands:

D P **Properties...**

Opens the **Button Properties** dialog box.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the button.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the text to Microsoft Excel, which is automatically launched if not already running. The text will appear in a single cell in a new Excel worksheet.

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Data Copies the text displayed on the button to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the button. Clicking in the object caption (if shown) gives the same result. To restore the button to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized button to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the button to fill the sheet. Clicking ▣ in the object caption (if shown) gives the same result. To restore the button to its previous size and location, choose **Restore** or click ❐. This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context specific help.

(D) (P) **Remove**

Removes the button from the sheet.

11.3 Button Properties

(D) (P)

The **Button Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).
When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

General

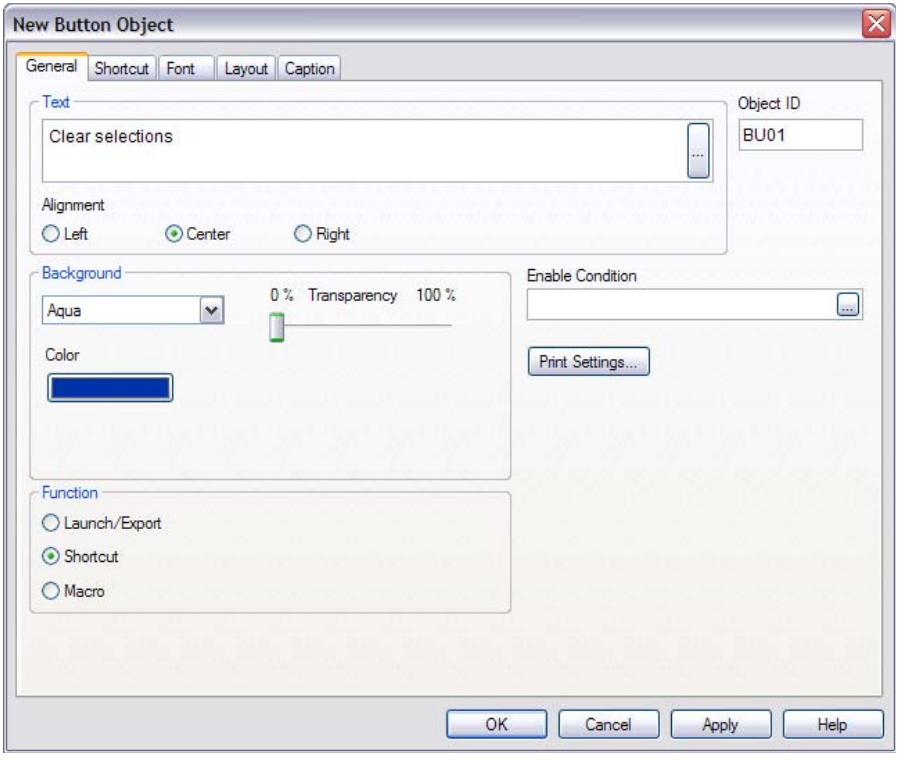


Figure 56. The General page in the Button Properties dialog

In the **Text** group you can set the properties of the text to be displayed on the button.

Text Marking this control and entering a text in the text field labels the button. The text may be defined as a calculated formula (see page 439) for dynamic update. The text may consist of several lines, divided when you press ENTER.

Alignment

The button text can be left-aligned, centered or right-aligned.

Background

In the **Background** group you can specify the background of the button. The drop-down gives you three different basic button styles to choose from.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Aqua Default for new buttons. Gives a rounded button with three-dimensional glassy look.

Color The color can be defined as a solid color as a gradient via the **Color Area** dialog that opens when clicking the color button.

Plain Produces a traditional plain QlikView button.

System Default
Provides a solid background in the color defined for buttons in the operating system.

Color Select this radio button if you want the button to be displayed with a colored background. The color can be defined as a solid color or as a gradient via the **Color Area** dialog that opens when clicking the color button.

Image Produces an image button. The image could be either a single static image or a combined image with three parts, one for each of the button's three possible states (active, inactive or depressed).

Combined Image



Mark this radio button and browse to an image file using the **Select Image...** button in order to assign a three-state combined image to the button. The image file must consist of three images, side by side, of the button: the first one of an active button, the second of a depressed button and the third one of a dimmed (inactive) button.

Single Image
Mark this radio button and browse to an image file using the **Select Image...** button in order to assign a single-state image to the button. Image types supported include jpg, png, bmp, gif and animated gif.

System Default
Provides a solid background in the color defined for buttons in the operating system.

Color Select this radio button if you want the button to be displayed with a colored background. The color can be defined

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

as a solid color or as a gradient via the **Color Area** dialog that opens when clicking the color button.

Transparency

Sets the degree of transparency of the button background. At 100% the background will be completely transparent. The transparency will apply regardless if a color or an image is used for background.

Function

In the **Function** group, you select the general type of function that the button should perform.

Launch/Export

This type of button will export a table containing a specific set of fields, but only those records that are applicable according to the made selection. Subsequently, a given application (e.g. a spreadsheet program) will be launched that reads the exported table.

Shortcut

This type of button will perform a QlikView command on a given field, e.g. **Info** or **Clear Selections**.

Macro This type of button performs a command as defined by a JScript or VBScript macro.

Object ID

The unique ID of the current button. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first button of an document will be assigned the ID BU01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

Enable Condition

The expression entered here determines the status of the button. If the expression returns 0, the button will be disabled; if the expression returns 1, the button will be enabled. If no expression is entered, 1 is assumed. Buttons that are disabled due to underlying status cannot be enabled by means of a condition.

Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

which are identical to the last two pages of the **Print** dialog (see page 247).

Launch

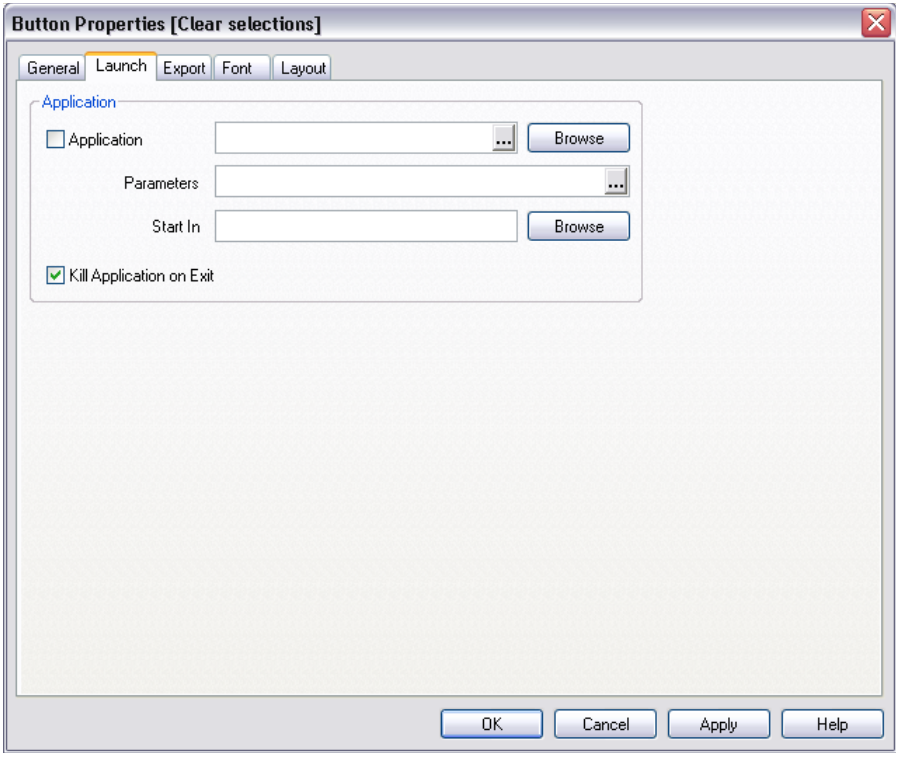


Figure 57. The Launch page in the Button Properties dialog

This page only exists if the **Function** has been set to **Launch/Export**.

Application

If this control is checked, the button will launch the program specified after the export file has been created.

Parameters

Here you can specify parameters for the command line from which the application is started.

Start in

Here you can set the starting directory for the application to be launched.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Kill Application on Exit

Sometimes one will build buttons that launch applications that execute some kind of auto-open macro, i.e. a macro performed every time the application is opened. It is then useful to be able to force the external application to exit when you exit QlikView. In such a case this check box should be marked.

Export

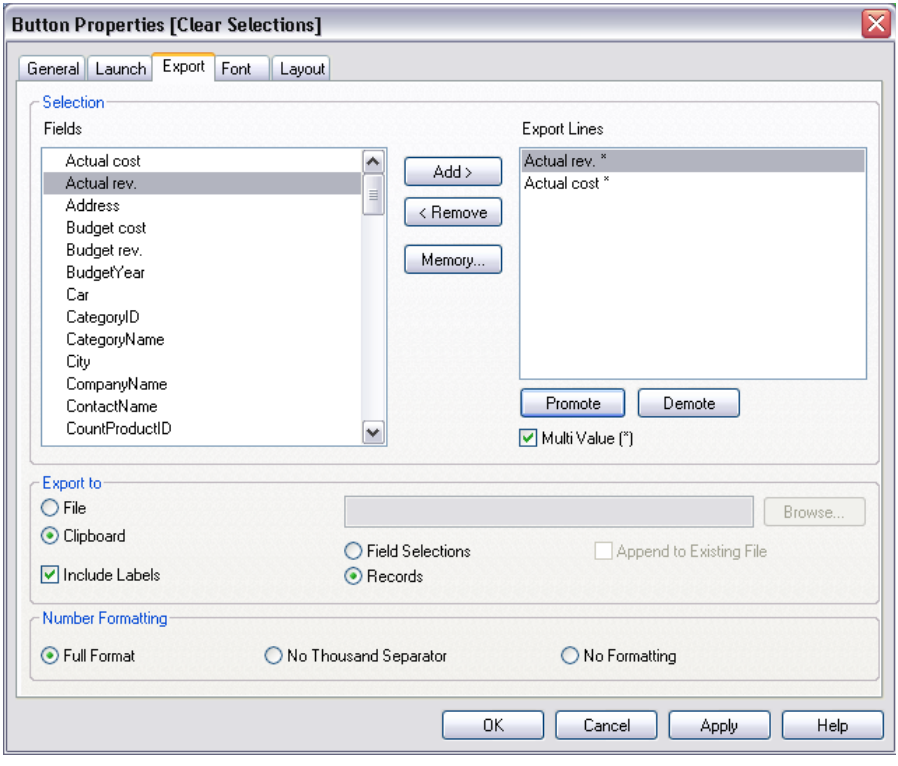


Figure 58. The Export page in the Button Properties dialog

This page only exists if you have set the **Function** option (**General** page) to **Launch/Export**.

Selection

In this group you set what fields should be selected for export.

Fields In the **Fields** box you find a list of the available fields.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Export Lines

In this box you find the fields you have selected for export. The fields for which you have allowed multiple values are marked with an asterisk.

Add >

Adds fields to the **Export Lines** box.

< Remove

Removes fields from the **Export Lines** box.

Memory...

Opens the **Calculation Memory Settings** dialog (see page 141 in Book I), where you can increase the allocated amount of memory.

Promote

Moves the selected field one step up, i.e. one step to the left in the export table.

Demote

Moves the selected field one step down, i.e. one step to the right in the export table.

Multi Value (*)

By marking a field in the **Export Lines** box and checking this control, you allow a field to have several values in the export listing.

Export to

In this group you can choose whether you want to export the values to a file or to the clipboard.

File If the button should perform an export to file, this box should be checked and the file name entered. If no file name is entered, the values will be exported to the clipboard. The file name may be entered as a calculated formula.

Browse

Opens the **Export File** dialog (Table 80 on page 257), allowing you to browse for a file to which the values should be exported.

Clipboard

Default setting. If no file is specified above, the values will be exported to the clipboard.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Field Selections

If this control is checked, the export file will, for each selected field, have all the possible field values on one row, separated by tabs.

Include Labels

If this control is checked, the first position on the line (when **Field Selections** is set) or the first record (when **Records** is set) will contain the field names.

Records

If this control is checked, the export file will have one column for each selected field, separated by tabs.

Append to Existing File

If this control is checked the export will be appended to the export file, if the file already exists. Labels will not be exported when appending to an existing file. If the export file does not exist, this flag has no meaning.

Number Formatting

Some other programs may have difficulties to handle numbers with number format correctly. QlikView offers three options for number formatting of numeric data to be exported to files or to the clipboard.

New export buttons will inherit the default setting from the **Export** page in the **User Preferences** dialog. The setting can however be individually set for each export button.

Full Format

Instructs QlikView to export numeric data with its full number format, just as it is shown in the sheet objects of the document.

No Thousand Separator

Removes any thousand separatorthousand separator from numeric data. This option is recommended if data are to be imported into MS Excel.

No Formatting

Removes all number formatting from the data and exports the raw numbers. The decimal separator will be as defined in the system settings (**Control Panel**).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Shortcut

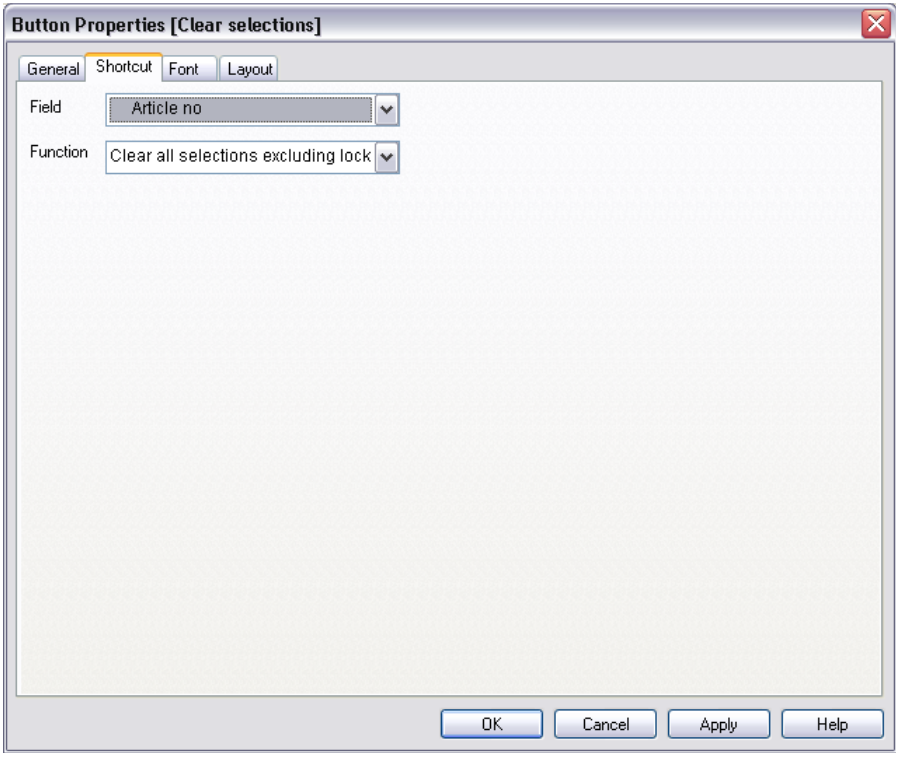


Figure 59. The Shortcut page in the Button Properties dialog

This page only exists if you have set **Function** (**General** page) to **Shortcut**. Here you set what action the button should perform.

Field The field on which the action should work.

Function
The command that should be performed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Macro

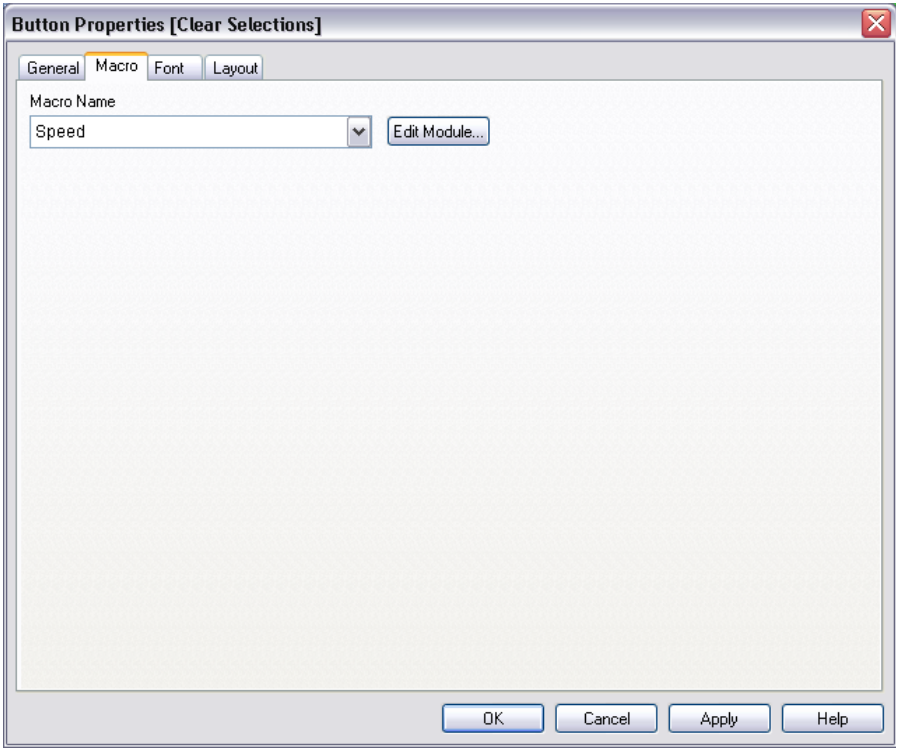


Figure 60. The Macro page in the Button Properties dialog

This page only exists if you have set **Function** (**General** page) to **Macro**. On this page you create macros that carry out VBScript commands. For more information on macros, see page 295.

Note There are limitations as to the behavior of certain macro triggers when working with documents on QlikView Server. Please study the special section "Considerations when using macros in QV documents on the QlikView Server" in the QlikView Server reference manual before designing server documents with macro triggers.

Macro Name

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dia-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

log. The macro (if it exists) will be executed each time the macro button is clicked.

Edit Module...

By clicking on this button the **Edit Module** dialog is opened.

Font

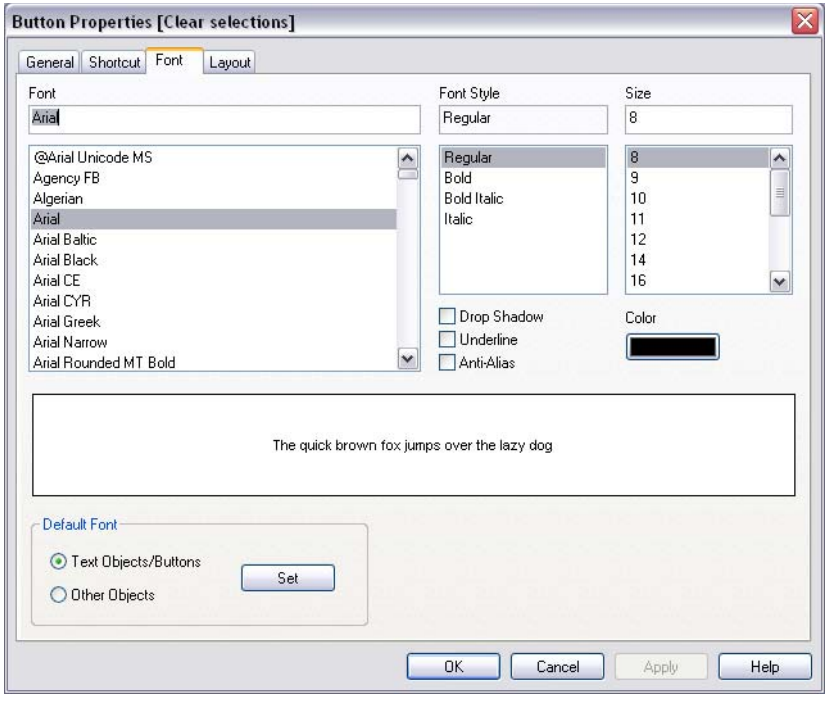


Figure 61. The Font page in the Button Properties dialog

In the **Font** page, you can specify the font, style and size of the button text. In addition, for buttons it is also possible to specify a color for the button text by using the **Color** settings.

Color This button opens the **Color Area** dialog where the font color can be set. See “The Color Area dialog” on page 23.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the button should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

12 THE TEXT OBJECT

Text objects can be used for displaying text information or an image in the layout. They can be moved and positioned anywhere on a sheet, just like any sheet object.

12.1 Creation

Text objects are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu or by clicking the **Create Text** button in the toolbar.



12.2 Text Object Menu

The text Object menu is found as the Object menu when a text object is active. It can also be opened as a float menu by clicking with the right mouse button on a text object. The menu contains the following commands:

Properties...

Opens the **Text Object Properties** dialog box.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the text object.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the text to Microsoft Excel, which is automatically launched if not already running. The text will appear in a single cell in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Text Copies the text displayed in the text object to the clipboard.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the text object. Clicking in the object caption (if shown) gives the same result. To restore the text object to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized text object to its previous size and location. It is also possible to restore a minimized object by

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the text object to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the text object to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context specific help.

D P **Remove**

Removes the text object from the sheet.

12.3 Text Object Properties

D P

The **Text Object Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 82).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

General

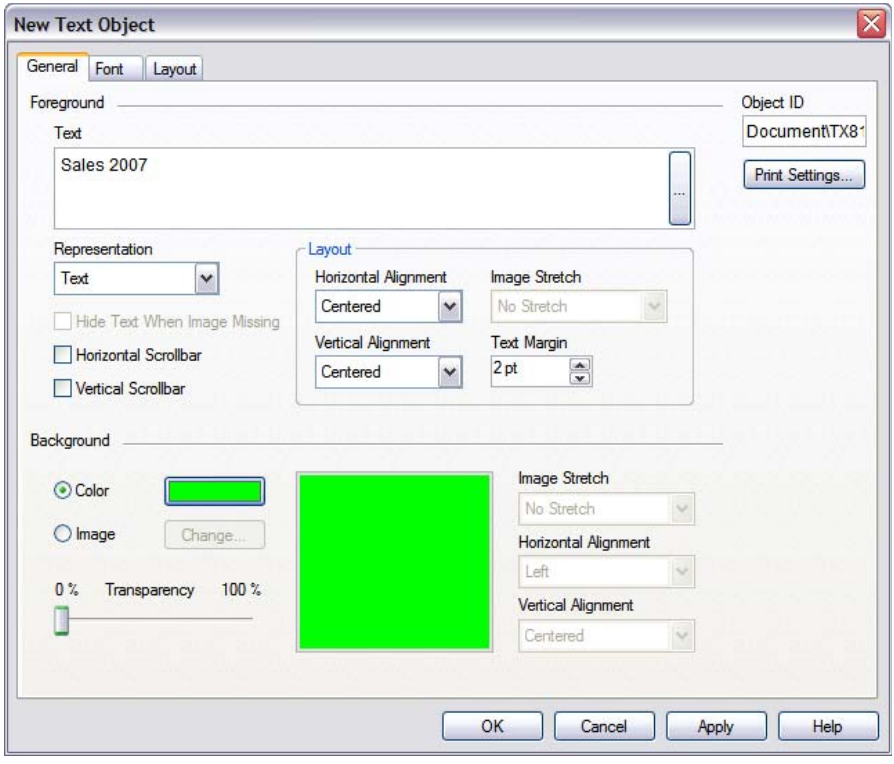


Figure 62. The General page in the Text Object Properties dialog

On the **General** page settings for the text, its background, alignment etc. can be made.

Foreground

In the **Foreground** group you can specify the foreground of the text object. The foreground usually consists of the text itself, but it may also be an image.

Text This is where you enter the text to be displayed. The text may be defined as a calculated formula (see page 439) for dynamic update.

Representation

The text in the Text object may be interpreted as a reference to an image in memory or on disk. When selecting **Text** the contents of the Text object will always be interpreted and

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

displayed as text. When selecting **Image** QlikView will try to interpret the text contents as a reference to an image. The reference may be a path to an image file on disk (e.g. `C:\Mypic.jpg`) or inside the .qvw document (e.g. `qmem://<Name>/<Peter>`). It can also be an info function linked to a field containing image info (e.g. `=info(MyField)`). If QlikView cannot interpret the text contents as a valid reference to an image, the text itself will be displayed.

Hide Text When Image Missing

If this option is selected, QlikView will not display text in the text object if interpretation as an image reference fails for some reason. The text object will then be left blank.

Horizontal Scroll Bar

If this check box is marked a horizontal scroll bar will be added to the text object when its text content is too wide to be displayed within the given area.

Vertical Scroll Bar

If this check box is marked a vertical scroll bar will be added to the text object when its text content is too long to be displayed within the given area.

Layout In this group you define how QlikView should display the text or foreground image within the text object area.

Horizontal Alignment

The text or image can be horizontally left-aligned, centered or right-aligned within the text object.

Vertical Alignment

The text or image can be vertically top-aligned, centered or bottom-aligned within the text object.

Image Stretch

This setting describes how QlikView formats the foreground image to fit in the text object area. There are four alternatives.

No Stretch

If this option is selected, the foreground image will be shown as is without any stretching. This may cause parts of the picture to be invisible or only part of the text object to be filled.

Fill If this option is selected, the foreground image will be stretched to fit the text object area without bothering about keeping the aspect ratio of the image.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Keep Aspect

If this option is selected, the foreground image will be stretched as far as possible to fill the text object area while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the foreground image will be stretched to fill the text object area in both directions while keeping the aspect ratio. This typically results in cropping of the image in one direction.

Text Margin

With this setting you may create a margin between the outer borders of the text object and the text itself. The width of the margin can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Background

In the **Background** group you can specify the background of the text object. The current settings are reflected in the preview pane to the right.

Color Select this radio button if you want the text to be displayed on a colored background. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Image Select this radio button if you want to display an image as background. To change the current image, click the **Change** button. If no text is entered in the **Text** field, the text object can be used for displaying a fixed image as a sheet object in the layout. Image types supported include jpg, png, bmp, gif and animated gif.

Transparency

Sets the degree of transparency of the text object background. At 100% the background will be completely transparent. The transparency will apply regardless if a color or an image is used for background.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Image Stretch

This setting describes how QlikView formats the background image to fit in the text object area. There are four alternatives.

No Stretch

If this option is selected, the background image will be shown as is without any stretching. This may cause parts of the picture to be invisible or only part of the text object to be filled.

Fill If this option is selected, the background image will be stretched to fit the text object area without bothering about keeping the aspect ratio of the image.

Keep Aspect

If this option is selected, the background image will be stretched as far as possible to fill the text object area while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the background image will be stretched to fill the text object area in both directions while keeping the aspect ratio. This typically results in cropping of the image in one direction.

Horizontal Alignment

The text can be horizontally left-aligned, centered or right-aligned within the text object.

Vertical Alignment

The text can be vertically top-aligned, centered or bottom-aligned within the text object.

Object ID

The unique ID of the current text object. Upon creation, every sheet object is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of object, as well as of a number. The first text object of a document will be assigned the ID TX01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet or bookmark in the document.

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Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Font

In the **Font** page (Table 61 on page 203), you can specify the font, style and size of the text in the text object.

It is also possible to specify a color for the text by using the settings in the **Color** group.

Color Select this radio button if you want the object to be displayed with a colored background. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the text object should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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13 THE LINE/ARROW OBJECT

D P A

The Line/Arrow Object is a sheet object that draws a line or an arrow in the layout.

13.1 Creation

D P

Line/Arrow Objects are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu or by pressing the **Create Line/Arrow Object** button in the toolbar.



13.2 Line/Arrow Object Menu

The Line/Arrow **Object** menu is found as the **Object** menu when a Line/Arrow Object is active. It can also be opened as a float menu by clicking with the right mouse button on a Line/Arrow Object.

D P **Properties...**

Opens the **Line/Arrow Object Properties** dialog box.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the line/arrow object. Clicking in the object caption (if shown) gives the same result. To restore the line/arrow object to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized line/arrow object to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the line/arrow object to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the line/arrow object to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context specific help.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Remove

Removes the current Line/Arrow Object from the sheet.

13.3 Line/Arrow Object Properties

The **Line/Arrow Object Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

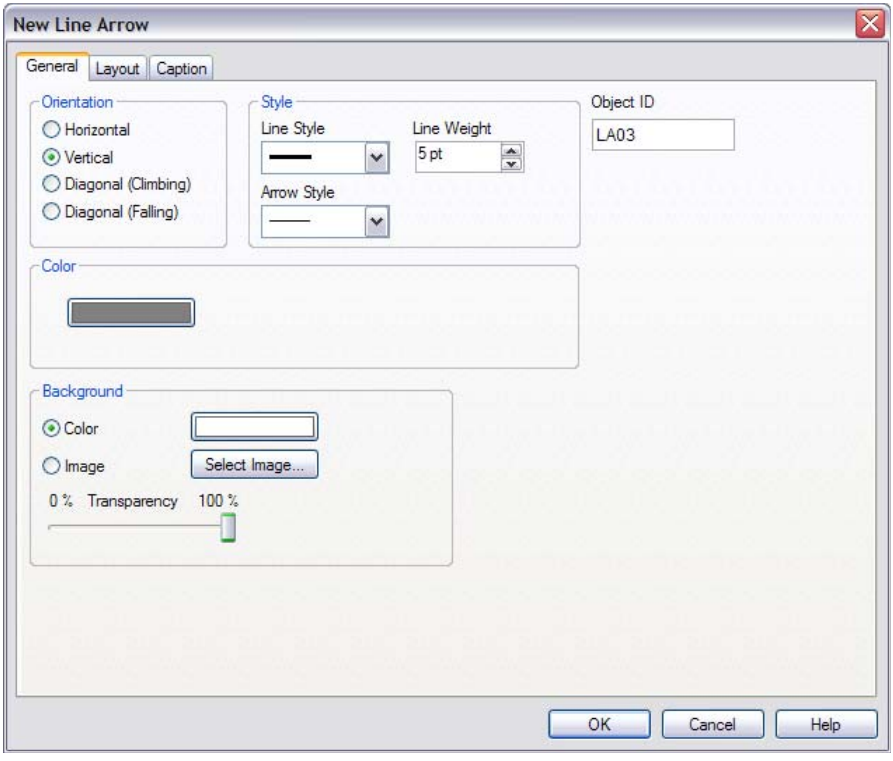


Figure 63. The General page in the Line/Arrow Object Properties dialog

On the **General** page of the **Line/Arrow** Object general settings (e.g. attributes and background) for line/arrows can be set.

Orientation

Sets the direction of the line/arrow in horizontal, vertical or one of two diagonal modes.

Style In this group the formatting of the line/arrow can be defined.

Line Style

This drop-down box is used to set the line to solid, dashed or dotted mode.

Arrow Style

This drop-down box is used to decide whether arrowheads are to be drawn at one or both ends of the line and whether arrowheads should be filled or not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net
Page 1.000/

Line Weight

Sets the weight of the line. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Color Click the button to specify a color for the line/arrow.

Background

In the **Background** group you can specify the background of the line/arrow object.

Color Select this radio button if you want the object to be displayed with a colored background. The color can be defined as a solid color or a gradient via the Color Area dialog that opens when clicking the button.

Image Select this radio button if you want to display an image as background. To change the current image, click the **Select Image** button.

Transparency

Sets the degree of transparency of the line/arrow object background. At 100% the background will be completely transparent. The transparency will apply regardless if a color or an image is used for background.

Object ID

The unique ID of the current line/arrow object. Upon creation, every layout entity is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of entity, as well as of a number. The first line/arrow object of a document will be assigned the ID LA01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet, alert, bookmark or report in the document.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the Line/Arrow Object should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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14 THE SLIDER/CALENDAR OBJECT



The Slider/calendar object provides alternative means to select values in QlikView fields or enter values in QlikView variables. The slider/calendar object has, as the name suggests, two completely different modes. As different as they may look, they still work very much the same way behind the visual user interface.

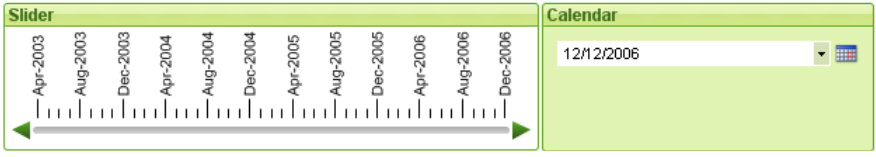


Figure 64. The two main incarnations of a slider/calendar object side by side, a slider to the left and a calendar input control to the right.

14.1 Using a Slider/Calendar Object

Slider Mode

A single value, two values or a range of values (depending on the properties of the object) is selected in a field or inserted into one or two variables by means of dragging a thumb tack along the slider background. The thumb tack can also be moved by means of scroll arrows. Some sliders may incorporate a scale and tick marks for navigation. See Figure 68 below for a graphical explanation of the various parts of a slider.

Calendar Mode

A slider/calendar object in calendar mode appears in the layout as a drop-down box with a calendar icon to the right. When clicking on the calendar icon it will expand to a calendar control (see below). It is possible to navigate between months and years by means of the arrow buttons or the month and year drop-down controls. After selecting a date or a range of dates (depending on the properties of the object) in the calendar control the selection will be applied to the underlying field or value.

If the object is connected to a field, selections in the field will be reflected in the expanded calendar control, using the same selection color codes as found in list boxes (e.g. green for selected values). Provided that the object is configured for multiple values, it will be possible to paint over multiple values just like in a list box. By pressing the CTRL key it is even possible to select

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net
Page 1.003/

multiple ranges of values, even if they appear in different months or years. Once the calendar control is closed after the selection, the drop-down box will function essentially as a field drop-down in a multi box.

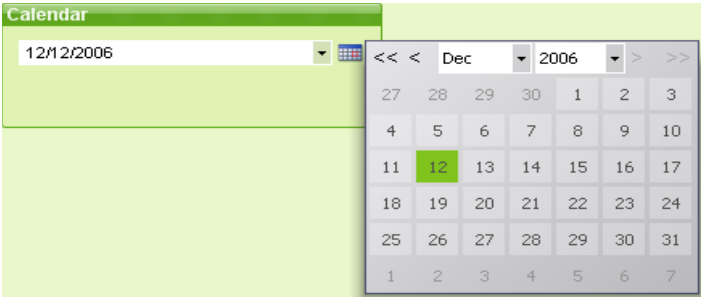


Figure 65. A calendar input control in an open state

14.2 Creation

Slider/calendar objects are created by choosing **New Sheet Object** from the **Layout** menu or from the sheet **Object** menu, or by pressing the **Create Slider/Calendar Object** button in the toolbar.

14.3 Slider/Calendar Object Menu

The Slider/Calendar Object object menu is found as the Object menu when a Slider/Calendar object is active. It can also be opened as a float menu by clicking with the right mouse button on a Slider/Calendar Object. The menu contains the following commands:

Properties...

Opens the **Slider/Calendar Object Properties** dialog.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the slider/calendar object. Clicking in the object caption (if shown) gives the same result. To restore the slider/calendar object to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized slider/calendar object to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Maximize

Enlarges the slider/calendar object to fill the sheet. Clicking ▣ in the object caption (if shown) gives the same result. To restore the slider/calendar object to its previous size and location, choose **Restore** or click ❐. This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the active Slider/Calendar object from the sheet.

14.4 Slider/Calendar Object Properties

(D) (P)

The **Slider/Calendar Object Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed, you probably don't have the privileges to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

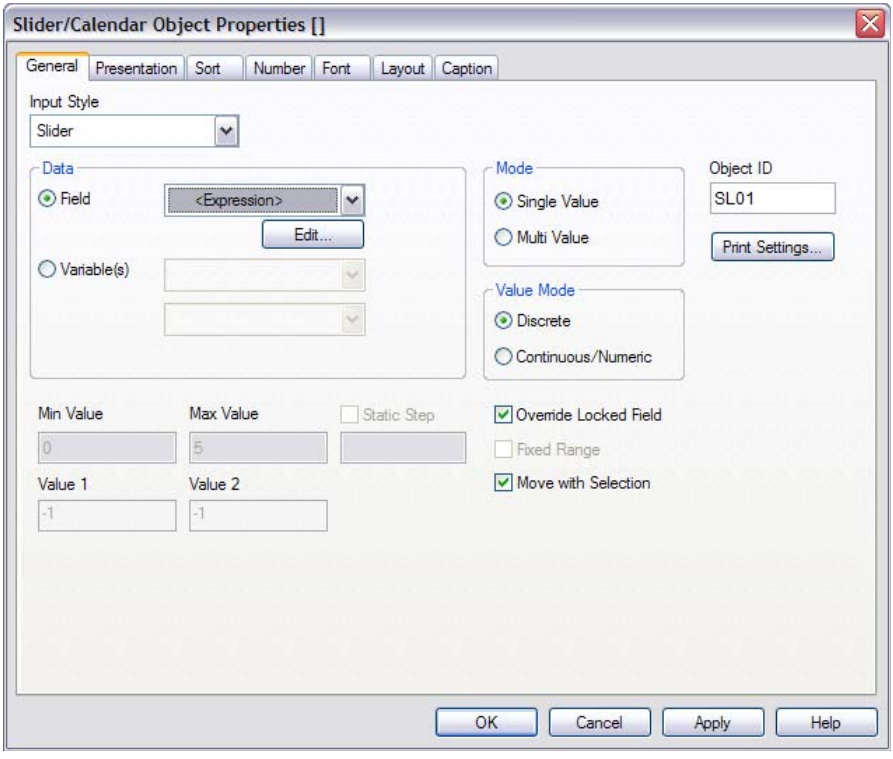


Figure 66. The General page of the Slider/Calendar Object Properties dialog

In the **General** page settings for the data to be manipulated by the Slider/Calendar Object can be made.

Input style

In this drop-down you select the basic mode of the slider/calendar object.

Slider Select this option if you want the object to be represented by a slider control.

Calendar

Select this option if you want the object to be represented by at calendar input control.

Data In this group you define which data object the slider/calendar object should be connected to. A slider/calendar object can be connected either to a field or to one or two variables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Field Select this radio button if you want to connect the slider/calendar object to a field or an expression. Select the field in the drop-down box. If **Expression** is chosen in the drop-down the **Edit Expression** dialog will open.

Edit... Opens the **Edit Expression** dialog for the expression chosen in the drop-down.

Variable(s)

Select this radio button if you want to connect the slider/calendar object to one or two variables. Select the variable(s) in the drop-down box(es). The second variable is only available if you select **Multi Value** under **Mode** below.

Mode In this group you specify if the slider/calendar object should be used to select a single value or a range of values.

Single Value

Select this radio button for the slider/calendar object to select a single value in a field or set a value to a single variable.

Multi Value

Select this radio button for the slider/calendar object to select a range of values in a field or set a value to each of two separate variables.

Value Mode

In this group you specify if the slider/calendar object should select discrete values or define a continuous range of values. This group is not available in calendar mode.

Discrete

Select this radio button for the slider/calendar object to map to existing field values or predefined variable values. This option is not available for **Multi Value** mode with **Variable(s)** data. This group is always assumed for calendar mode.

Continuous/Numeric

Select this radio button for the slider/calendar object to map to all field values within a continuous numeric range or predefined variable values. This option is not available for **Single Value** mode with **Field** data.

Min Value

Sets the minimum value for the slider/calendar object in **Continuous/Numeric** value mode.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Max Value

Sets the maximum value for the slider/calendar object in **Continuous/Numeric** value mode.

Static Step

Mark the check box and enter a value in the edit box to specify a static step for slider/calendar object values in the **Continuous/Numeric** value mode. This group is not available in calendar mode.

Value 1

Shows current value for the slider/calendar object in **Continuous/Numeric** value mode if slider/calendar object is **Continuous/Numeric**. In **Continuous/Numeric** mode the low value is shown.

Value 2

Shows current high value for the slider/calendar object in **Continuous/Numeric** value mode. Only relevant in **Multi Value** mode.

Override Locked Field

If this check box is marked, selections can be made via the slider/calendar object in a field even if the field is locked. the field will still be locked for logical changes stemming from selections in other fields. This option is selected by default for slider/calendar objects.

Fixed Range

If this check box is marked, the width of the numeric range defined for a slider/calendar object in **Continuous/Numeric** and **Multi Value** mode will be locked. The user will then not be able to widen or narrow the range by dragging the edges of the slider thumbtack.

Override Locked Field

If this check box is marked, selections can be made via the slider in a field even if the field is locked. the field will still be locked for logical changes stemming from selections in other fields. This control is not available in calendar mode.

Move with Selection

If this check box is marked, the slider thumbtack will move the selections are made in the underlying field or values entered in underlying variable(s) via other sheet objects. This control is not available in calendar mode.

Print Settings...

By pressing this button you will gain access to the **Print Settings** dialog where margins and header/footer format can be defined. The **Print Settings** dialog holds two pages, **Layout** and **Header/Footer**, which are identical to the last two pages of the **Print** dialog (see page 247).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Presentation (Slider Mode)

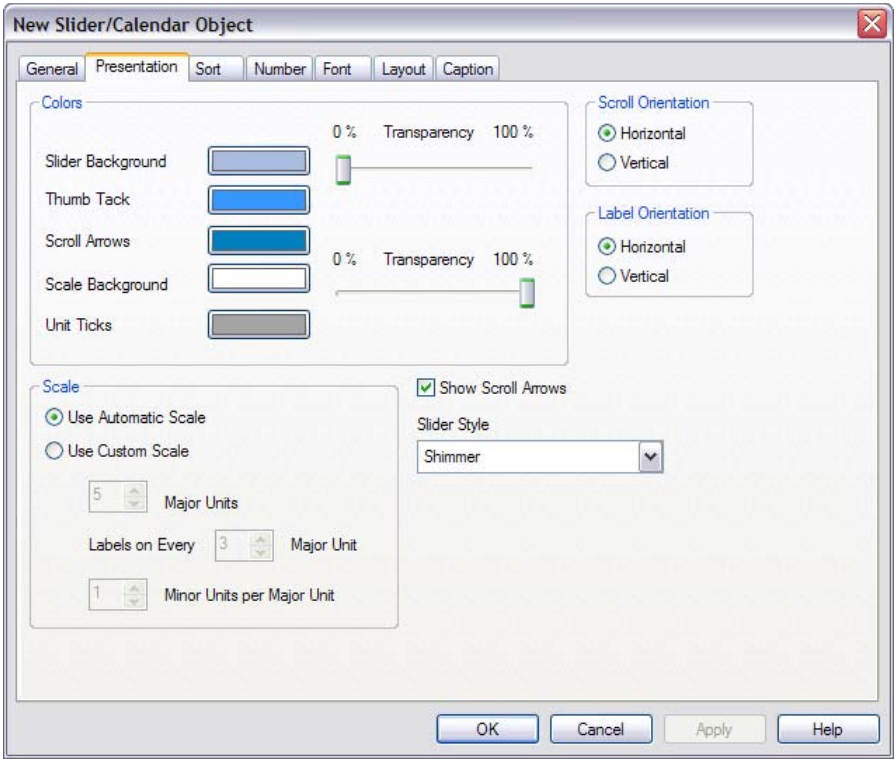


Figure 67. The Presentation page in the Slider Object Properties page.

In the **Presentation** page for slider mode the visual properties of the slider control can be configured.

Colors In this group you can define colors for the different parts of the slider (see Figure 68 on page 227).

Slider Background

Defines the color of the slider background. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button. The degree of transparency of the slider background can be set using the **Transparency** control to the right of the button. At 0% the background will be completely opaque. At 100% the background will be completely transparent.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Thumbtack

Defines the color of the slider thumbtack. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Scroll Arrows

Defines the color of the slider scroll arrows, if shown. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Scale Background

Defines the color of the slider scale background. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button. The degree of transparency of the scale background can be set using the **Transparency** control to the right of the button. At 0% the background will be completely opaque. At 100% the background will be completely transparent.

Ticks Defines the color of the slider scale ticks and text.

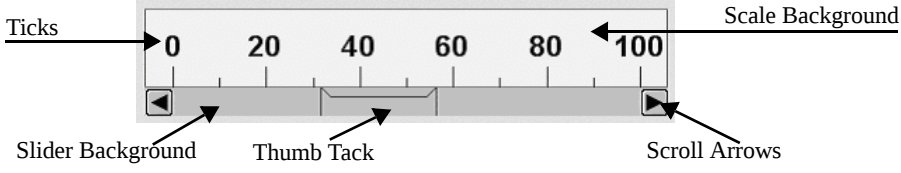


Figure 68. The different parts of a slider/calendar object.

Scroll Orientation

The slider can be oriented in **Horizontal** or **Vertical** direction.

Label Orientation

Sets whether scale text should be oriented in **Horizontal** or **Vertical** direction.

Scale In this group you can define if the slider should have a scale and how it is to be formatted.

Use Automatic Scale

If this option is selected scale settings will be automatically based on slider size and underlying values.

Use Custom Scale

If this option is selected scale settings can be set manually using the three settings described below.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Major Units

Defines the number of major units on the slider scale.

Label On Every n Major Unit

Defines the density of scale label text.

Minor Units Per Major Unit

Defines the number of minor units between each major unit on the slider scale.

Show Scroll Arrows

Mark this check box if you want scroll arrows to be shown in the slider arrows.

Slider Style

Here you may select different looks for the slider.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Presentation (Calendar Mode)

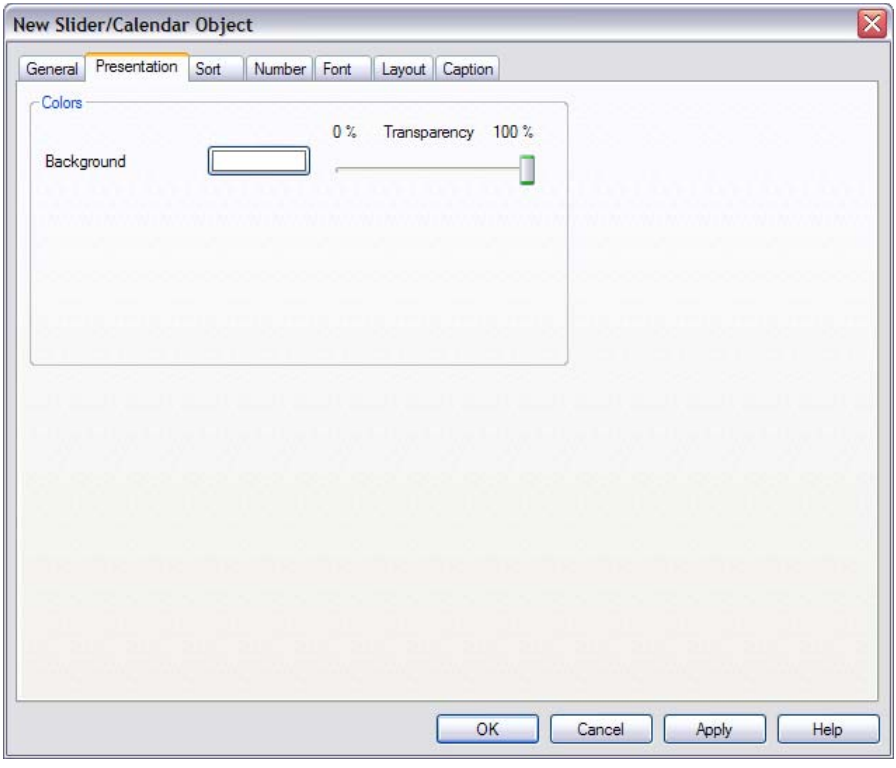


Figure 69. The Presentation page for the calendar mode

In the **Presentation** page for calendar mode the visual properties of the calendar control can be configured.

Colors In this group you can define colors for the calendar control.

Background

Defines the color of the calendar control background. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button. The degree of transparency of the slider background can be set using the **Transparency** control to the right of the button. At 0% the background will be completely opaque. At 100% the background will be completely transparent.

Sort On the **Sort** page the sort order can be set for the slider data. This data is very similar to its counterpart under **List Box Properties** (see page 52).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Number

On the **Number** page the number format can be set for the slider scale. This dialog is very similar to its counterpart under **Document Properties** (see page 56).

Font

On the **Font** page (page 58), you can change the font of the text in the Slider/Calendar Control Object.

You can specify the font, style and size of the text. The font chosen applies to all text contained in the Slider/Calendar Control object.

Layout

On the **Layout** page (page 108), you can specify how the Slider/Calendar Control Object should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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15 THE BOOKMARK OBJECT

D P A

The bookmark object is a sheet object that is used to display and select selection bookmarks. Depending on its configuration it can also be used for adding new bookmarks or deleting old ones. The bookmark object basically offers the same options as the **Bookmark menu** (page 88 in Book I) but can be positioned on the sheet as a sheet object.

15.1 Creation

D P

Bookmark objects are created choosing **New Sheet Object** from the **Layout** menu or from the sheet's **Object** menu, or by pressing the **Create Bookmark Object** button in the toolbar.

15.2 Bookmark Object Menu

The bookmark object menu is found as the Object menu when a bookmark object is active. It can also be opened as a float menu by clicking with the right mouse button on a bookmark object. The menu contains the following commands:

D P **Properties...**

Opens the **Properties** dialog of the Bookmark object.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Add Bookmark

Saves the current set of selections as a bookmark. The default name can be changed in the **Create Bookmark dialog** that opens automatically. This command can also be invoked via the keyboard shortcut CTRL+B.

Remove Bookmark

Opens a cascade menu with the ten most recently used bookmarks defined in the document. By choosing one of them, that bookmark will removed from the document.

Replace Bookmark

Opens a cascade menu with the ten most recently used bookmarks currently defined in the document. By choosing one of these, the contents of that bookmark will be replaced with the current state of selections and variable values.

Import Bookmarks...

Opens the **Import Bookmark(s)** dialog for importing bookmarks from a QlikView bookmark file.

Export Bookmarks...

Opens the **Export Bookmark(s)** dialog for exporting bookmarks to a QlikView bookmark file.

Copy to Clipboard

This cascade menu contains the various copy options for the sheet object.

Image Copies an image of the sheet object to the clipboard. The image will include or exclude the sheet object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the sheet entire sheet object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Minimize

Iconizes the bookmark object. Clicking in the object caption (if shown) gives the same result. To restore the bookmark object to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized bookmark object to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the bookmark object to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the bookmark object to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114)).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the active bookmark object from the sheet.

15.3 Bookmark Object Properties

(D) (P)

The **Bookmark Object Properties** dialog is opened by choosing **Properties** from the **Object** menu. If the **Properties** command is dimmed you probably don't have the privileges needed to perform property changes (see page 81). When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

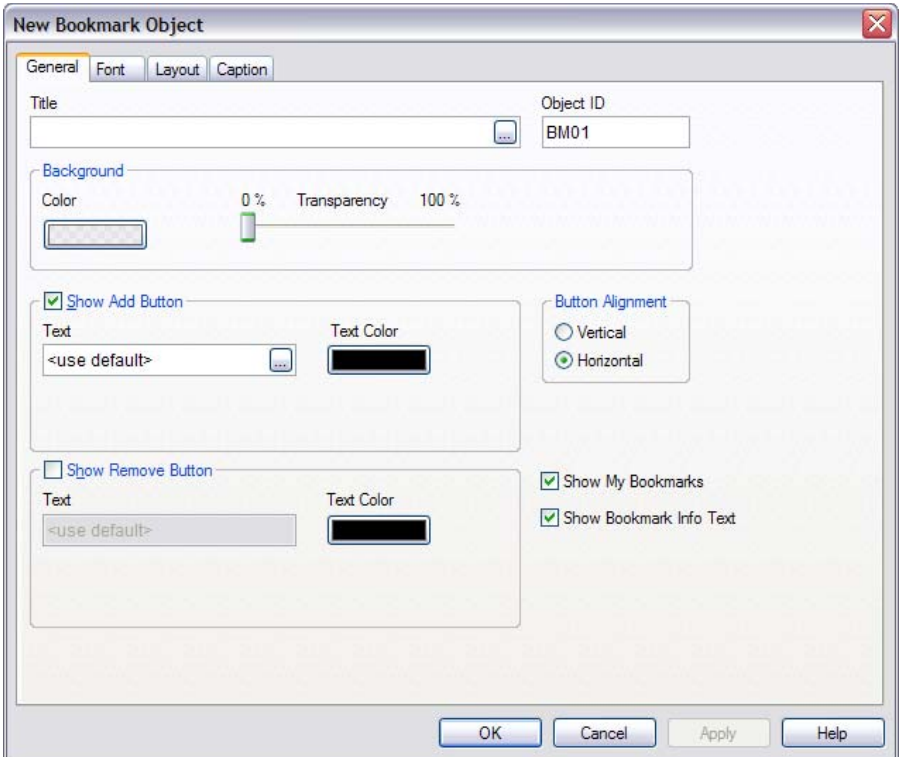


Figure 70. The General page in the Bookmark object Properties dialog.

In the **General** page settings for title and configuration of the Bookmark object can be made.

Window Title

Sets the title for the bookmark object. This name will be shown in the object caption. The title may be defined as a calculated formula (see page 439) for dynamic update.

Object ID

Unique object identifier for the sheet object. Can be used for referencing the sheet object from Automation and macros. May be changed to any name which is not already occupied by another sheet object, sheet or bookmark in the document.

Background

In this group you specify the appearance of the bookmark object background.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Color Sets the background color of the bookmark object. The color can be defined as a solid color or a gradient via the **Color Area dialog** that opens when clicking the **Color** button.

Transparency
Sets the degree of transparency of the bookmark object background. At 0% the background will be completely opaque with the color defined under **Background Color** above.

Show Add Button
In this group you set the options for an **Add bookmark** button in the bookmark object.

Text Here you may type a text to be shown on the **Add Bookmark** button. If no text is typed the edit box will show <use default> and the text “Add Bookmark” will be shown on the button.

Text Color
Sets the text color of the **Add Bookmark** button.

Background Color
Sets the background of the **Add Bookmark** button. The color can be defined as a solid color or a gradient via the **Color Area dialog** that opens when clicking the **Background Color** button.

Show Remove Button
In this group you set the options for a **Remove Bookmark** button in the bookmark object.

Text Here you may type a text to be shown on the **Remove Bookmark** button. If no text is typed the edit box will show <use default> and the text “Remove Bookmark” will be shown on the button.

Text Color
Sets the text color of the **Remove Bookmark** button.

Background color
Sets the background color of the **Remove Bookmark** button. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the **Background Color** button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Button Alignment

Here you may choose how the **Add** and **Remove** buttons are to be positioned in relation to each other, when both are shown.

Vertical

The buttons are positioned on top of each other.

Horizontal

The buttons are positioned side by side.

Show My Bookmarks

Mark this check box in order to display personal bookmarks in the bookmark object list of bookmarks. Personal bookmarks will be listed last with a divider separating the document bookmarks from the personal bookmarks.

Show Bookmark Info Text

Font

On the Font page (Figure 31 on page 108), you can change the font of the text in the bookmark object.

You can specify the font, style and size of the text. The font chosen applies to all text contained in the bookmark object.

Layout

On the **Layout** page (Figure 32 on page 109), you can specify how the bookmark object should appear in the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

16 CUSTOM OBJECT

D P A

The **Custom Object** is a sheet object that is used to carry custom defined OCX replacement controls. Replacement controls are windowless OCX controls programmed by QlikTech, yourself or third party vendors and which comply with the specifications for QlikView replacement OCX controls. The OCX control will be drawn in the rectangle on the sheet outlined by the underlying custom object. Communication between the OCX control and the QlikView document is maintained via the QlikView Automation interface.

The custom object adds the possibility to extend QlikView layouts with functionality not found in the product itself. When designing QlikView a strong focus has always been given on only adding generally applicable functionality. The OCX replacement control is a way to allow more specific sheet objects suited for special underlying data sets or display needs.

The QlikView installation DVD comes with a few sample OCX replacement controls. These are provided as is and with full VB source code. You may use them as they are or modify the source code to better suit your needs. QlikTech does not offer support on these sample controls.

16.1 Creation

D P

Custom Objects are created by choosing **New Sheet Object** form the **Layout** menu or from the **Sheet object** menu, or by pressing the **Create Custom Object** button in the toolbar.

16.2 Object Menu of the Custom Object

The **Object** menu of the **Custom Object** is found as the **Object** menu when a **Custom Object** is active. It can also be opened as a float menu when right-clicking a **Custom Object**. The menu contains the following commands:

D P **Properties for Replacement Control...**

Opens the **Properties** dialog for the OCX replacement control used. This dialog is programmed by the provider of the OCX replacement control and may vary in looks and functionality. It may also be unavailable for certain replacement controls.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Properties...

Opens the **Custom Object Properties** dialog.

Copy Image to Clipboard

Copies an image of the custom object to the clipboard.

Minimize

Iconizes the custom object. Clicking in the object caption (if shown) gives the same result. To restore the custom object to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 33 on page 114).

Restore

Restores a minimized or maximized list box to its previous size and location. It is also possible to restore a minimized object by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 33 on page 114) and if the object is in the minimized or maximized state.

Maximize

Enlarges the custom object to fill the sheet. Clicking in the object caption (if shown) gives the same result. To restore the custom object to its previous size and location, choose **Restore** or click . This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 33 on page 114).

Help Opens context-specific help.

Remove

Removes the active custom object from the sheet.

16.3 Custom Object Properties

The Custom Object Properties dialog is opened by choosing Properties from the Object menu. If the Properties command is dimmed you probably don't have the privileges needed to perform property changes (see page 81). When the wanted prop-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

erties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

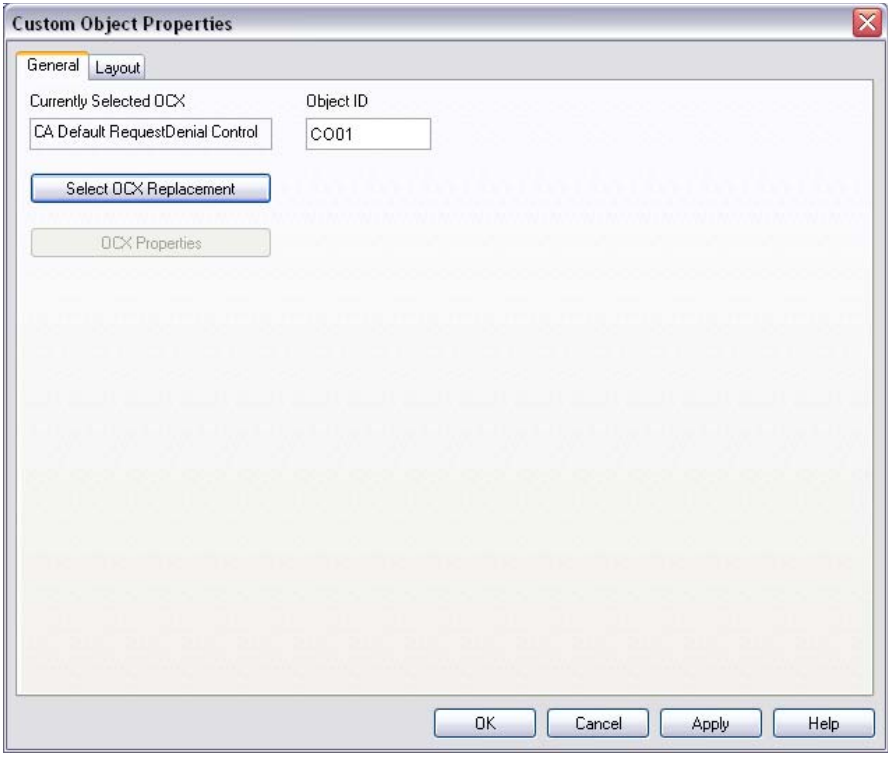


Figure 71. The General page in the Custom Object Properties dialog

In the **General** page settings for title and configuration of the Custom Object can be made.

Currently Selected OCX

Shows the name of the currently selected OCX replacement.

Object ID

Unique object identifier for the sheet object. Can be used for referencing the sheet object from Automation and macros. May be changed to any name which is not already occupied by another sheet object, sheet or bookmark in the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Select OCX Replacement

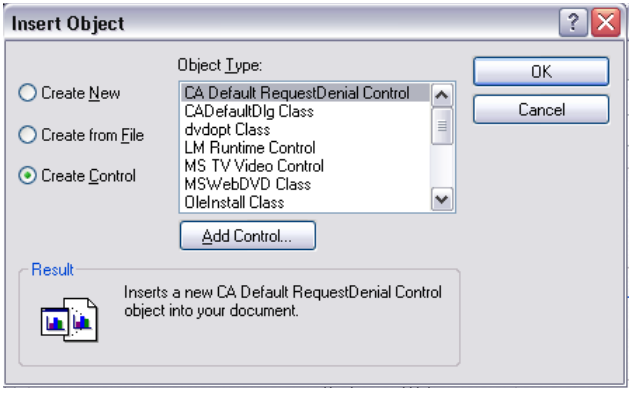


Figure 72. The Insert Object dialog

Press this button to open the Insert Object dialog where you may select or change an OCX replacement control. The Object Type list contains all insertable OCX controls registered on your system. Select one OCX in the list and

OCX Properties

Opens the **Properties** dialog for the OCX replacement control used. This dialog is programmed by the provider of the OCX replacement control and may vary in looks and functionality. It may also be unavailable for certain replacement controls.

Layout

On the **Layout** page (Figure 32 on page 109) you can specify how the custom object should appear on the layout. This includes settings for shape, border and the layer on which it should reside.

Caption

On the **Caption** page (Figure 33 on page 114), advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

17 SERVER COLLABORATION

17.1 The Collaboration Pane

The **Collaboration Pane** offers an easy way for end-users to manage their own server sheet objects and to access other users' shared objects.

Configuring the pane

The **Collaboration Pane** can be toggled on and off via the **Collaboration Pane** command in the **View** menu, or by pressing F2. The pane can be moved and docked to any side of the QlikView application window. It can also be left free-floating next to the QlikView window.

The **Collaboration Pane** can be left on when working with local documents (non server-based) but the it has no function.

The **Collaboration Pane** contains two areas. The **My Objects** area lists two areas. The **My Objects** area lists your own personal server objects for the active server document. The **Shared Objects** area lists all shared sheet objects (including your own shared objects) linked to the current server docuement.

To hide an object in the QlikView application window, right-click the object and choose **Hide**. In order to show the object in the layout again you must drag the object from the **Collaboration Pane**.

When hovering an object, a pop-up is shown containing information about the name of the object, the object type, owner and latest modification date.

Shared objects

Here the shared objects are shown. They can be grouped differently according to **Type**, **Owner** and **Date**. Change the grouping by clicking on the arrowhead next to shared objects. The list can be expanded to show more information about each object or compressed to save space. Click on the arrowhead next to the object to expand, click again to compress.

The objects that are shown in the layout are marked by a check in the **My Objects** and **Shared Objects areas**.

To use someone else's shared object you must drag it to the application window.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Adding and sharing objects

When you create a new server sheet object it will automatically be added to the **My Objects** list.

To share one of your own server objects to other users, drag the corresponding icon from the **My Objects** area to the **Shared Objects** area or right-click on the object in the **My Objects** area and choose **Share**. The object will appear in the **Shared Objects** are but also remain in the **My Objects** area, now marked with a small hand to indicate its shared status.

To unshare an object which you have previously shared, drag the icon from the **Shared Objects** area back to the **My Objects** area or right-click on the object in the

+-area and choose **Unshare**. The object will disappear from the **Shared Objects** list and no longer be available for other users. Note that it will however not disappear from other users' active sessions).

17.2 The Server Objects Dialog

The **Server Objects** dialog offers another more list-oriented way to manage your personal server objects and to select among other users' shared server objects. The dialog contains two pages:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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My Server Objects

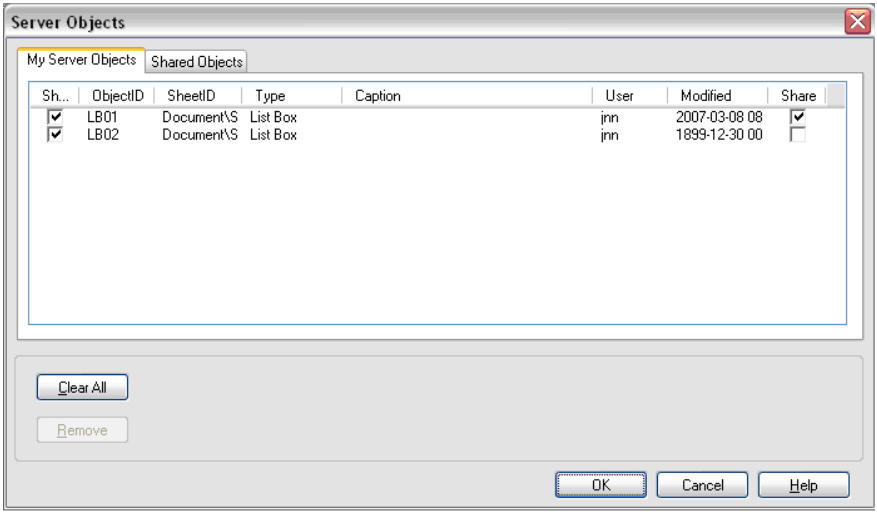


Figure 73. The My Server Objects page of the Server Objects dialog

In the **My Server Objects** page you can manage your own personal server objects and share them with other users.

At the top of the dialog you will find a list of all personal server objects currently defined for the QlikView document. The objects are described by, and may be sorted by several columns:

Show Mark this check box if you want the object to appear in the layout of the document. If the check box is left unchecked, the object will not appear, but will remain accessible via this dialog.

Object ID
The unique ID of the object.

Sheet ID
The ID of the sheet where the object will reside when shown.

Type The type of the object (e.g. list box).

Caption
The caption of the object (if defined).

User The Windows identity of the user who created the object (yourself).

Modified
A timestamp indicating when the object was last modified.

Share This check box is only available in the **My Server Objects** page. By marking it for one of your personal server objects, you will make

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

that object available to other authenticated users of the same server document in their **Shared Objects** page. The object will stay in your **My Server Objects** page and will not appear in your **Shared Objects** page. You may at any time revoke the sharing by deselecting the check box.

At the bottom of the dialog you will find buttons which can be used to perform actions with the objects in the list above.

Clear All
Removes all objects in the list.

Remove
Removes the selected object from the list.

Shared Objects

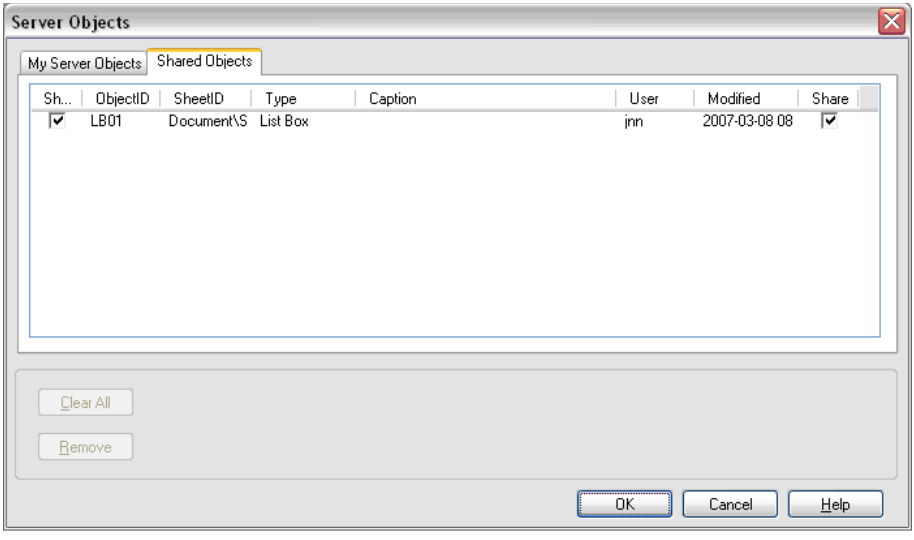


Figure 74. The Shared Objects page of the Server Objects dialog

In the **Shared Objects** page you can manage the display of other users' shared server objects.

At the top of the dialog you will find a list of all shared server objects currently defined for the QlikView document. The objects are described by, and may be sorted by several columns:

Show Mark this check box if you want the object to appear in the layout of the document. If the check box is left unchecked, the object will not appear, but will remain accessible via this dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Object ID
The unique ID of the object.

Sheet ID
The ID of the sheet where the object will reside when shown.

Type The type of the object (e.g. list box).

Caption
The caption of the object (if defined).

User The Windows identity of the user who created the object.

Modified
A timestamp indicating when the object was last modified.

Share This check box is only available in the **My Server Objects** page. By marking it for one of your personal server objects, you will make that object available to other authenticated users of the same server document in their **Shared Objects** page. The object will stay in your **My Server Objects** page and will not appear in your **Shared Objects** page. You may at any time revoke the sharing by deselecting the check box.

At the bottom of the dialog you will find buttons which can be used to perform actions with the objects in the list above.

Clear All
Removes all objects in the list.

Remove
Removes the selected object from the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

18 EXPORTING AND PRINTING



18.1 Print

To open this dialog box, choose **Print...** or **Print Possible...** from the **File** menu, from the toolbar or from the **Object** menu of a printable object. The **Print** dialog box contains three pages: **General**, **Layout** and **Header/Footer**.

In the right of the dialog on all pages you will find a preview pane which outlines how margins and header will appear when printed.

At the bottom you will find the following buttons:

Save Settings
: Saves all print settings for the active sheet object.

Print Preview
: Opens the **Print Preview** dialog.

Print Starts printing and leaves the dialog.

Cancel Exits the **Print** dialog without printing.

Help Opens help for the dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

General

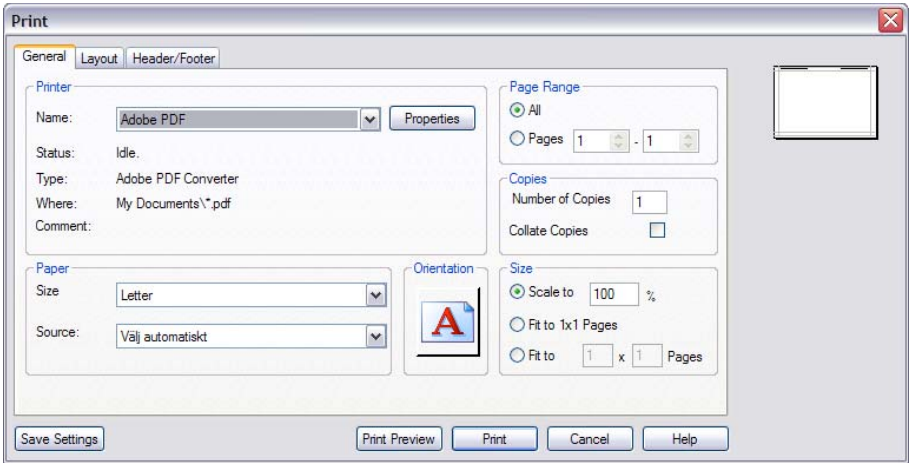


Figure 75. The General page of the Print dialog

On the **General** page of the **Print** dialog you select e.g. printer, number of copies to be printed and page range.

Printer In the **Printer** group, you select the printer.

Name Select a printer in the drop-down box.

Properties
Sets properties for the selected printer.

Paper In the **Paper** group, the size and source of paper to be used are selected.

Size Paper size can be selected in the drop-down box.

Source Paper source can be selected in the drop-down box.

Orientation
By clicking on the orientation icon, you can choose between the print settings portrait and landscape.

Page Range
In the **Page Range** group, the number of pages to be printed is specified. If certain types of charts are selected, this group is dimmed (see **Size** below).

All If this check box is marked, all pages in the range will be printed.

Pages Here you enter the number of pages to be printed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Copies In the **Copies** group, the number of copies to be printed can be set.

Number of Copies

Here you enter the number of copies to be printed.

Collate Copies

If this check box is marked, each page will be printed together with its copies. If it is not marked, all the pages will first be printed sequentially and then copied.

Size In the **Size** group, the size of the object to be printed can be set. If the object is a pie chart, bar chart, line chart, combo chart or scatter chart, this group will be dimmed since these charts are always fit to one page.

Scale to N%

If this option is selected, the size of the object will be scaled to a fixed percentage of its actual size.

Fit to 1x1 Pages

If this option is selected, the size of the object will be scaled to fit one page.

Fit to NxN Pages

If this option is selected, the size of the object will be scaled to fit a specified number of pages.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Layout

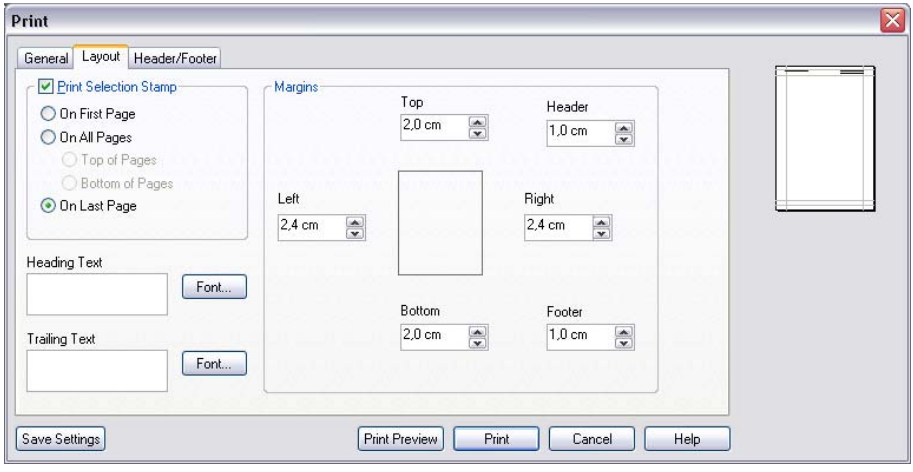


Figure 76. The Layout page in the Print dialog

On the **Layout** page of the **Print** dialog you may e.g. set the margins and heading text for the document to be printed.

Print Selection Stamp

In the **Print Selection Stamp** group you may specify that a selection stamp be printed together with the printed object.

Current Selections

If this check box is marked, the text "Selection status", followed by the names of the fields and the number of field values selected, will be printed with the printed object.

On First Page

Select this option to have the selection stamp printed at the top of the first page.

On All Pages

Select this option to have the selection stamp printed on every single page. There are further options for whether the selection stamp should be printed at the **Top of Pages** or at the **Bottom of Pages**.

On Last Page

Select this option to have the selection stamp printed at the bottom of the last page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Heading Text

In the edit box you may specify a text to be printed before the printed sheet object. This text may be a calculated formula. By clicking on the **...** button you open a large editor window for easier editing of longer text. The **Font** button next to the edit box allows you to select a separate font for the text.

Trailing Text

In the edit box you may specify a text to be printed after the sheet object to be printed. This text may be a calculated formula. By clicking on the **...** button you open a large editor window for easier editing of longer text. The **Font** button next to the edit box allows you to select a separate font for the text.

Margins

In the **Margins** group you may change the margins around the printed object. Changes can be seen in the preview pane at the right of the **Print** dialog.

Top Specifies the distance between the top of the paper and the upper border of the printed object.

Header
Specifies the distance between the top of the paper and the header text, if such is used. For the header text to appear this value must be smaller than **Top**.

Left Specifies the distance between the left edge of the paper and the left border of the printed object.

Right Specifies the distance between the right edge of the paper and the right border of the printed object.

Bottom Specifies the distance between the bottom of the paper and the lower border of the printed object.

Footer Specifies the distance between the bottom of the paper and the lower border of the footer text if such is used. For the footer text to appear this value must be smaller than **Bottom**.

The distance can be specified in mm, cm or ". The default unit is set on the **Design** page of **User Preferences**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Header/Footer

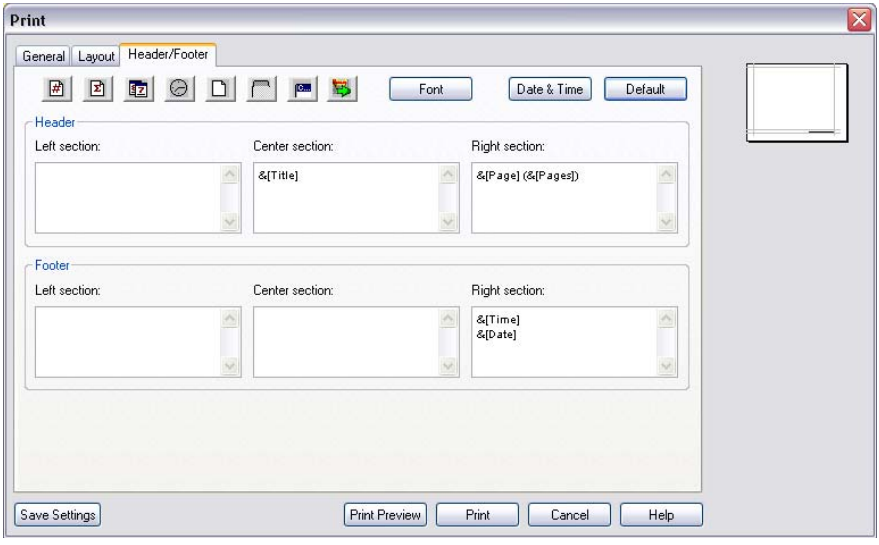


Figure 77. The Header/Footer page in the Print dialog

On the **Header/Footer** page of the **Print** dialog settings for header and footer can be set.

Header

In the **Header** group the print header can be set for the sheet object. The header can be specified in three panes.

Left Section

Text to be printed left adjusted in the header.

Center Section

Text to be printed center adjusted in the header.

Right Section

Text to be printed right adjusted in the header.

Footer In the **Footer** group the print footer can be set for the sheet object. The footer can be specified in three panes.

Left Section

Text to be printed left adjusted in the footer.

Center Section

Text to be printed center adjusted in the footer.

Right Section

Text to be printed right adjusted in the footer.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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All these text panes can contain special control codes listed below. They can also be calculated formulas (see page 439). Right-click in one of the boxes and select **Edit** from the menu that appears in order to expand the edit box to a full editor dialog.

The following buttons can be used to insert control codes for specific system information into any of the text panes. The control codes may of course be typed directly, if you so please.

Page Pressing this button or entering the code &[Page] causes the page number to be printed. 

Pages Pressing this button or entering the code &[Pages] causes the total number of pages to be printed. 

Date Pressing this button or entering the code &[Date] causes the current date to be printed. Date format can be set in the **Date & Time** dialog (see below). 

Time Pressing this button or entering the code &[Time] causes the current time to be printed. Time format can be set in the **Date & Time** dialog. 

File Pressing this button or entering the code &[File] causes the document file name to be printed. 

Sheet Pressing this button or entering the code &[Sheet] causes the sheet name to be printed. 

Title Pressing this button or entering the code &[Title] causes the title of the printed object to be printed. 

Picture

Pressing this button will open a browser dialog where you can select a valid picture file whose content will be printed as graphics in the header or footer pane. You may also manually enter the code &[Picture=*filename*] where *filename* is the complete filename and path of the file containing the graphics. A header/footer pane can only contain one single picture and all text and other codes surrounding &[Picture] will be disregarded. 

Font The font of each text can be set individually. Position the cursor in the text you wish to format and use this button to set the font.

Default Sets headers and footers to QlikView defaults.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Date & Time

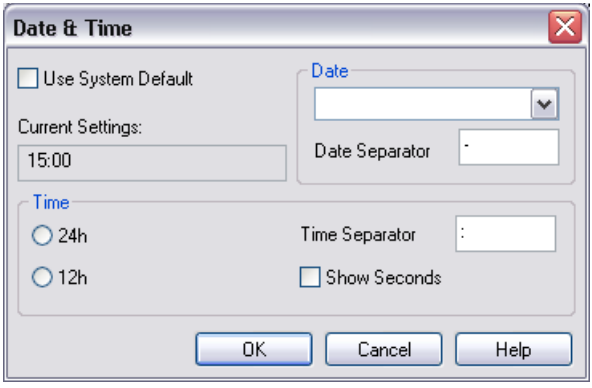


Figure 78. The Date & Time dialog

Opens the Date & Time dialog (see Figure 78)where formatting of the result of the &[Date] and &[Time] codes can be set. To specify your own settings, you must first deselect the Use System Default check box.

Use System Default
Mark this check box to use the system settings and not the settings of this dialog.

Current Settings
A view of the current date and time format.

Date The date format can be set here. You find the options by opening the drop-down list.

Date Separator
Here you can choose the character to be used as date separator.

Time In the Time group settings for the time format can be set

24h Mark this check box to show time in the 24 hour notation.

12h Mark this check box to show time in the 12 hour notation.

Time Separator
Here you can choose the character to be used as time separator.

Show Seconds
Mark this check box to show seconds in the time format.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18.2 Print Sheet

To open this dialog box, choose **Print Sheet** from the **File** menu. The **Print Sheet** dialog box is identical to the general **Print** dialog with one exception: the **Size** group on the **General** page which is here replaced by another group, **Sheet Options**.

Sheet Options

The **Sheet Options** group contains the following settings:

This Sheet

By selecting this option only the current sheet will be printed.

All Sheets

By selecting this option all sheets in the document will be printed.

Draw Background

Mark this check box to include the sheet background (wallpaper) when printing.

18.3 Print Preview

By choosing the command **Print Preview** from the **File** menu or clicking on the **Print Preview** button in the **Print** dialog, you open a window showing a detailed print preview of the current object.

Print Transfers control the **Print** dialog, from which you can print the active object.

#pages drop-down

This drop-down menu offers a quick way to change which pages should be displayed in the preview.

Next If the preview contains several pages, you click this button to view the next page.

Previous

If the preview contains several pages, you click this button to view the previously shown page.

Add Page

Extends the preview to include another page if the active object does not fit in one page.

Remove Page

Removes one of the preview pages.

Close Closes the dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18.4 Copy Mode

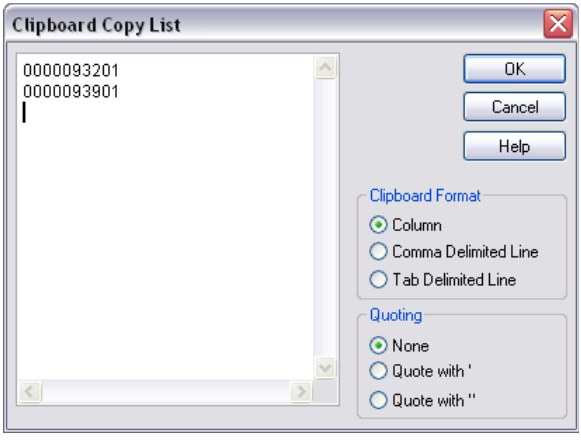


Figure 79. The Clipboard Copy List dialog

When **Copy Mode** in the **Edit** menu is chosen, the **Clipboard Copy List** dialog (Figure 79) opens. This dialog box simplifies copying to clipboard. As long as it is open, QlikView will be in copy mode and everything clicked will automatically be copied to the clipboard copy list.

No new logical selections can be made while in copy mode.

Clipboard Format

In this group, the format of the copy list is set. **Column**, **Comma Delimited Line** and **Tab Delimited Line** are the available options.

Quoting

In this group the quoting for the selected elements can be set.

None Leaves the elements unquoted.

Quote with '

Encloses all elements with single quotes. This is useful if the elements copied are to be pasted into the script as field values.

Quote with "

Encloses all elements with double quotes. This is useful if the elements copied are to be pasted into the script as field names or into a Visual Basic script, e.g. a QlikView macro.

OK Closes the **Clipboard Copy List** dialog and transfers its content to the Windows clipboard.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Cancel Closes the **Clipboard Copy List** dialog without transferring its content to the Windows clipboard.

18.5 Export to File

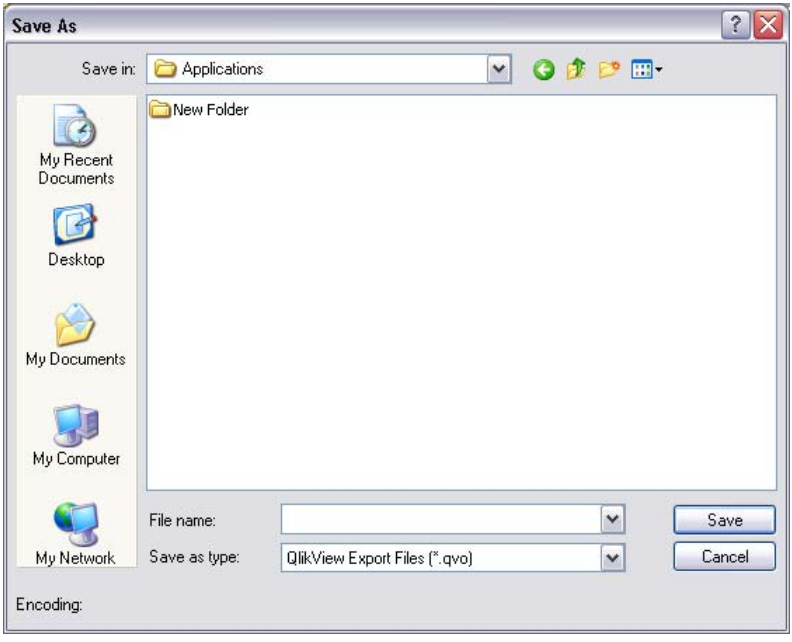


Figure 80. The Save As dialog

The **Save As** dialog box appears when you choose **Export...** from the float menu of the table box, pivot table or straight table. You can also open it by selecting **File** or clicking **Browse** in the **Button Properties** dialog, **Export** page (Table 58 on page 198).

In this dialog you can define the file to which the data should be exported (export file).

Save in:
Browse to find the directory containing your file.

File name
The name of the file selected will appear in this list. It is also possible to define a new file by entering a name.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Save as type

Here you can choose an appropriate format for your export file by selecting one of the options in the drop-down list. You can choose between Comma Delimited, Semicolon Delimited, Tab Delimited, Hypertext (HTML), ANSI, XML and Unicode XML. The default format is *.qvo (QlikViewOutput), a tab separated file.

Encoding

Table export can be made using ANSI, Unicode or UTF-8 character sets.

If you opened this dialog from the **Button Properties** dialog, the file name and the path of the file will appear in the file edit box of the **Export** page (Table 58 on page 198) when you click **Save**. If you opened it by choosing **Export...** from the table box object menu, clicking **Save** means exporting the values of the table box to the file specified.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

19 LAYOUT THEMES

19.1 About QlikView Layout Themes

Theme Basics

A QlikView layout theme is a set of formatting properties that can be applied to a whole QlikView layout or to parts thereof. Theme files are coded in xml and normally kept in a special QlikView theme folder under Windows' Application Data folder for the active user.

Themes can significantly reduce time and effort needed to make a QlikView layout good-looking and consistent. They can also be used to enforce a certain graphical style within a company etc.

Theme Topology

A QlikView theme file consists of individual sections for each type of layout object (document, sheet and all different types of sheet objects). Each of these sections has three sub-sections, one for object type specific properties, one for border/caption properties and one for printer setting properties (only for printable object types). Each section and sub-section can be created or replaced separately using the **Theme Maker Wizard**, without affecting other sections in the theme file.

A theme section is created as follows:

1 Format a specific object according to your wishes

2 Use the **Theme Maker Wizard** to extract selected properties from that object and insert them into a theme file

General Purpose Themes

General purpose themes are themes which have defined sections for all different object types. There are a number of such themes provided with the QlikView installation package.

If you want to create such a theme yourself you must:

1 Format **Document Properties** to your liking

2 Format the **Sheet Properties** of one sheet to your liking

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3 Create (if necessary) and format one sheet object of each type to your liking. Caption/Border properties typically only need to be formatted once for sheet object types which normally use captions (list boxes, charts etc.) and once those which normally do not use captions (text objects, buttons etc.)

4 Run the **Theme Maker Wizard** creating a new theme and insert properties from the first of the formatted entities listed above (in what order doesn't matter)

5 Run the **Theme Maker Wizard** repeatedly, once for every remaining formatted entity listed above.

Specific Purpose Themes

It is possible to create themes for specific uses. Depending on the purpose these may only need to define a small sub-set of the available theme sections and sub-sections. As an example you may define a theme which sets only chart objects to a given size and position on the sheet. In order to do that you need to define a theme with one single property from the caption/border group only for charts, i.e. one single sub-section.

19.2 Applying Themes in the Layout

QlikView layout themes can be applied either manually at any given time or automatically every time a new layout object is created. Themes can be applied to

- individual sheet objects
- a group of sheet objects
- a sheet
- the whole document

Applying a Theme to Individual Objects

Do as follows:

1 Activate the sheet object by clicking it

2 Open the **Properties** dialog for the sheet object from the context menu.

3 Go to the **Layout** page

4 Click the **Apply Theme...** button

5 Select a theme in the browser dialog that opens

6 Click **OK**

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All properties in the theme which are applicable to the selected sheet object will now be applied. If you want to apply a theme to a group of sheet objects, you must first make them all active by means of SHIFT+clicking or by doing a lasso selection.

Applying a Theme to a Sheet

Do as follows:

1 Activate the sheet by clicking its tab

2 Open the **Sheet Properties** dialog from the **Settings** menu

3 Go to the **Layout** page

4 Click the **Apply Theme...** button

5 Select a theme in the browser dialog that opens

6 Click **OK**

All properties in the theme which are applicable to the document will now be applied. Additionally the theme will also be applied to all sheets and all sheet objects in the document.

Applying a theme to a whole document

Do as follows:

1 Open the document or activate it.

2 Open the **Document Properties** dialog from the **Settings** menu.

3 Go to the **Layout** page

4 Click the **Apply Theme...** button

5 Select a theme in the browser dialog that opens

6 Click **OK**

All properties in the theme which are applicable to the document will now be applied. Additionally the theme will also be applied to all sheets and all sheet objects in the document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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19.3 Making Themes with the Theme Maker Wizard

You start the Theme Maker Wizard by choosing **Theme Maker Wizard** from the **Layout** menu.



Figure 81. The Start page of the Theme Maker Wizard

The first time you start the wizard you will be met by a start page outlining the purpose of the wizard and the basic steps involved. If you want to skip the start page when you use the wizard in the future, mark the **Don't show this page again** check box.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 1 - Select Theme File

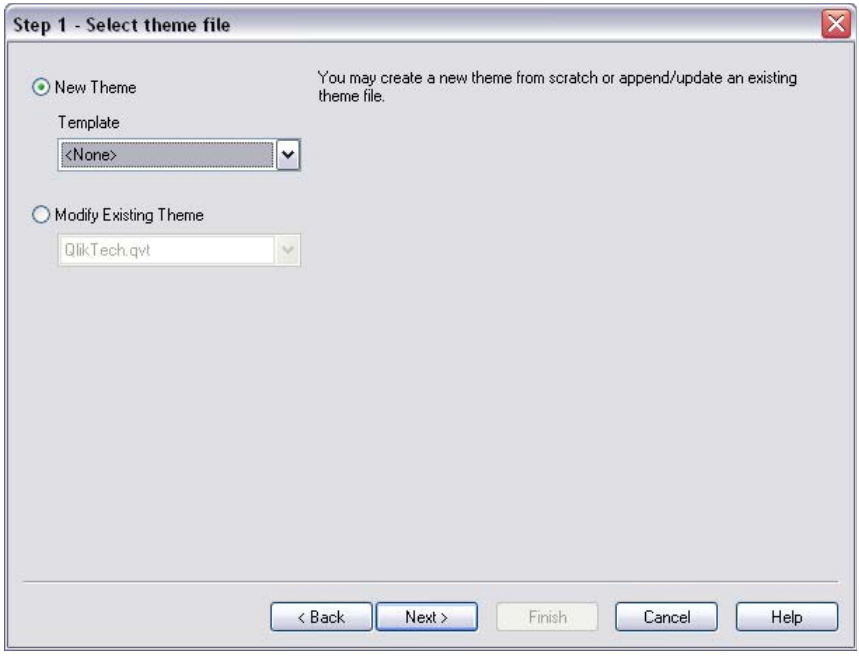


Figure 82. The first page of the Theme Maker Wizard

You can choose between creating a new theme from scratch, creating a new theme based on an existing one or modifying an existing theme.

New Theme

Choose this option if you want to create a new theme.

Template

If you want to base your new theme on an existing one, choose the base theme in this drop-down. The drop-down will list all existing themes in your default QlikView theme folder. At the bottom of the list you will find a **Browse...** option for browsing for theme files in other locations.

Modify Existing Theme

Choose this option if you want to modify an existing theme. Select a theme in the drop-down. The drop-down will list all existing themes in your default QlikView theme folder. At the bottom of the list you will find a **Browse...** option for browsing for theme files in other locations.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Click **Next** to continue. If you have chosen to create a new theme, a Save As dialog will appear.

Step 2 - Source Selection

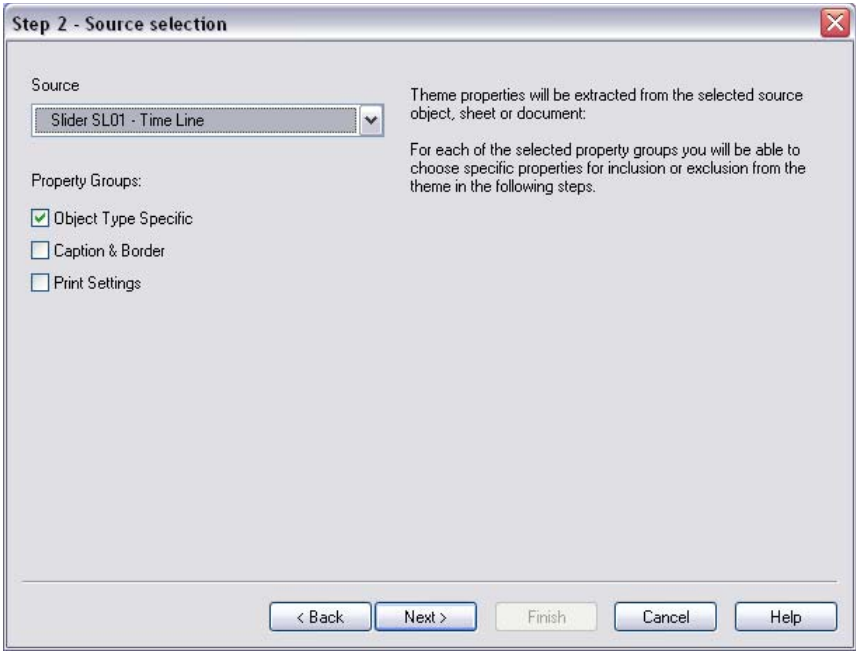


Figure 83. The second page of the Theme Maker Wizard

When building a theme you take one or more groups of formatting properties from an existing object. The source object can be any sheet object, any sheet or even the document itself.

Source Select the source object from the list in the drop-down. The drop-down list contains a list of all available objects in the document. The active object will be pre-selected.

Property Groups

There are three main groups of formatting properties that can be extracted from a layout object and inserted into a theme. Mark one or more of the three check boxes below for extraction from the source object to the theme:

Object Type Specific

Mark this check box to extract object type specific properties from the source object for inclusion in the theme.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Object type specific properties are those that only exist in a given object type, e.g. charts. This type of properties can only be copied to objects of the same type as the source object type.

Caption and Border

Mark this check box to extract caption and border properties from the source object for inclusion in the theme. This type of properties can be copied to other object types than the source object type.

Printer Settings

Mark this check box to extract printer settings properties from the source object for inclusion in the theme. This type of properties can be copied to other object types than the source object type.

For each of the selections above you will be able to choose specific properties for inclusion in or exclusion from the theme in the following wizard steps.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Step 3 - Select Specific Properties

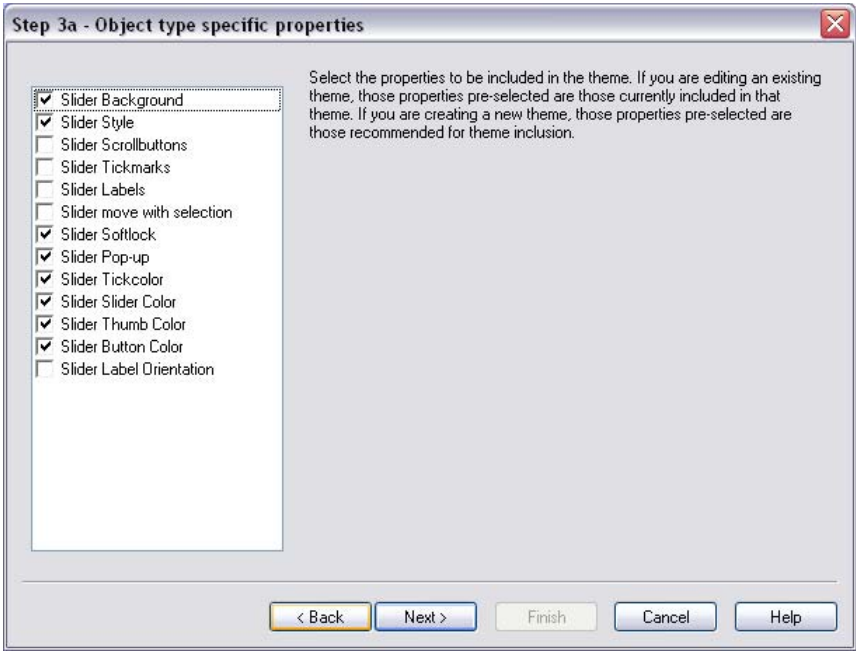


Figure 84. The third page of the Theme Maker Wizard as it could appear for slider specific properties.

In step 3 you will make more detailed selections of properties to be extracted from the source object and included in the theme. This wizard step will be repeated for each of the three main property groups selected in step 2.

Each item in the list indicates a single property or a group of properties, which can be included in or excluded from the theme. Mark those items that you want to include.

If you are modifying an existing theme, those items marked as you enter this step are those currently included in the theme. By changing selections you will overwrite all previous settings in the theme.

If you are creating a new theme from scratch, the items that are marked as you enter this step are those which are typically suitable for inclusion in a general purpose theme.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Step 4 - Insertion of Properties in a Theme

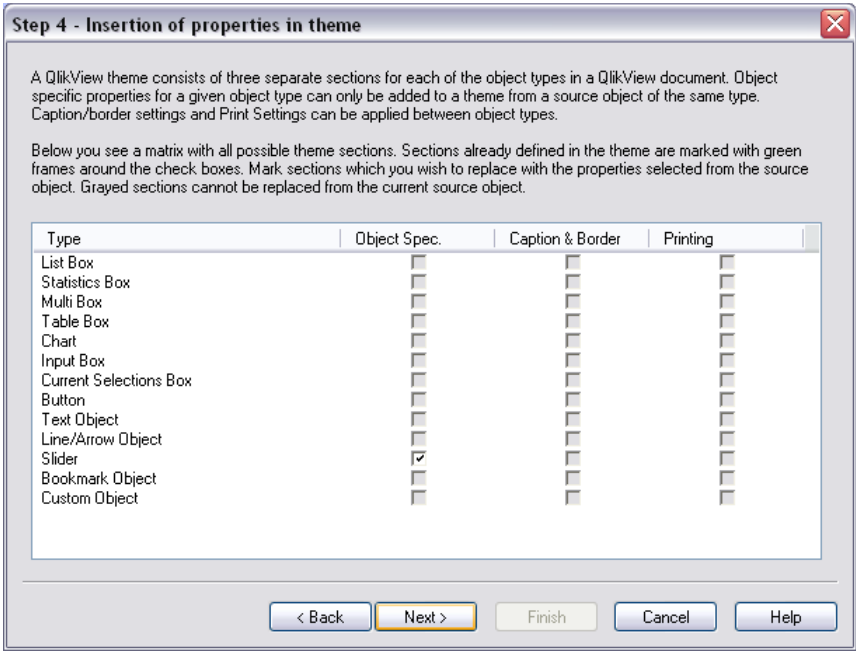


Figure 85. The fourth page of the Theme Maker Wizard

In the fourth step of the wizard you decide which sections and sub-sections of the theme should be written to the theme with the extracted object properties. There are three columns with check boxes, each check box representing one sub-section of the theme. Based on your selections in step 2 and 3 of the wizard only some of the check boxes will be available for selection, the remainder being grayed out.

Check boxes surrounded by green frames indicate sub-sections that are currently defined in the theme (only applicable when modifying an existing theme).

The columns with check boxes correspond to the three check boxes in step 2. It is only possible to make selections in a column if the corresponding check box was selected in step 2, followed by appropriate selections in step 3.

The object type specific sub-section can only be selected for the type of source object selected in step 2. Caption/border settings and printer settings can be set across object types.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Step 5 - Save Theme

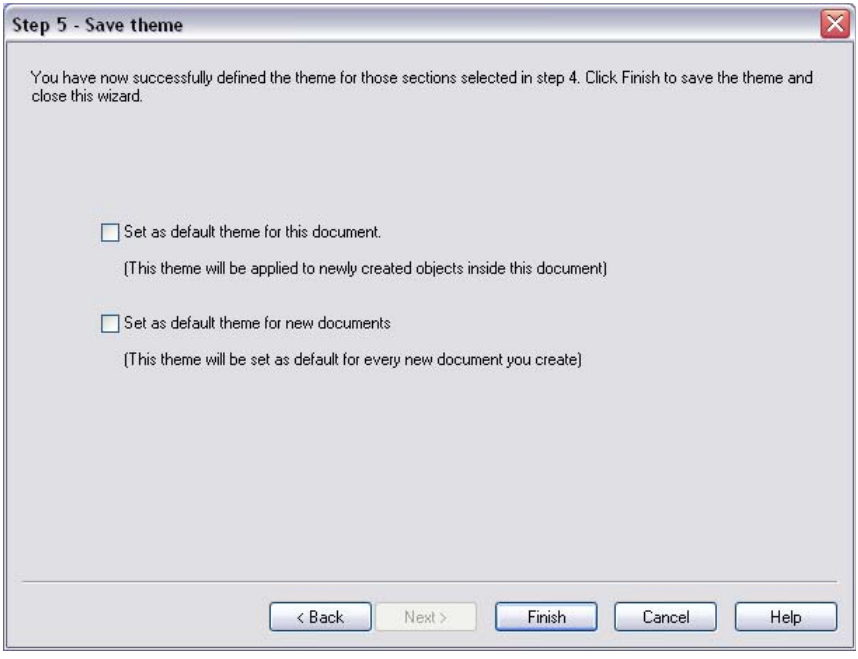


Figure 86. The fifth page of the Theme Maker Wizard

You have now concluded the process of creating or modifying a theme. In case you would like to use the saved theme as defaults for new documents or objects there are two options available:

Set as Default Theme for this Document

Mark this check box to use this theme as default theme in the current document. This means that it will be applied to all created sheets and sheet objects in the document. The selected theme must be accessible from disc at all times in order to be used. It is also important that the theme used is defined for all types of objects that may occur in a QlikView document. Default themes can be set at all times from the **Preferences** page of the **Document Properties** dialog.

Set as Default Theme for New Document

Mark this check box to use this theme as default theme for new documents. This means that it will be set as default theme in new documents. The selected theme must be accessible from disc at all times in order to be used. It is also important that the theme used is

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net
Page 1.052/

defined for all types of objects that may occur in a QlikView document. Default themes new documents can be set at all times from the **Design** page of the **User Preferences** dialog.

Click **Finish** to save the theme and return to the layout.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

20 OBJECTS CLIENT PAGE GENERATOR

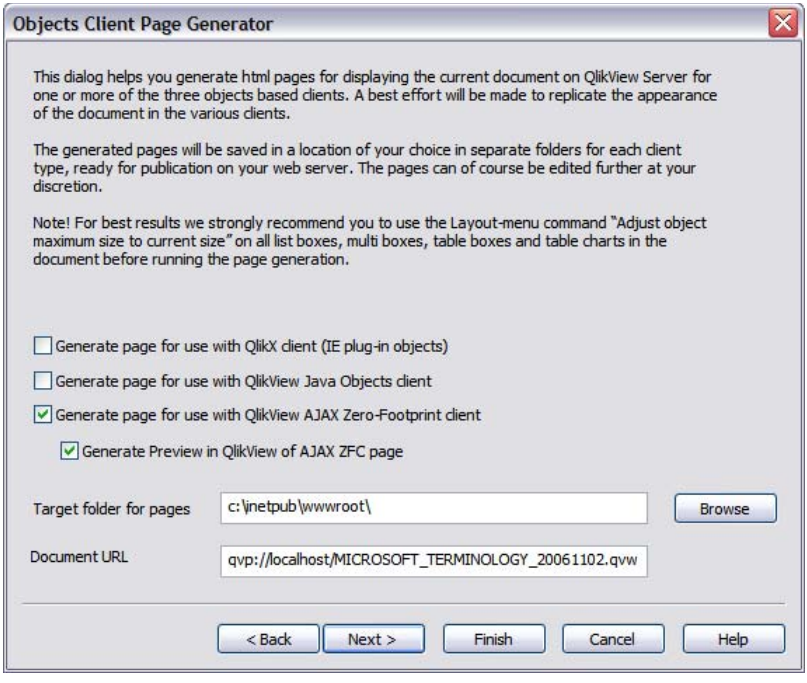


Figure 87. The Objects Client Page Generator dialog

This dialog helps you generate html pages for displaying the current document on QlikView Server for one or more of the three objects based clients. A best effort will be made to replicate the appearance of the document in the various clients. The generated pages will be saved in a location of your choice in separate folders for each client type, ready for publication on your web server. The pages can of course be edited further at your discretion, using a third-party html editor.

Note For best results we strongly recommend you to use the **Layout** menu command **Adjust Object Maximum Size to Current Size** on all list boxes, multi boxes and table charts in the document before running the page generation.

The following settings can be made:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Generate page for use with QlikX client (IE plug-in objects)

If this check box is marked, a page will be generated for the object version of the QlikView IE plug-in (a.k.a. QlikX).

Generate page for use with QlikView Java Objects client

If this check box is marked, a page will be generated for the object version of the QlikView Java client (a.k.a. QlikView Java Objects).

Generate page for use with QlikView AJAX Zero-Footprint client

If this check box is marked, a page will be generated for the object version of the QlikView AJAX Zero-Footprint client.

Generate Preview in QlikView of AJAX ZFC page

If this check box is marked, a page will be generated for the object version of the QlikView IE plug-in (a.k.a. QlikX).

Target folder for pages

Specifies the folder where the generated pages will be saved. Each page variant (for different client types) will be saved in a separate sub-folder in the specified location.

Document URL

Specifies the target document URL on the QlikView Server where the pages are to be run. This setting is necessary for the Java Objects and QlikX pages to work properly.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART II: NUMBER FORMATS

- **Data Types in QlikView**
- **Number Format Dialogs**
- **Format Codes**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

21 DATA TYPES IN QLIKVIEW



QlikView can handle text strings, numbers, dates, times, time stamps and currencies correctly. They can be sorted, displayed in a number of different formats and they can be used in calculations. This means e.g. that dates, times and time stamps can be added to or subtracted from each other.

21.1 Data Representation inside QlikView

In order to understand data interpretation and number formatting in QlikView, it is necessary to know how data is stored internally by the program. All of the data loaded into QlikView is available in two representations, as a string and as a number.

1. The string representation is always available and is what is shown in the list boxes and the other sheet objects. Formatting of data in list boxes (number format) only affects the string representation.
2. The number representation is only available when the data can be interpreted as a valid number. The number representation is used for all numeric calculations and for numeric sorting.

If several data items read into one field have the same number representation, they will all be treated as the same value and will all share the first string representation encountered. Example: The numbers 1.0, 1 and 1.000 read in that order will all have the number representation 1 and the initial string representation 1.0.

21.2 Number Interpretation

Data With Type Information

Fields containing numbers with a defined data type in a database loaded via ODBC will be handled by QlikView according to their respective formats. Their string representation will be the number with an appropriate formatting applied.

QlikView will remember the original number format of the field even if the number format is changed in the number format dialogs of the application. The original format can always be restored by clicking on the **Default from input** button in the number format dialogs.

The QlikView default formats for the different data types are:

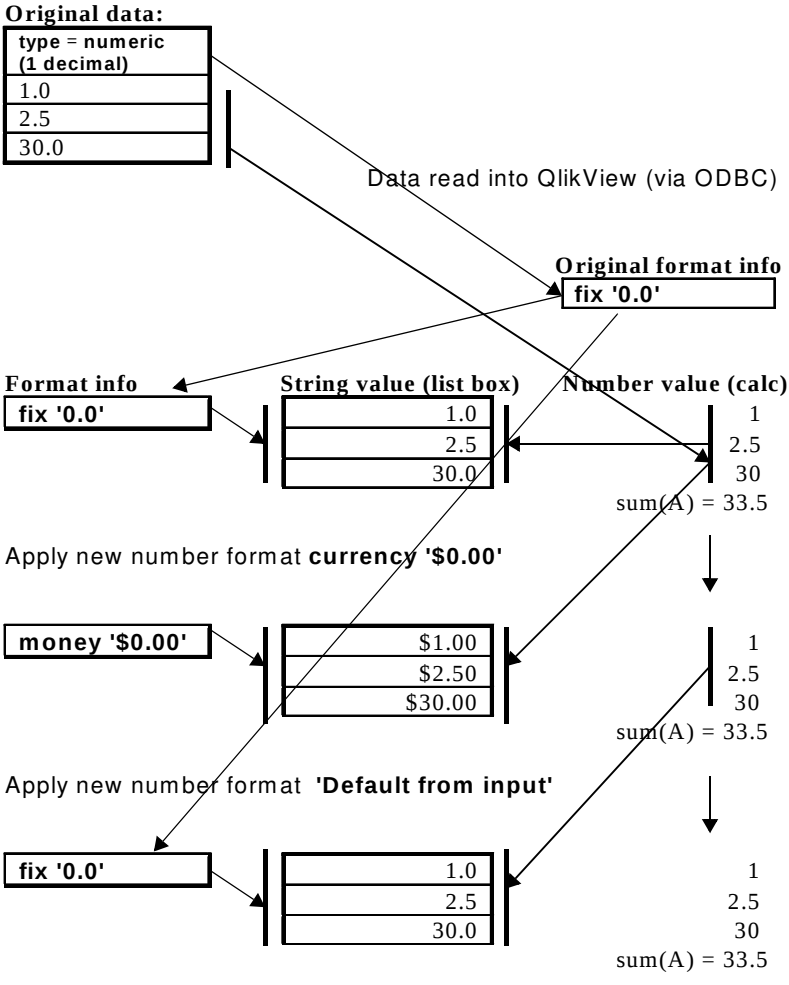
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

- integer, floating point numbers the default setting for number
- currency: the default setting for currency
- time, date, timestamp: ISO standard formatting

The default settings for number and currency are defined via the script number interpretation variables (see page 356) or the operating system settings (**Control Panel**).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:



Data Without Type Information

For data without specific formatting information from the source (e.g. data from text files or ODBC data with a general format) the situation becomes more complicated. The final result will depend on at least five different factors:

1 The way data is written in the source database

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

2 The operating system settings for number, time, date etc. (**Control Panel**)

3 The use of optional number interpreting variables in the script

4 The use of optional interpretation functions in the script

5 The use of optional formatting functions in the script

6 The number formatting controls in the document

QlikView tries to interpret input data as a number, date, time etc. As long as the system default settings are used in the data, the interpretation and the display formatting is done automatically by QlikView, and the user does not need to alter the script or any setting in QlikView. There is an easy way to find out if the input data has been correctly interpreted: numeric values are right-aligned in list boxes, whereas text strings are left-aligned.

By default, the following scheme is used until a complete match is found. (The default format is the format such as the decimal separator, the order between year, month and day, etc. specified in the operating system, i.e. in the **Control Panel**, or in some cases via the special number interpretation variables in the script, see page 356.)

QlikView will interpret the data as

1 a number according to the default format for numbers.

2 a date according to the default format for date.

3 a time stamp according to the default format for time and date.

4 a time according to the default format for time.

5 a date according to the following format: yyyy-MM-dd.

6 a time stamp according to the following format: YYYY-MM-DD hh:mm*[*:ss*[*.fff*]]*.

7 a time according to the following format: hh:mm*[*:ss*[*.fff*]]*.

8 money according to the default format for currency.

9 a number with '.' as decimal separator and ',' as thousands separator, provided that neither the decimal separator nor the thousand separator is set to ','.

10 a number with ',' as decimal separator and '.' as thousand separator, provided that neither the decimal separator nor the thousand separator is set to '.'.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Page 1.062/

11 a text string. This last test never fails: if it is possible to read the data, it is always possible to interpret it as a string.

When loading numbers from text files some interpretation problems may occur, e.g. an incorrect thousand separator or decimal separator may cause QlikView to interpret the number incorrectly. The first thing one should do is to check that the number interpretation variables in the script (see page 356) are correctly defined and that the system settings in the **Control Panel** are correct.

Once QlikView has interpreted data as a date or time, it is possible to change to another date or time format in the properties dialog for the sheet object.

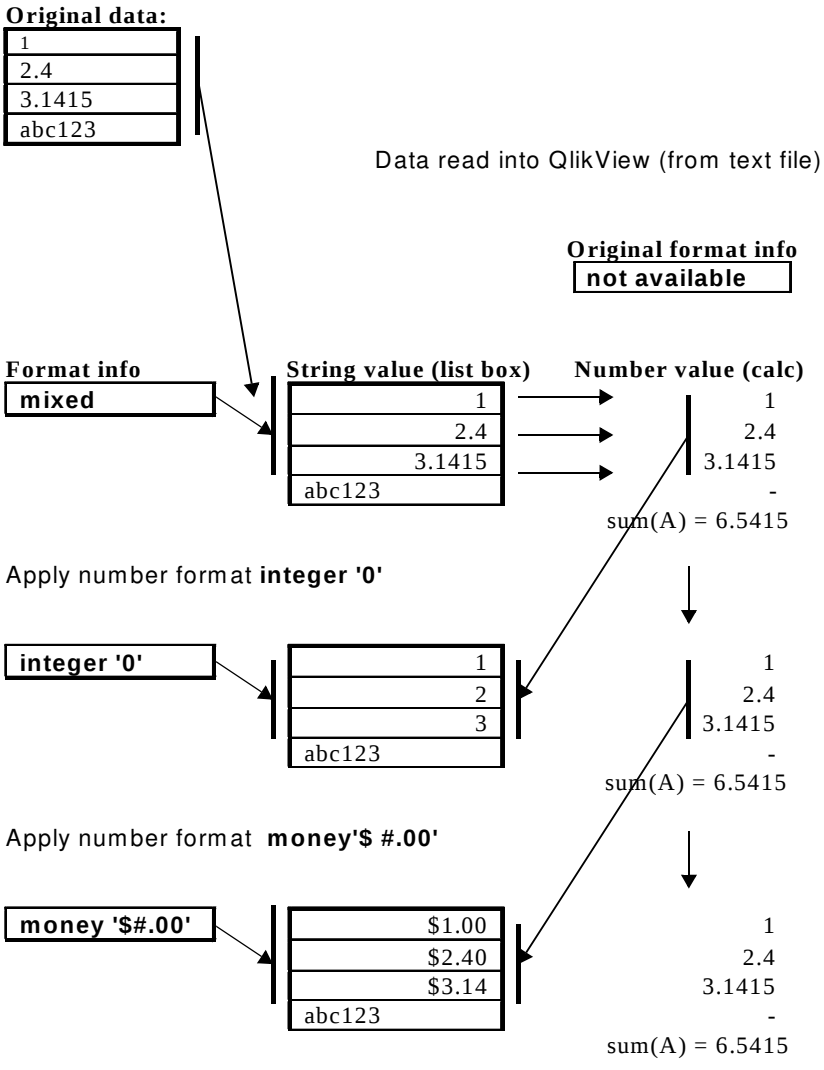
Since there is no predefined format for the data, different records may of course contain differently formatted data in the same field. You may e.g. find valid dates, integers and text in one field. The data will therefore not be formatted, but shown in its original form in list boxes etc.

When you first enter a number format dialog for such a field, the format will be set as **Mixed**. As soon as you change the number formatting of the field, it will be impossible for QlikView to return to the original formatting of the different field values, unless the script is re-executed with the **Survive Reload** check box deselected.

The **Default from input** button in the number format dialogs is thus unavailable for this kind of fields once the number format has been changed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:



21.3 Dates and Times

QlikView stores each date, time and time stamp found in data as a date serial number. The date serial number is used for dates, times and time stamps and in arithmetic cal-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

culations based on date and time entities. Dates and times can thus be added and subtracted, intervals can be compared, etc.

The date serial number is the (real valued) number of days passed since Dec 30, 1899, i.e. the QlikView format is identical to the 1900 date system used by Microsoft Excel for Windows, Lotus 1-2-3, Corel Quattro Pro and other programs, in the range between March 1, 1900 and Feb 28, 2100. For example, 33857 corresponds to Sept 10, 1992. Outside this range, QlikView uses the same date system extended to the Gregorian calendar, which is now the standard calendar in the Western World.

The serial number for times is a number between 0 and 1. The serial number 0.00000 corresponds to 00:00:00, whereas 0.99999 corresponds to 23:59:59. Mixed numbers indicate the date and time: the serial number 2.5 represents January 1, 1900 at 12:00 noon.

The data is however displayed according to the format of the string. By default, the settings made in the **Control Panel** are used. It is also possible to set the format of the data by using the number interpretation variables in the script (see page 356) or with the help of a formatting function, see page 461. Finally it is also possible to reformat the data in the properties sheet of the sheet object.

Examples:

1997-08-06	is stored as	35648
09:00	is stored as	0.375
1997-08-06 09:00	is stored as	35648.375

or vice versa

35648	with number format 'D/M/YY' is shown as	6/8/97
0.375	with number format 'hh.mm' is shown as	09.00

As mentioned earlier, QlikView will follow a set of rules to try to interpret dates, times and other data types. The final result however will be affected by a number of factors as described above.

Examples:

These examples assume the following default settings:

number decimal separator:	.
short date format:	YY-MM-DD
time format:	hh:mm

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The following data is read into QlikView as the field A:

Original data:

0.375
33857
97-08-06
970806
8/6/97

Inside QlikView:

A1) QlikView interpretation (without the special interpretation function in the script)

String value (list box)	Number value
0.375	0.375
33857	33857
97-08-06	35648
970806	970806
8/6/97	-

A2) With number format **date 'YYYY-MM-DD'**

String value (list box)	Number value
1899-12-30	0.375
1992-09-10	33857
1997-08-06	35648
4557-12-21	970806
8/6/97	-

A3) With number format **date 'MM/DD/YYYY'**

String value (list box)	Number value
12/30/1899	0.375
09/10/1992	33857
08/06/1997	35648
12/21/4557	970806
8/6/97	-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

A4) With number format **time 'hh:mm'**

String value (list box)	Number value
09:00	0.375
00:00	33857
00:00	35648
00:00	970806
8/6/97	-

A5) With number format **fix '# ##0.00'**

String value (list box)	Number value
0.38	0.375
33 857.00	33857
35 648.00	35648
970 806.00	970806
8/6/97	-

B1) QlikView interpretation with the special interpretation function **date#(A, 'M/D/YY')**

String value (list box)	Number value
0.375	-
33857	-
97-08-06	-
970806	-
8/6/97	35648

B2) With number format **date 'YYYY-MM-DD'**

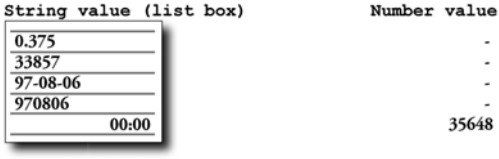
String value (list box)	Number value
0.375	-
33857	-
97-08-06	-
970806	-
1997-08-06	35648

B3) With number format **date 'MM/DD/YYYY'**

String value (list box)	Number value
0.375	-
33857	-
97-08-06	-
970806	-
08/06/1997	35648

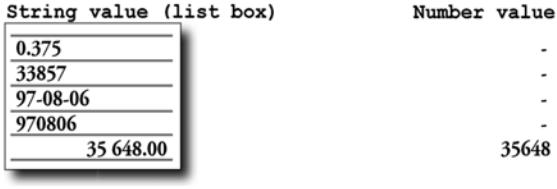
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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B4) With number format **time 'hh:mm'**



String value (list box)	Number value
0.375	-
33857	-
97-08-06	-
970806	-
00:00	35648

B5) With number format **fix '# ##0.00'**



String value (list box)	Number value
0.375	-
33857	-
97-08-06	-
970806	-
35 648.00	35648

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

22 NUMBER FORMAT DIALOGS

The format for dates, times and numbers for any field can be set either in the script (see page 461) or in the **Number** page of the properties dialogs. Here you can choose a format different from the one used by the system. Each field can only have one number format at any given time. Changes made in the **Number** page of any sheet object containing the field or in the **Number** page of the **Document Properties** will affect the formatting of the field in all sheet objects.

22.1 Document Properties

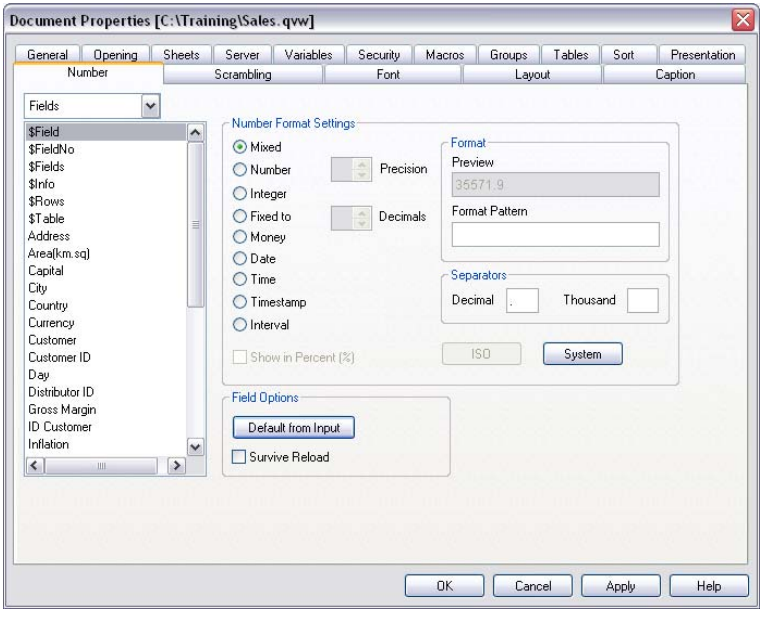


Figure 88. The Number page in the Document Properties dialog

Fields A list of the fields or variables available for formatting. Mark the field(s) or variable(s) for which you want to set the number format. Several field(s) or variable(s) can be marked simultaneously.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Variables

A list of the variables available for formatting. Mark the variable or variables for which you want to set the number format. Several variables can be marked simultaneously.

Field Options

Default from input

Resets the format (if possible) to the input format as interpreted by the script. This option is only available for fields loaded with specific type information.

Survive Reload

If this control is checked, the set number format will be kept also after a reexecution of the script. If not, the format will be reset to its original settings at the reexecution.

Mixed Field values of different types will be shown with different formatting. Initially, all fields without specific type information are set to **Mixed**.

Number

Numeric field values will be shown as numbers.

Integer

Numeric field values will be shown as integer numbers.

Fix Numeric field values will be shown as numbers with a fix number of decimals.

Money Numeric field values will be shown in the money format.

Date Numeric field values will be shown as dates.

Time Numeric field values will be shown as times.

Timestamp

Numeric field values will be shown as time stamps.

Interval

Numeric field values will be shown as intervals.

Note If you change from the **Mixed** format to some other number format, you may lose the original formatting information, i.e. QlikView will then not be able to distinguish between numbers and dates. QlikView will issue a warning before overwriting the formatting information.

Precision

The number of significant digits to use. This control is valid only for the **Number** alternative.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Decimals
The number of decimals digits to use. This control is valid only for the **Fix** number alternative.

Show in Percent (%)
Click this button to toggle formatting as percentage instead of absolute numbers on and off. Percentage formatting is only available for **Number**, **Integer** and **Fix**.

Format
The format code that further specifies the display format of the field. See also page 291.

Preview
A preview based on the format code specified above.

Separators
In this group it is possible to set a decimal separator and a thousand separator different from the system separators.

ISO Sets the format to the ISO standard. Only valid for date, time, time stamp and interval.

System
Sets the format to the system settings.

22.2 List Box, Multi Box, Table Box and Input Box

The list box, multi box and table box properties dialogs also contain **Number** pages. Each field has a default number format which can be set on the **Number** page of the **Document Properties** dialog as described in the previous section. Normally this is the number format used when displaying field values in a list box, multi box or table box. It is however possible to use a separate number format in an individual sheet object. To do this, mark this check box **Override Document Settings** and specify a number format in the group control below.

The **Number** pages of list boxes, multi boxes and table boxes otherwise differ from the **Number** page of the **Document Properties** dialog only regarding the **Fields** list. Since a list box contains only one field, the **Fields** list is not available in the **Number** page of the **List Box Properties** dialog. As for the **Fields** list in the multi box or table box properties **Number** page, it contains only the fields currently shown in the concerned multi box or table box.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The **Input Box Properties** dialog contains a **Number** page, that in large resembles to the dialogs described above. The list however only contains the variables shown in the input box.

22.3 Chart

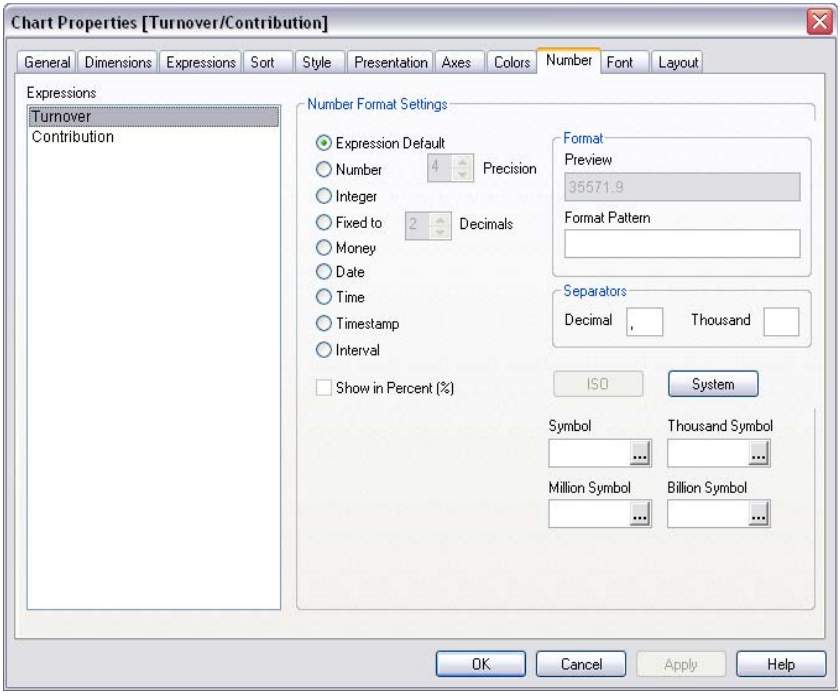


Figure 89. The Number page in the Chart Properties dialog

The Number page in the Chart Properties dialog differs from the others in that the number format is only available for the expressions. Setting the number format for an expression does not affect the number format setting for the fields. Each chart can have its own number formats.

If you want to change the number format for the dimensions in e.g. a pivot table, this must be done in the **Document Properties Number** page.

However, if the x-axis is set to **Continuous** on the **Axes** page, the x-axis dimension is treated as an expression.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Expressions

A list of the expressions in the chart. Mark the expression for which you want to set the number format. Several expressions can be marked simultaneously. If the x-axis is set to **Continuous** on the **Axes** page, the x-axis dimension is also treated as an expression.

Expression Default

The inherent number format of the chart expression.

Symbol The symbol to use as unit.

1 000 Symbol

The symbol to use for one thousand units. The symbol may be defined as a calculated formula (see page 439 in Book III) for dynamic update.

1 000 000 Symbol

The symbol to use for one million units. The symbol may be defined as a calculated formula (see page 439 in Book III) for dynamic update.

1 000 000 000 Symbol

The symbol to use for one billion units. The symbol may be defined as a calculated formula (see page 439 in Book III) for dynamic update.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23 FORMAT CODES

In the number format controls described above and in several of the interpretation and formatting functions it is possible to set the format for numbers and dates by using a *format code*. This describes how to format a number, date, time or time stamp.

23.1 Numbers

- To denote a specific number of digits, use the symbol "0" for each digit.
- To denote a possible digit, use the symbol "#". If the format contains only #'s to the left of the decimal point, numbers less than 1 begin with a decimal point.
- To mark the position of the thousand separator or the decimal separator, use the thousand separator and the decimal separator.

Examples:

# ##0	describes the number as an integer with a thousand separator.
###0	describes the number as an integer without a thousand separator.
0000	describes the number as an integer with at least four digits. E.g. the number 123 will be shown as 0123.
0.000	describes the number with three decimals.
0.0##	describes the number with at least 1 decimal and at most three decimals.

The format code is used for defining the positions of the separators. It is not possible to set the separator in the format code. Use the respective control (in dialogs) or parameter (in script functions) for this.

It is possible to use the thousand separator to group digits by any number of positions. E.g a format string of "0000-0000-0000" (thousand separator="-") could be used to display a nine a nine-digit part number as 12-4567-8912.

Special number formats

QlikView can interpret and format numbers in any radix between 2 and 36 including binary, octal and hexadecimal. It can also handle roman formats.

To indicate binary format the format code should start with (bin) or (BIN).

To indicate octal format the format code should start with (oct) or (OCT).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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To indicate binary format the format code should start with (hex) or (HEX). If the capitalized version is used A-F will be used for formatting (e.g. 14FA). The non-capitalized version will result in formatting with a-f (e.g. 14fa). Interpretation will work for both variants regardless of the capitalization of the format code.

The use of (dec) or (DEC) to indicate decimal format is permitted but unnecessary.

To indicate a format in any radix between 2 and 36 the format code should start with (rxx) or (Rxx) where xx is the two-digit number denoting the radix to be used. If the capitalized R is used letters in radices above 10 will be capitalized when QlikView is formatting (e.g. 14FA). The non-capitalized r will result in formatting with non-capital letters (e.g. 14fa). Interpretation will work for both variants regardless of the capitalization of the format code. Note that (r02) is the equivalent of (bin), (R16) is the equivalent of (HEX) and so on.

To indicate roman numbers the format code should start with (rom) or (ROM). If the capitalized version is used capital letters will be used for formatting (e.g. MMXVI). The non-capitalized version will result in formatting with lower cap letters (mmxvi). Interpretation will work for both variants regardless of the capitalization of the format code. Roman numbers are generalized with minus sign for negative numbers and 0 for zero. Decimals are ignored with roman formatting.

Examples:

num(199, '(bin)')	returns 11000111
num(199, '(oct)')	returns 307
num(199, '(hex)')	returns c7
num(199, '(HEX)')	returns C7
num(199, '(r02)')	returns 11000111
num(199, '(r16)')	returns c7
num(199, '(R16)')	returns C7
num(199, '(R36)')	returns 5J
num(199, '(rom)')	returns cxcix
num(199, '(ROM)')	returns CXCIX

23.2 Dates

- To describe the day, use the symbol "D" for each digit.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- To describe the month number, use the symbol "M" or "MM" for one or two digits. "MMM" denotes short month name in letters as defined by the operating system or by the override system variable MonthNames in the script. "MMMM" denotes long month name in letters as defined by the operating system or by the override system variable LongMonthNames in the script.
- To describe the year, use the symbol "Y" for each digit.
- To describe the weekday, use the symbol "W". One W will return the number of the day (e.g. 0 for Monday) as a single digit. "WW" will return the number with two digits (e.g. 02 for Wednesday). "WWW" will show the short version of the weekday name (e.g. Mon) as defined by the operating system or by the override system variable DayName in the script. "WWWW" will show the long version of the weekday name (e.g. Monday) as defined by the operating system or by the override system variable LongDayName in the script
- Arbitrary separators can be used.

Examples:

YY-MM-DD	describes the date as 01-03-31.
YYYY-MM-DD	describes the date as 2001-03-31.
YYYY-MMM-DD	describes the date as 2001-Mar-31.
31 MMMM YYYY	describes the date as 31 March 2001.
M/D/Y	describes the date as 3/31/01.
W YY-MM-DD	describes the date as 6 01-03-31.
WWW YY-MM-DD	describes the date as Sat 01-03-31.
WWWW YY-MM-DD	describes the date as Saturday 01-03-31.

23.3 Times

- To describe the hours, use the symbol "h" for each digit.
- To describe the minutes, use the symbol "m" for each digit.
- To describe the seconds, use the symbol "s" for each digit.
- To describe the fractions of a second, use the symbol "f" for each digit.
- To describe the time in AM/PM format, use the symbol "tt" after the time.
- Arbitrary separators can be used.

Examples:

hh:mm	describes the time as 18:30
hh.mm.ss.ff	describes the time as 18.30.00.00

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

hh:mm:tt	describes the time as 06:30:pm

23.4 Time Stamps

The same notation as that of dates and times above is used.

Examples:

YY-MM-DD hh:mm	describes the timestamp as 97-03-31 18:30
M/D/Y hh.mm.ss.ffff	describes the timestamp as 3/31/97 18.30.00.0000

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

PART III: MACROS AND AUTOMATION

- **Edit Module Dialog Box**
- **About the VBScript Language**
- **QlikView Automation Interface**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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24 USING AUTOMATION AND MACROS WITH QLIKVIEW



24.1 The QlikView Automation Interface

QlikView is equipped with an Automation interface (Automation was previously known as OLE Automation). This interface allows an external program or internal macro to access and control the QlikView application.

The complete specification of the QlikView Automation interface can be found in the folder Documentation of your QlikView application.

The Automation interface is an integral part of QlikView and you do not have to perform any special tasks to activate it.

24.2 How Automation and Macros Can Control QlikView

External Control of QlikView

QlikView objects are accessible by means of Automation from external programs, e.g. programs written in Visual Basic or C++ supporting Automation.

Such code can be used to control QlikView from other applications or from stand-alone programs.

Stand-alone executable files can be invoked from a QlikView document by means of launch buttons.

Internal Macro Interpreter

QlikView objects are also accessible via Automation from inside QlikView by means of the built-in macro interpreter.
Macros written in VBScript or JScript inside a QlikView document can currently be invoked in several ways:

Document events:

1 A macro can be run after opening a QlikView document.

2 A macro can be run when closing a document.

3 A macro can be run after script re-execution.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

4 A macro can be run after the **Reduce Data** command.

5 A macro can be run after a selection in any field in the document.

Sheet events:

6 A macro can be run after a sheet is activated.

7 A macro can be run when a sheet is deactivated.

Sheet object events:

8 A macro can be run after a sheet object is activated.

9 A macro can be run when a sheet object is deactivated.

Button events:

10 A button sheet object can be linked to a macro.

11 Three predefined toolbar buttons can be linked to macros.

Field events:

12 A macro can be run after a selection has been made in a specified field.

13 A macro can be run when a selection is made in any field logically associated with a specified field.

14 A macro can be run when selections are locked in a specified field.

15 A macro can be run when selections are unlocked in a specified field.

Variable events:

16 A macro can be run after a value has been entered in a specified variable.

17 A macro can be run when the value of a specified variable containing a formula has been changed due to a change in the formula value.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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25 INTERNAL MACRO INTERPRETER AND MACROS



25.1 Edit Module Dialog

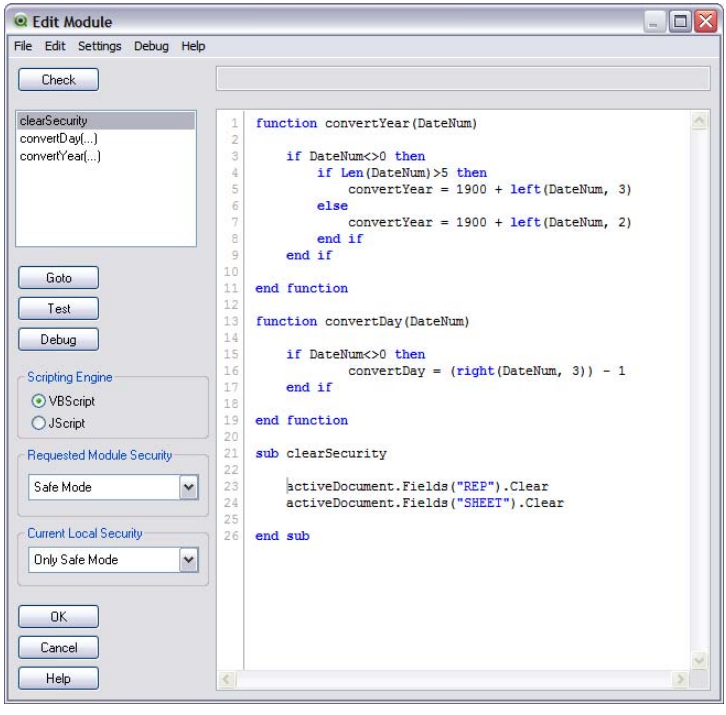


Figure 90. The Edit Module dialog

Macros and custom defined functions can be written in VBScript or JScript using the **Edit Module** dialog. The module is saved with the document.



By choosing **Edit Module** from the **File** menu, or by choosing the **Edit Module** button from the toolbar, you will enter the **Edit Module** dialog. The following controls are available:

III

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The centerpiece of the dialog is a large edit box where you type your macros. All macros should be written as subroutines between a matching pair of `sub..end sub` (VBScript only) or as functions between a matching pair of `function..end function` (VBScript) or as `function..{..}`(JScript).

All subroutines and functions which have been syntax checked and found valid will be listed to the left in the dialog.

Check Once you have written a macro, you can have it syntax-checked by pressing this button. All approved subroutines and functions will be listed to the left in the dialog. Functions and subroutines with parameters will be listed followed by (...).

Message
The current status and any error messages will be displayed in this box.

Goto All subroutines and functions which have been syntax checked and found valid will be listed to the left in the dialog. By selecting a name in the list and pressing this button the macro edit box will be scrolled to the selected entry point.

Test After selecting a macro in the list of entry points you can test its operation by clicking this button, provided that the macro is a VBScript subroutine without parameters. Error messages will be displayed in the **Message** box.

Debug By pressing this button you will enter macro debug mode. Before pressing the button you must mark the macro that you wish to debug in the list of entry points. The macro selected must be a VBScript subroutine without parameters. You must also set one or more breakpoints in the code. Breakpoints are to be toggled by clicking on a line number next to a position in the code or by positioning the cursor in the line and pressing F9. See description of macro debugger below for further details.

Scripting Engine
Sets the scripting engine for the document. You may choose between **VBScript** and **JScript**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Requested Module Security

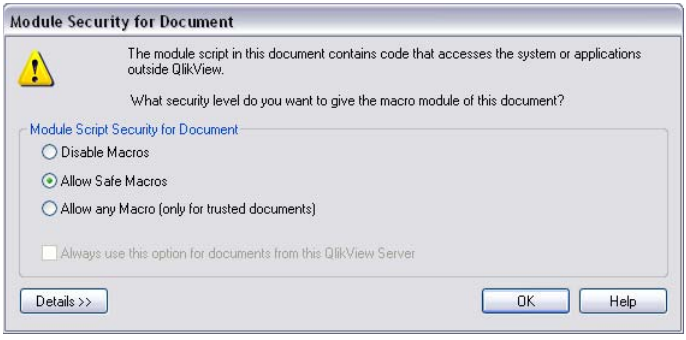


Figure 91. The Module Security dialog

The designer of the QlikView document can set the intended macro security level to **Safe Mode** or **System Access**. By indicating **Safe Mode** the document designer indicates that the macros in the module do not contain any code that can access the system or applications outside QlikView. Typically this would mean code containing `CreateObject`, `GetObject` or `Launch`. If such code is encountered during macro execution in a document declared to be in **Safe Mode**, the execution will fail. If however the document designer indicates **System Access** mode the end user will be prompted (see Figure 91 above) when opening the document to approve system access (**Allow System Access**), disable all macros in the document (**Disable Macros**) or allow only macros without system access (**Safe Mode**). As soon as the user has chosen to approve or ban the macros this will be remembered by the system and no more prompts will appear when opening the document.

User Allowed Security Level

When opening a document declared to be in safe mode by the document's designer, which contains potentially unsafe code in the macro module script, the user will be prompted to approve, disable or partially disable macros (see above). This choice will be remembered by the system but can be changed at any later time via this setting. The macro security level can be set to **Don't run at All**, **Safe Mode** or **System Access**.

OK This button saves changes and takes you back to the QlikView main menu.

Cancel This button discards changes and takes you back to the QlikView main menu.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Furthermore, the **Edit Module** dialog contains a number of commands in five menus:

Export menu

Export to Module File...
Saves the contents of the edit box in a text file to be specified in the **Save Module** dialog that appears. The file will have the extension .qvm.

Print... Opens Windows standard **Print** dialog. This command can also be invoked via the shortcut command CTRL+P.

Edit menu

Undo Undoes the latest change. This command can also be invoked via the shortcut command CTRL+Z.

Redo Redoes the latest **Undo**.This command can also be invoked via the shortcut command CTRL+Y.

Cut Exports the selected text to the Clipboard. This command can also be invoked via the shortcut command CTRL+X.

Copy Copies the selected text to the Clipboard. This command can also be invoked via the shortcut command CTRL+C .

Paste Pastes the contents of the Clipboard into the dialog at the position of the cursor. This command can also be invoked via the shortcut command CTRL+V.

Clear Clears all the text in the edit box.

Select All
Selects all the text in the edit box.

Insert File...
Lets you browse for a file containing macros and inserts its contents into the edit box at the position of the cursor.

Find/Replace
Opens a dialog allowing you to find and replace numbers or characters in the macros. This command can also be invoked via the keyboard shortcut command CTRL+F.

Goto... Opens a dialog where you can enter the number of the page where you want to go. This command can also be invoked via the shortcut command CTRL+P.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Settings menu

Configure

Opens the **Editor** page in the **User Preferences** dialog (page 115), where you can set the font and color of the different text types appearing in the edit box.

Debug Menu

Help menu

Help Opens the interactive QlikView help.

25.2 Macro debugger

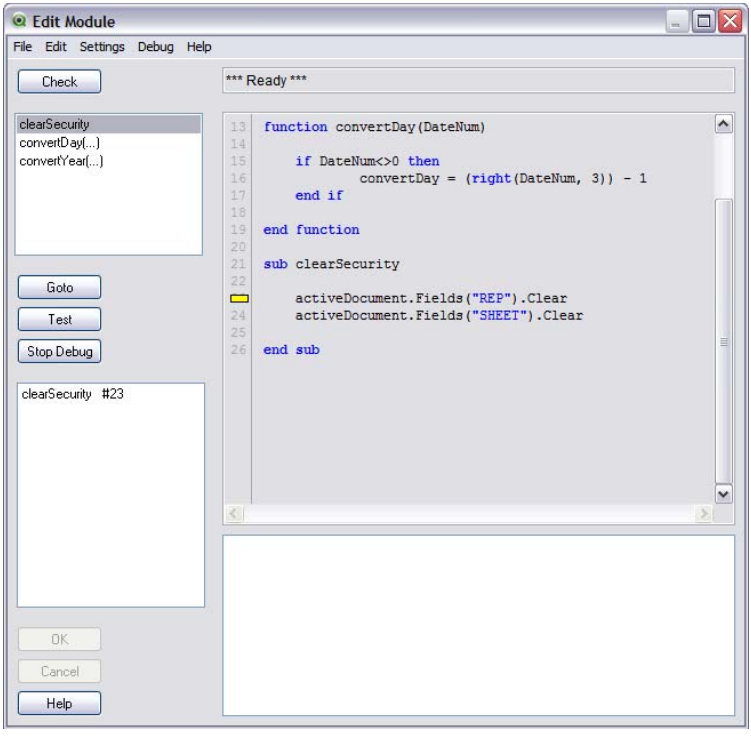


Figure 92. The Macro Debug page of the Edit Module dialog

Before you can use the macro debugger , you must install the Microsoft Script Debugger.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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By pressing the **Debug** button in the **Edit Module** dialog you will enter macro debug mode. In this mode you may step through the macro and inspect variable contents as you go along.

Before debug mode is entered you must select a macro (subroutines without parameters only) from the list and set one or more breakpoints in the code. Breakpoints can be toggled at any time by clicking on a line number next to a position in the code or by positioning the cursor in the line and pressing F9. Pressing CTRL+SHIFT+F9 will clear all breakpoints.

When entering debug mode two new panes appear in the dialog window. In the lower left you will find a pane indicating the current call stack. By double-clicking in the list the editor window will be scrolled to the position of the call clicked upon. The execution pointer will not be moved however.

In the lower right you will find a pane with current variables. By double-clicking one of the variables you will open the **Variables** dialog where the properties of the variable can be further examined and its value changed interactively.

In debug mode a separate menu becomes available. Many of the items on this menu have a keyboard shortcut counterpart. The keyboard shortcuts can be individually customized in the **Editor** page of **User Preferences**. The shortcuts mentioned below are the installation defaults.

Continue
: Continues execution of the macro to the next breakpoint or the end of the macro. Equivalent to pressing F5.

Step Into
: Steps execution one line. If the next line is a call to a subroutine execution will be stepped to the first line of the subroutine. Equivalent to pressing F8.

Step Out
: Executes the remaining statements of the current subroutine. Equivalent to CTRL+SHIFT+F8.

Step Next
: Steps execution one line. If the next line is a call to a subroutine the subroutine will be executed in its entirety and stopped at the first line after the subroutine call. Equivalent to pressing SHIFT+F8.

Variable Window
: Opens a window where the values of different variables can be inspected and changed.

Expression Window
: Opens a dialog where you may enter and evaluate a VBScript or JScript expression based on current variable values.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Clear Breakpoints

Equivalent to pressing CTRL+SHIFT+F9.

Stop Debugging

Exits debug mode and returns to the normal **Edit Module** dialog.

25.3 Invoking Macros

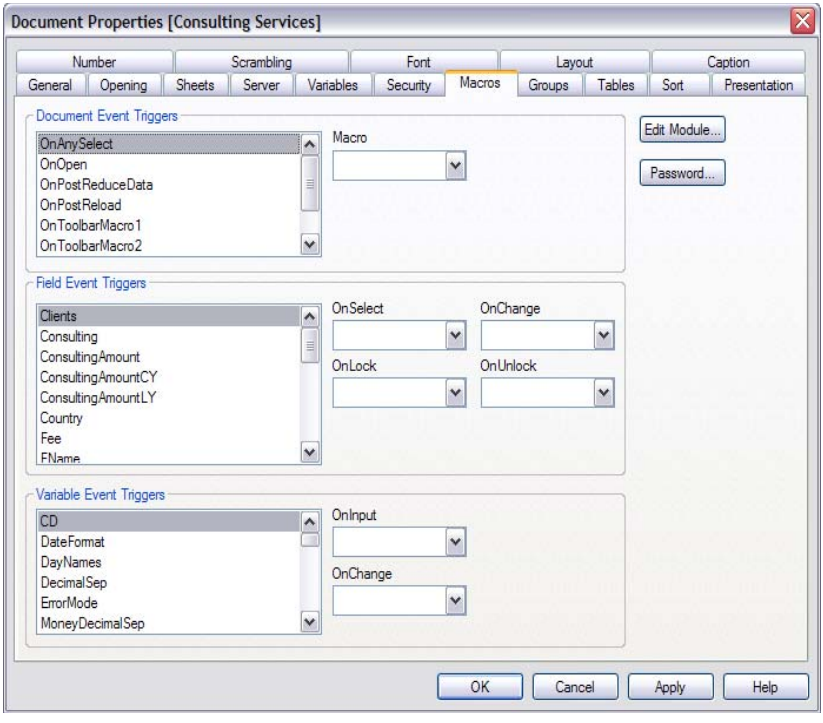


Figure 93. The Macros page in the Document Properties dialog

Invoking Macros on Document Events and Field Events

Choose the **Macros** page in the **Document Properties** dialog.

Document Event Triggers

In the **Document Event Triggers** group you can set macros to trigger on selected events in the document. You must select an event in the list before you can assign macros to it.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

OnAnySelect

Select this event to assign a macro to be executed each time a selection has been made in any field of the QlikView document.

OnOpen

Select this event to assign a macro to be executed each time the QlikView document is opened.

OnPostReduceData

Select this event to assign a macro to be executed after each time the **Reduce Data** command has been executed.

OnPostReload

Select this event to assign a macro to be executed each time the script has been re-executed.

OnToolbarMacro1

Select this event to assign a macro to be executed when the predefined toolbar macro button 1 is depressed.



OnToolbarMacro2

Select this event to assign a macro to be executed when the predefined toolbar macro button 2 is depressed.



OnToolbarMacro3

Select this event to assign a macro to be executed when the predefined toolbar macro button 3 is depressed.



Macro In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the selected document event occurs.

Field Event Triggers

In the **Field Event Triggers** group you can set macros to trigger on changes in the logical state of a specified field in the document. You must select a field in the list before you can assign macros to events in it.

OnSelect

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time a selection has been made in the specified field.

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OnChange

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time a selection has been made in any field which is logically associated with the specified field.

OnUnlock

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the field is unlocked.

Variable Event Triggers

In the **Variable Event Triggers** group you can set macros to trigger on changes in the contents of a specified variable in the application. You must first select a variable in the list before you may assign macros to events in it.

OnInput

In this drop-down list you can select from existing macro names or type any name which you later create a macro for in the **Edit Module** dialog. The macro, if it exists will be executed each time a new value is directly entered in the selected variable.

OnChange

In this drop-down list you can select from existing macro names or type any name which you later create a macro for in the **Edit Module** dialog. The macro, if it exists will be executed each time the value of the selected variable changes as a result of changes in other variables or the logical state of the application (typically applies when the variable contains a formula).

Edit Module

By clicking on this button the **Edit Module** dialog is opened.

Password

Allows you to set a password for entering the **Edit Module** dialog. To change the password, click the **Password** button again. After entering the password, the **Module Password** dialog is opened and the password can be reset. The password cannot be removed.

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Invoking Macros on Sheet Events

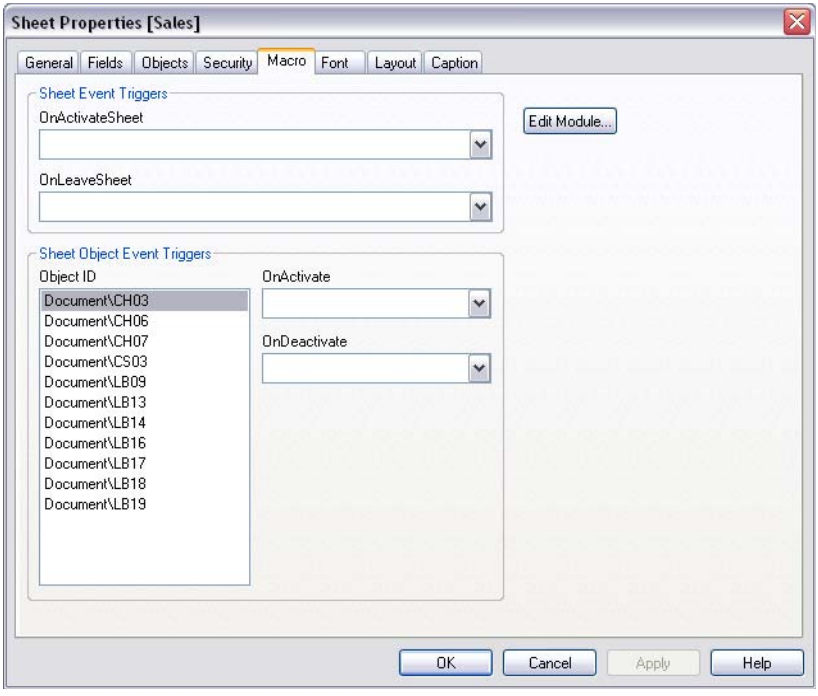


Figure 94. The Macro page of the Sheet Properties dialog

Choose the **Macro** page in the **Sheet Properties** dialog.

Edit Module

By clicking on this button the **Edit Module** dialog is opened.

Sheet Event Triggers

In the **Sheet Event Triggers** group you can set macros to trigger on change of active sheet.

OnActivateSheet

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet is activated.

OnLeaveSheet

In this drop-down list you can select an existing macro name or type any name for which you later create a macro

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in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet is deactivated.

Sheet Object Event Triggers

In the **Sheet Object Event Triggers** group you can set macros to trigger on activation and deactivation of a specified sheet object on the sheet. You must first select a sheet object in the list before a macro can be assigned to it.

OnActivate

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet object is activated.

OnDeactivate

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed each time the sheet object is deactivated.

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Invoking Macros With Sheet Object Buttons

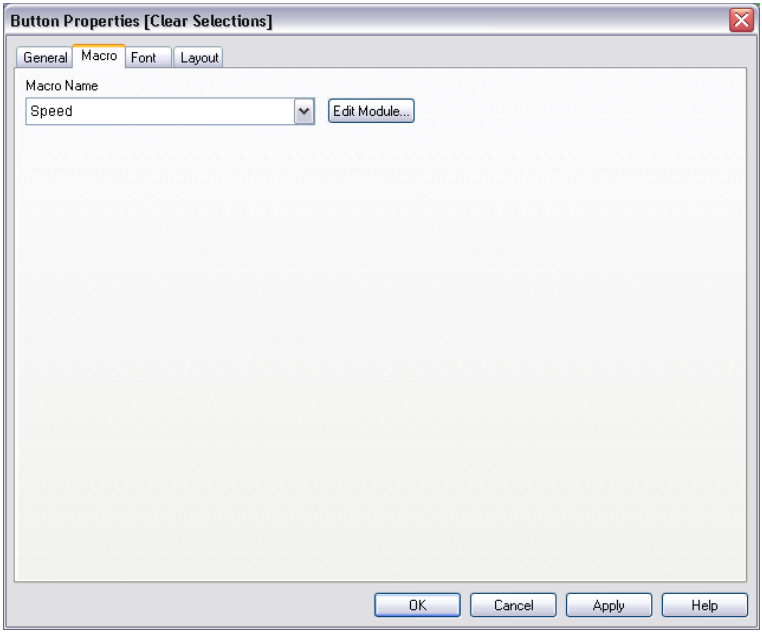


Figure 95. The Macro page in the Button Properties dialog

The **Macro** page of the **Button Properties** dialog becomes available if you choose **Macro** under **Function** on the **General** page.

Macro Name

In this drop-down list you can select an existing macro name or type any name for which you later create a macro in the **Edit Module** dialog. The macro (if it exists) will be executed when the button is clicked.

Edit Module

By clicking on this button the **Edit Module** dialog is opened.

25.4 Examples of Macros

This section gives you a few very small examples of VBScript macros, which could however be very useful.

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Clearing All Selections in Current Document

```
Rem ** clears the active document **
Rem ** including locked selections **
Sub Clr
   ActiveDocument.ClearAll(true)
end sub
```

Locking all selections in Current Document

```
Rem ** locks all selections **
Sub Lk
   ActiveDocument.LockAll
end sub
```

Selecting a Value in a Certain Field

```
Rem ** clears the active document **
Rem ** (excluding locked selections) **
Rem ** and selects Q2 in field Quarter **
Sub SecondQtr
   ActiveDocument.ClearAll(false)
   ActiveDocument.Fields("Quarter").Select("Q2")
end sub
```


Activating a Certain Sheet

```
Rem ** Activates the sheet named Market **
Sub MarketSheet
   ActiveDocument.Sheets("Market").Activate
end sub
```

Using VBScript Input Boxes for User Interaction

```
rem ** Clear selections, ask for product, **
rem ** select that product, **
rem ** go to sheet "Market", **
rem ** show pivot table "Sales" **
Sub ChooseValue
   Set q = ActiveDocument
   q.ClearAll (false)
   Set f = q.Fields("Model Name")
   x = inputbox ("Enter product")
   f.Select(x)
   set s = q.Sheets("Market")
   s.Activate
   s.SheetObjects("Sales").Activate
end sub
```


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25.5 Special library functions for JScript

Whereas the standard VBScript functions InputBox and MsgBox can be used freely in VBScript macros, no direct counterpart is available when using JScript. For this purpose a special library qvlib has been added for these actions. The functions are demonstrated in the example below.

```
// JScript
function Test()
{
   personName = qvlib.InputBox("What is you name?")
   msg = "Hello " + personName + " !"
   qvlib.MsgBox(msg)
}
```

The qvlib functions actually work also in VBScript macros as shown in the example below, but in this case you might as well use the generic VBScript functions InputBox and MsgBox.

```
rem VBScript
sub TestModule
   name = qvlib.InputBox("What is your name?")
   msg = "Hello "
   msg = msg + name + " !"
   qvlib.MsgBox(msg)
end sub
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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26 GETTING HOLD OF A QLIKVIEW DOCUMENT



26.1 Accessing QlikView Documents from the Outside

QlikView documents can be accessed from outside the QlikView program by means of the Automation interface.

Accessing an Existing QlikView Document

A direct way to access existing documents is to use GetObject.

Example (Does not work in VBScript!):

```
Private Sub OpenAndReload_Click()
   Set QvDoc = GetObject
   ("c:\windows\desktop\test.qvw")
   QvDoc.Reload
End Sub
```


26.2 Accessing QV Documents from the Internal Macro Interpreter

When using the internal macro interpreter, the only reference available is the ActiveDocument property of the class Application. All references must be made starting from that point.

Examples:

```
Sub Clr
   Set QVDoc = ActiveDocument
   QvDoc.ClearAll(false)
End sub
Sub EndQV
   ActiveDocument.Application.Quit()
End sub
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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27 VBSCRIPT FUNCTION CALLS FROM SCRIPT



VBScript or JScript functions defined in the macro module of a QlikView document can be called from the script. If a function called is not recognized as a standard script function, a check will be made to see if a custom functions resides in the module. This gives you a large degree of freedom to define your own functions. Using custom macro functions will of course be somewhat slower than executing the standard functions.

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```
rem ************************************************
rem ***THIS IS VBSCRIPT CODE FROM THE MODULE*********
rem************************************************
rem ********* Global variables ********************
dim flag

rem *******functions accessible from script *********

rem ************ wrap for input box ******************
function VBin(prompt)
     VBin=inputbox(prompt)
end function

rem ************ clear global flag ******************
function VBclearFlag()
     flag=0
end function

rem ********* test if reference has passed ***********
function VBrelPos(Ref, Current)
   if Ref=Current then
      VBRelPos="Reference"
      flag=1
   elseif flag=0 then
      VBRelPos="Before "&Ref&" in table"
   else
      VBRelPos="After "&Ref&" in table"
   end if
end function

// ************************************************
//  *************THIS IS THE SCRIPT *****************
//  ************************************************

let MaxPop=VBin('Max population in millions :');
// Ask limit

let RefCountry=VBin('Reference country :');
// Ask ref.

let dummy=VBclearFlag();     // Clears the global flag

Load
   Country,recno(),
   Capital,
   "Area(km.sq)",
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
   "Population(mio)",
   VBrelPos('$(RefCountry)',Country)
   as RelativePos
from country1.csv
(ansi, txt, delimiter is ',', embedded labels)
where "Population(mio)" <= $(MaxPop);
```

27.1 Transfer of Parameters

The following rules apply for parameter transfer of parameters between the load script and VBScript:

- Missing parameters are passed as NULL
- If the actual expression evaluates to a valid number, the number is passed, else if the actual expression evaluates to a valid string, the string is passed, else NULL is passed.
- NULL is passed as VT_EMPTY.
- Return values are treated in a natural way.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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28 THE VISUAL BASIC PROGRAMMING LANGUAGE



28.1 About Visual Basic

This documentation is not intended as a manual for the Visual Basic language. The reader is supposed to possess a basic knowledge of Visual Basic programming.

Visual Basic is a very suitable language for writing macros and other programs for controlling QlikView via its Automation interface. Such code could of course also be written in other programming languages supporting Automation, e.g. Visual C++, but for most users Visual Basic in one of its forms is likely to be the first choice. For this reason a few words about the language could be appropriate in this documentation.

Visual Basic is a programming language with roots in the old BASIC language, known to almost everyone who has ever programmed a computer. In comparison with its ancestor, Visual Basic however has a number of additions which make it a quite modern object oriented programming language. Visual Basic has during the last few years turned into a macro and scripting language widely used by major software producers. It was therefore a natural choice to use this language (in its VBScript incarnation) as the macro language for QlikView.

28.2 Differences Between VB, VBA and VBS

Visual Basic as a stand alone compiler (VB), Visual Basic for Applications (VBA) and Visual Basic Script (VBS) are all variations of the Visual Basic language. Most of the basic syntax and keywords are the same, but small variations exist. When it comes to advanced capabilities and the ability to communicate with the outside world from the code, there are large differences, especially between VB/VBA on one side and VBS on the other. Some main differences between VB, VBA and VBScript are described below.

	VB	VBA	VBScript
Compile stand-alone.exe	yes	no	no
Full VB syntax	yes	yes	no
Data types	full	full	small

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Different Versions of VBScript

Apart from the incomplete listing of differences above, additional differences may exist as a result of which version of VBScript you are using. QlikView is currently shipped with VBScript version 3.1.

VB Features Not Included in VBScript

Clipboard access
Collection
Conditional compilation
Constants
Data types (only variant supported)
Date/Time
DDE
Debug commands
File input/output
Financial

Features with Limited Implementation in VBScript

Array handling
Error handling (only On Error Resume Next)

Some VB Keywords and Functions Not Supported by VBScript

Declare
Dim ... as <datatype>
DoEvents
For Each ... Next
GoSub ... Return
GoTo
Line Numbers
Line Labels
Like
New
With ... End With

28.3 Note About Parameters to Methods and Properties

In VB, VBA and VBS the following rules apply to the use of parentheses around arguments:

- Always use parentheses around parameters to properties.

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- Arguments to single parameter methods may optionally be enclosed in parentheses.
- Arguments to multiple parameter methods *must not* be enclosed in parentheses.

28.4 Getting Hold of the System from VBScript

When using the internal VBScript interpreter, it is possible to get hold of a reference to the local file system by using a statement like the following:

```
set fso = CreateObject("Scripting.FileSystemObject")
```

This reference can then be used for operations towards the file system.

Example:

```
sub LogFunktion
'This routine logs selection to a text file

set fso= CreateObject("Scripting.FileSystemObject")
set mypath = ActiveDocument.GetProperties
directory = mypath.MyWorkingDirectory

On Error Resume Next

' See if file already exists.
set f = fso.GetFile(directory & "log.txt")
' If not, then create it.
if Err <> 0 then
   set f=fso.CreateTextFile(directory & "log.txt")
end if

set txsStream = f.OpenAsTextStream(8) 'For Append

set doc = ActiveDocument
set mySel = doc.fields("Field").GetSelectedValues

for i = 0 to mySel.Count - 1
   txsStream.WriteLine Now&" "&mySel.Item(i).text
next
txsStream.WriteBlankLines 1
txsStream.Close

end sub
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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29 USING MACROS IN QV DOCUMENTS ON THE QV SERVER



29.1 Macros on QlikView Server

As of version 4.04 the QlikView Server can execute macros in QlikView documents. Due to client-server environment some considerations must be taken when using macros.

When using Java clients all macros are run in the server. This causes considerable restrictions in permitted operations.

When using QlikView as a client all macros are executed in the client. In this case more operations can be permitted.

29.2 Macro functionality limitations

Functionality that will normally work well in macros in the QlikView Server environment with any type of client is:

- Logical operations such as clearing or selecting in fields
- Operations related to variables

The following types of functionality will work when using QlikView (Analyzer, Professional or Developer) as client but NOT with Java clients:

- Layout operations acting on sizing, positioning, minimization etc. of sheet objects using direct access functions rather than SetProperties. Examples: SetRect, Minimize, Restore
- Activate and Deactivate on sheets and sheet objects
- Operations changing User Preferences

The following types of functionality are not to be used in the QlikView Server environment , as they may cause unexpected results:

- Layout operations acting on the properties of sheets and sheet objects via SetProperties
- Operations changing document or user settings
- All operations related to the script, including Reload

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- Data reduction operations, e.g. ReduceData
- Operations such as Save and Open document

29.3 Macro trigger limitations

The following triggers will work as usual in the QlikView Server environment regardless of which client is used:

Document.OnAnySelect
Field.OnSelect
Field.OnChange
Field.OnUnlock
Document.OnPressMacroButton
Variable.OnChange
Variable.OnInput

The following triggers will be meaningless in conjunction with the QlikView Java Objects client, but work with all other clients:

Sheet.OnActivateSheet
Sheet.OnLeaveSheet

The following types of functionality will work when using QlikView (Analyzer, Professional or Developer) as client but NOT with Java clients:

OnToolbarMacro1
OnToolbarMacro2
OnToolbarMacro3
SheetObject.OnActivate
SheetObject.OnDeActivate

The following triggers are not to be used in the QlikView Server environment, since they lack meaning or may cause unexpected results:

OnOpen
OnPostReduceData
OnPostReload

29.4 VBScript functions

VBScript functions defined in the module of a QlikView document will generally work well on QlikView Server. General functionality limitations as defined in the previous section apply.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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29.5 Server Side Export

It is possible to export the content of any chart to a text file on the server by using a Macro connected to a Button. This feature has to be added in the QlikView document and then the macro can be executed from the QlikView Server directly in the web browser.

In the QlikView document QWT.qvw provided on the CD, you find a sheet called “Server Side Export”. As the button is clicked, the content of the Straight Table CH20 can be exported as a text file to the server directory for QlikView Server. The exported data can then easily be read into Excel or other programs.

Below you find a sample of VB Script code used in the Edit Module in QlikView for making the export possible. The macro is then connected to a trigger, in the case of this example, a button.

```
Sub ServerExport
   Set st = ActiveDocument.GetSheetObject("CH20")
   st.ServerSideExport "C:\ProgramFiles\QlikView
Server\CH20export.skv" , ";" ,0
End Sub
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

INDEX

A

Activating
- sheet 69
- sheet objects 88

Average (statistics box) 125

B

Bookmark object 231–236
Border 59
- of sheet objects 109
- settings in document properties 60

Button 191–204

C

Calendar Mode 219
Caption
- in sheet objects 65, 114
- settings in document properties 65

Caption Style 20
Chart 129–133
Color Area dialog 23–25
Compression 17
Constraints
- in input box 186

Copy 70
Copying
- field values to clipboard 256
- image to clipboard 70

Creating
- a bookmark object 231
- a button 191
- a chart 131
- a current selections box 171
- a line/arrow object 213
- a list box 93
- a multi box 135
- a sheet 69
- a sheet object 87
- a slider object 220
- a statistics box 119
- a table box 153
- a text object 205
- an input box 179

Current Selections box 171–177
Custom Format Cell Dialog 158
Custom object 237–240

D

Data
- types 275

Date format 273
Default Export Encoding 20
Disable Layout Undo 19
Document Event Triggers 43, 305
Document Properties 15–68

E

Edit Module dialog 299
Example 61
Exporting
- image to file 71
- with button 198

F

Field Event Triggers 43, 306
Field groups 46
Fonts 58
Format code 291–292
Format codes 291
Fractile (statistics box) 126

G

Groups of fields 46

H

Help Text
- in sheet objects 117
- setting ~ in document properties 68

I

Image border definition file 61
Input 36
Input box 179–190
- using 179

Internal 297
invoking 305

K

Kurtosis (statistics box) 125

L

Layer 59
Legacy Fractile Calculation 19
Line/arrow object 213–217
List box ??– 66, 93–115
Local Objects and Server Objects 87
Loosely Coupled Tables 49

M

Macro debugger 303
Macros 305
  examples 310
Macros, invoking
  on document events 42
  on sheet events 83, 308
  with button 202, 310
Median (statistics box) 126
Memory
  statistics 17
Missing count (statistics box) 125
Multi box 135–151

N

Null count (statistics box) 125
Number format
  codes 291
  dialogs 285
  handling ~ in QlikView 273–294
Number Interpretation 275
Numeric count (statistics box) 125

O

Object 70
Object menu
  for button 191
  for chart 132
  for current selections box 171
  for input box 180
  for line/arrow object 213
  for list box 93
  for multi box 135
  for sheet objects 88
  for sheets 70
  for slider object 220
  for statistics box 120
  for table box 154
  for text object 205
Objects Client Page Generator 271
Only value (statistics box) 126

P

Pop-up Window Settings 21
Predefined Values 38
Print Options 247–254
Print Preview 255
Print Sheet 255
Programming languages 319

R

Rounded 62

S

Security page
  Document Properties 39
  Sheet Properties 81
Sheet Event Triggers 308
Sheet Object Event Triggers 309
Sheet Properties 71
Skewness (statistics box) 125
Slider Mode 219
Slider object 219–230
Special 312
Standard deviation (statistics box) 125
Statistical functions 125
Statistics box 119–127
Styling Mode 20
Sum (statistics box) 125

T

Table box 153–170
  using 153
Tabrow 20
Tabrow Style 20
Tabs 69
Text count (statistics box) 125
Text object .....205–??
Theme Maker Wizard 262
Time format 273
Total count (statistics box) 125

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

U

Use 60

V

Value 37
Variable Event Triggers 44, 307
VBScript function calls from script 315
Visual Basic 319

Z

Zoom 75

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

QlikView

Reference Manual

Book III: Charts

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Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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OVERVIEW BOOK III

CHARTS

GLOSSARY

APPENDIX

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

CONTENT

PART I: CHARTS

1 INTRODUCTION 15
1.1 Creation 15
1.2 Chart Object Menu 15
1.3 Selections in Charts 16
1.4 Chart Properties 16

2 BAR CHART 25
2.1 Creation 25
2.2 Bar Chart Object Menu 25
2.3 Chart Properties 28

3 LINE CHART 83
3.1 Creation 83
3.2 Line Chart Object Menu 83
3.3 Chart Properties 86

4 COMBO CHART 95
4.1 Creation 95
4.2 Combo Chart Object Menu 95
4.3 Chart Properties 98

5 RADAR CHART 107
5.1 Creation 107
5.2 Radar Chart Object Menu 107
5.3 Chart Properties 110

6 SCATTER CHART 119
6.1 Creation 119
6.2 Scatter Chart Object Menu 119
6.3 Chart Properties 122

7 GRID CHART 137
7.1 Creation 137
7.2 Grid Chart Object Menu 137
7.3 Chart Properties 140

8 PIE CHART 149
8.1 Creation 149

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

8.2 Pie Chart Object Menu 149
8.3 Chart Properties 152

9 FUNNEL CHART 159
9.1 Creation 159
9.2 Funnel Chart Object Menu 159
9.3 Chart Properties 162

10 BLOCK CHART 169
10.1 Creation 169
10.2 Block Chart Object Menu 169
10.3 Chart Properties 172

11 GAUGE CHART 181
11.1 Creation 181
11.2 Gauge Chart Object Menu 181
11.3 Chart Properties 184

12 PIVOT TABLE 193
12.1 Creation 193
12.2 Using the Pivot Table 193
12.3 Pivot Table Object Menu 197
12.4 Chart Properties 201

13 STRAIGHT TABLE 217
13.1 Creation 217
13.2 Using the Straight Table 217
13.3 Straight Table Object Menu 218
13.4 Chart Properties 221

14 EDIT EXPRESSION 229
14.1 The Colormix Wizard 234

15 THE QUICK CHART WIZARD 239
15.1 Starting the Quick Chart Wizard 240
15.2 Pages of the Quick Chart Wizard 241

16 THE TIME CHART WIZARD 251
16.1 Starting the Time Chart Wizard 252
16.2 Pages of the Time Chart Wizard 253

17 THE STATISTICS CHART WIZARD 261
17.1 Starting the Statistics Chart Wizard 261
17.2 Chi2-Test 262
17.3 Paired t-test 263
17.4 Independent Samples t-test 265

18 CHART EXPRESSIONS 267

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net
Page 1.121/

18.1 Chart Expression Syntax 267
18.2 Variable Text Expansion 268
18.3 Operators 269
18.4 Aggregation Functions 272
18.5 Synthetic Dimension Functions 333
18.6 Other Functions 334

19 EXAMPLES 419
19.1 Examples of Aggregate Qualifiers 419
19.2 Examples of Ranking Functions 420
19.3 Examples of Chart Inter-Record Functions 423

20 NESTED AGGREGATIONS AND RELATED ISSUES 429
20.1 Nested Aggregations with total Qualifier 429
20.2 Nested Aggregations with the aggr Function 429
20.3 Sum of rows in Pivot Tables 431
20.4 Linear Regression in Table Charts 434

21 CALCULATED FORMULAS 437
21.1 Entering a Calculated Formula 437
21.2 Expression Syntax for Calculated Formulas 437
21.3 Error Messages 438

22 FIELD GROUPS 439
22.1 Hierarchic Groups (Drill-Down) 439
22.2 Non-Hierarchic Groups (Cyclic) 440

23 CUSTOM ERROR MESSAGES 441

GLOSSARY

GLOSSARY 445

APPENDIX

LIMITATIONS AND REQUIREMENTS 459
A.1 Limitations of the Amount of Data to be Loaded 459
A.2 System Requirements 459

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

A.3 Dynamic Link Libraries (dll's) Needed 461

KEYBOARD COMMAND SHORTCUTS 463

B.1 File Menu Command Shortcuts 463
B.2 Edit Menu Command Shortcuts 464
B.3 View Menu Command Shortcuts 464
B.4 Selections Menu Commands Shortcuts 465
B.5 Settings Menu Command Shortcuts 465
B.6 Bookmarks Menu Command Shortcuts 465
B.7 Object Menu Command Shortcuts (List box, Statistics box and Open Multi Box) 466
B.8 F Key Keyboard Shortcuts 466

APPLICATION PERFORMANCE OPTIMIZATION 467

C.1 Introduction 467
C.2 Count (Distinct 'FieldName') 467
C.3 If (Condition(Text),....) 468
C.4 Sum (If (Condition, 'FieldName'…)) 469
C.5 If (Condition, Sum('FieldName')..) 470
C.6 If (Condition1, Sum('FieldName'), If (Condition2, Sum('Field-Name')…….. 470
C.7 Sorting text 471
C.8 Dynamic captions and text objects 471
C.9 Macro triggers ("on change") 472

FREQUENTLY ASKED QUESTIONS 473

D.1 Installation 473
D.2 QlikView Documents 474
D.3 Scripts and Loading Data 475
D.4 QlikView Logic 477
D.5 Layout 479
D.6 Sharing QlikView Documents with Other People 480

DATA PROTECTION ISSUES 483

E.1 Data Security and Integrity 483
E.2 The Right to Alter Data 483
E.3 Data Integrity 484
E.4 The Right to View Data 484

USING QLIKVIEW DOCUMENTS AS AN INFORMATION SERVER 485

F.1 Information Server 485
F.2 Extracting Data via ODBC/OLEDB 485
F.3 Extracting Data From AS/400 With Router 486

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

F.4 Extracting Data From Mainframe, AS/400 etc. Without Router 486
F.5 Using QlikView Binary Files 486
F.6 Aggregation 486
F.7 Sharing QlikView Documents in Workgroups 487
F.8 Mailing QlikView Documents 487
F.9 Posting QlikView Documents on a Web Page 488
F.10 Posting QlikView Documents on an FTP Server 488
F.11 QlikView Document on Server - Basic Setup 489
F.12 QlikView Document on Server - Advanced Setup 490
F.13 Customized QlikView Documents 492
F.14 QlikView Server 492
F.15 QlikView Publisher 492

BACKUS-NAUR FORMALISM 493

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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PART I: CHARTS

- **Creation of Charts**
- **Chart Properties**
- **Chart Expressions**
- **Calculated Formula**
- **Field Groups**

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1 INTRODUCTION

Charts and tables are sheet objects that can show numbers very compactly. You can e.g. show sums of money, distributed over different fields such as year, month, account number, etc.

Charts and tables can be set to display either the frequencies of different values of a field, or a calculated entity, e.g. the sum of the possible values of a field. In both cases, a certain field must be chosen as x-axis, i.e. this field will be used to label the slices of the pie, the different bars in the bar chart and the rows in the pivot table, respectively. The chart types you can choose between are bar chart, line chart, combo chart, scatter chart, pie chart, pivot table, straight table, radar chart, grid chart, block chart and gauge chart. The chart types are illustrated on page 22.

1.1 Creation



Charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.



If you want to create a simple chart and find the great number of different settings available overwhelming, choose **Create QuickChart** from the list box object menu or from the **Layout** menu, or click the **QuickChart** button in the toolbar. The wizard that appears will help you to create a chart in a quick and easy way. The result is however always a full-blown chart - it is only the creation process that has been simplified.

For a detailed description of the Quick Chart Wizard, see chapter “the quick chart wizard” on page 239 ff.

1.2 Chart Object Menu

The chart **Object** menu is found as the **Object** menu when a chart is active. It can also be opened as a float menu by clicking with the right mouse button on a chart. The chart object menu looks different depending on the active chart type. To find the commands that apply to the chart type you are working with, see the chapter on that specific chart.

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1.3 Selections in Charts

Selections in field data can be made directly in all of QlikView's charts and tables by means of clicking or painting with the mouse. For details about selections in charts, see chapter “Selections in Charts and Tables” on page 154 in Book I.

1.4 Chart Properties

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don’t have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The regular chart wizard and the **Chart Properties** dialog are identical. However, the settings available on the different properties pages depend on the chart type you have chosen on the first page (**General** page). For information on the different pages of the **Chart Properties** dialog (except for the **General** page, which is described below), we therefore refer to the chapters on the specific charts.

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General

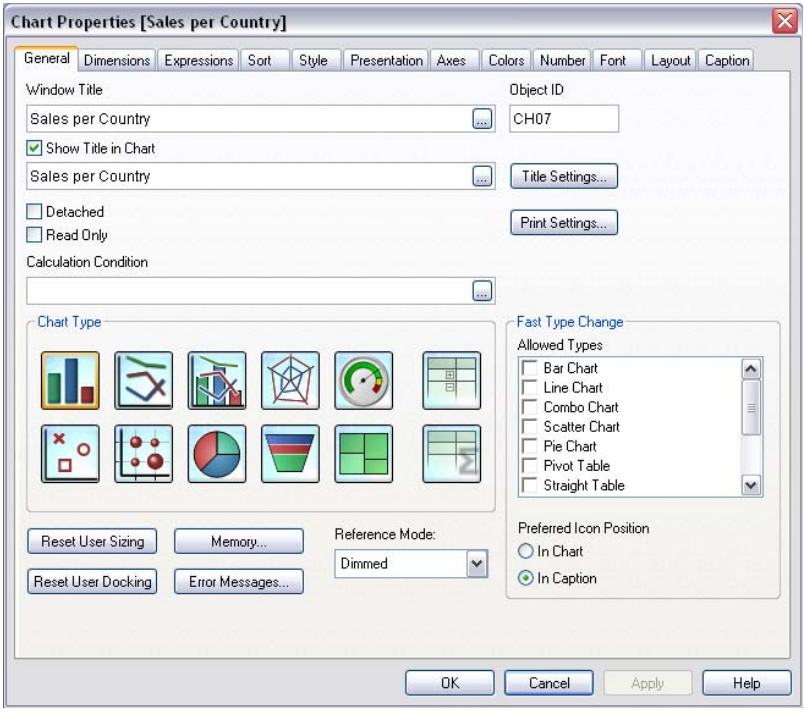


Figure 1. The General page in the Chart Properties dialog

The **General** page, where titles and chart type can be set, is the first page of the chart wizard and the properties dialog.

Window Title

The title to be displayed in the window header. The title may be defined as a calculated label expression (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Chart Title

By default, the label of the first expression defined is set as chart title. Deselect the check box if you do not wish any chart title to appear. To get back to the original title, simply clear the check box. The title may be defined as a calculated formula (see page 439) for dynamic update. To have the text on multiple lines: press ENTER. The chart title is not shown in pivot tables and straight tables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Title Settings...

Opens the **Title Settings** dialog, where advanced settings can be made for the chart title. See page 21 for details on this dialog.

Object ID

The unique ID of the current chart. Upon creation, every QlikView layout entity is assigned a unique ID for control via Automation. The ID consists of a combination of letters defining the type of entity, as well as a number. The first chart of a document will be assigned the ID CH01. An object ID may be changed to any other string that is currently not used for any other sheet object, sheet, bookmark, report or alert in the document.

Detached

Marking this check box will detach the chart, so that it will no longer be dynamically updated when selections are made.

Read Only

By marking this check box the chart becomes read only, i.e. selections cannot be made by clicking or painting with the mouse in the chart.

Calculation Condition

Typing an expression in this text box sets a condition to be fulfilled for the chart to be calculated. If the condition is not fulfilled, the text 'Calculation condition unfulfilled' will be displayed in the chart. By clicking the **...** button the **Edit Expression** dialog is opened for easier editing of long formulas.

Chart Type

In this group you select what type of chart to use: bar chart, line chart, combo chart, scatter chart, pie chart, radar chart, funnel chart, grid chart, block chart, gauge chart, pivot table or straight table.

Bar Chart

The most basic chart type. Displays values as bars of different height.

Line Chart

Instead of being displayed in bars, the data can be presented as lines between value points, as value points only or as both lines and value points. Line charts are useful when you want to show changes or trends.

Combo Chart

This option allows you to combine the features of the bar chart with those of the line chart: you can show the values

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of one expression as bars while displaying those of a second expression as lines or symbols.

Radar Chart

The radar chart is a form of the line chart where the x-axis is wrapped around 360 degrees. The result is similar to a spider web or a radar screen.

Scatter Chart

The scatter chart presents pairs of values from two expressions. The expression values are reflected on the two axes. This chart type is useful when you want to show data where each instance has two numbers, e.g. country (population and population growth).

Grid Chart

Similar to the scatter chart but plots dimension values on the axes and uses an expression to determine the plot symbol. A special mode makes it possible to show a third dimension in the form of small pie charts as plot symbols.

Pie Chart

Pie charts normally show the relation between a single dimension and a single expression, but can sometimes have two dimensions.

Funnel Chart

The funnel chart is typically used for showing data in flows and processes. From a display standpoint it is related to the pie chart. The chart may be shown with either segment height/width or segment area proportional to data. It is also possible to draw the chart with equal segment heights/widths, disregarding data points.

Block Chart

Block charts show the relation between expression values as blocks of varying area. Up to three dimensions can be shown, where each dimension block in sub-divided in sub-blocks. Often an extra expression is used to calculate the color of each block.

Gauge Chart

Gauge charts are typically used for displaying a single expression value without any dimensions. QlikView offers a wide range of gauge variants.

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Pivot Table

Presents dimensions and expressions in table form. Subtotals can be shown and the data can be grouped as a cross table with several dimensions.

Straight Table

As opposed to the pivot table, the straight table cannot display sub-totals or serve as a cross table. On the other hand, any of its columns can be sorted and each of its rows contains one combination of dimension(s)+expression(s).

Fast Type Change

In the **Fast Type Change** group you can enable an icon in the chart from which the user can change chart type without going through the chart properties dialog. Right-click the icon to see a drop-down list of chart types and select one by a simple click.

Allowed Types

In this list you can select which chart types that should appear in the drop-down list. Two or more types have to be selected for fast type change to be enabled.

Preferred Icon Position

In graphical charts the fast type change icon can be positioned either inside the chart or in the sheet object caption. In table charts the caption is the only alternative. Select **In Chart** if you want the fast change icon to appear inside graphical charts. If you select **In Caption** the icon will always appear in the caption.

Reset User Sizing

By pressing this button all user sizing of legend, title etc. in graphical charts will be reset. Docking of individual items will not be affected.

Reset User Docking

By pressing this button all user docking of legend, title etc. in graphical charts will be reset.

Memory...

Opens the **Calculation Memory Settings** dialog, in which it is possible to increase the memory allocated to the chart. This is only necessary for large and complex charts. The dialog is only available if the **Ignore Calculation Limits** setting has been unchecked in the **Objects** page in **User Preferences**.See **Memory Calculation Settings** on page 142 in Book I.

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Error Messages

Opens the **Custom Error Messages** dialog, where you can define custom error messages to be displayed instead of the standard ones. See further on page 443.

Reference Mode

Here you may choose between some different options for how the reference background should be plotted when using the **Set Reference** option from the chart's context menu. This setting is only meaningful for some types of charts.

Title Settings dialog

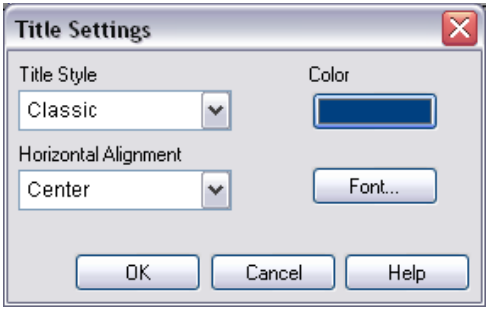


Figure 2. The Title Settings dialog

The Chart title can be formatted in a number of ways using this dialog.

Title Style

Sets the basic style for the title. You may choose from:

Classic Title area without border and with transparent background. QlikView 5 style.

Divider Title area with transparent background. Line divider between title and plot area. The divider line is drawn using the color specified under **Color**.

Glass Title area with semi-transparent glass-like surface as background.

Tinted Title area with semi-transparent colored surface as background. Uses the color specified under **Color**.

Solid Title area with solid colored surface as background. Uses the color specified under **Color**.

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Background Color

Sets the color of the title background for selected styles. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

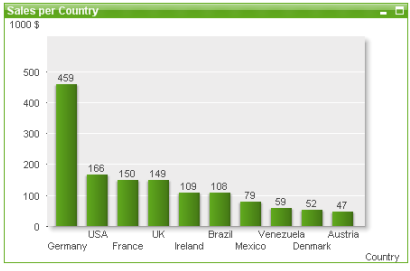
Horizontal Alignment

Specifies how the title text is positioned in relation to the plot area. The alternatives are **Left**, **Center** and **Right**.

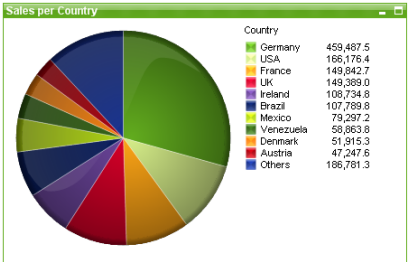
Font...

Sets the font to be used in the chart title. The standard **Font** dialog for charts opens when you click the button.

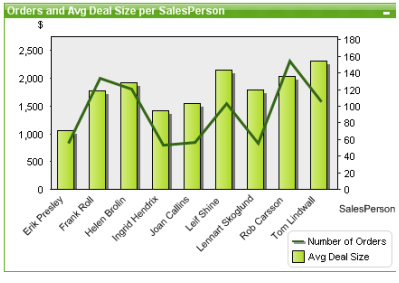
The different chart types available:



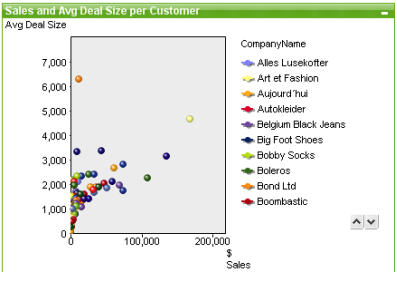
Bar chart



Pie chart

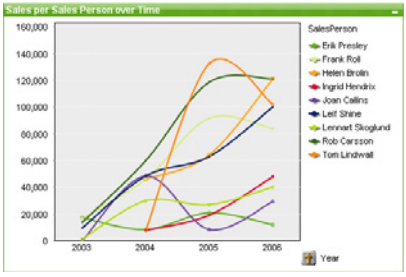


Combo chart

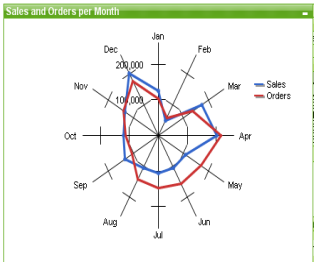


Scatter chart

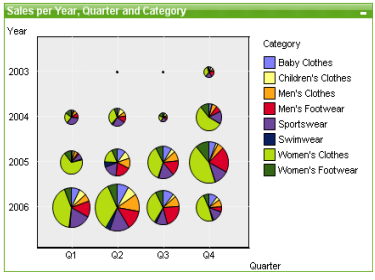
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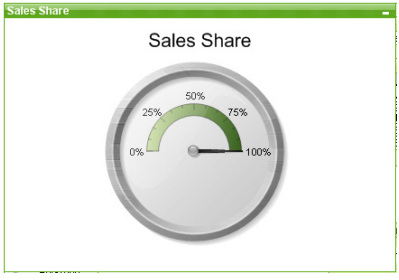
Line chart



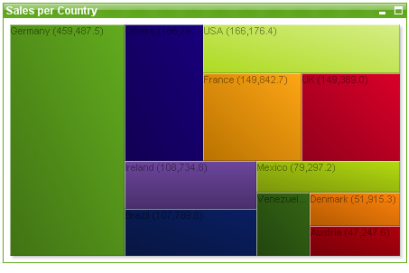
Radar chart



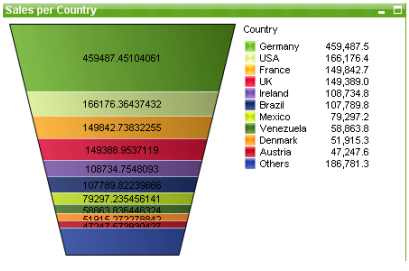
Grid chart



Gauge chart



Block chart



Funnel chart

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sales per CategoryName

CategoryName	ProductName	Sales	Quantity
Men's Clothes	Atles Lussekofta	$30,126.55	1057
	Bow tie	$9,534.57	1315
	Desperado Jeans	$18,240.68	706
	Lenin Jeansshorts	$14,900.64	828
	Mr2 Trousers	$17,944.48	1067
	O-Man Underwear	$1,649.87	298
	Rossi Bermuda Shorts	$10,947.25	1397
	Samba Soccer Socks	$4,941.14	1175
	US-Master Jeans	$21,764.94	817
	Total	**$130,050.12**	**8660**
Women's Clothes	Chantell Shirt	$7,504.70	388
	Halter Dress	$361,096.85	981
	Jack Flash Dress	$42,638.00	722
	Langoste Shirt	$4,433.35	246
	Le Baby Dress	$47,571.88	623
	Minnki Pälsii	$10,472.71	184
	Okkaba Skin Jackets	$42,258.78	601
	Oyaki Kimono	$9,084.42	806

Pivot table

Sales per CategoryName

CategoryName	ProductName	Sales	Quantity
		$1,565,525.31	**51952**
Men's Clothes	Atles Lussekofta	$30,126.55	1057
Men's Clothes	Bow tie	$9,534.57	1315
Men's Clothes	Desperado Jeans	$18,240.68	706
Men's Clothes	Lenin Jeansshorts	$14,900.64	828
Men's Clothes	Mr2 Trousers	$17,944.48	1067
Men's Clothes	O-Man Underwear	$1,649.87	298
Men's Clothes	Rossi Bermuda Shorts	$10,947.25	1397
Men's Clothes	Samba Soccer Socks	$4,941.14	1175
Men's Clothes	US-Master Jeans	$21,764.94	817
Women's Clothes	Chantell Shirt	$7,504.70	388
Women's Clothes	Halter Dress	**$361,096.85**	981
Women's Clothes	Jack Flash Dress	$42,638.00	722
Women's Clothes	Langoste Shirt	$4,433.35	246
Women's Clothes	Le Baby Dress	$47,571.88	623
Women's Clothes	Minnki Pälsii	$10,472.71	184
Women's Clothes	Okkaba Skin Jackets	$42,258.78	601
Women's Clothes	Oyaki Kimono	$9,084.42	806

Straight table

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2 BAR CHART

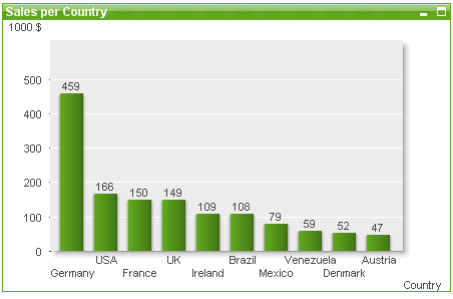


Figure 3. The bar chart is the most basic chart type.

2.1 Creation

Bar charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

If you want to create a simple bar chart and find the great number of different settings available overwhelming, choose **Create QuickChart** from the list box object menu or from the **Layout** menu (**QuickChart**), or click the **QuickChart** button in the toolbar. The wizard appearing will help you to create a chart in a quick and easy way. For more information, see page 239.

2.2 Bar Chart Object Menu

The bar chart **Object** menu is found as the **Object** menu when a bar chart is active. It can also be opened as a float menu by right-clicking on a bar chart. The menu contains the following commands:

Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the charts static, i.e. cuts the hot link to the selected data.

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Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Set Reference

By choosing this option you set a chart reference, i.e. a fixed plot of the chart with the current selections. When further selections are made in the document the reference plot remains, dimmed in the background. Chart axes etc. will be adjusted to always include the maximum of the background data set and the current data set. The current data set is always plotted on top of the reference plot, i.e. some portions of the reference plot may be obscured by the current data set plot. The way the background is dimmed can be controlled via the **Reference Mode** setting on the **General** page of the **Chart Properties** dialog. The display of reference chart plots is only possible in some chart types, e.g. bar charts, line charts, combo charts, radar charts, scatter charts, grid charts and gauge charts with needles. The reference will be lost when closing the document or when reloading data.

Clear Reference

This menu item replaces the **Set Reference** menu item when a reference is set. By choosing it the previously set reference will be cleared and the chart will revert to normal plot mode.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check boxcheck box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

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Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Clear All Selections

Deselects the values of all the fields in the bar chart.

Print...

Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Export...

Opens a dialog for saving an image of the chart to file. The image can be saved as bmp, jpg, gif or png.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking  in the object caption (if shown) gives the same result. To restore the chart to its previous size and location,

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choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the chart.

2.3 Chart Properties

(D) (P)

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

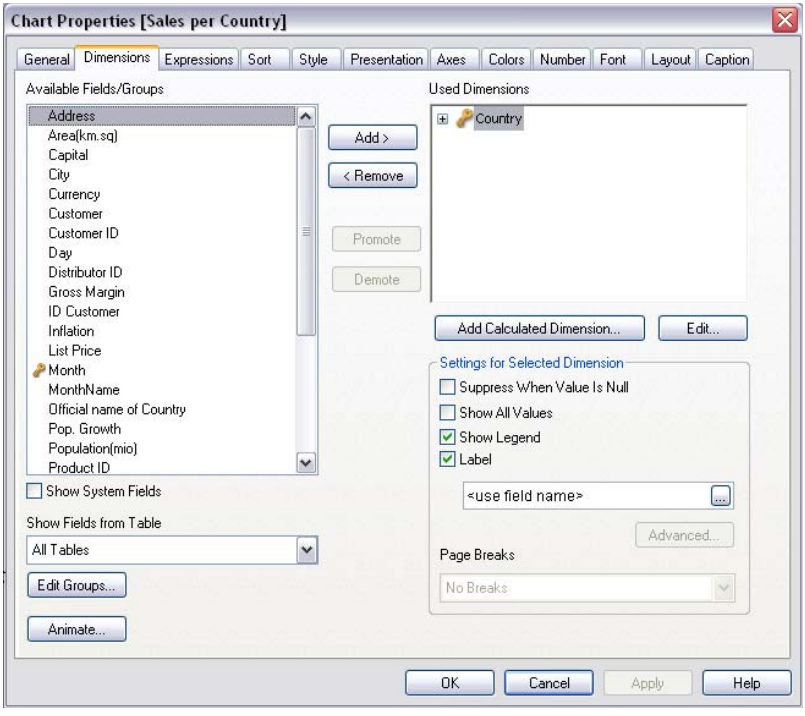


Figure 4. The Dimensions page in the Chart Properties dialog

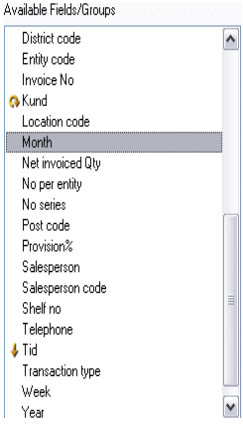
In the **Dimensions** page, the dimensions to be shown in the chart can be set.

Two things are important to think about when making charts:

- What do you want to look at? What should the sizes of the bars in the bar chart correspond to? The answer might be the Sum of Sales, or something similar. This is set on the **Expressions** page.
- What do you want to group it by? Which field values do you want to use as labels for the bars in the bar chart? The answer might be per Country, or something similar. This is set on the **Dimensions** page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Available Fields/Groups



A list of the fields and field groups that can be used as dimensions (e.g. on the x-axis in a standard bar chart). Names of field groups are preceded by symbols: a straight arrow, indicating a drill-down field group, or a curved arrow, indicating a cyclic field group. Groups are defined in the **Document Properties** dialog (**Groups** page). For further information on drill-down and cyclic field groups, see page 441. All fields which appear in more than one input table will be preceded with a key symbol. Pie charts, line charts and scatter charts cannot display more than two dimensions. In bar charts, up to three dimensions can be shown. To display a field or field group in the chart, select it and click the **Add >** button to move it to the column of **Fields/Groups Used as Dimensions**.

Show Systems Fields

Check this box to make the system fields visible in the **Available Fields/Groups** column.

Show Fields from Table

Normally this drop-down shows the value **-All Tables-** and the **Available Fields/Groups** list contains all fields and groups of the document. By selecting a specific table name in the drop-down list you may limit the **Available Fields/Groups** list to only fields from that input table. Finally you may select **-All Tables (Qualified)-** which will show all fields in the document qualified with their table name. A field will appear one time for each table it appears in.

Edit Groups

Opens the **Groups** page (page 46) in the **Document Properties** dialog, where groups can be created or edited.

Animate...

Opens the **Animation** dialog where you can use the chart's first dimension for animation. See page 34 for description of the **Animation** dialog. Animation is only available for bitmap charts excluding pie charts. Some functionality limitations apply when using animation.

Used Dimensions

This list contains the dimensions currently selected for use in the chart. The number of dimensions that can be used varies with the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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type of chart. Superfluous dimensions for any given type will be disregarded.
When used in tables, the dimension data cells can be dynamically formatted by means of attribute expressions. Click on the “+” expansion icon in front of any dimension to display the placeholders or the dimension’s attribute expressions. They are:

Background color

Double click on **Background Color** in order to enter an attribute expression for calculating the cell background of the dimension cell. The expression used should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. Whenever a background color expression is entered for a dimension, the icon will turn from gray scale to color.

Text Color

Double click on **Text Color** in order to enter an attribute expression for calculating the cell text color of the dimension cell. The calculated text color will have precedence over table style. The expression used should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. Whenever a text color expression is entered for a dimension, the icon will turn from gray scale to color.

Text Format

Double click on **Text Format** in order to enter an attribute expression for calculating the font style of text in the table cell for each dimension cell. The calculated text format will have precedence over table style. The expression used as text format expression should return a string containing a B for bold text, I for italic text and/or U for underlined text. Whenever a text color expression is entered for a dimension, the color of the expression placeholder will change from gray to black.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Add By clicking this button, you move selected field(s) and field group(s) from the column of available fields/groups to the column of displayed fields/groups.

Remove

By clicking this button, you move selected field(s) and field group(s) from the column of displayed fields/groups to the column of available fields/groups.

Promote

Promotes the selected field or field group in the **Used Dimensions** list. Use this button if you want to change the order of the dimensions.

Demote

Demotes the selected field or field group in the **Used Dimensions** list. Use this button if you want to change the order of the dimensions.

Add Calculated Dimension...

Adds a new dimension and opens it for editing in the **Edit Expression** dialog (see page 229 for details). A chart dimension is often a single field, but can also be dynamically calculated. A calculated dimension consists of an expression involving one or more fields. All standard functions may be used. Aggregation functions may not be used but the **aggr** function can be included for achieving nested aggregation. Calculated dimensions will only work in QlikView versions 7.5 and later.

Edit... Opens the dimension for editing in the **Edit Expression** dialog. See **Add Calculated Dimension...** above for details on calculated dimensions.

Settings for Selected Dimension

In this group you find settings for individual dimension.

Suppress When Value Is NULL

If this check box is marked, the field selected in the **Displayed Fields/Groups** above will not be displayed in the chart if its value is NULL.

Show All Values

Select this box to show all the dimension field values in the chart, including logically excluded values.

Show Legend

Mark this check box to show legend (names of field values) on the x-axis for the selected dimension field.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Label Mark this check box to show a dimension label (the field name) on the x-axis. The label may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Advanced

Opens the **Advanced Field Settings** dialog (see page 147).

Page Breaks

Here you may choose to insert page breaks when printing a table wherever the value of the current dimension changes. There are three modes:

No Breaks

Page breaks are inserted automatically where needed without any relation to the data.

Forced Breaks

A page break is always inserted when the dimension changes value.

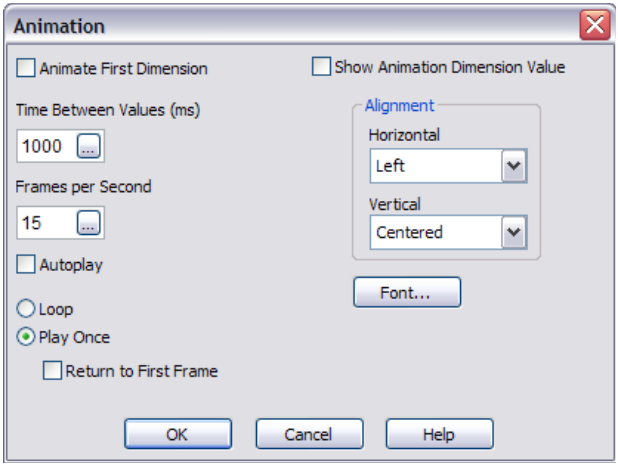
Conditional Breaks

No page break will be inserted if all rows with the following dimension value can be printed on the current page.

Note Page breaks are only visible when printing and not in the layout on the screen.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Animation dialog



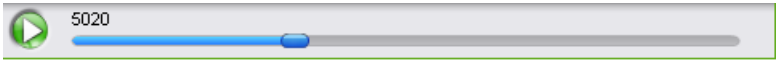
Animate First Dimension

By marking this check box you indicate that the chart's first dimension should be used for chart animation. Animation is only available for bitmap charts excluding pie charts. Some functionality limitations apply when using animation. For example, it is not possible to make painted or clicked selections in an animated chart. Trend lines will not be drawn in animated charts. Animation will only be possible when there is more than one possible value in the animation dimension.

When a chart is animated an **Animation Bar** will appear at the bottom of the chart plot area. The **Animation Bar** features a **Play** button, which starts the animation. when the animation is running the **Play** button is replaced by a **Pause** button. You may stop or start the animation whenever you like using these controls. A **Progress Bar** shows the progress of the animation. You may animate manually by pointing at the progress bar handle with the mouse, pressing down the left mouse button and dragging it to any position. Manual animation normally skips interpolated frames (see **Frames Per Second** setting below) and moves only between actual values in the animation dimension. By pressing the ctrl key while dragging it is possible to drag over interpolated frames. Above the progress bar the value of the animation dimension for the current frame (in case

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

of interpolated frames the previous actual animation dimension value) will be shown.



Time Between Values (ms)

Sets the time in milliseconds between each value in the animation dimension. This value may be given as a calculated expression (see page 439).

Frames per Second

Sets the number of frames per second. QlikView will interpolate plotting between the actual values of the animation dimension. The value must be an integer between 1 and 30. This value may be given as a calculated expression (see page 439)

Autoplay

Mark this check box if you want an animation to start automatically whenever a selection is made in the document.

Loop Select this option if you want the animation to play repeatedly until stopped with the Pause button in the **Animation Bar**.

Play Once

Select this option if you want the animation to run only once from beginning to end, whenever it is started.

Return to First Frame

Mark this check box if you want the animation to return to the first frame after completion.

Show Animation Dimension Value

By marking this check box the value of the data will be shown in the chart during the animation.

Alignment

Sets the alignment of the displayed value.

Horisontal

Aligns the value to the right, center or left.

Vertical

Aligns the value at the top, center or bottom.

Font Sets the font and text color for the displayed value.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Expressions

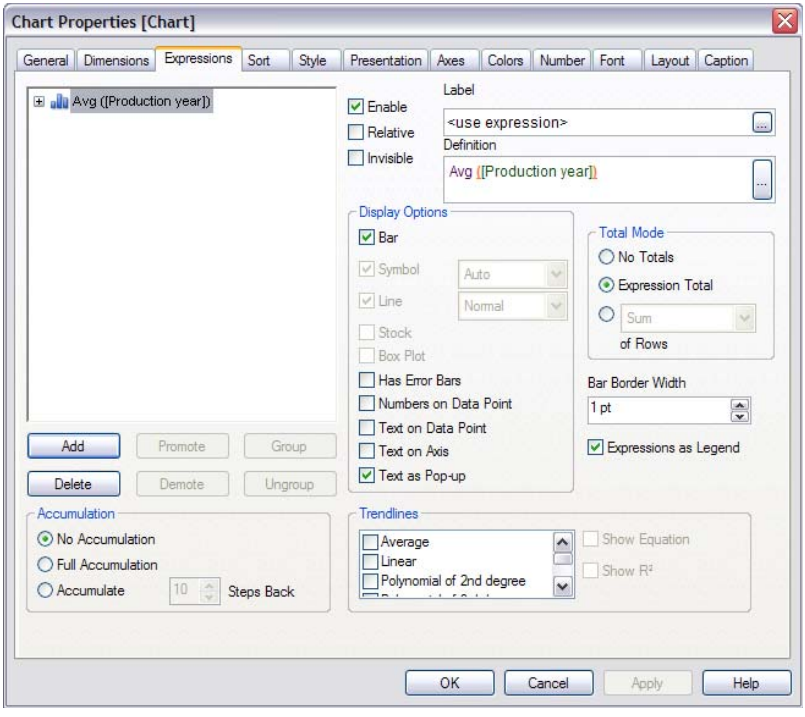


Figure 5. The Expressions page in the Chart Properties dialog

On the **Expressions** page you define expressions to be displayed in the chart. The Expressions page for table charts differ in a number of ways to the corresponding page for bitmap charts. As an example trend lines, accumulation and relative expressions are not available in pivot tables.

It is possible to define a pivot table completely without expressions. It may then be used as a tree view for navigating the different dimension levels.

Expressions

The upper left corner of the dialog contains a list of the chart's expressions. An expression defines the calculated contents of a chart, e.g. the data shown on the y-axis in an expression column.

Navigating the tree controls:
The expression list is in fact a tree control with a large set of control options. In front of each expression you will find an expansion icon ⊞. By clicking on the expansion icon you open up underlying sub-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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expressions or attribute expressions. The icon will then shift to a collapse icon . By clicking that icon you collapse the display of any sub-expressions or attribute expressions. In complex cases up to three levels of expansion may be possible.

Display options / plot modes:
After the expansion/collapse icon on each row you will see an icon for each available attribute expression. These are normally set in the **Display Options** group (see below). There is for example one icon for bar , one for line and so on. In certain chart types it is possible for one expression to be shown in multiple ways, which will be reflected by a list of several icons. The icons shown are dependent on the type of chart chosen. You may find that the icons shown next to a given expression will change if you change the chart from e.g. a bar chart to a combo chart or to a straight table. Only icons reflecting plot types possible in the active chart type will be shown.

Sub expressions:
Certain plot options make use of sub expressions, i.e. a set of two or more expressions that together define the plot symbol. By selecting Stock as Display Option you will create four sub expressions, of which at least the first two must be defined. For Box Plot there will be five. In these two cases the base expression will just be an empty placeholder in the tree control. All expression definitions lie within the sub expressions.

Another instance of sub expressions is when error bars are used. The error bars are defined by one or two sub expressions. In this case however the base expression contains its own definition.

Attribute expressions:
Expression data can be dynamically formatted by means of attribute expressions. Click on the '' expansion icon in front of any expression to display the placeholders for the dimension's attribute expressions. You may choose to use any number and combination of attribute expressions on a given base expression. Formatting defined by means of attribute expression superseded default formatting of the data plots in terms of color etc. The available attribute expression types are:

Background color
Click on **Background Color** in order to define an attribute expression for calculating the basic plot color of the data point. The calculated color will have precedence over

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

default QlikView color selection. The expression used should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic) which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. Whenever a background color attribute expression is entered for an expression, the icon will turn from gray scale to color.

Text Color

Click on **Text Color** in order to define an attribute expression for calculating the text color of text associated with the data point. The calculated color will have precedence over default QlikView color selection. The expression used should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. Whenever a text color attribute expression is entered for an expression, the icon will turn from gray scale to color.

Text Format

Click on **Text Format** in order to enter an attribute expression for calculating the font style for text associated with the data point. The calculated text format will have precedence over table style. The expression used as text format expression should return a string containing a B for bold text, I for Italic text and/or U for underlined text. Whenever a text format attribute expression is entered for an expression, the color of the attribute expression placeholder will change from gray to black.

Pie Popout

Click on **Pie Popout** in order to enter an attribute expression for calculating whether the pie slice associated with the data point should be drawn in an extracted “popout” position. This type of attribute expression only has effect on pie charts. Whenever a pie popout attribute expression is entered for an expression, the color of the attribute expression placeholder will change from gray to color.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Bar Offset

Click on **Bar Offset** in order to enter an attribute expression for calculating an offset for the bar or bar segment accordingly. This is useful e.g. when making so called waterfall charts. This type of attribute expression only has effect on bar charts. Whenever a bar offset attribute is entered for an expression, the color of the attribute expression placeholder will change from gray to color.

Line Style

Click on **Line Style** in order to enter an attribute expression for calculating the line style for the line or line segment associated with the data point.
The relative width of the line can be controlled by including a tag <W*n*> where *n* is a multiplying factor to be applied on the default line width of the chart. The number n must be a real number between 0.5 and 8. Example: <W2.5>.
The style of the line can be controlled by including a tag <S*n*> where *n* is an integer between 1 and 4 indicating the style to be used (1=continous, 2= dashed, 3=dotted, 4=dashed/dotted). Example: <S3>.

The <W*n*> and <S*n*> tags can be freely combined, but only the first occurrence of each counts.

This type of attribute expression only has effect on line, combo and radar charts. Whenever a line style attribute expression is entered for an expression, the color of the attribute expression placeholder will change from gray to color.

Show Value

Click on **Show Value** in order to enter an attribute expression for calculation whether the data point plot should be complemented with a “number on data point value“, even if **Numbers on Data Points** has not been selected for the main expression. If **Numbers on Data Points** is selected for the main expression the attribute expression will be disregarded. This type of attribute expression only has effect on bar, line and combo charts. Whenever a show value attribute expression is entered for an expression, the color of the attribute expression placeholder will change from gray to color.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Expression cycle groups:



Finally there is the concept of expression groups. Any number of base expressions (with their respective sub expressions and attribute expressions) may be bundled together in a group. A group is shown in the list as a placeholder with a cycle icon. By expanding the group, you can see the expressions it contains. In the chart only the first expression in the list will be used for display. The expression to be shown out of the group can be changed by clicking the cycle icon in the chart or in the table expression column header. By right-clicking the cycle icon, you get a pop-up list of the available expressions for direct selection. When you cycle the group the second expression will be promoted to the top of the list and the previously active expression demoted to the bottom of the list.

You can add an expression to a group in two ways. The first method is by simply dragging an expression on top of another expression in the list (creates a new cycle group). The second method is by selecting an expression in the list and then click on the **Group** button (see below). The expression will then be grouped with the expression or cycle group residing above in the list.

You can correspondingly remove an expression from a group by dragging it out of the group in the list or by selecting it and pressing the **Ungroup** button (see below). If only one expression remains in the cycle group after the extraction, that expression will also be extracted and the cycle group will cease to exist.

Add By clicking this button, you get to the **Edit Expression** dialog (page 229), in which it is possible to create new expressions. The option is only available in the context menu that appears when right-clicking in the list of expressions.

Delete Deletes the selected expression.. The option is also available in the context menu that appears when right-clicking on an expression in the list of expressions.

Copy The option is only available in the context menu that appears when right-clicking on an expression in the list of expressions. When using this command on a main expression, all data and settings associated with the expression (including label) will be copied to the clipboard as a piece of xml. The expression may then be pasted back into the same chart or into any other QlikView chart in the same or another document. If you use the command on an attribute expres-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

sion, only the attribute expression definition will be copied. An attribute expression may then be pasted onto any main expression in the same or another chart.

Export...

The option is only available in the context menu that appears when right-clicking on a main expression in the list of expressions. When using this command on a main expression, all data and settings associated with the expression (including label) may be exported to an xml file. The expression may then be imported back into the same chart or into any other QlikView chart in the same or another document. The command opens the **Export Expression** dialog from which you can choose the destination of the export file. The file will receive the extension Ex.xml.

Paste The option is only available in the context menu that appears when right-clicking in the list of expressions and only if an expression has previously been copied to the clipboard. If a main expression has previously been copied to the clipboard, you may paste it into the blank area in the list of expressions, creating a new expression identical to the copied one. If an attribute expression has been copied, you may paste it onto a main expression.

Import...

The option is only available in the context menu that appears when right-clicking in the blank area in the list of expressions. The command opens a dialog where you can browse to previously exported expressions. The imported expression will appear as a new main expression in the chart.

Promote

Promotes the selected expression one step up in the list. Use this button if you want to change the order of the expressions.

Demote

Demotes the selected expression one step down in the list. Use this button if you want to change the order of the expressions.

Group It is possible to group two or more expressions, so that only one of them is displayed in the chart at any given time. The expression to be shown out of the group can be changed by clicking the cycle icon in the chart or in the table expression column header. By right-clicking the cycle icon, you get a pop-uppop-up list of the available expressions for direct selection (see the picture above). You may assign an expression to a cycle group by selecting an expression in the list and then click on the Group button. The expression will then

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

be grouped with the expression or cycle group residing above it in the list.

Ungroup

This command is only available when an expression belonging to a cycle group has been selected in the Expressions list above. By clicking on the button, the expression will be moved out of the cycle group and placed as an independent expression after the cycle group in the list. If only one expression remains in the cycle group after the extraction, that expression will also be extracted and the cycle group will cease to exist.

Enable

Marking this check box will enable the selected expression. If the box is not marked, the expression will not be used at all.

Relative

Marking this check box will set the chart to show the result in percent instead of absolute numbers. This option is not available for pivot tables.

Invisible

Marking this check box will cause the expression not to be plotted while maintaining the space normally allocated for its plotting.

Label The label of the expression. Enter the name you wish to display in the chart. If no text is entered, the label will be automatically set to the expression text.

Definition

Shows the composition of the selected expression. It is possible to edit the expression directly in this box. By clicking the **...** button the full **Edit Expression** dialog is opened.

Display Options

In this group you can select how the data points are plotted. Some options are only available for certain chart types. Some options cannot be combined and some options will utilize one or more additional expressions in order to create complex plots.

Bar Shows the values of the selected expression as bars. This option is only available for bar and combo charts. Some options cannot be combined and some options will utilize one or more additional expressions in order to create complex plots.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Symbol

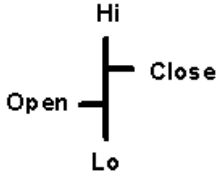
Shows the values of the selected expression as symbols. This option is only available for line and combo charts. Choose between several different symbols in the drop-down menu.

Line Shows the values of the selected expression as a line. This option is only available for line and combo charts. Choose between **Normal**, **Smooth** and three different **Plateau** lines in the drop-down menu.

Smooth Line

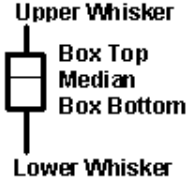
Mark this check box to get smoothed lines. This option is only available if line representation is chosen in line and combo charts.

Stock Mark this check box to plot the expression as a stock marker. The expression will be preceded by the icon in the **Expressions** list and appear as an empty placeholder with four sub expressions. The first sub expression will be used for plotting the **Hi** point of the stock marker. Sub expression two will be used for the **Lo** point. These two expressions must contain valid definitions in order for the stock marker to be drawn. Sub expression three is optional but is otherwise used for the **Close** point of the stock marker. Sub expression four is also optional but is otherwise used for the **Open** point of the stock marker. New empty sub expressions will be created automatically when **Stock** is marked for a base expression. When **Stock** has been selected for an expression you cannot select **Bar**, **Line**, **Symbol**, **Box Plot** or **Has Error Bars** for the same expression. **Stock** cannot be selected for an expression if any of those options are already selected for that expression. Stock plot is only available in combo charts.



Box Plot

Mark this check box to plot the expression as a box plot, often used for display of statistical data. The expression will be preceded by the icon in the **Expressions** list and appear as an empty placeholder with



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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five sub expressions. The first sub expression will be used for plotting the **Box Top** point of the box plot. Sub expression two will be used for the **Box Bottom** point. These two expressions must contain valid definitions in order for the box plot to be drawn. Sub expression three to five are optional. If used, sub expression three defined the **Median**, sub expression four the **Upper Whisker** and sub expression five the **Lower Whisker**. A common extension to the box plot are so called outliners for extreme values. These can be achieved by plotting separate expressions as symbol. New empty sub expressions will be created automatically when **Box Plot** is marked for a base expression. When **Box Plot** has been selected for an expression you cannot select **Bar**, **Line**, **Symbol**, **Stock** or **Has Error Bars** for the same expression. **Box Plot** cannot be selected for an expression if any of those options are already selected for that expression. Box plot is only available in combo charts.

Has Error Bars

Mark this check box to utilize one or two expressions following the selected expression as auxiliary expressions for error bars plotted on top of the main expression's data points. If **Symmetric** is selected only one auxiliary expression will be used and plotted symmetrically around the data point. If **Asymmetric** is selected two auxiliary expressions will be used and plotted above and below the data point respectively. The error bar expressions should return positive numbers. The auxiliary expressions utilized for error bars are preceded by the icons  (symmetric),  (asymmetric high) or  (asymmetric low) in the **Expressions** list and cannot be utilized for anything else in the chart. If there are no expressions already defined after the selected expression, new dummy auxiliary expressions will be created automatically. This option is only available in bar, line and combo charts.

Numbers on Data Point

Mark this check box to plot the y-value above each data point. This option is only available in bar, line, combo and pie charts. When used for pie charts, the numbers will be shown next to the pie slices.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Text on Data Point

Mark this check box to have the result of the expression plotted as text on top of the data points. This option is only available in bar, line, combo and pie charts. When used for pie charts, the value will be shown next to the pie slices.

Text on Axis

Mark this check box to have the result of the expression plotted as text at each x-axis value, the axis and the axis labels. This option is only available in bar, line and combo charts.

Text as Pop-up

Mark this check box to have the result of the expression shown in the pop-uppop-up balloon messages appearing when hovering over a data point in a chart in the layout. This option can be used with or without any of the other display options. It is thus possible to have an expression that does not appear in the chart itself but only in hover pop-ups.

Bar Border Width

Specifies the width of the border line around bars in bar and combo charts. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Expressions as Legend

When several expressions are used, it is possible to display a legend showing the expressions and the corresponding colors.

Total Mode

By selecting one of the options in this group, you decide how the total of the selected expression is to be calculated. This setting is important for relative display or when showing totals.

No Totals

If this option is selected no total will be calculated for the expression.

Expression Total

If this option is selected, the expression total will be calculated using all the values of the field. If, e.g., the selected column contains the average salaries for different business categories, choosing the **Expression Total** option will result in the average salary for all the business categories.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

F(x) of Rows

If this option is selected, the individual values of each data point (each bar in a bar chart, each row in a straight table etc.) for the selected expression will be summed up, aggregated, using the selected aggregation function (typically summed up). This option is not available for pivot tables.

Accumulation

By choosing between the settings in this group, you decide whether the values in the chart should be accumulated or not. In an accumulated chart, each y-value is added to the y-value of the following x-value. In an accumulated bar chart showing the sum of sales per year, e.g., the value of the year 1996 is added to that of 1997. If your chart contains several expressions, select the expression (in the **Expressions** box) whose values you wish to accumulate. Accumulation is not available for pivot tables.

No Accumulation

If this check check boxbox is marked, the y-values of the selected chart expression will not be accumulated.

Full Accumulation

Marking this box will result in each y-value accumulating all previous y-values of the expression. See above under **Accumulation**.

Accumulate N steps back

By entering a number in the box, you set the number of y-values in the expression to be accumulated. See above under **Accumulation**.

Trend lines

In selected QlikView charts expression plots can be complemented or replaced by statistical trend lines. Trend lines can only be displayed in scatter charts, line charts and in bar/combo charts with maximally one dimension and one expression shown as bars. For other types of charts, the settings in the **Trend lines** box are unavailable and have no effect. In scatter charts the data points are treated as if y=f(x). For bar, line and combo charts it is allowed to deselect all options under **Plot Options** and still add trend lines, which will then be plotted without the underlying data points. Trend lines in bar, line and combo charts may be extrapolated by specifying a forecast and/or backcast interval (**Axes** page). The extrapolated lines will be dotted. Trend lines in charts with a discrete x-axis will be shown as lines with symbols. On a continuous axis only the line will be shown.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Average
The average is plotted as a straight line.

Linear A linear regression line is plotted.

Polynomial of 2nd degree
A polynomial trend line of the second degree is plotted.

Polynomial of 3rd degree
A polynomial trend line of the third degree is plotted.

Polynomial of 4th degree
A polynomial trend line of the fourth degree is plotted.

Exponential
An exponential trend line is plotted.

Show Equation
If this check box is marked for a specific expression, the expression's trend lines will be complemented by the trend-line equation expressed as text in the chart.

Show R^2
If this check box is marked for a specific expression, the expression's trend lines will be complemented by the coefficient of determination expressed as text in the chart.

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Sort

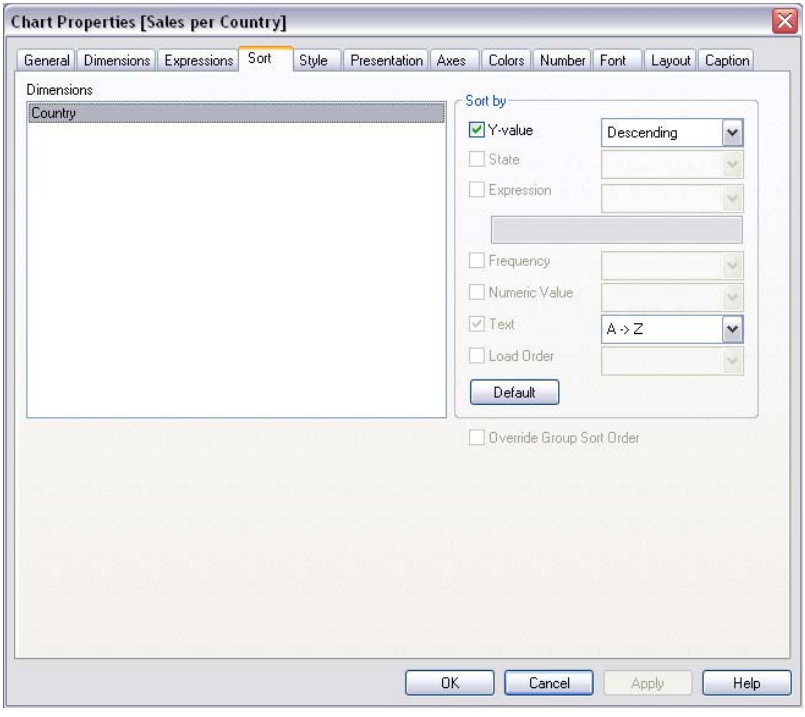


Figure 6. The Sort page in the Chart Properties dialog

On this page you can sort the values of the dimensions according to one of the available sort orders.

Dimensions

A list of the fields you have chosen as chart dimensions on the **Dimensions** page. The field marked is the one whose sort order you are currently changing.

Sort by

In the **Sort by** group, the sort order of the dimension values (bars in the bar chart, slices in the pie chart and usually rows in the tables) can be set. Pivot tables can only be sorted by some property of the first column.

Y-value

Here it is possible to set whether the dimension values should be sorted according to the numeric value of the y-axis. This option is not available for calculated dimensions.

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State Sorts the values according to their logical state (selected, optional or excluded).

Expression
Sorts the values according to the expression entered into the text edit box below this sort option. This option is not available for calculated dimensions.

Frequency
Sorts the values by frequency (number of occurrences in the table).

Numeric Value
Sorts the values according to their numeric value.

Text Sorts the values in alphabetical order.

Load Order
Sorts the values according to their initial load order.

Default
Sets the default sort order.

Override Group Sort Order
This check box is only available when a group dimension is selected in the **Dimensions** list. Normally the sort order of a group dimension is determined for each field in a group via the group properties. By marking this check box you can override any such settings on group level and apply a single sort order for the dimension, regardless of which field is active in the group.

The order of priority is **Y-value**, **State**, **Expression**, **Frequency**, **Numeric Value**, **Text** and **Load Order**. Each of these sort criteria can be set to ascending or descending.

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Style

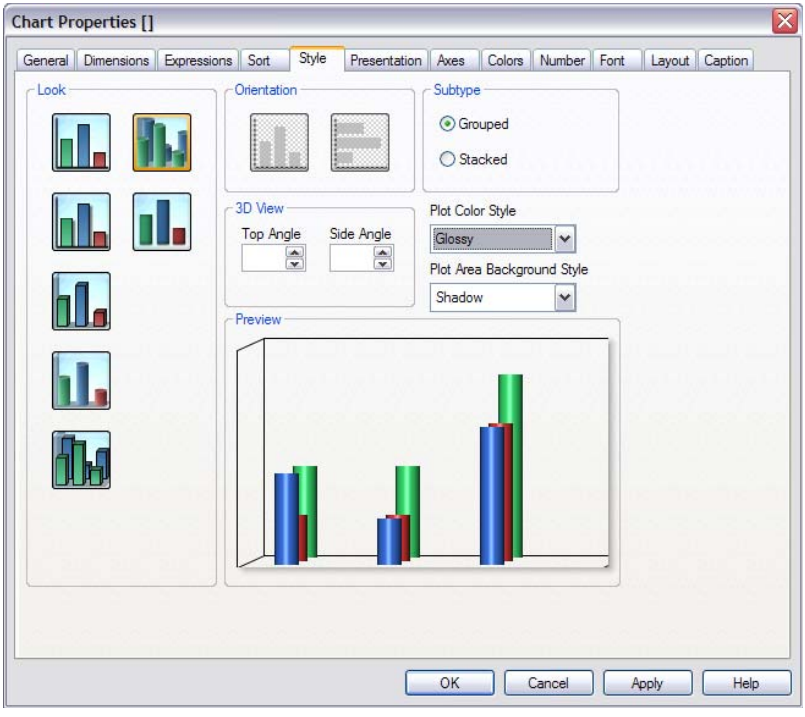


Figure 7. The Style page for bar charts in the Chart Properties dialog

On this page you select the basic style for the bar chart.

Look Select one of the available styles.

Orientation

Here you can set the orientation of the chart to either vertical or horizontal as indicated by the icons.

Chart Subtype

In this group it is possible to choose between **Grouped** and **Stacked** mode, provided that the chart has exactly two dimensions or exactly one dimension but more than one expression. Negative values in stacked bars are stacked separately downwards below the x-axis.

3D View

The settings in this group define the angle from which the chart is viewed in 3D modes.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Top Angle

Defines the vertical angle of the 3D view. The value must be an integer between 0 and 30.

Side Angle

Defines the side angle of the 3D view. The value must be an integer between 0 and 45.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

Dark Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style

This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow

This options gives a shadow effect on the plot area background.

Preview

Offers a preview of the basic visual properties of the chart.

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Presentation

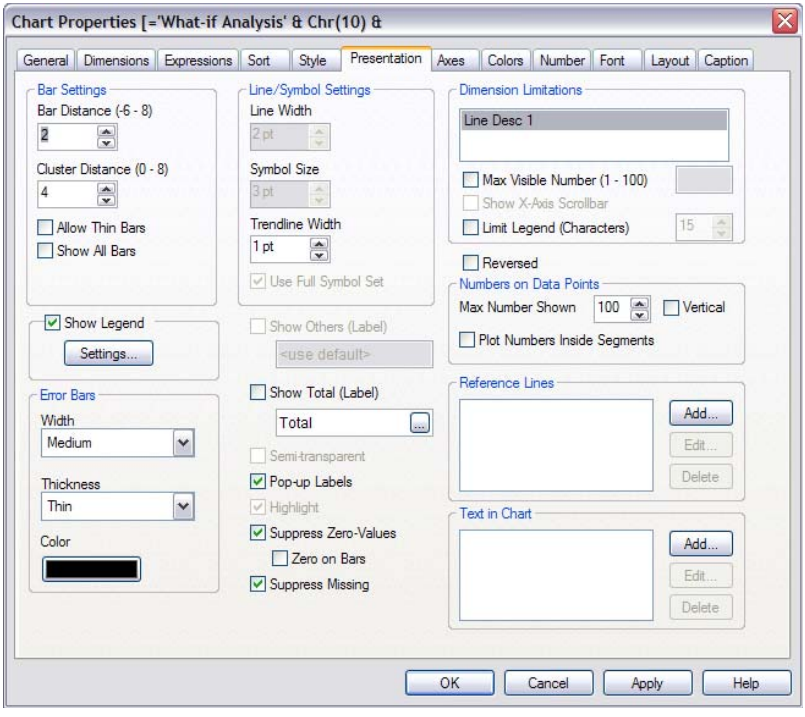


Figure 8. The Presentation page for bar charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the bar chart is presented on the screen.

Bar Settings

In the **Bar Settings** group you can set display options for bars in the chart.

Bar Distance

By entering an appropriate number, it is possible to set the distance between the bars in the cluster. It is also possible to enter negative numbers. Values between -6 and 8 are allowed.

Cluster Distance

By entering an appropriate number, it is possible to set the distance between clusters in the chart. Values between 0 and 8 are allowed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Allow Thin Bars

For charts with non-continuous x-axis, QlikView will only display as many data points as can be accommodated in the plot area available. Remaining data points are truncated from the chart. By default bars will be drawn with a minimum width of four pixels, so that they are clearly distinguishable. Mark this check box to allow bar width down to one pixel.

Show All Bars

For charts with non-continuous x-axis, QlikView will only display as many data points as can be accommodated in the plot area available. Remaining data points are truncated from the chart. Mark this check box to force plotting of all bars. The bars will be compressed and some data points may become obscured by others.

Show Others (Label)

Mark this check box to display a separate x-axis value for “Others”, i.e. an expression value for all dimension values excluded by a limitation under **Dimension Limitations-Max Number**. The 'Others' value will only be meaningful for expressions where **F(x) of Rows** total is meaningful (see “**Expressions**” page 36) and the value will be calculated using the function specified under that option. A label for the 'Others' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default **Others** label found in the **Objects** page of the **User Preferences** will be used (see page 121 in Book I).

Show Total

Mark this check box to display a separate x-axis value for “Total”, i.e. an expression total for all dimension values. The 'Total' value will only be meaningful for expressions where **F(x) of Rows** total is meaningful (see “**Expressions**” page 36) and the value will be calculated using the function specified under that option. A label for the 'Total' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default **Total** label found in the **Objects** page of the **User Preferences** will be used (see page 121 in Book I). Only symbol and no line will be plotted for 'Total'.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Pop-up Labels

By selecting this check box the values of the dimension(s) and expression(s) will appear as a pop-up balloon when hovering with the cursor over data point in the chart.

Suppress Zero-Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Zero on Bars

This setting is only applicable when **Suppress Zero-Values** is deselected. If the check box is marked and **Numbers on Data Point** or **Text on Data Point** is selected for the chart expression under **Display Options** on the **Expressions** page, zero values will appear as text above the data points. In other cases zero values will be suppressed.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Line/Symbol Settings

In the **Line/Symbol Settings** group you can set display options for trend lines in the chart.

Trendline Width

Here you can set the width of the trend lines by entering an appropriate number. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The line can be taken away by setting the width to 0.

Show Legend

Select this check box if you want legend to be shown in the chart when applicable. If the chart is dimensionless, but has several expressions, unchecking this box will show the expressions on the axis instead.

Settings...

Opens the **Legend Settings** dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Error Bars

In this group you can set formatting options for error bars, if such are used in the chart.

Width Specifies the width of the error bars. You may choose between **Narrow**, **Medium** and **Wide**.

Thickness

Specifies the thickness of the error bars. You may choose between Thin, Medium and Thick.

Color Click the button to select a color for the error bars.

Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Max Number

Select this check box to limit the number of dimension values to be shown at any one time. Enter the maximum number of values in the scroll box.

Show X-Axis Scroll Bar

Select this check box to show a scroll control in the place of the X-axis. The scroll bar can be used to scroll the selection of the X-axis values to be shown. The number of values shown at any one time will be the number set under **Max Number**. This option is only available when **Max Number** is selected.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by **...** in the chart. This option can be used independently to the other options in this group.
used independently to the other options in this group.

Reversed

When this check box is marked, the values shown in the chart will be reversed, i.e. if the 10 highest values are shown and the box is checked the chart will then show the 10 lowest values.

Numbers on Data Points

In the **Numbers on Data Points** group you can set display options for numbers on data points, provided that this option has been

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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selected for one or more chart expressions under **Plot Options** in the **Expression** page of the chart's properties.

Vertical Shows the numbers vertically.

Max Number Shown

In this box you can specify an upper limit for the number of data points to show numbers for in the chart. If no limit is specified, numbers will be shown for all data points, which may affect the readability of the chart.

Plot Numbers Inside Segments

Marking this this check box will plot numbers on data points inside the segments instead of on top of them.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the chart plot area from a given point on a continuous x-axis or a y-axis. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 57 for details about the Reference Lines dialog.

Edit Mark an existing reference line in the list and click this button in order to edit its properties in the **Reference Lines** dialog. Double-clicking the reference line in the list has the same effect. See page 57 for details about the **Reference Lines** dialog.

Delete Mark an existing reference line in the list and click this button in order to delete it from the list.

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Legend Settings dialog

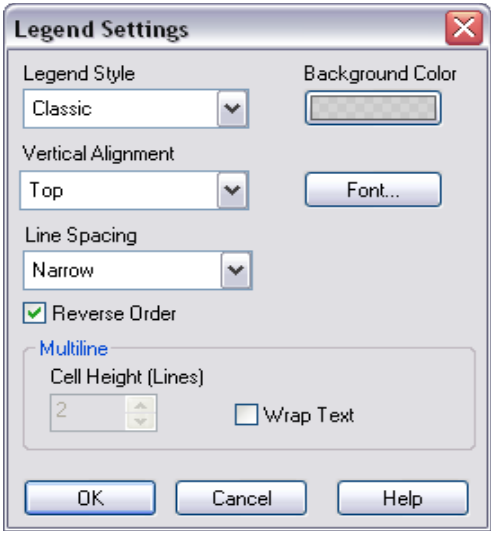


Figure 9. The Legend Settings dialog

The chart legend can be formatted in a number of ways using this dialog.

Legend Style

Sets the basic style for the legend. You may choose from:

Classic Legend without border and with transparent background. QlikView 5 style.

Glass Legend with semi-transparent glass-like surface as background.

Frame Transparent background legend with frame. The frame is drawn using the color specified under **Background Color**.

Solid Legend with solid colored surface as background. Uses the color specified under **Background Color**.

Tinted Legend with semi-transparent colored surface as background. Uses the color specified under **Background Color**.

Background Color

Sets the color of the legend background selected styles. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Vertical Alignment

Specifies how the legend is positioned in relation to the plot area, when it needs less vertical space than the plot area. The alternatives are **Top**, **Center** and **Bottom**.

Font... Sets the font to be used in the chart legend, if other than the default chart font. The standard **Font** dialog for charts opens when you click the button.

Line Spacing

Specifies the distance between items in the legend. You may choose between **Narrow**, **Medium** and **Wide**.

Reverse Order

When marking this check box, the sort order of the legend will be reversed.

Multi Line

In this group you set the options for multiline legend items.

Wrap Text

If this check box is marked, the text of the legend items will be wrapped in two or more lines.

Cell Height (Lines)

If you have selected **Wrap text**, this is where you specify how many lines should be used for each item.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Reference Lines

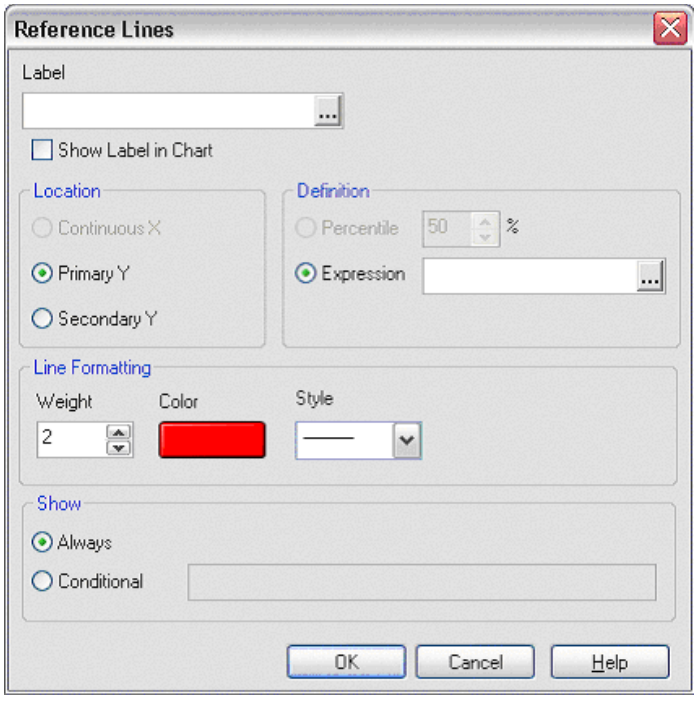


Figure 10. The Reference Lines dialog

A reference line is a line intersecting the chart plot area from a given point on a continuous x- or y-axis. It may be used e.g. to indicate a certain level, point in time etc. in relation to chart data. The reference line is only drawn if it falls within the current range of the axis from which it originates.

Label Here you may specify a label to be drawn next to the reference line. As default the value of *Expression* will be used.

Show Label in Chart
Mark this check box if you want the label to appear next to the reference line.

Location
In the **Location** group you define from which axis the reference line should originate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Continuous X

Select this option if you want the reference line to originate from the x-axis. This option is only available if the chart has a Continuous x-axis (see Axes page below).

Primary Y

Select this option if you want the reference line to originate from the primary y-axis (left/bottom).

Secondary Y

Select this option if you want the reference line to originate from the secondary y-axis (right/top).

Definition

The value at which the reference line should be drawn is specified in the **Expression** edit box. The definition could either be a fixed numeric value or a calculated expression (see page 439). By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Line Formatting

In the **Line Formatting** group you define how the reference line will look.

Weight

Specifies the weight of the reference line. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Color By clicking this button you may select a color for the reference line.

Style Specifies the style of the reference line, e.g continuous, dashed or dotted.

Show In this group, it is possible to specify a condition under which the reference line is shown.

Always

The reference line will always be shown.

Conditional

The reference line will be shown or hidden depending on a conditional expression which will be evaluated each time the chart is to be drawn. The reference line will only be visible when the expression returns true.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Chart Texts

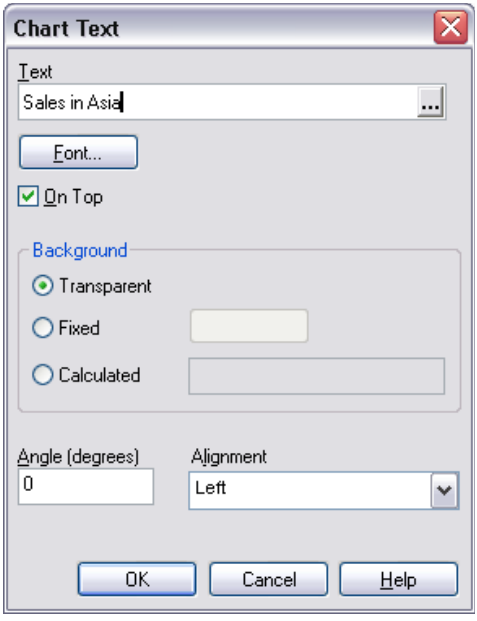


Figure 11. The Chart Texts dialog

Any number of free floating texts may be added to the chart. If a text is placed fully within the plot area, QlikView will attempt to move it relative to the plot area when sizing the chart. If placed at least partly outside the plot area, the text will be moved in relation to the entire chart.

Text Here you may edit the text currently selected in the list. By clicking the **... button** a larger editor window is opened for better editing of long texts or expressions. The text may be defined as a calculated expression.

Font Sets the font and text color for the text currently selected in the list.

On Top By marking this check box the text currently selected in the list will be forced to the foreground when drawing the chart.

Background

In the **Background** group you may specify the background as **Transparent**, **Fixed** (select color with the colored button) or **Calculated** (enter the formula for the color in the edit box).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Angle (degrees)

Here you may specify an angle between 0 and 360 degrees for the text. The default is 0.

Alignment

Sets the horizontal alignment of the text within its background to Left, Center or Right.

Axes

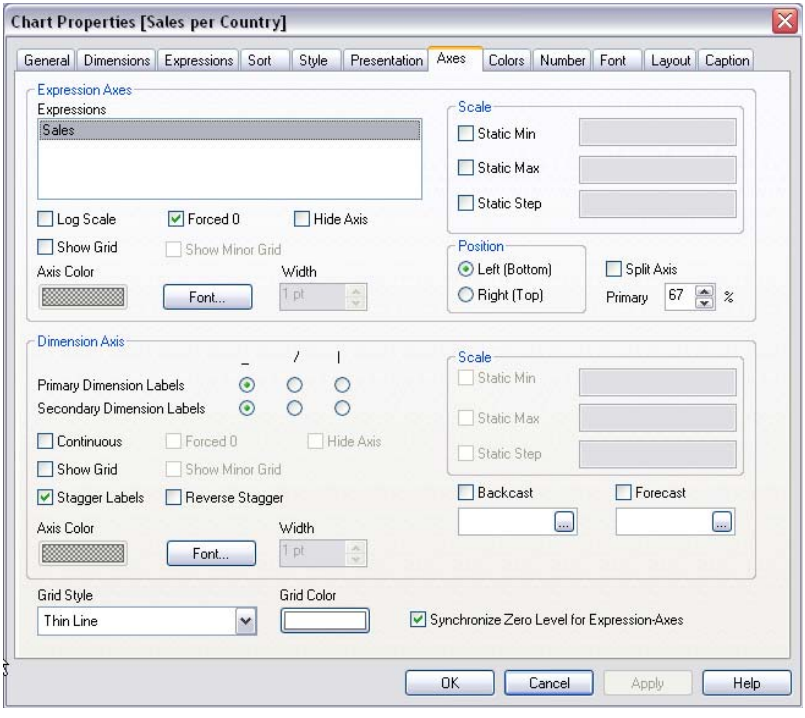


Figure 12. The Axes page in the Chart Properties dialog

In the **Axes** page, the display properties of the x- and y-axes are set. A chart can have two scales on the y-axis if several expressions are shown. If two scales are used, one will be shown to the left and the other to the right.

Expression Axes

In the Expression Axes group you select settings for the y-axes. Every expression has its own axis settings. If two expressions, which are plotted on the same axis have conflicting settings, those of the expression that comes first in order will prevail.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Expressions

In this list you select the expression for which you want to set the axis properties.

Log Scale

Changes the y-axis to a logarithmic scale. A logarithmic scale can only be used when all data points in the chart are positive (>0).

Forced 0

Fixes the lower edge of the chart to zero on the y-axis. This option is not available when a logarithmic axis is used.

Hide Axis

Hides the axis for the selected expression.

Show Grid

Shows a grid in the chart originating from the tick marks of the y-axis. The grid lines can be formatted by using the **Grid Style** and **Grid Color** settings (see below).

Show Minor Grid

Shows minor lines in-between the grid lines. Only available if **Show Grid** is selected. The grid lines can be formatted using the **Grid Style** and **Grid Color** settings (see below).

Axis Color

By clicking on this button you may select the color which will be used when drawing the axis, its tick marks, grid and axis labels.

Font By pressing this button you open a font dialog, where font and text color can be set for the axis. Unless changed from the chart's default setting these font settings will automatically follow changes in the chart's default font, as set on the **Font** page of the chart properties.

Width Sets the width of the axis and its tick marks.

Scale In the **Scale** group you can set scale properties for the axis. Normally the minimum and maximum values of the axis, and the distance between tick marks, are calculated dynamically depending on the current data set. Each of these values can, however, be individually locked.

Static Min

By selecting this check box you can set a fixed minimum value for the axis. The minimum value

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

may be entered as a calculated formula (see page 439).

Static Max

By selecting this check box you can set a fixed maximum value for the axis. The maximum value may be entered as a calculated formula (see page 439).

Static Step

By selecting this check box you can set a fixed interval for tick marks on the axis. The value may be entered as a calculated formula (see page 439). If this setting results in more than 100 tick marks, the value used will be modified.

Position

Assigns the expression to the **Left** or **Right** (**Bottom** or **Top** in horizontal mode) y-axis.

Split Axis

By selecting this check box, the y-axis will be split in two parts while still being drawn as one continuous line. This creates an impression of two charts sharing a common axis. Expressions being assigned to **Left(Bottom)** under **Position** will be drawn on the primary part of the axis (normally the upper part of the chart) while expressions being assigned to **Right(Top)** under **Position** will be drawn on the secondary part of the axis (normally the lower part of the chart).

Primary (%)

Defines the percentage of the available axis length that will be used for the primary part of the axis when **Split Axis** is used.

Dimension Axes

In the **Dimension Axes** group you select settings for the x-axes.

Primary Dimension Labels

Select one of the radio buttons to display labels of the first chart dimension labels horizontally, tilted, or vertically.

Secondary Dimension Labels

Select one of the radio buttons to display labels of the second chart dimension labels (clustered bars only) horizontally, tilted, or vertically.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Continuous
Sets the x-axis to be continuous, i.e. it will be interpreted numerically and shown with numerically correct intervals.

Grid Shows a grid in the chart originating from the tick marks of the x-axis.

Forced 0
Fixes the left edge of the chart to zero on the x-axis. This option is not available when a logarithmic axis is used.

Hide Axis
Hides the x-axis.

Show Grid
Shows a grid in the chart originating from the tick marks of the x-axis. The grid lines can be formatted using the **Grid Style** and **Grid Color** settings (see below).

Show Minor Grid
Shows minor lines in-between the grid lines. Only available if **Show Grid** is selected. The grid lines can be formatted using the **Grid Style** and **Grid Color** settings (see below).

Stagger Labels
Select this option to stagger x-axis labels when they become to many to show side by side.

Reverse Stagger
X-axis labels are normally staggered bottom-up from left to right. When marking this check box, the stagger will be reversed to top-down.

Axis Color
By clicking this button you may select the color to be used when drawing the axis, its tick marks, grid and axis labels.

Font By pressing this button you open a font dialog where font and text color can be set for the axis. Unless changed from the chart's default setting theses font settings will automatically follow changes in the chart's default font as set on the **Font** page of the chart properties.

Width Sets the width of the axis and its tick marks.

Scale In the **Scale** group you can set scale properties for the x-axis, provided that it is set to **Continuous**. Normally the minimum and maximum values of the axis and the distance between tick marks are calculated dynamically depending

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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on the current data set. Each of these values can however be individually locked.

Static Min

By selecting this check box you can set a fixed minimum value for the continuous x-axis. The min value may be entered as a calculated formula (see page 439).

Static Max

By selecting this check box you can set a fixed maximum value for the continuous x-axis. The max value may be entered as a calculated formula (see page 439).

Static Step

By selecting this check box you can set a fixed interval for tick marks on the continuous x-axis. The value may be entered as a calculated formula (see page 439). If this setting results in more than 100 tick marks, the value used will be modified.

Backcast

By checking this box and entering an integer in the edit box, you force the x-axis to be extended to the left of the actual data points plotted. This is useful when using trend-lines. The backcast line will be dotted. The value may be entered as a calculated formula.

Forecast

By checking this box and entering an integer in the edit box, you force the x-axis to be extended to the right of the actual data points plotted. This is useful when using trend-lines. The forecast line will be dotted. The value may be entered as a calculated formula.

Grid Style

Select a grid line style for the chart in the drop-down.

Grid Color

Click the button to select a color for grid lines in the chart.

Synchronize Zero Level for Expression-Axes

Synchronizes the zero level of the two y-axes (left/right or top/bottom.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Colors

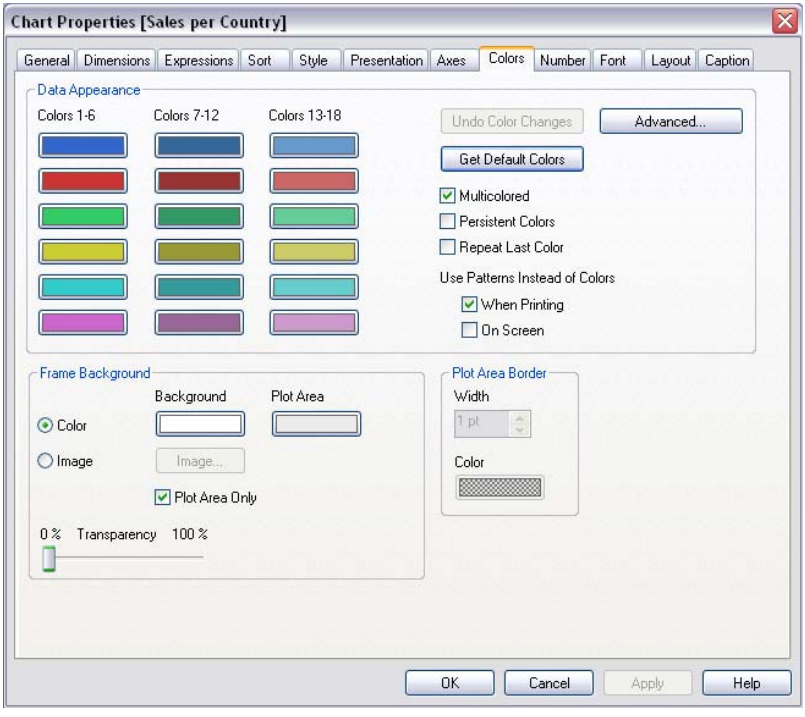


Figure 13. The Colors page in the Chart Properties dialog

In the **Colors** page, settings are made for the colors to be used when drawing the chart. The page consists of two main parts, one for the data plotting and one for the background**.**

Data Appearance

In the **Data Appearance** group color settings are made for the data points plotted in the chart. QlikView provides 18 different colors, which are assigned to the dimension field values according to their original load order.

Color 1-18

Here you can set the colors for each of the 18 available colors in the color map. The colors can be defined as solid colors or gradients via the **Color Area** dialog (see page 23 in Book II) that opens when clicking the color button.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Undo Color Changes

Resets the color map to the settings it had upon entry to the dialog.

Get Default Colors

Resets the color map to the QlikView default settings.

Advanced...

This button opens the **Advanced Color Map** dialog where color maps can be set and retrieved on sheet, document, user and QlikView default level. See further on page 70.

Multicolored

Assigns different colors to the different bars (lines, symbols or pie slices in other types of charts). If this check box is not marked, all the bars will be displayed in the same color.

Persistent Colors

Locks the colors assigned to each data point even if selections reduce the total number of data points. In this mode color representation will never change for a given data point, but you run the risk of having two adjacent bars or slices with the same color for different data points.

Repeat Last Color

Select this check box to assign the last (18th) color to field values loaded as number 18 and forward. If you leave this check box unselected, the 19th value (according to the original load order) will get the first color, the 20th value the second color, etc.

Use Patterns Instead of Colors

Mark one or two of these check boxes to use patterns instead of colors **On Screen** or **When Printing**.

Frame Background

In the **Frame Background** group color settings are made for the plot area background and the background of the area surrounding the plot area.

Color The chart will be plotted with a colored background. Different colors can be set for the plot area and the surrounding area.

Background Color

The color used for the background around the plot area or in the case of pie charts for the entire chart background. The color can be defined as a solid color or a gradient via the Color Area dialog that

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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opens when clicking the button. The default color is white.

Plot Area Color
The color used for the plot area of the chart. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the button. The default color is light gray. This setting is unavailable for pie charts.

Image The chart will be plotted with an image background. Change image by pressing the button.

Plot Area Only
When image background is selected it can extend over the entire background or, if this check box is selected, be confined to the plot area. This option only applies when the **Image** option is chosen above.

Transparent
The chart will be plotted with a transparent background. Objects behind the chart will be visible through it.

Plot Area Border
In the **Plot Area Border** subgroup settings are made for the border rectangle normally drawn around the actual plot area. These settings are unavailable for pie charts.

Width Here you may set the line width of the rectangle drawn around the plot area. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0.

Border Color
Click the colored button to change the color of the rectangle. Default is black.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The Advanced Color Map dialog

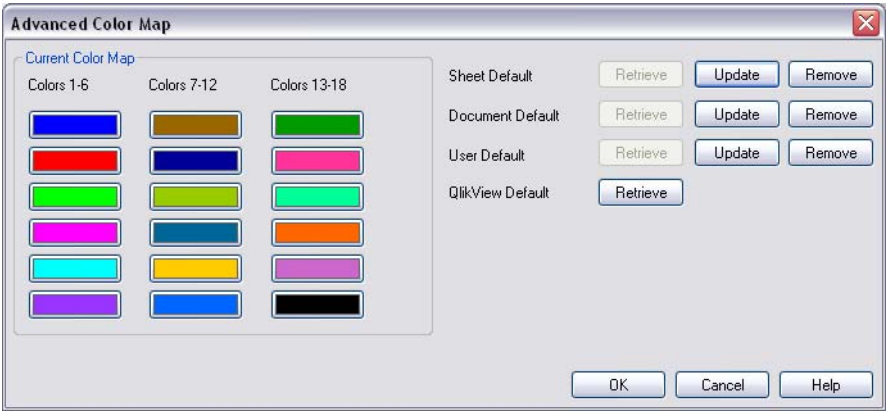


Figure 14. The Advanced Color Map dialog

In the **Advanced Color Map** dialog you may retrieve, set or clear color settings for several default levels.

Current Color Map

When the dialog is opened the color map of the current chart is shown. You may change the color map by clicking individual colors or by pressing the **Get** button for **Sheet Default**, **Document Default**, **User default** or **QlikView Default**.

Sheet Default

Sets, retrieves or clears the default color map for the current sheet. Press **Retrieve** to retrieve the current sheet default color map (option only available if a sheet default is available). Press **Update** to apply the current color map as sheet default. Press **Remove** to clear the default for the current sheet (option only available if a sheet default is available).

Document Default

Sets, retrieves or clears the default color map for the current document. Press **Retrieve** to retrieve the current document default color map (option only available if a document default is available). Press **Update** to apply the current color map as document default. Press **Remove** to clear the default for the current document (option only available if a document default is available).

User Default

Sets, retrieves or clears the default color map for the current sheet. Press **Retrieve** to retrieve the current user default color map (option

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

only available if a user default is available). Press **Update** to apply the current color map as user default. Press **Remove** to clear the default for the current user (option only available if a user default is available).

QlikView Default

Press **Retrieve** to retrieve the QlikView default color map (option only available if a sheet default is available). This default cannot be changed.

OK Returns to the **Color** page of the **Chart Properties** dialog and applies changes in the current color map back to the color map in that dialog.

Cancel Returns to the **Color** page of the **Chart Properties** dialog without applying changes in the current color map back to the color map in that dialog.

Help Opens context-specific help.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Number

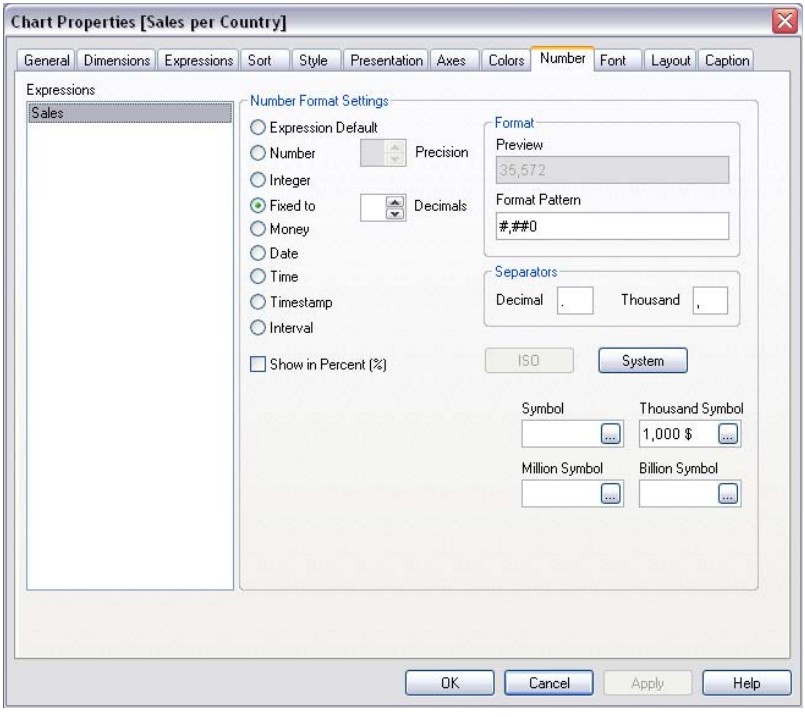


Figure 15. The Number page in the Chart Properties dialog

In the **Number** page, the display number format can be set. It is possible to set the date, time and number format for the different axes and expressions. If the x-axis is set to **Continuous** on the **Axes** page, the x-axis dimension is also treated as an expression.

Expressions

A list of the expressions in the chart. Mark the expression for which you want to set the number format. Several expressions can be marked simultaneously. If the x-axis is set to **Continuous** on the **Axes** page, the x-axis dimension is also treated as an expression.

For an explanation of the other controls, see page 285 in Book II.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Font

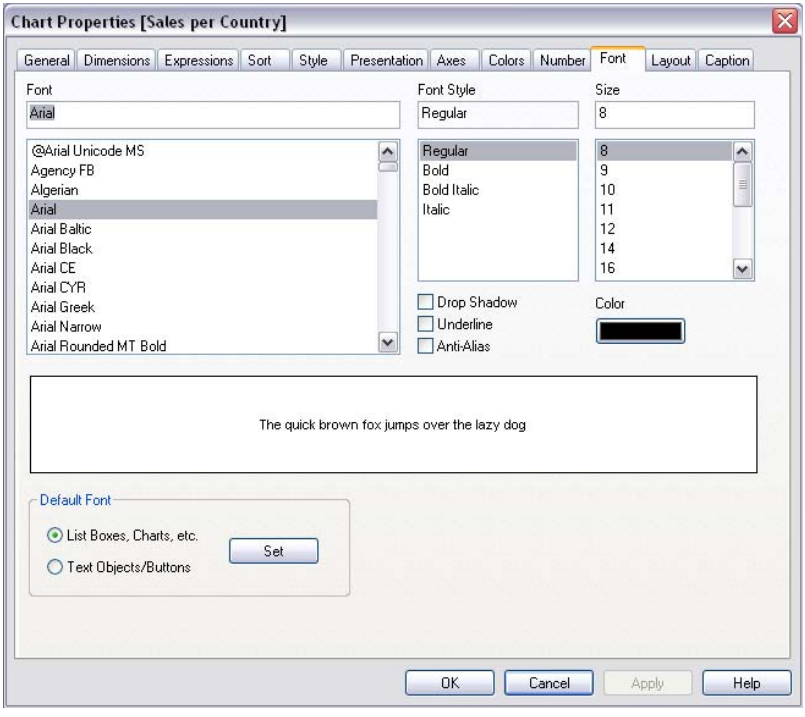


Figure 16. The Font page in the Chart Properties dialog

In the **Font** page, you can change the font of the text in the chart.

The font chosen will be applied to all text in the chart, which has not been set to a font of its own in the separate Font controls provided for e.g. title, axes or legend. You can specify the font, style and size of the text. Additional settings are:

Drop Shadow
If this check box is marked a drop shadow will be added to the text.

Underline
If this check box is marked the text will be underlined.

Anti-Alias
If this check box is marked anti-aliasing will be applied to the text, making it fit more smoothly with the background. This option may degrade drawing speed on very slow computers.

Color Here you may select the color of the text. There are two options:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Fixed Select this option for a fixed text color of your choice. Click the colored button to change the specified color.

Calculated

Select this radio button if you want the text color calculated dynamically from an expression. The expression must evaluate to a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using the special color functions (see page 413). If the result of the expression is not a valid color representation, black will be used.

Layout

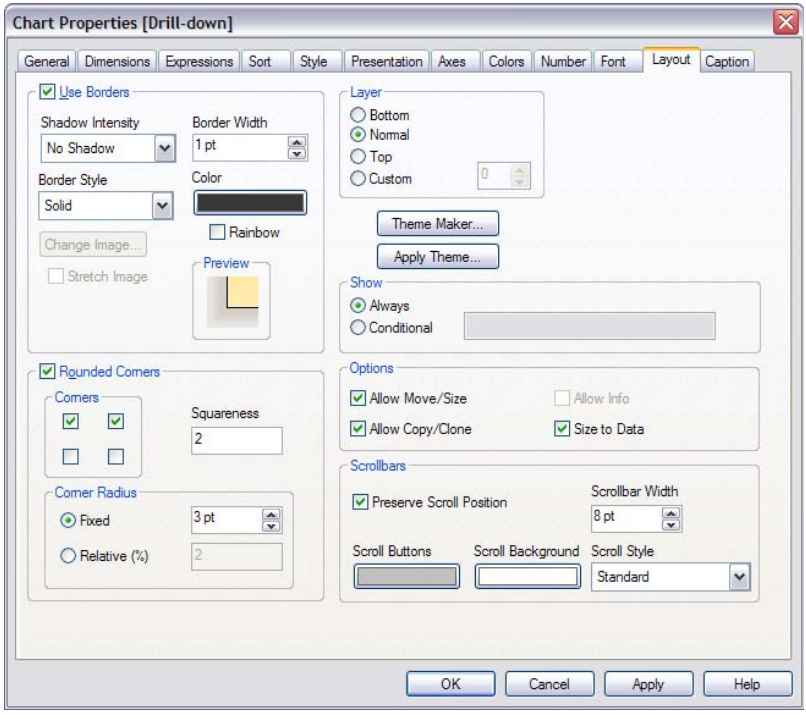


Figure 17. The Layout page in the Chart Properties dialog

In the **Layout** page you can specify how the bar chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **Layout** page is common to all sheet objects, although the use of some of the settings are restricted for certain types of charts. The bar chart is therefore referred to as the sheet object below.

Use Borders

Mark this check box in order to use a border around the sheet object. You specify the type of border by selecting in the drop-down menu. The **Shadow Intensity** drop-down menu makes it possible to set the intensity of the shadow that surrounds the sheet objects. There is also the choice of **No Shadow**.

Border Width

Here you can set the width of the border. Available for all border types. When setting the width of image borders, make sure the width corresponds to the corner width defined in the image. The width can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Border Style

There are the following predefined border types:

Solid A solid unicolored border.

Depressed
Border giving the impression of depressing the sheet object from the background.

Raised Border giving the impression of raising the sheet object from the background.

Walled Border giving the impression of a wall around the sheet object.

Image Border specified by custom image.

Change Image

If the **Image** border type is selected, you can click this button to set the image you wish to use.

Stretch Image

If the **Image** border type is used and this check box is marked the image pattern will be stretched to fit to the entire space between the corners. If it is not marked, as many copies as possible of the pattern will be displayed, tiled.

For an example of creating an image border, see page 61.

Most of the border types can be specified further with the help of the following settings:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Color Click this button to open a dialog in which you can choose an appropriate base color from the color palette for all border types except **Image**.

Rainbow

Creates a rainbow-colored border for all border types except **Image**. The rainbow will start with the selected base color on top of the sheet object.

When **Simplified** is the chosen **Styling Mode**, there is no choice of border type, there is only the **Shadow Intensity** drop-down menu and the **Border Width** setting.

Rounded Corners

In the **Rounded Corners** group, settings can be made for the general shape of the sheet object.

Rounded Corners

If this check box is marked, it is possible to use rounded shapes for the corners of the sheet object. It is possible to achieve shapes from rectangular via super elliptic to elliptic/circular.

Corners

By marking each of these four check boxes, the rounding options are turned on for the respective corners of the sheet object. Corners for which the check box remain unmarked will be drawn rectangular.

Squareness

A number between 2 and 100 defining the general shape of the rounded corners. The number 2 corresponds to a perfect ellipse (or circle for a 1:1 aspect ratio), whereas higher numbers move over super elliptic shapes towards a rectangle.

Corner Radius

This setting determines the radius of the corners in fixed distance or as a percent of the total quadrant. This setting lets you control the extent to which the corners will be affected by the underlying general shape set under **Squareness**. A fixed distance can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Layer In the **Layer** group, the sheet object can be assigned one of three layers on the sheet.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Bottom A sheet object with the **Bottom** layer property can never obscure sheet objects in the **Normal** and **Top** layers. It can only be placed on top of other sheet objects in the **Bottom** layer.

Normal When created, sheet objects reside in the normal (middle) layer. A sheet object in the **Normal** layer can never be obscured by sheet objects in the **Bottom** layer and can never obscure sheet objects in the **Top** layer.

Top A sheet object in the **Top** layer can never be obscured by sheet objects in the **Normal** and **Bottom** layers. Only other sheet objects in the **Top** layer can be placed on top of it.

Custom

The **Top**, **Normal** and **Bottom** layers correspond to internally numbered layers 1, 0 and -1 respectively. In fact all values between -127 and 127 are accepted. Choose this option to enter a value of your choice.

Theme Maker...

Opens the **Theme Maker** dialog (see page 259) for definition of layout themes.

Apply Theme...

Opens a file browser dialog for opening a QlikView layout theme file to be applied to the sheet object. See page 259 for more information on QlikView layout themes.

Show In the **Show** group, it is possible to specify a condition under which the sheet object is shown.

Always

The sheet object will always be shown.

Conditional

The sheet object will be shown or hidden depending on a condition expression which will be evaluated each time the sheet object is to be drawn. The sheet object will only be visible when the condition returns true.

Users with Admin privileges for the document can override all show conditions with the **Show All Sheets and Sheet Objects** in the **Security** page of **Document Properties** (see page 81). This functionality can be toggled by pressing CTRL+SHIFT+S.

Options

In the **Options** group, it is possible to disallow moving/resizing of the sheet object.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Allow Move/Size

If this check box is deselected, it will become impossible for the user to move or resize the sheet object.

Allow Copy/Clone

If this check box is deselected it will become impossible for the user to copy or clone the sheet object. Note that sheet objects can only be copied/cloned by users of QlikView Developer and QlikView Professional.

Allow Info

By default, an info icon  will appear in the top right corner of the sheet object if information is linked to the selected field value. Mark this check box if you do not wish the icon to be displayed. This option is available only for list boxes and multi boxes.

Size to Data

Normally the borders around all table sheet objects in QlikView will shrink when selections cause the size of the table to be less than allocated size for the sheet object. By deselecting this check box this automatic adjustment of size will be turned off leaving any surplus space blank.

Scrollbars

In this group you can set the appearance of scroll bars in the QlikView sheet object.

Preserve Scroll Position

When marking this this box and the corresponding box in **User Preferences**, **Objects** page, QlikView will try to preserve the scroll position after a selection in table objects and charts with an x-axis scroll bar.

Scroll Background

Sets the scroll bar background color. Select a color by clicking the button. Note that medium gray tones often render the best results for scroll bars.

Scroll Buttons

Sets the scroll button color. Select a color by clicking the button. Note that medium gray tones often render the best results for scroll bars.

Scroll Bar Width

Sets the scroll bar width. The width can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Scroll Style

Sets the scroll bar style. Select a style in the drop-down control. The **Classic** scroll bar style corresponds to QlikView 4/5 scroll bars. The **Standard** scroll bar style gives a more modern look. The third style is **Light**, which is a thinner, lighter bar.

Caption

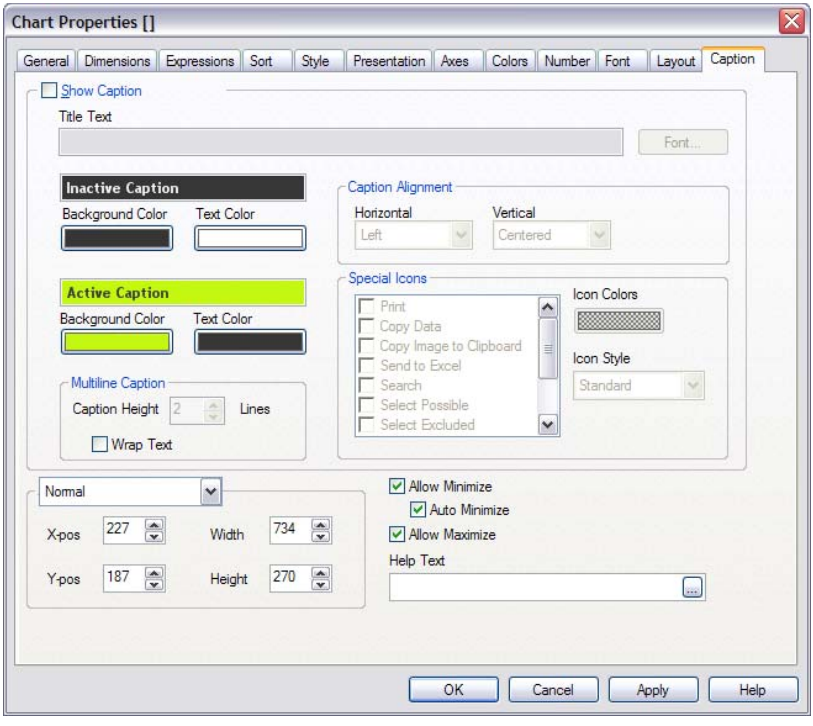


Figure 18. The Caption page in the Chart Properties dialog

In the **Caption** page advanced settings can be made for the caption. Background and foreground text color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction.

Show Caption

If this check box is marked, a caption will be drawn at the top of the sheet object. List boxes and other "box objects" will have caption

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

turned on by default, whereas buttons, text areas and line/arrow objects will have it turned off.

Title Text

The text to be displayed in the sheet object caption. This setting is identical to the **Windows Title** setting found in the **General** page of the properties dialogs of a number of sheet objects. However, for objects such as the text objects, this is the only place where the caption text can be edited. The **Font...** button opens the **Font Dialog** where the font of the caption text can be set.

Inactive Caption / Active Caption

In this group you can set the colors of the caption in its different states. A preview pane shows the current settings of the selected state.

Background Color

Sets the background color. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the color button.

Text Color

Click the colored button to select a color.

Multiline Caption

In this group you can specify multiple line captions.

Caption Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the caption should have.

Wrap Text

If this check box is marked, the caption will be wrapped in two or more lines.

Normal/Minimized Size/Position

In this group you can set exact pixel size and position of the QlikView sheet object in its normal or minimized state. Select state in the drop-down control.

X-pos Sets the horizontal position of the left side of the sheet object in relation to the sheet's left edge. The setting is made in pixels.

Y-pos Sets the vertical position of the top side of the sheet object in relation to the sheet's upper edge. The setting is made in pixels.

Width Sets the width of the QlikView sheet object in pixels.

Height Sets the height of the QlikView sheet object in pixels.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Caption Alignment

In this group you set text alignment for caption text.

Horizontal

Sets the horizontal alignment of the caption text. The options are **Left**, **Center** and **Right**.

Vertical

Sets the vertical alignment of the caption text. The options are **Top**, **Center** and **Bottom**. This setting is only relevant when **Multiline Caption** is used.

Special Icons

Many of the object menu commands of the sheet objects can be configured as caption icons. Select commands to be shown as caption icons by marking the check box to the left of each command in the list.

Icon Colors

Sets the background color of the caption icons. The color can be defined as a solid color or a gradient via the **Color Area** dialog that opens when clicking the color button. This setting applies to all icons in the sheet object, not only the special caption icons.

Icon Style

Sets the icon style. Select a style in the drop-down control. This setting applies to all icons in the sheet object, not only the special caption icons.

Note Use the special caption icons with care. One or two of them may provide great help for the end-user while too many may create a “Christmas tree” that severely degrades usability.

Allow Minimize

If this check box is marked, it is possible to turn the sheet object into an icon. The minimize icon will appear in the sheet object caption.

Auto Minimize

This setting, which makes it possible to toggle between sheet objects, should be applied to several sheet objects (preferably positioned on top of each other) on one and the same sheet. Only one of the sheet objects will have its full size at any given time: as soon as you restore a minimized sheet object with auto minimize set, all other sheet objects

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

with auto minimize set will turn into icons. This option is designed mainly for charts and tables, but may be applied to all sheet objects except buttons, text objects and line/ arrow objects.

Allow Maximize

If this check box is marked, it is possible to enlarge the sheet object to fill the sheet. The maximize icon will appear in the sheet object caption.

Help Text

Opens a text box in which you can type an optional help message. The text will be displayed when you position the cursor on the help icon  in the top right corner of the sheet object. The text may be a calculated formula. The text may be a calculated formula (see page 439).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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3 LINE CHART

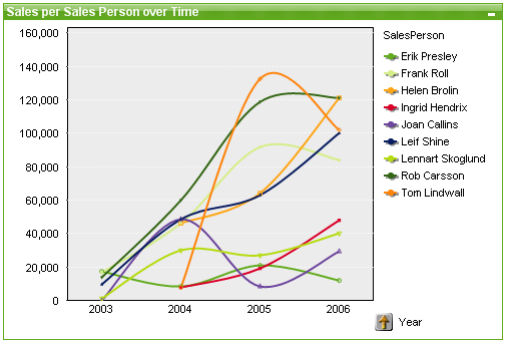


Figure 19. An example of a Line chart

Line charts present data as lines between value points, as value points only or as both lines and value points. Line charts are useful when you want to show changes or trends.

3.1 Creation

Line charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

If you want to create a simple line chart and find the great number of different settings available overwhelming, choose **Create QuickChart** from the list box object menu or from the **Layout** menu (**QuickChart**), or click the **QuickChart** button in the toolbar. The wizard appearing will help you to create a chart in a quick and easy way. For more information, see page 239.

3.2 Line Chart Object Menu

The line chart **Object** menu is found as the **Object** menu when a line chart is active. It can also be opened as a float menu by clicking with the right mouse button on a line chart. The menu contains the following commands:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the charts static, i.e. cuts the hot link to the selected data.

Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

only available when running QlikView Professional or Developer.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Clear All Selections

Deselects the values of all the fields in the line chart.

Export Image to File

Opens a dialog for saving an image of the chart to file. The image can be saved as bmp, jpg, gif or png.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Remove

Removes the chart.

3.3 Chart Properties

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29).

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36).

Sort

In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Style

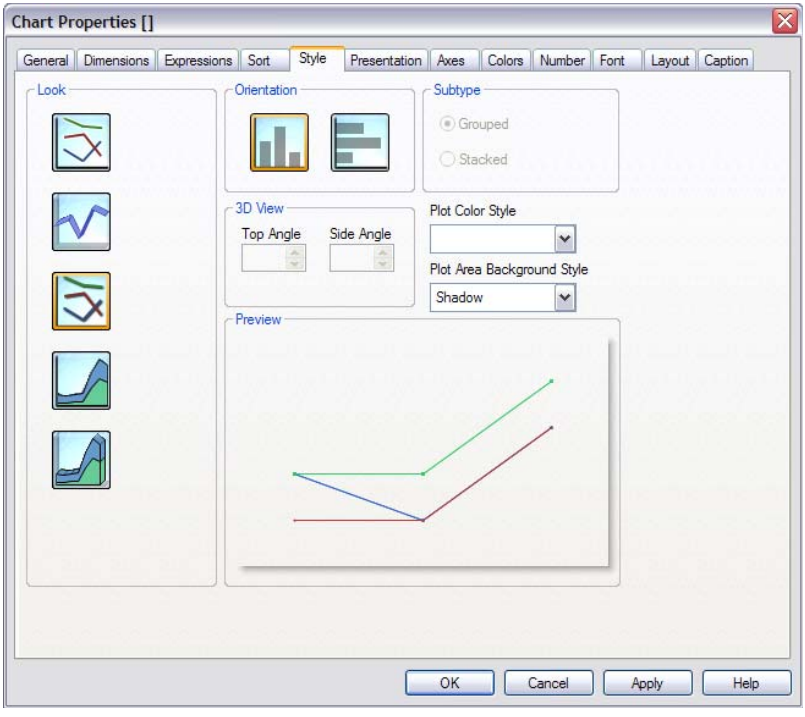


Figure 20. The Style page for line charts in the Chart Properties dialog

In this page you select the basic style for the line chart.

Look Select one of the available styles.

Orientation

Here you can set the orientation of the chart to either vertical or horizontal as indicated by the icons.

3D View

The settings in this group define the angle from which the chart is viewed in 3D modes.

Top Angle

Defines the vertical angle of the 3D view. The value must be an integer between 0 and 30.

Side Angle

Defines the side angle of the 3D view. The value must be an integer between 0 and 45.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

Dark Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style

This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow

This options gives a shadow effect on the plot area background.

Preview

Offers a preview of the basic visual properties of the chart.

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Presentation

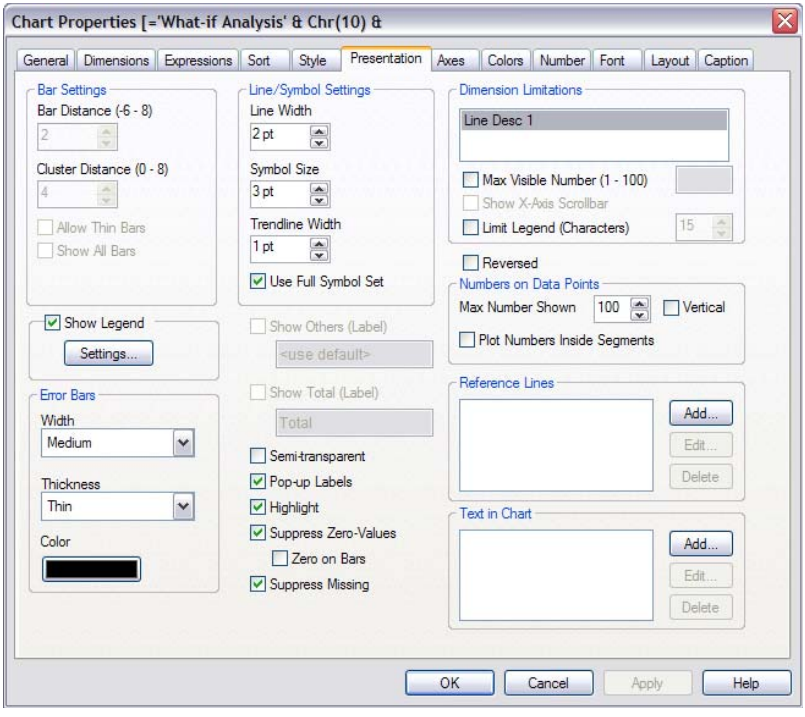


Figure 21. The Presentation page for line charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the line chart is presented on the screen.

Show Others (Label)

Mark this check box to display a separate x-axis value for 'Others', i.e. an expression value for all dimension values excluded by a limitation under **Dimension Limitations-Max Number**. The 'Others' value will only be meaningful for expressions where **F(x) of Rows** total is meaningful (see "**Expressions**" page 36) and the value will be calculated using the function specified under that option. A label for the 'Others' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default **Others** label found in the **Objects** page of the **User Preferences** will be used (see page 121 in Book I). Only symbol and no line will be plotted for 'Others'.

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Show Total

Mark this check box to display a separate x-axis value for 'Total', i.e. an expression total for all dimension values. The 'Total' value will only be meaningful for expressions where **F(x) of Rows** total is meaningful (see "**Expressions**" page 36) and the value will be calculated using the function specified under that option. A label for the 'Total' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default **Total** label found in the **Objects** page of the **User Preferences** will be used (see page 121 in Book I). Only symbol and no line will be plotted for 'Total'.

Line/Symbol Settings

In the **Line/Symbol Settings** group you can set display options for lines and symbols in the chart.

Line Width

Sets the line width for lines. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0. This option is available only when lines are used.

Symbol Size

Sets the size of the symbols, when such are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0.

Trendline Width

Here you can set the width of the trendlines by entering an appropriate number. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0.

Use Full Symbol Set

If this check box is marked, different kinds of symbols available will be used to distinguish data points from each other. If it is not marked, all the symbols will be drawn as plus signs.

Semi-transparent

By selecting this check box, the line chart will be drawn semi-transparent when using area style.

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Pop-up Labels

By selecting this check box the values of the dimension(s) and expression(s) will appear as a pop-up balloon when hovering with the cursor over data point in the chart.

Highlight

If this check box is marked hovering with the mouse over a line or symbol in it will result in the line or symbol being highlighted for better overview. The highlighting applies also in the legend where applicable.

Suppress Zero-Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Show Legend

Mark this check box if you want the legend to be shown in the chart when applicable. If the chart is dimensionless, but has several expressions, unchecking this box will show the expressions on the axis instead.

Settings...

Opens the **Legend Settings** dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

Error Bars

In this group you can set formatting options for error bars, if such are used in the chart.

Width Specifies the width of the error bars. You may choose between **Narrow**, **Medium** and **Wide**.

Thickness

Specifies the thickness of the error bars. You may choose between Thin, Medium and Thick.

Color Click the button to select a color for the error bars.

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Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Max Number

Select this check box to limit the number of dimension values to be shown at any one time. Enter the maximum number of values in the scroll box.

Show X-Axis Scroll Bar

Select this check box to show a scroll control in the place of the X-axis. The scroll bar can be used to scroll the selection of the X-axis values to be shown. The number of values shown at any one time will be the number set under **Max Number**. This option is only available when **Max Number** is selected.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by ... in the chart. This option can be used independently to the other options in this group.

Reversed

When this check box is marked, the values shown in the chart will be reversed, i.e. if the 10 highest values are shown and the box is checked the chart will then show the 10 lowest values.

Numbers on Data Points

In the **Numbers on Data Points** group you can set display options for numbers on data points, provided that this option has been selected for one or more chart expressions under **Plot Options** in the **Expression** page of the chart's properties.

Vertical

Shows the numbers vertically.

Max Number Shown

In this box you can specify an upper limit for the number of data points to show numbers for in the chart. If no limit is specified, numbers will be shown for all data points.

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Plot Numbers Inside Segments

Marking this check box will plot numbers on data points inside the segments instead of on top of them.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the chart plot area from a given point on a continuous x- or y-axis. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 130 for details about the **Reference Lines** dialog.

Edit Mark an existing reference line in the list and click this button in order to edit its properties in the **Reference Lines** dialog. Double-clicking on the reference line in the list has the same effect. See page 130 for details about the **Reference Lines** dialog.

Delete Mark an existing reference line in the list and click this button in order to delete it from the list.

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Axes

In the **Axes** page, the display properties of the x- and y-axes settings are set. This page is identical with the **Axes** page of the bar chart (Figure 12 on page 62).

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

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Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the line chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

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4 COMBO CHART

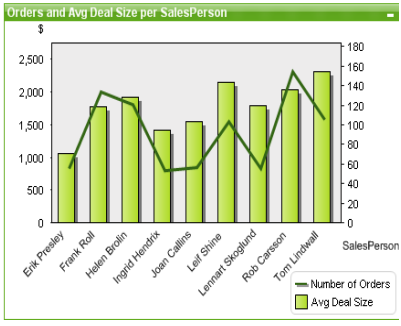


Figure 22. An example of a Combo chart

The combo chart allows you to combine the features of the bar chart with those of the line chart: you can show the values of one expression as bars while displaying those of a second expression as lines or symbols.

4.1 Creation

Combo charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

4.2 Combo Chart Object Menu

The combo chart **Object** menu is found as the **Object** menu when a combo chart is active. It can also be opened as a float menu by clicking with the right mouse button on a combo chart. The menu contains the following commands:

Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the charts static, i.e. cuts the hot link to the selected data.

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Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

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Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page(see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the chart.

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4.3 Chart Properties



When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29).

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36).

Sort

In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

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Style

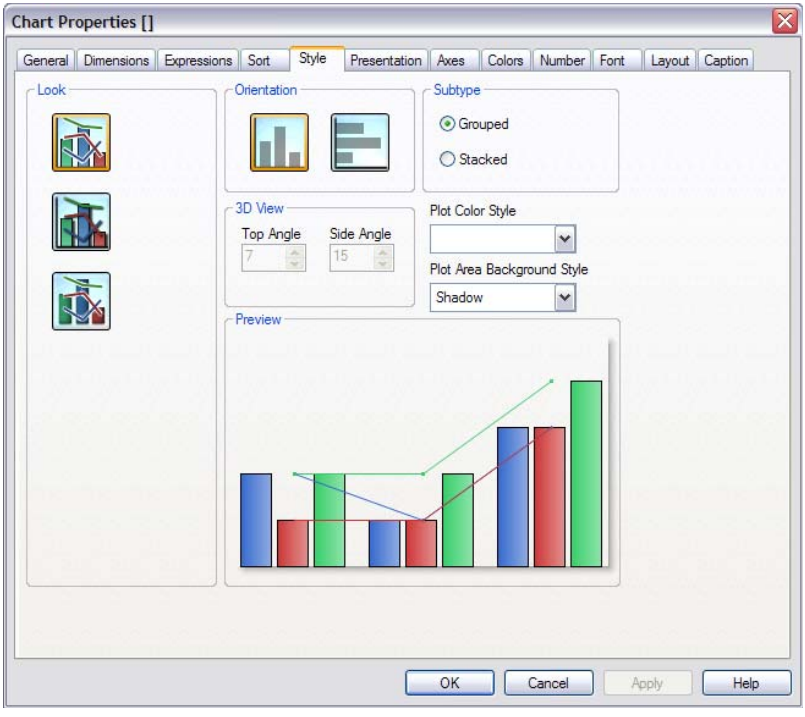


Figure 23. The Style page for combo charts in the Chart Properties dialog

In this page you select the basic style of the combo chart.

Look Select one of the available styles.

Orientation

Here you can set the orientation of the chart to either vertical or horizontal as indicated by the icons.

Chart Subtype

In this group it is possible to choose between **Grouped** and **Stacked** mode, provided that the chart has exactly two dimensions or exactly two dimensions but more than one expression. Negative values in stacked combos are stacked separately downwards below the x-axis.

3D View

The settings in this group define the angle from which the chart is viewed in 3D modes.

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Top Angle

Defines the vertical angle of the 3D view. The value must be an integer between 0 and 30.

Side Angle

Defines the side angle of the 3D view. The value must be an integer between 0 and 45.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

Dark Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style

This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow

This options gives a shadow effect on the plot area background.

Preview

Offers a preview of the basic visual properties of the chart.

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Presentation

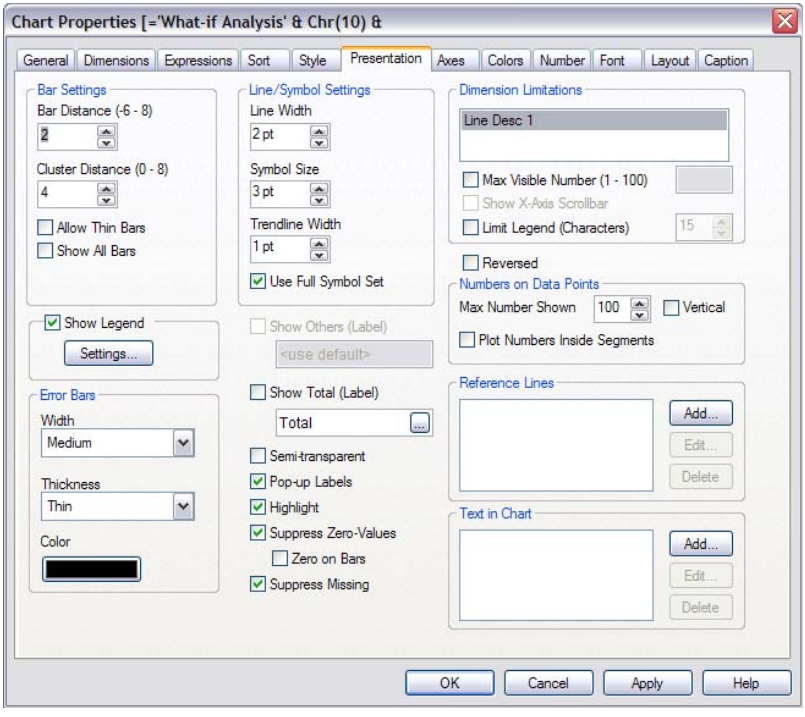


Figure 24. The Presentation page for combo charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the combo chart is presented on the screen.

Bar Settings

In the **Bar Settings** group you can set display options for bars in the chart.

Bar Distance

By entering an appropriate number, it is possible to set the distance between the bars in the cluster. It is also possible to enter negative numbers. Values between -6 and 8 are allowed.

Cluster Distance

By entering an appropriate number, it is possible to set the distance between clusters of bars in the chart. Values between 0 and 8 are allowed.

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Allow Thin Bars

For charts with non-continuous x-axis, QlikView will only display as many data points as can be accommodated in the plot area available. Remaining data points are truncated from the chart. By default bars will be drawn with a minimum width of four pixels, so that they are clearly distinguishable. Mark this check box to allow bar width down to one pixel.

Show All Bars

For charts with non-continuous x-axis, QlikView will only display as many data points as can be accommodated in the plot area available. Remaining data points are truncated from the chart. Mark this check box to force plotting of all bars. The bars will be compressed and some data points may become obscured by others.

Here you can set the width of the trend lines by entering an appropriate number.

Show Others (Label)

Mark this check box to display a separate x-axis value for 'Others', i.e. an expression value for all dimension values excluded by a limitation under **Dimension Limitations - Max Number**. The 'Others' value will only be meaningful where the **F(x) of Rows** total (see **Expression** page on page 36) and the value will be calculated using the function specified under that option. A label for the 'Others' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default **Others** label found in the **Objects** page of the **User Preferences** will be used (see page 90 in Book I).

Show Total

Mark this check box to display a separate x-axis value for 'Total', i.e. an expression total for all dimension values. The 'Total' value will only be meaningful for expressions where the **F(x) of Rows** total is meaningful (see **Expression** page on page 36) and the value will be calculated using the function specified under that option. A label for the 'Total' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default Total label found in the Objects page of the User Preferences will be used (see page 121 in Book I).

Semi-transparent

By selecting this check box, the area to be filled will be drawn semi-transparent.

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Line/Symbol Settings

In the **Line/Symbol Settings** group you can set display options for lines and symbols in the chart.

Line Width

Sets the line width for lines. This option is available only when lines are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0.

Symbol Size

Sets the size of the symbols, when such are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0.

Trendline Width

Here you can set the width of the trendlines by entering an appropriate number. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The border can be taken away by setting the width to 0.

Use Full Symbol Set

If this check box is marked, different kinds of symbols available will be used to distinguish data points from each other. If it is not marked, all the symbols will be drawn as plus signs.

Pop-up Labels

By marking this check box the values of the dimension(s) and expression(s) will appear as a pop-up balloon when hovering with the cursor over data point in the chart.

Highlight

If this check box is marked hovering with the mouse over a line or symbol in it will result in the line or symbol being highlighted for better overview. The highlighting applies also in the legend where applicable.

Suppress Zero-Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

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Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Show Legend

Mark this check box if you want legend to be shown in the chart when applicable. If the chart is dimensionless, but has several expressions, unchecking this box will show the expressions on the axis instead.

Settings...

Opens the Legend Settings dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Max Number

Select this check box to limit the number of dimension values to be shown at any one time. Enter the maximum number of values in the scroll box.

Show X-Axis Scroll Bar

Select this check box to show a scroll control in the place of the X-axis. The scroll bar can be used to scroll the selection of the X-axis values to be shown. The number of values shown at any one time will be the number set under **Max Number**. This option is only available when **Max Number** is selected.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by ... in the chart. This option can be used independently to the other options in this group.

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Reversed

When this check box is marked, the values shown in the chart will be reversed, i.e. if the 10 highest values are shown and the check box is marked the chart will then show the 10 lowest values.

Numbers on Data Points

In the **Numbers on Data Points** group you can set display options for numbers on data points, provided that this option has been selected for one or more chart expressions under **Plot Options** in the **Expression** page of the chart's properties.

Vertical

Shows the numbers vertically.

Max Number Shown

In this box you can specify an upper limit for the number of data points to show numbers for in the chart. If no limit is specified, numbers will be shown for all data points, which may affect the readability of the chart if there are many.

Plot Numbers Inside Segments

Marking this check box will plot numbers on data points inside the segments instead of on top of them.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the chart plot area from a given point on a continuous x-axis or a y-axis. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 57 for details about the Reference Lines dialog.

Edit Mark an existing reference line in the list and click this button in order to edit its properties in the **Reference Lines** dialog. Double-clicking the reference line in the list has the same effect. See page 57 for details about the **Reference Lines** dialog.

Delete Mark an existing reference line in the list and click this button in order to delete it from the list.

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

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Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Axes In the **Axes** page, the display properties of the x- and y-axes settings are set. This page is identical with the **Axes** page of the bar chart (Figure 12 on page 62).

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the combo chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

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5 RADAR CHART

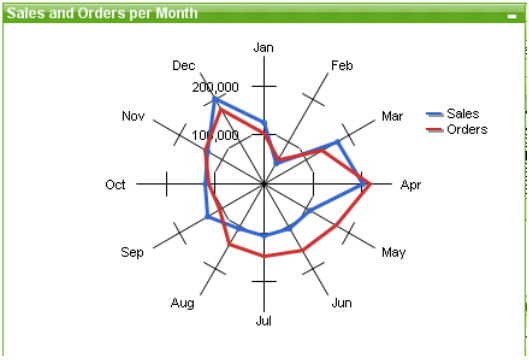


Figure 25. An example of a radar chart

Radar charts could be described as line charts where the x-axis is wrapped around 360 degrees and with one y-axis for each x-value. The result is similar to a spider web or a radar screen.

5.1 Creation

Radar charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

5.2 Radar Chart Object Menu

The radar chart **Object** menu is found as the **Object** menu when a radar chart is active. It can also be opened as a float menu by clicking with the right mouse button on a radar chart. The menu contains the following commands:

Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the charts static, i.e. cuts the hot link to the selected data.

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Attach

Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Copy Values to Clipboard

Copies the values to the clipboard in the form of a table.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Clear All Selections

Deselects the values of all the fields in the radar chart.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

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Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the chart.

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5.3 Chart Properties

When you click the **Create Chart** button in the toolbar, the **Create Chart** wizard opens. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.

Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** buttons. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the Chart Properties dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29).

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36).

Sort

In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

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Style

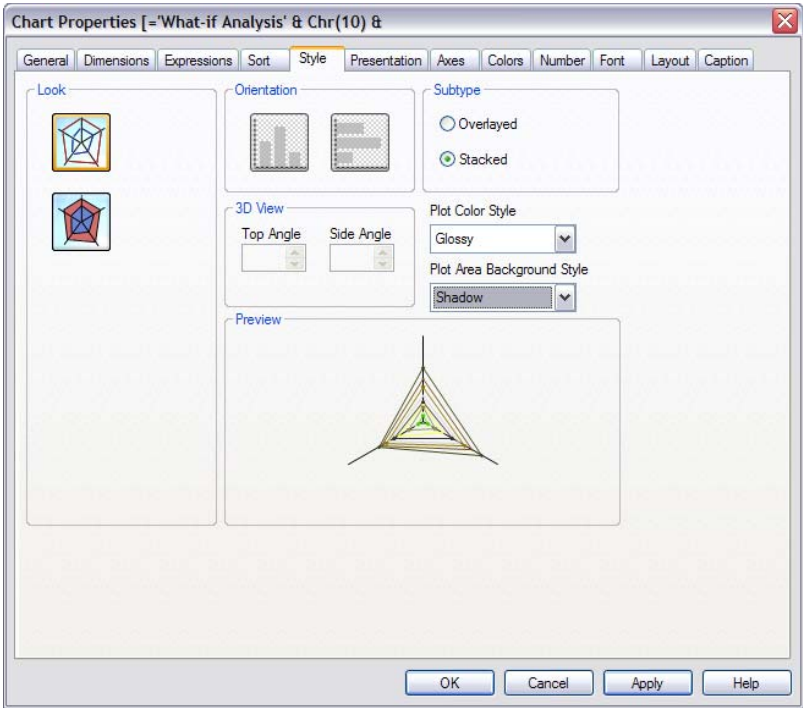


Figure 26. The Style page for radar charts in the Chart Properties dialog

In this page you select the basic style of the radar chart.

Look Select one of the available styles.

Subtype

In this group it is possible to choose between **Overlayed** and **Stacked** mode, provided that the chart has more than one dimension or more than one expression. In overlayed mode each polygon is plotted from the center of the chart. In stacked mode the polygons are plotted outside each other.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base

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colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color
: Sets all colors in the color map to solid colors.

Dark Gradient
: Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient
: Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style
: This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow
: This options gives a shadow effect on the plot area background.

Preview
: Offers a preview of the basic visual properties of the chart.

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Presentation

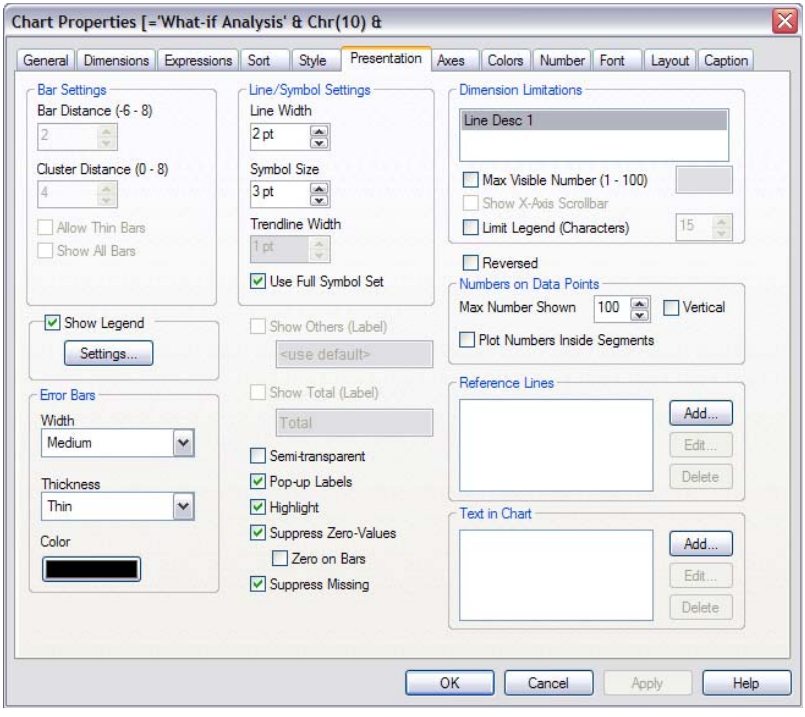


Figure 27. The Presentation page for radar charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the radar chart is presented on the screen.

Line/Symbol Settings

In the **Line/Symbol Settings** group you can set display options for lines and symbols in the chart.

Line Width

Sets the line width for lines. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The line can be taken away by setting the width to 0. This option is available only when lines are used.

Symbol Size

Sets the size of the symbols, when such are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl,

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pixel), points (pt, pts, point) or docunits (du, docunit). The symbol can be taken away by setting the size to 0.

Trendline Width

Here you can set the width of the trend lines by entering an appropriate number. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The trendline can be taken away by setting the width to 0.

Use Full Symbol Set

If this check box is marked, different kinds of symbols available will be used to distinguish data points from each other. If it is not marked, all the symbols will be drawn as plus signs.

Show Legend

Select this check box if you want legend to be shown in the chart when applicable.

Settings...

Opens the Legend Settings dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

Show Others (Label)

Mark this check box to display a separate x-axis value for 'Others', i.e. an expression value for all dimension values excluded by a limitation under **Dimension Limitations - Max Number**. The 'Others' value will only be meaningful where the **F(x) of Rows** total (see **Expression** page on page 36) and the value will be calculated using the function specified under that option. A label fot the 'Others' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default **Others** label found in the **Objects** page of the **User Preferences** will be used (see page 90 in Book I).

Show Total

Mark this check box to display a separate x-axis value for 'Total', i.e. an expression total for all dimension values. The 'Total' value will only be meaningful for expressions where the **F(x) of Rows** total is meaningful (see **Expression** page on page 36) and the value will be calculated using the function specified under that option. A label for the 'Total' data point may be typed in the edit box. The label may be defined as a calculated formula (see page 439) for dynamic update.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Page 1.227/

If nothing is specified, the default Total label found in the Objects page of the User Preferences will be used (see page 121 in Book I).

Semi-transparent

By selecting this check box, the area to be filled will be drawn semi-transparent.

Pop-up Labels

By selecting this check box the values of the dimension(s) and expression(s) will appear as a pop-up balloon when hovering with the cursor over data points in the chart.

Highlight

If this check box is marked hovering with the mouse over a line or symbol in it will result in the line or symbol being highlighted for better overview. The highlighting applies also in the legend where applicable.

Suppress Zero-Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Max Number

Select this check box to limit the number of dimension values to be shown at any one time. Enter the maximum number of values in the scroll box.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by ... in the chart. This option can be used independently to the other options in this group.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Reversed

When this check box is marked, the values shown in the chart will be reversed, i.e. if the 10 highest values are shown and the check box is marked the chart will then show the 10 lowest values.

Numbers on Data Points

In the **Numbers on Data Points** group you can set display options for numbers on data points, provided that this option has been selected for one or more chart expressions under **Plot Options** in the **Expression** page of the chart's properties.

Vertical

Shows the numbers vertically.

Max Number Shown

In this box you can specify an upper limit for the number of data points to show numbers for in the chart. If no limit is specified, numbers will be shown for all data points.

Plot Numbers Inside Segments

Marking this check box will plot numbers on data points inside the segments instead of on top of them.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the chart plot area for a given point on the y-axes. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 59 for details on the **Reference Lines dialog**.

Edit Mark an existing reference line in the list and click this button in order to edit its properties in the Reference Lines dialog. Double-clicking the reference line in the list has the same effect. See page 59 for details on the **Reference Lines dialog**.

Delete

Mark an existing reference line in the list and click this button in order to delete it from the list.

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

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Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Axes In the **Axes** page, the display properties of the x- and y-axes settings are made. This page is identical with the Axes page of the bar chart (Figure 12 on page 62).

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font In the **Font** page, you can change the font of the text in the chart. The page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the radar chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74)

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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6 SCATTER CHART

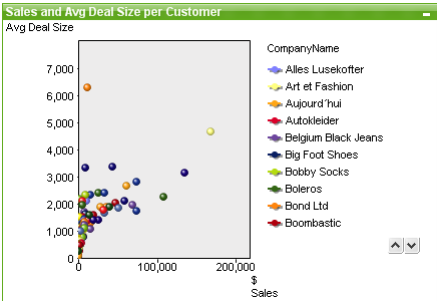


Figure 28. An example of a Scatter chart

The scatter chart presents pairs of values from two expressions. This is useful when you want to show data where each instance has two numbers, e.g. country (population and population growth).

6.1 Creation

Scatter charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

6.2 Scatter Chart Object Menu

The scatter chart **Object** menu is found as the **Object** menu when a scatter chart is active. It can also be opened as a float menu by clicking with the right mouse button on a scatter chart. The menu contains the following commands:

Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the charts static, i.e. cuts the hot link to the selected data.

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Attach

Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Copy Values to Clipboard

Copies the values to the clipboard in the form of a table.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Clear All Selections

Deselects the values of all the fields in the scatter chart.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

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Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context-specific help.

(D) (P) **Remove**

Removes the chart.

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6.3 Chart Properties



When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc. The scatter chart is somewhat different from the other chart types in that it actually displays expressions on both axes while iterating over one or more dimensions.

Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions over which the chart should be iterated can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29). In most cases, scatter charts should have only one or two dimensions, although more can be specified. If two dimensions are used the chart will have one data point for each combination of values in the first and second dimension.

Expressions

In the typical scatter chart, the x -axis and the y-axis both display an expression applying the **avg** or **only** function on single fields. The **avg** function is most likely to produce optimal results.

To make the creation of standard scatter charts easy, a simplified expression page is used. You only have to select the fields you wish to display on the axes, and possibly specify appropriate labels.

X Y In the **X** and **Y** groups you specify the fields to be shown on the respective axes by selecting them from the respective drop-down lists.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Label By default, the field names are set as expression labels, but you can edit them in these boxes. The label may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Show Label
Check these boxes if you want the expression labels to be displayed in the chart.

Z In the **Z** group you specify an optional expression which will be used to calculate the size of each data point plotted in the scatter.

Bubble Chart
If this check box is selected a third (Z) chart expression will be used to calculate the relative size of the scatter points. The value of the expression will determine the area of the bubble plotted.

Bubble Size Expression
This is where you enter the expression that determines the relative size of the bubble drawn at each scatter point.

Advanced Mode
Changes the **Expressions** page to the standard dialog page used for all other chart types. Can be useful for special purposes.

Sort

In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Style

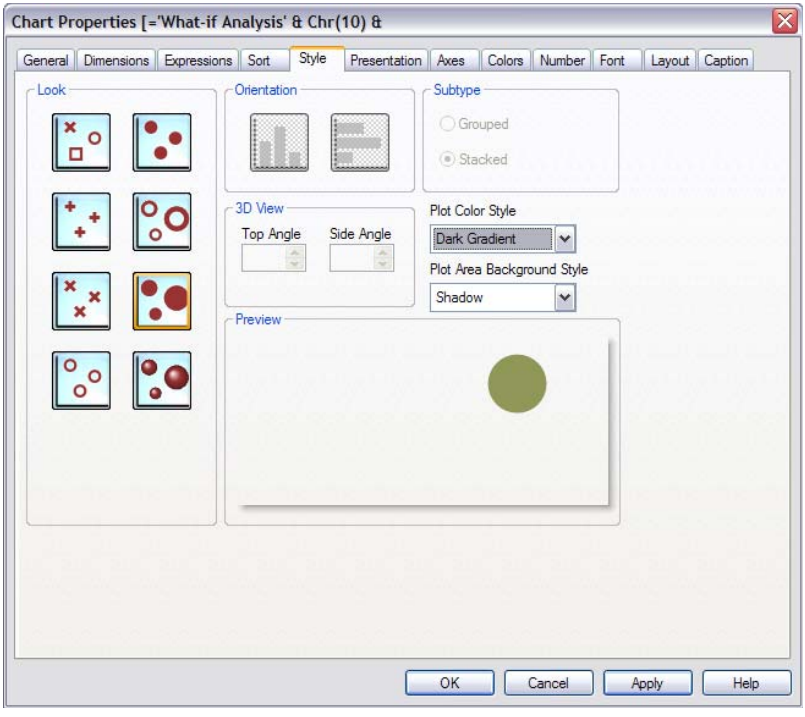


Figure 29. The Style page for scatter charts in the Chart Properties dialog

In this page you select the basic style of the scatter chart.

Look Select one of the available styles. If a bubble variant is selected a third (Z) chart expression will be used to calculate the relative size of the scatter points. The value of the expression will determine the area of the bubble plotted.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Dark Gradient
Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient
Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style
This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow
This options gives a shadow effect on the plot area background.

Preview
Offers a preview of the basic visual properties of the chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Presentation

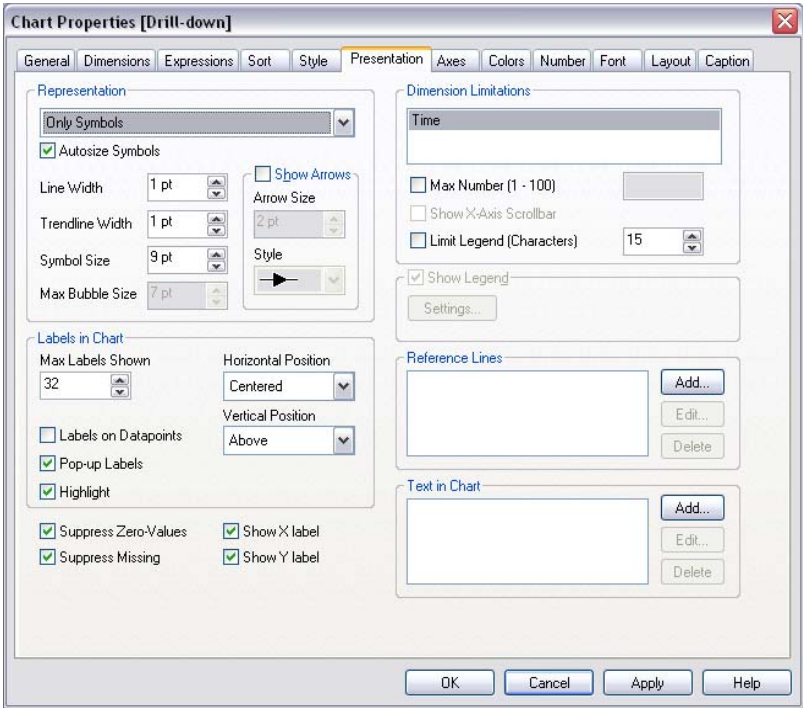


Figure 30. The Presentation page for scatter charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the scatter chart is presented on the screen.

Representation

In the **Representation** group you can set display options for scatter symbols and connecting lines in the chart. When a scatter chart has two dimensions instead of one defined on the **Dimensions** page, each value in the first dimension will result in one scatter data point for each of its associated values in the second dimension. These may then be connected by lines. In the drop-down box you can choose between drawing **Only Symbols**, **Only Lines** or **Both Lines and Symbols**.

Line Width

Sets the line width for lines, when such are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl,

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pixel), points (pt, pts, point) or docunits (du, docunit). The line can be taken away by setting the width to 0.

Symbol Size

Sets the size of the symbols, when such are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The line can be taken away by setting the width to 0.

Trendline Width

Here you can set the width of the trendlines, when such are used by entering an appropriate number. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The trendline can be taken away by setting the width to 0. Trendlines are selected on the **Expressions** page in **Advanced Mode**.

Max Bubble Size

Sets the size of the largest bubble in the chart when bubble style is used. All smaller values from the Z expression will be plotted smaller in a linear relation. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The bubbles can be taken away by setting the width to 0.

ShowArrows

If this check box is marked and the scatter chart has more than one dimension defined on the **Dimensions** page arrows will be drawn on the connecting lines. The arrows will be directed between scatter points in the order defined by the sort order of the second dimension.

Arrow Size

Sets the size of the arrows, when such are used.

Style Sets the style of the arrows, when such are used.

Suppress Zero Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Show X Label

Shows field label along the x-axis.

Show Y Label

Shows field label along the y-axis.

Labels in Chart

In the **Labels in Chart** group you can set options for showing data point labels in the chart plotting area. The labels plotted are the same as those in the legend.

Labels on Data Points

Shows labels next to the scatter points inside the chart plot area.

Pop-up Labels

By selecting this check box the value(s) of the dimension(s) will appear as a pop-up balloon when hovering with the cursor over data point in the chart. This setting works independently from the **Labels on Data Points** option. The settings below in this group have no effect on pop-up labels.

Highlight

If this check box is marked hovering with the mouse over a line or symbol in it will result in the line or symbol being highlighted for better overview. The highlighting applies also in the legend where applicable.

Max Labels Shown

Sets a limit for how many labels that are plotted in the chart. Setting this number too high may degrade chart readability.

Horizontal Position

In the drop-down box you can select whether the labels should be plotted to the left of the scatter point, to the right of the scatter point or be horizontally centered on the scatter point.

Vertical Position

In the drop-down box you can select whether the labels should be plotted on top of the scatter point, below the scatter point or be vertically centered on the scatter point.

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Dimension Limitations

In this group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list, then check **Max Number** and enter an appropriate number of values to be shown.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the chart plot area from a given point on the x-axis, the y-axis or both. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 130 for details about the **Reference Lines** dialog.

Edit Mark an existing reference line in the list and click on this button in order to edit its properties in the **Reference Lines** dialog. Double-clicking on the reference line in the list has the same effect. See page 130 for details about the **Reference Lines** dialog.

Delete Mark an existing reference line in the list and click on this button in order to delete it from the list.

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Show Legend

Select this check box if you want legend to be shown in the chart when applicable.

Settings...

Opens the **Legend Settings** dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

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Reference Lines Dialog

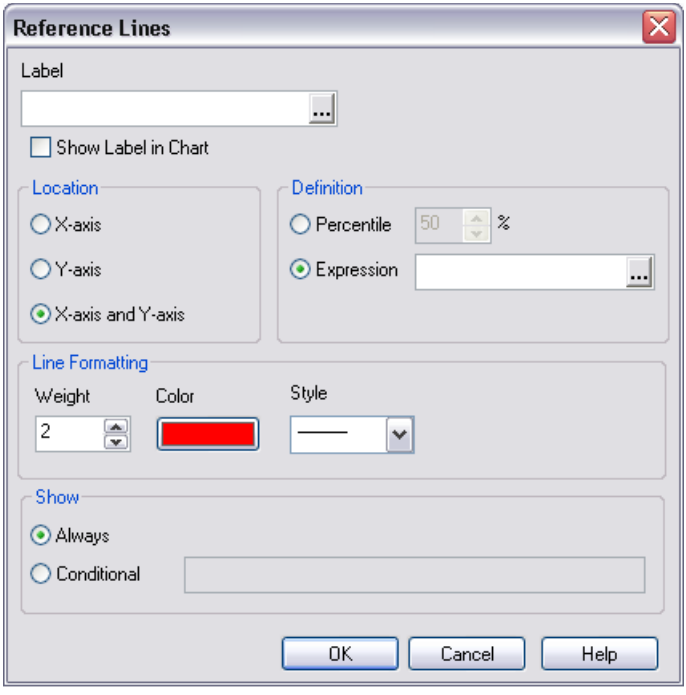


Figure 31. The Reference Lines dialog of the Scatter chart

A reference line in the scatter chart is a line intersecting the chart plot area from a given point on one or both axes. It may be used e.g. to indicate a certain level, or percentiles of chart data. The reference line is only drawn if it falls within the current range of the axis from which it origins.

Legend

Here you may specify a label to be drawn next to the reference line. As default the value of **Expression** will be used.

Show Legend

Select this check box if you want the label to appear next to the reference line.

Axis In the **Axis** group you define from which axis the reference line should origin.

X Select this option if you want the reference line to origin from the x-axis.

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Y Select this option if you want the reference line to origin from the y-axis.

X and Y

Select this option if you want the reference line to origin from both the x- and y-axes.

Definition

In the **Definition** group the value at which the reference line should be drawn is specified. For a scatter chart it could be either at a fixed percentile of the current chart data or an arbitrary numeric expression.

Percentile

Select this option if you want the reference line to be drawn at a given percentile of the current chart data. The percentile (a value between 1 and 100) must be entered in the edit box.

Expression

Select this option if you want to specify a fixed value or an arbitrary numeric expression for where the reference line is to be drawn. The value in the edit box may be a calculated expression (see page 439).

Line Formatting

In the **Line Formatting** group you define how the reference line will look.

Weight

Specifies the width of the reference line. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The line can be taken away by setting the width to 0.

Color By clicking on the button you may select a color for the reference line.

Style Specifies the style of the reference line (continuous, dashed or dotted.

Show In this group, it is possible to specify a condition under which the reference line is shown.

Always

The reference line will always be shown.

Conditional

The reference line will be shown or hidden depending on a condition expression which will be evaluated each time the

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chart is to be drawn. The reference line will only be visible when the condition returns true.

Axes

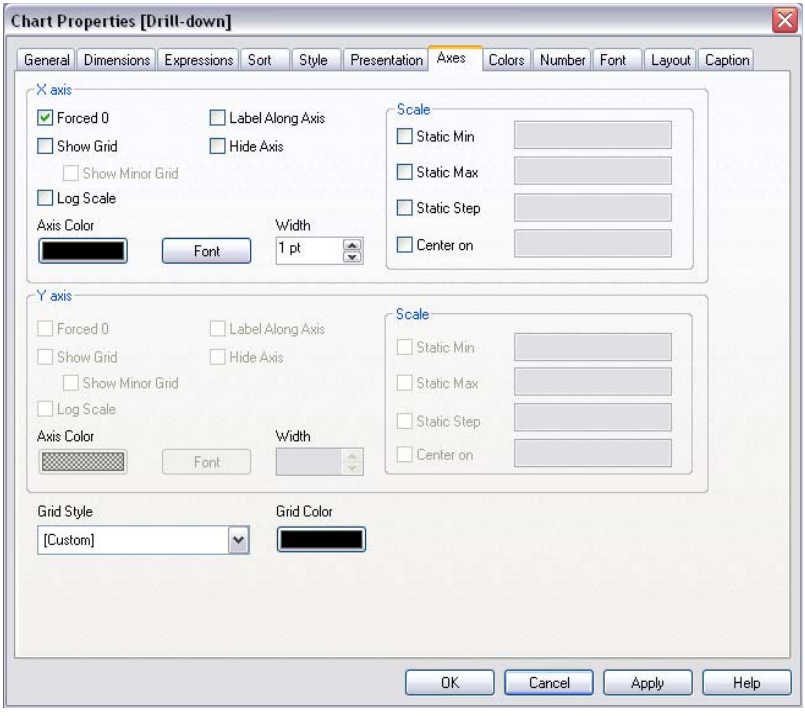


Figure 32. The Axes page for scatter charts in the Chart Properties dialog

In the **Axes** page settings for the x- and y-axes can be made.

X-axis In the **X-axis** group you select settings for the scatter chart x-axis (horizontal axis).

Forced 0

Fixes the lower edge of the chart to zero on the axis. This option is not available when a logarithmic axis is used.

Show Grid

Shows a grid in the chart originating from the tick marks of the y-axis. The grid lines can be formatted using the **Grid Style** and **Grid Color** settings (see below).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Show Minor Grid

Shows minor lines in-between the grid lines. Only available if the **Grid Style** and **Grid Color** settings has been selected (see below).

Log Scale

Changes the y-axis to a logarithmic scale. A logarithmic scale can only be used when all data points in the charts are positive (>0).

Hide Axis

Hides the y-axis.

Label Along Axis

If this check box is marked the expression label for the axis will be drawn alongside and centered on the axis. If this option is deselected the label will be drawn to the right.

Axis Color

By clicking on this button you may select the color which will be used when drawing the axis, its tick marks, grid and axis labels.

Font By pressing this button you will come to a font dialog where font and text color can be set for the axis. Unless changed from the chart's default setting these font setting will automatically follow changes in the chart's default font as set on the **Font** page of the chart properties.

Width Sets the width of the axis and its tick marks.

Scale In the **Scale** group you can set scale properties for the axis. Normally the minimum and maximum values of the axis and the distance between tick marks are calculated dynamically depending on the current data set. Each of these values can however be individually locked.

Static Min

By selecting this check box you can set a fixed minimum value for the axis. The min value may be entered as a calculated formula (see page 439). If the **Center on** value conflicts with **Static Min** and **Static Max** the **Center on** value will have priority.

Static Max

By selecting this check box you can set a fixed maximum value for the axis. The max value may be entered as a calculated formula (see page 439). If the **Center on** value con-

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flicts with **Static Min** and **Static Max** the **Center on** value will have priority.

Static Step

By selecting this check box you can set a fixed interval for tick marks on the axis. The value may be entered as a calculated formula (see page 439). If this setting results in more than 100 tick marks, the value used will be modified.

Center on

By selecting this check box you can set a fixed value on the axis which will be positioned in the center of the plot area. The value may be entered as a calculated formula (see page 439). If the **Center on** value conflicts with **Static Min** and **Static Max** the **Center on** value will have priority.

Y-axis

In the **Y-axis** group you select settings for the scatter chart y-axis (vertical axis). The individual settings are exactly the same as for the x-axis (see above) except for the:

Label along Axis

If this check box is marked the expression label for the axis will be drawn vertically alongside and centered on the y-axis. The text will be tilted 90 degrees. If this option is deselected the expression label will be printed horizontally at the top of the axis.

Grid Style

Select a grid line style for the chart in the drop-down.

Grid Color

Click the button to select a color for grid lines in the chart.

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Layout

In the **Layout** page, you can specify how the scatter chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

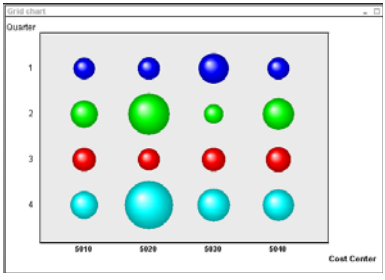
Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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7 GRID CHART



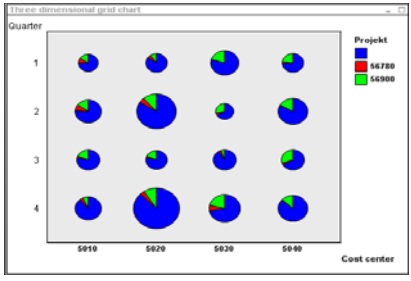


Figure 33. Two examples of a grid chart

The grid chart is similar to the scatter chart but plots dimension values on the axes and uses an expression to determine the plot symbol. A special mode makes it possible to show a third dimension in the form of small pie charts as plot symbols.

7.1 Creation

Grid charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

7.2 Grid Chart Object Menu

The grid chart **Object** menu is found as the **Object** menu when a grid chart is active. It can also be opened as a float menu by clicking with the right mouse button on a grid chart. The menu contains the following commands:

Properties
Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach
Makes the charts static, i.e. cuts the hot link to the selected data.

Attach
Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

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Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minuimum value is -127.

Copy Values to Clipboard

Copies the values to the clipboard in the form of a table.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Clear All Selections

Deselects the values of all the fields in the grid chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context-specific help.

D P **Remove**

Removes the chart.

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7.3 Chart Properties



When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29). A grid chart typically has two or tree dimensions. The first dimension will be plotted on the X-axis and the second dimension on the Y-axis. If a third dimension is present it can be used to create small pie charts for each position in the grid. Further dimensions are ignored.

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36). In a grid chart only the first dimension is used when plotting the chart.

Sort

In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

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Style

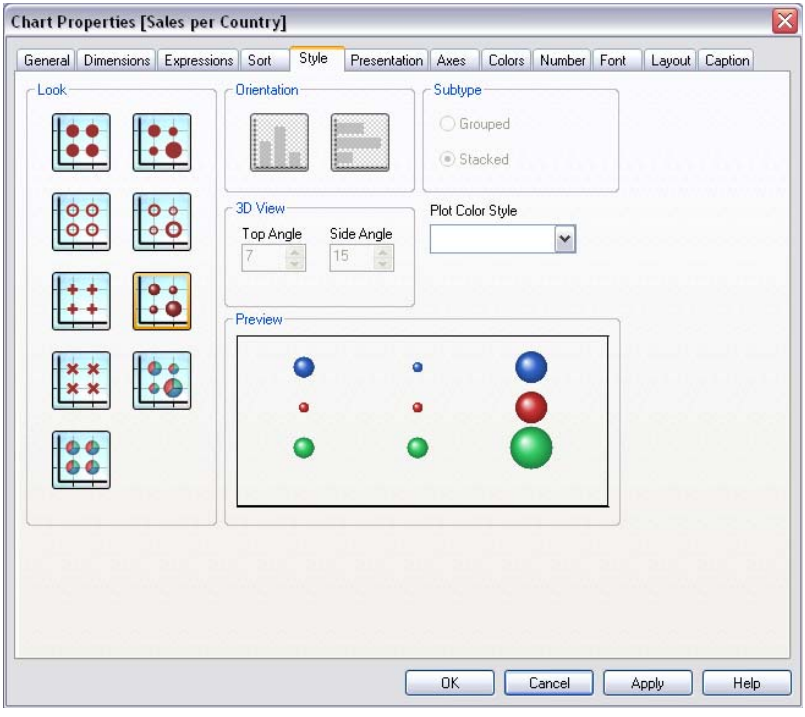


Figure 34. The Style page for grid charts in the Chart Properties dialog

In this page you select the basic style of the grid chart.

Look Select one of the available styles.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

Dark Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

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Light Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style

This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow

This options gives a shadow effect on the plot area background.

Preview

Offers a preview of the basic visual properties of the chart.

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Presentation

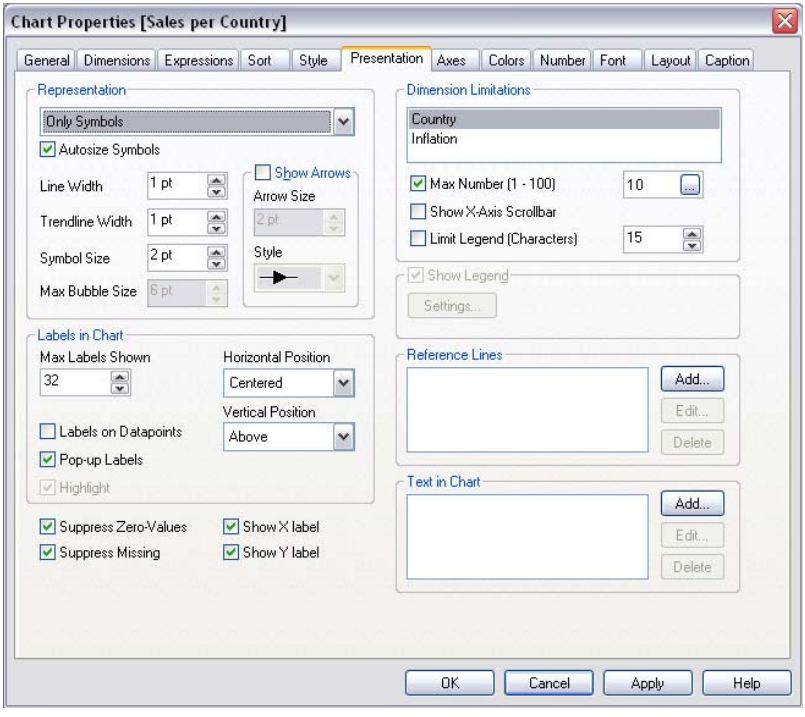


Figure 35. The Presentation page for grid charts in the Chart Properties dialog

By changing the settings on this page you modify the way the grid chart is presented on the screen.

Representation

In the **Representation** group you can set display options for plot symbols in the chart.

Autosize Symbols

If this check box is marked, the maximum size of the plot symbols in bubble mode will be automatically calculated. If unchecked the maximum size can be set manually under **Max Bubble Size** below. This setting has no meaning when uni-size plot symbols have been selected on the **Style** page.

Line Width

Sets the line width for lines. This option is available only when lines are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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or docunits (du, docunit). The line can be taken away by setting the width to 0.

Symbol Size

Sets the size of the symbols, when such are used. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit).

Max Bubble Size

Sets the size of the largest bubble in the chart when bubble style is used. All smaller values from the Z expression will be plotted smaller in a linear relation. The value can be specified in mm, cm, inches (", inch), pixels (px, pxl, pixel), points (pt, pts, point) or docunits (du, docunit). The bubbles can be taken away by setting the width to 0. This setting has no meaning when uni-size plot symbols have been selected on the **Style** page.

Labels in Chart

In the **Labels in Chart** group you can set options for showing data point labels in the chart plotting area. The labels plotted are the same as those in the legend.

Labels on Data Points

Shows labels next to the scatter points inside the chart plot area.

Pop-up Labels

By selecting this check box the value(s) of the dimension(s) will appear as a pop-up balloon when hovering with the cursor over data point in the chart. This setting works independently from the **Labels on Data Points** option. The settings below in this group have no effect on pop-up labels.

Max Labels Shown

Sets a limit for how many labels that are plotted in the chart. Setting this number too high may degrade chart readability.

Horizontal Position

In the drop-down box you can select whether the labels should be plotted to the left of the scatter point, to the right of the scatter point or be horizontally centered on the scatter point.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Vertical Position

In the drop-down box you can select whether the labels should be plotted on top of the scatter point, below the scatter point or be vertically centered on the scatter point.

Suppress Zero Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Show X Label

Shows field label along the x-axis, instead of at the end of the axis.

Show Y Label

Shows field label along the y-axis, instead of at the end of the axis.

Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Max Number

Select this check box to limit the number of dimension values to be shown at any one time. Enter the maximum number of values in the scroll box.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by ... in the chart. This option can be used independently to the other options in this group.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the chart plot area from a given point on the y-axis. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 130 for details about the **Reference Lines** dialog.

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Edit Mark an existing reference line in the list and click on this button in order to edit its properties in the **Reference Lines** dialog. Double-clicking on the reference line in the list has the same effect. See page 130 for details about the **Reference Lines** dialog.

Delete Mark an existing reference line in the list and click on this button in order to delete it from the list.

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Show Legend

Select this check box if you want legend to be shown in the chart when applicable.

Settings...

Opens the **Legend Settings** dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

Axes In the **Axes** page, the display properties of the x- and y-axes settings are set. This page is identical with the **Axes** page of the scatter chart (Figure 32 on page 132).

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the grid chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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8 PIE CHART

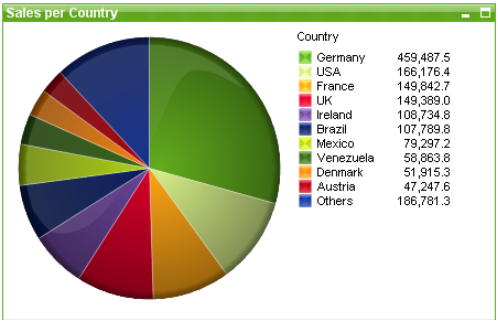


Figure 36. An example of a pie chart

Pie charts normally show the relation between a single dimension and a single expression, but can sometimes have two dimensions.

8.1 Creation

Pie charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

If you want to create a simple pie chart and find the great number of different settings available overwhelming, choose **Create QuickChart** from the list box object menu or from the **Layout** menu (**New Object - QuickChart**), or click the **QuickChart** button in the toolbar. The wizard appearing will help you to create a chart in a quick and easy way. For more information, see page 239.

8.2 Pie Chart Object Menu

The pie chart **Object** menu is found as the **Object** menu when a pie chart is active. It can also be opened as a float menu by clicking with the right mouse button on a pie chart. The menu contains the following commands:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the chart static, i.e. cuts the hot link to the selected data.

Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Copy Values to Clipboard

Copies the values to the clipboard in the form of a table.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the chart.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

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Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

D P **Remove**

Removes the chart.

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8.3 Chart Properties



When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29).

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36).

Note The specific use of the two following settings is however possible.

Numbers on Data Point

Mark this check box to plot the y-value next to each pie slice. The default number format of the expression as set on the **Numbers** page will be applied.

Text on Data Point

Mark this check box to have the result of the expression plotted as text next to each pie slice. By creating an extra expression containing the name of the dimension field and marking it only for use as

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Text on Data Point, it is possible to show the data labels next to the pie slices.

It is possible to combine both of the above display options in a pie chart. Text will be plotted above the number.

Sort In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

Style

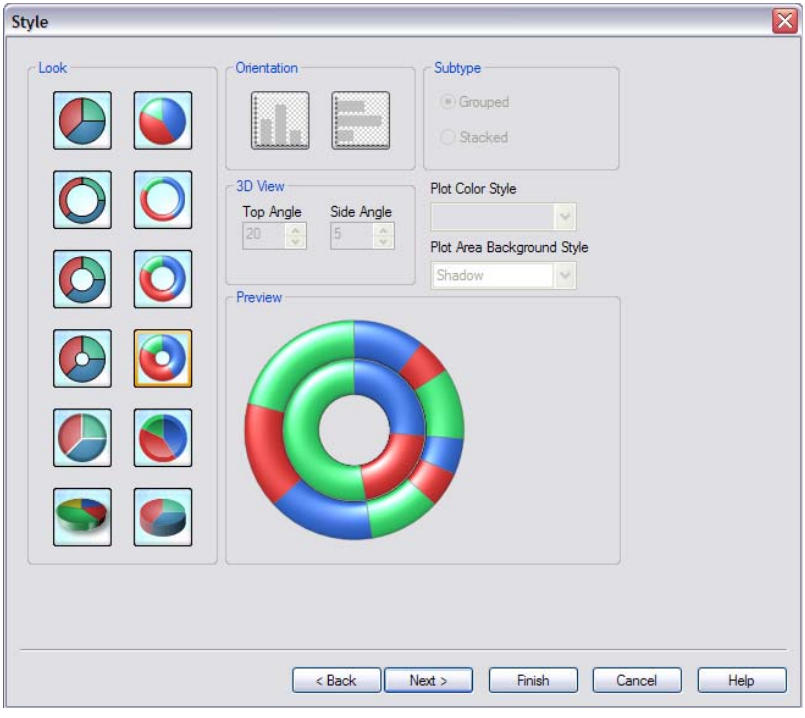


Figure 37. The Style page for pie charts in the Chart properties dialog

In this page you select the basic style of the pie chart.

Look Select one of the available styles.

3D View

The settings in this group define the angle from which the chart is viewed in 3D modes.

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Top Angle

Defines the vertical angle of the 3D view. The value must be an integer between 0 and 30.

Side Angle

Defines the side angle of the 3D view. The value must be an integer between 0 and 45.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

Dark Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style

This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow

This options gives a shadow effect on the plot area background.

Preview

Offers a preview of the basic visual properties of the chart.

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Presentation

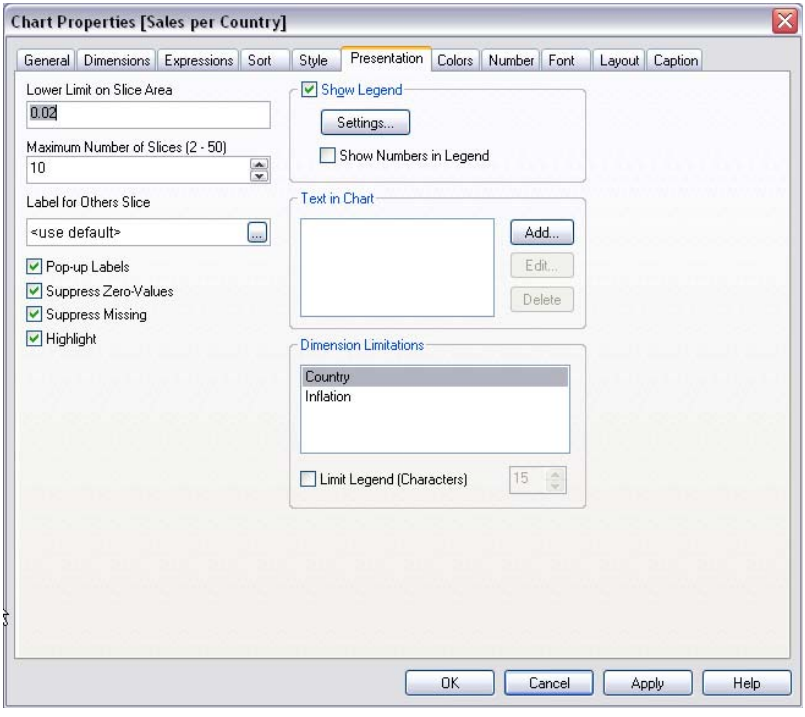


Figure 38. The Presentation page for pie charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the pie chart is presented on the screen.

Lower Limit on Slice Area
Sets the minimum size for a slice in order to be shown.

Maximum Number of Slices (2-50)
Sets the maximum number of slices.

Label for Others Slice
The name of the surplus slice. If no string is entered, the default value found in the **Objects** page of the **User Preferences** dialog will be used.

Pop-up Labels
By selecting this check box the values of the dimension(s) and expression(s) will appear as a pop-up balloon when hovering with the cursor over data point in the chart.

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Suppress Zero-Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Highlight

If this check box is marked hovering with the mouse over a pie segment will result in the segment being highlighted for better overview. The highlighting applies also in the legend where applicable.

Show Legend

In the **Show Legend** group you can turn legend on or off and access the **Legend Settings** dialog. These settings are only available when chart data makes it possible to show a legend.

Settings...

Opens the **Legend Settings** dialog, where advanced settings can be made for the chart legend. See page 57 for details on this dialog.

Show Numbers in Legend

Shows numbers for the slices in legend. This option is only available for the main dimension in two-dimensional charts.

Text in Chart

In the **Text in Chart** group you can add free-floating text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

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Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by ... in the chart. This option can be used independently to the other options in this group.

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the pie chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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9 FUNNEL CHART

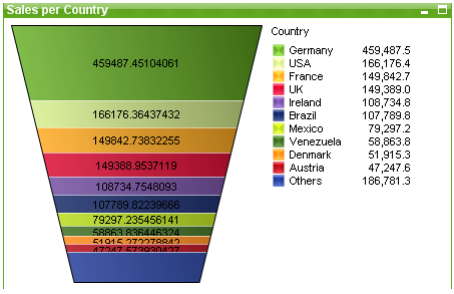


Figure 39. An example of a Funnel chart

The funnel chart is typically used for showing data in flows and processes. From a display standpoint it is related to the pie chart. The chart may be shown with either segment height/width or segment area proportional to data. It is also possible to draw the chart with equal segment heights/widths, disregarding data points.

9.1 Creation

Funnel charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

9.2 Funnel Chart Object Menu

The **Funnel** chart **Object** menu is found as the **Object** menu when a Funnel chart is active. It can also be opened as a float menu by clicking with the right mouse button on a Funnel chart. The menu contains the following commands:

Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the chart static, i.e. cuts the hot link to the selected data.

Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

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Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Clear All Selections

Clears all selections in the fields that are used as dimensions in the chart.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the chart.

Print as PDF...

Opens the Print dialog with the QlikView PDF printer pre-selected. After hitting OK you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikView PDF printer is normally installed as part of the QlikView installation package.

Copy Values to Clipboard

Copies the values to the clipboard in the form of a table. The table is the straight table equivalent of the funnel chart.

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Export...

Opens a dialog for saving an image of the chart to file. The image can be saved as bmp, jpg, gif or png.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

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Remove

Removes the chart.

9.3 Chart Properties

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29). A funnel chart typically has one to three dimensions. Additional dimensions are ignored.

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36). In a funnel chart only the first expression is used when plotting the chart. Additional expressions can be used for pop-up purposes or as text/numbers in data segments.

Sort

On this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

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Style

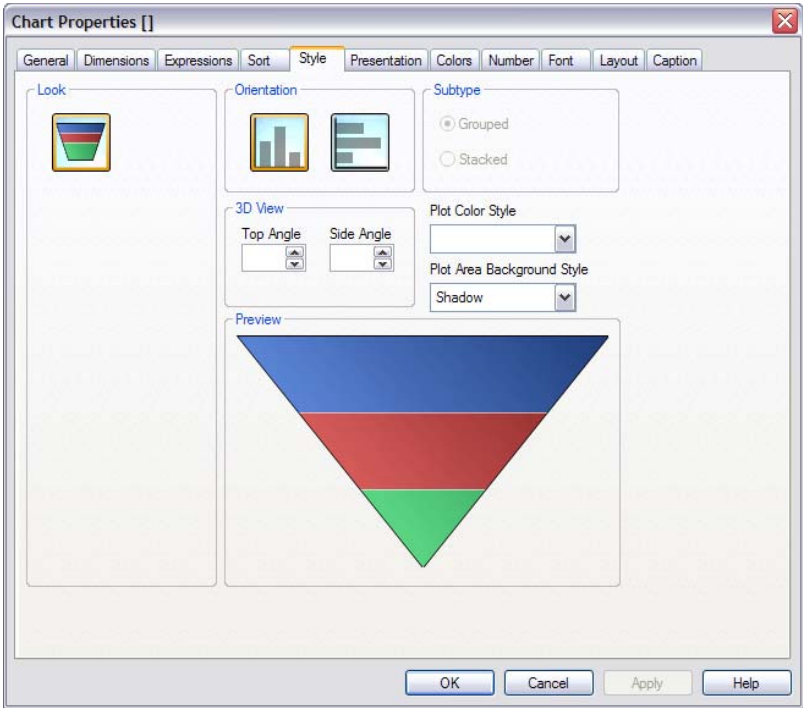


Figure 40. The Style page for Funnel charts in the Chart Properties dialog

On this page you set the style of the Funnel chart.

Look There is currently only one style available for funnel charts.

Orientation

The chart can be drawn in a vertical or horizontal direction.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

Solid Color

Sets all colors in the color map to solid colors.

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Dark Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient

Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style

This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow

This options gives a shadow effect on the plot area background.

Preview

Offers a preview of the basic visual properties of the chart.

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Presentation

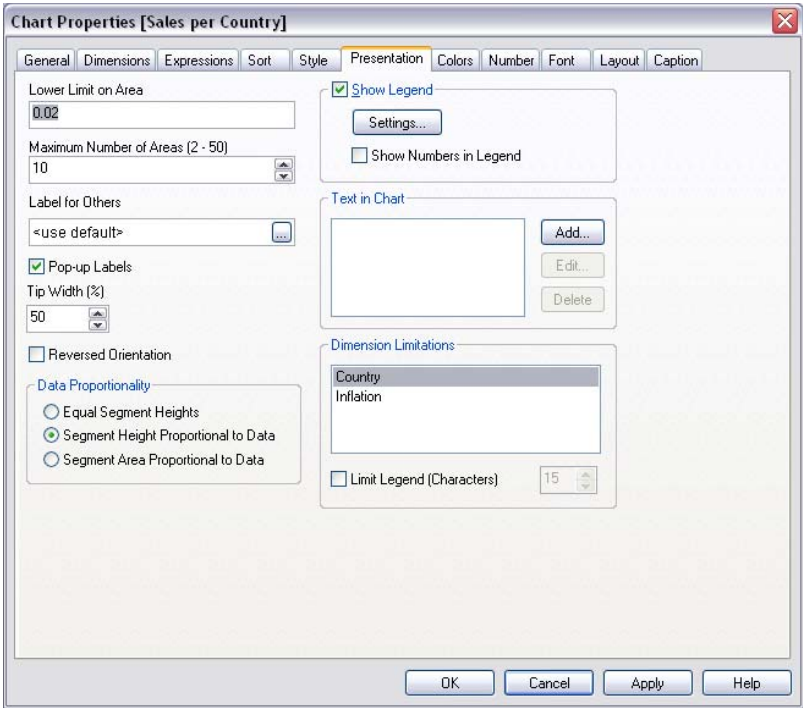


Figure 41. The Presentation page for Funnel charts

By changing the settings on this page, you modify the way the funnel chart is presented on the screen.

Lower Limit on Area

Sets the minimum size for a data segment in order to be shown. Segments that are too small to be shown will be grouped under **Others**.

Maximum Number of Areas (2-50)

Sets the maximum number of segments. Segments not shown will be grouped under Others.

Label for Others

The name of the surplus segment containing data for segments not shown due to limitations in the two settings above. If no string is entered, the default value found in the **Objects** page of the **User Preferences** dialog will be used.

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Pop-up Labels

Mark this check box in order for data to appear in a pop-up balloon when hovering with the cursor over a data segment in the chart. This setting has no effect on expressions marked for display as pop-up.

Tip Width (%)

Defines the width of the funnel tip as a percentage of the funnel mouth width.

Reverse Orientation

Mark this check box if you want to make the funnel point to the left or upwards.

Data Proportionality

This setting controls the degree to which the segments are proportional to the underlying data.

Equal Segment Heights

No proportionality to data. Each segment is drawn with the same height (width for horizontal funnels) as all others. Typically only makes sense with numbers displayed in the chart.

Segment Height Proportional to Data

Each segment is drawn with the total area proportional to underlying data.

Segment Area Proportional to Data

Each segment is drawn with the total area proportional to underlying data.

Show Legend

In the **Show Dimension Labels** group you can control the display of dimension data labels in the chart. Mark the check box in order to display data labels. Data labels are shown only for the current top level of the chart.

Settings...

Opens the **Legend Settings** dialog, where the legend settings can be modified. See for details on this dialog.

Show Numbers in Legend

Mark this check box to show values next to the dimension data labels.

Text in Chart

In the Text in Chart group you can add free-floating text to the chart.

Add By pressing this button you open the Text in Chart dialog where you may create and edit free-floating texts to be dis-

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played in the chart. See for details about the Text in Chart dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the Text in Chart dialog. Double-clicking the text in the list has the same effect. See for details on the Text in Chart dialog.

Dimension Limitations

In the Dimension Limitations group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by ... in the chart. This option can be used independently to the other options in this group.

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the funnel chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74)

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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10 BLOCK CHART

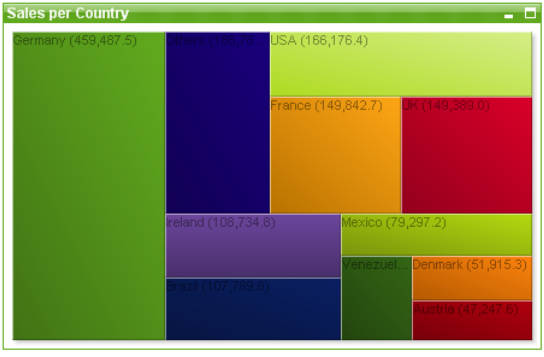


Figure 42. An example of a Block Chart

The Block chart shows the relation between expression values as blocks of varying area. Up to three dimensions can be shown, where each dimension is sub-divided in sub-blocks. An extra expression is often used to calculate the color of each block, in which case the chart type is also known as a heat chart.

10.1 Creation

Block charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

10.2 Block Chart Object Menu

The Block chart **Object** menu is found as the **Object** menu when a Block chart is active. It can also be opened as a float menu by clicking with the right mouse button on a Block chart. The menu contains the following commands:

Properties

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach

Makes the chart static, i.e. cuts the hot link to the selected data.

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Attach

Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Clear All Selections

Clears all selections in the fields used as dimensions in the chart.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Print... Opens the standard **Print** dialog box (see page 247).
print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

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Export...

Opens a dialog for saving an image of the chart to file. The image can be saved as bmp, jpg, gif or png.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page(see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

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Remove

Removes the chart.

10.3 Chart Properties

When you click the **Create Chart** button in the toolbar, the **Create Chart** wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.

Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button.

The wizard and the **Chart Properties** dialog contain a number of pages which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29). A Block chart typically has one to three dimensions. Further dimensions are ignored.

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36). In a Block chart only the first expression is used when plotting the chart. Additional expressions can be used for pop-up purposes. It is also possible to use **Text on Data Point** expressions for display of data in the innermost level data blocks.

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Style

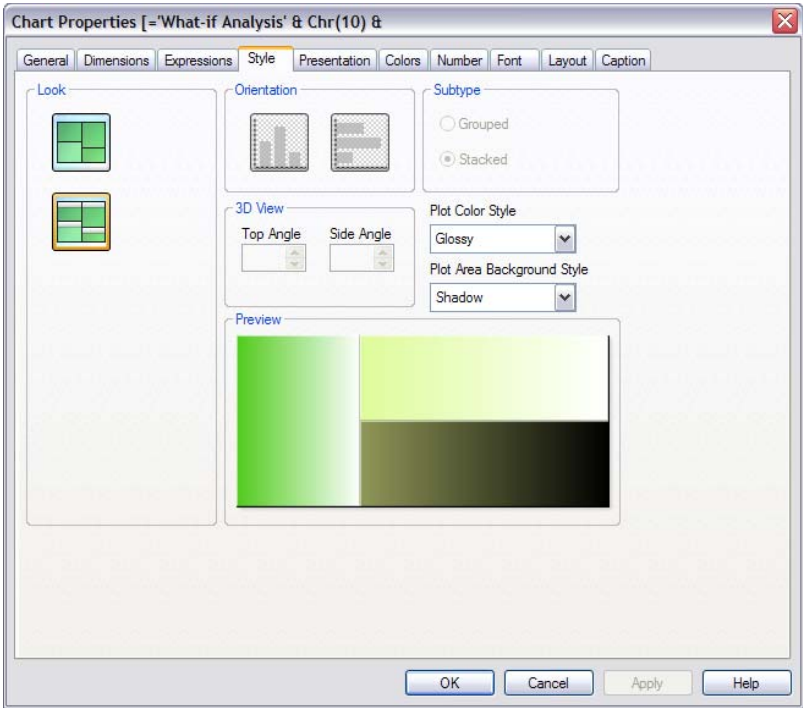


Figure 43. The Style page for Block charts in the Chart Properties dialog

In this page you set the style of the Block chart.

Look Choose between non-captioned and captioned drawing style. In the non-captioned style only top level dimension labels will be shown in the chart, plotted in the center of their respective blocks. In the captioned style top and intermediate level dimension labels are plotted in captions at the top of their respective blocks. Bottom level dimension labels are then plotted inside each low level block.

Plot Color Style

This control can be used to impose a color style on all plot colors in the chart. When a style is selected in the drop-down all colors under **Color Map** on the **Colors page** will be changed to the selected style. The change is instantaneous and the setting itself will not be saved until the next time you enter this page of the dialog. The actual base colors in the color map are not affected. The **Plot Color Style** setting is not available for all chart looks. Four options are available.

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Solid Color
Sets all colors in the color map to solid colors.

Dark Gradient
Sets all colors in the color map to a one-color gradient going towards a darker tone.

Light Gradient
Sets all colors in the color map to a one-color gradient going towards a darker tone.

Glossy Gives a glossy look to all segments.

Plot Area Background Style
This control can be used to change the appearance of the plot area background. This setting is only available for charts with a plot area. The following options are available:

Frame A frame is drawn around the plot area.

Shadow
This options gives a shadow effect on the plot area background.

Preview
Offers a preview of the basic visual properties of the chart.

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Presentation

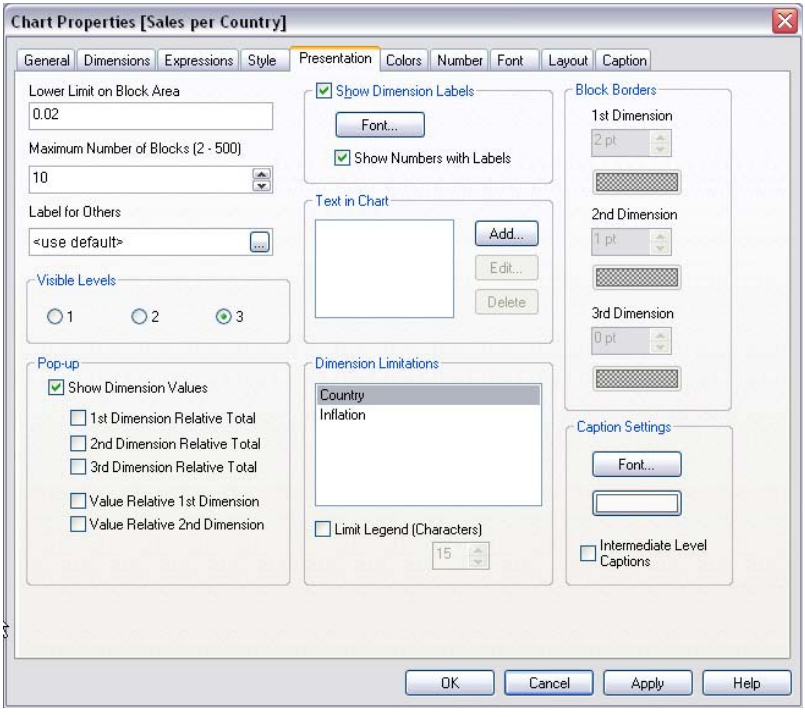


Figure 44. The Presentation page for Block charts in the Chart Properties dialog

By changing the settings on this page you modify the way the pie chart is presented on the screen.

Lower Limit on Block Area

Sets the minimum size for a block in order to be shown. Blocks that are too small to be shown will be grouped under **Others**.

Maximum Number of Blocks (2-50)

Sets the maximum number of blocks. Blocks not shown will be grouped under **Others**.

Label for Others

The name of the surplus block containing data for blocks not shown due to limitations in the two settings above. If no string is entered, the default value found in the **Objects** page of the **User Preferences** dialog will be used.

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Visible Levels

A block chart can be shown with a maximum of three levels of blocks (dimensions). In this control you may limit the number of shown levels to more than one or two.

Pop-up

In this group you can specify to which extent the values of the dimension(s) and some other data will appear in the pop-up balloon when hovering with the cursor over data point in the chart. These settings have no effect on expressions marked for display as pop-up.

Show Dimension Values

Mark this check box in order to show the values of all dimensions associated with a given data point in the hover pop-up balloon. This check box must be marked in order for the options below to become available.

1st Dimension Relative Total

Mark this check box in order to include in the hover pop-up balloon the value of the chart's plot expression aggregated over the 1st dimension value as a percentage of the overall chart total.

2nd Dimension Relative Total

Mark this check box in order to include in the hover pop-up balloon the value of the chart's plot expression aggregated over the 2nd dimension value as a percentage of the overall chart total.

3rd Dimension Relative Total

Mark this check box in order to include in the hover pop-up balloon the value of the chart's plot expression aggregated over the 3rd dimension value as a percentage of the overall chart total.

Value Relative 1st Dimension

Mark this check box in order to include in the hover pop-up balloon the value of the chart's plot expression aggregated over the 1st dimension value.

Value Relative 2nd Dimension

Mark this check box in order to include in the hover pop-up balloon the value of the chart's plot expression aggregated over the 2nd dimension value.

Show Dimension Labels

In the Show Dimension Labels group you can control the display of dimension data labels in the chart. Mark the check box in order to

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display data labels. Data labels are shown only for the current top level of the chart.

Font...

Opens the **Font** dialog where the font of the data labels can be modified. See page 73 for details about this dialog.

Show Numbers with Labels

Mark this check box to show values next to the dimension data labels.

Text in Chart

In the **Text in Chart** group you can add free-floating text to the chart.

Add By pressing this button you open the **Text in Chart** dialog where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog. Double-clicking the text in the list has the same effect. See page 61 for details about the **Text in Chart** dialog.

Delete Mark an existing text in the list and click this button in order to delete it from the list.

Dimension Limitations

In the **Dimension Limitations** group you may limit the number of data points to be plotted within a given dimension. Select one of the dimensions by clicking in the list before changing one or more of the settings below.

Limit Legend (Characters)

Select this check box to limit the length of the dimension value strings to be shown on axes and in the chart legend. Enter the maximum length in the scroll box. Truncated values will be followed by **...** in the chart. This option can be used independently to the other options in this group.

Block Borders

In the **Block Borders** group you can set the width and color of the borders drawn around the blocks on the three different dimension levels. Block borders are not applicable when the caption style of block charts is used.

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1st Dimension

Set the width of the border surrounding blocks on the first dimension level in the scroll control and select border color with the color button below.

2nd Dimension

Set the width of the border surrounding blocks on the second dimension level in the scroll control and select border color with the color button below.

3rd Dimension

Set the width of the border surrounding blocks on the 3rd dimension level in the scroll control and select border color with the color button below.

Caption Settings

In the **Caption Settings** group you can set the font and color of the caption used for top and intermediate dimension levels. These settings are only applicable when the caption style of block charts is used.

Font... Opens the **Font** dialog for setting caption font.

Color Opens the **Color Area** dialog for setting caption base color.

Intermediate Level Captions

Mark this check box if you want captions drawn on the intermediate dimension level in three-dimensional block charts.

Colors

In the **Colors** page, the default display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67).

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the Font page of the bar chart (Figure 16 on page 73).

Layout

In the **Layout** page, you can specify how the block chart should appear on the layout. This includes settings for shape, border and the layer where the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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11 GAUGE CHART

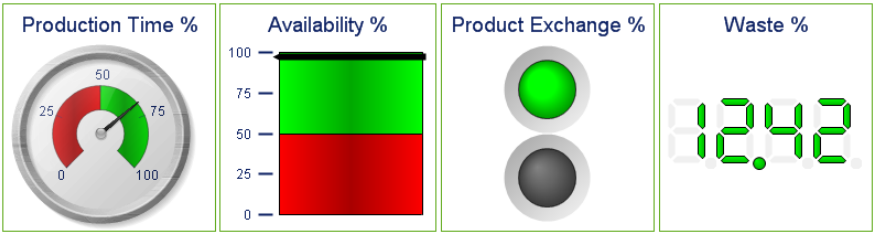


Figure 45. Four examples of gauge charts

Gauge charts are used to display the value of a single expression without dimensions. There are four basic types of gauges available: Circular, linear, traffic light and LED.

11.1 Creation

Gauge charts are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the chart.

11.2 Gauge Chart Object Menu

The gauge chart **Object** menu is found as the **Object** menu when a gauge chart is active. It can also be opened as a float menu by clicking with the right mouse button on a gauge chart. The menu contains the following commands:

Properties
Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Detach
Makes the chart static, i.e. cuts the hot link to the selected data.

Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the chart.

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Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Copy Values to Clipboard

Copies the values to the clipboard in the form of a table.

Print Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send Values to Excel

Exports the underlying data (the straight table equivalent to the chart) to Microsoft Excel, that is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Clear All Selections

Deselects the values of all the fields in the gauge chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Export...

Opens a dialog for saving an image of the gauge to file. The image can be saved as bmp, jpg, gif or png.

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Remove

Removes the chart.

11.3 Chart Properties

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart, e.g. the chart type, the dimensions, titles, etc.



Once a chart is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the chart can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29). Gauge charts do not make use of chart dimensions, so this page can be ignored.

Expressions

On the **Expressions** page you set the expressions to be displayed in the chart. This page is identical with the **Expressions** page of the bar chart (Figure 5 on page 36). The gauge chart will always display the value of the first expression only.

Sort

In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Style

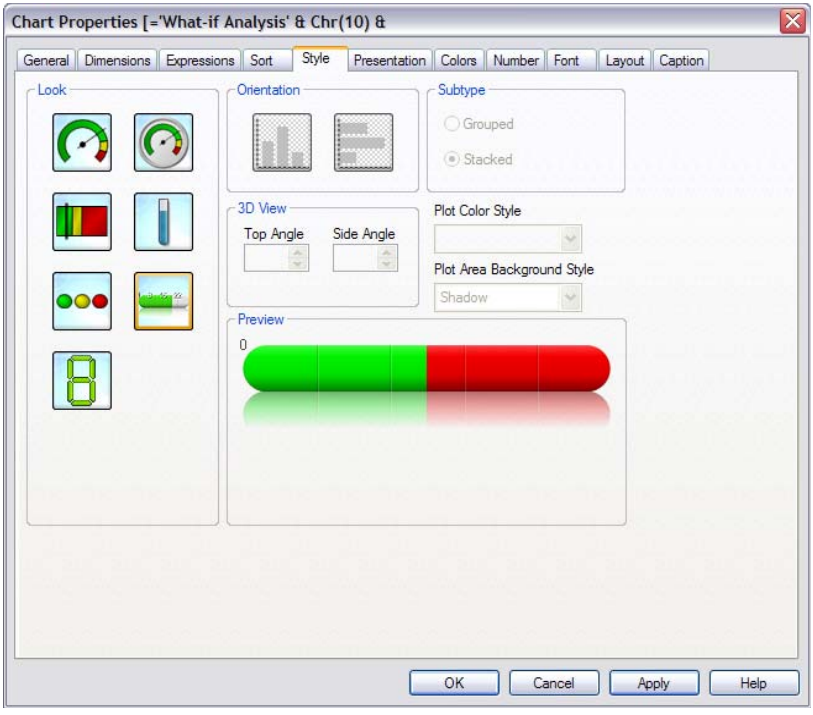


Figure 46. The Style page for gauge charts

In this page you select the basic style of the gauge chart.

Look Select one of the available styles.

Orientation

Here you can set the orientation of the chart to either vertical or horizontal as indicated by the icons. The setting is only relevant for linear and traffic light style gauges.

Preview

Offers a preview of the basic visual properties of the chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Presentation

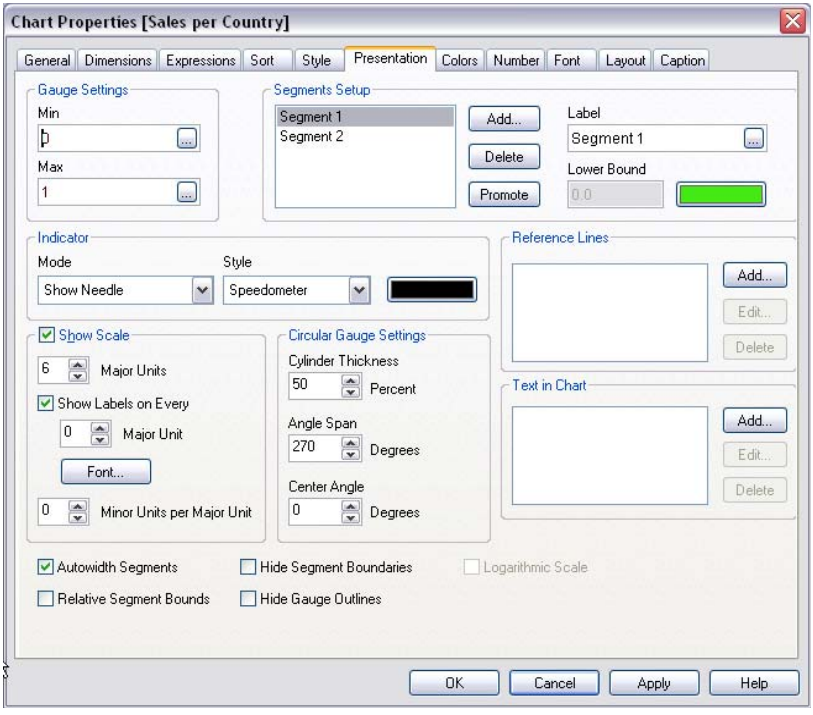


Figure 47. The Presentation page for circular gauge charts in the Chart Properties dialog

By changing the settings on this page, you modify the way the gauge chart is presented on the screen. The **Presentation** page gauge charts looks slightly different depending on which style you have selected on the **Style** page.

Gauge Settings

In the **Gauge Settings** group you set minimum and maximum values for the gauge chart.

Min Specifies the minimum value of the gauge. This corresponds to the bottom position of the gauge indicator.

Max Specifies the maximum value of the gauge. This corresponds to the top position of the gauge indicator.

Segments Setup

In this group you define the segments making up the gauge. All gauges except LED style gauges must have at least one segment. For circular and linear gauges the segments make up differently col-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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ored areas in the gauge background. For traffic light gauges each segment corresponds to one light. A list of segments is shown and you may select one segment in the list to change its properties.

Add Adds a new segment at the end of the list.

Delete Deletes the segment currently selected in the list.

Promote
Moves the segment currently selected in the list one step up.

Label Specifies a name for the selected segment. This name is for identification only and is not used when drawing the gauge chart.

Lower Bound
Specifies the gauge value where the selected segment starts. The upper bound of a segment is the lower bound of the following segment or, in case of the last segment the gauge's **Max** value. This value can only be edited if the option **AutoWidth Segments** (see below) has been deselected. The value can be entered as a formula for dynamic update. If the option **Relative Segment Bounds** (see below) has been selected the segment bounds should be entered as numbers between 0 and 1 indicating a fraction of the total range between the **Min** and **Max** values.

Color Click the color button to specify the color of the segment. The color can be defined as a solid color or a gradient via the **Color Area dialog** (see page 23) that opens when clicking the button. Gradients have no effect in traffic light style gauges.

Indicator

In the **Indicator** group you set the visual properties of the gauge indicator. This group is not available for LED style gauge charts.

Mode Specifies the value display mode of the gauge.

* For circular and linear style gauges the following four modes are available:

Show Needle
Shows the gauge value by means of a needle indicator. The type of needle can be set under **Style** below.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Fill to Value
Shows the gauge value by means of filling the gauge background with the defined segment color(s) only up to the current value. The remaining part up to the **Max** value is left blank.

Needle and Fill to Value
Combines the two options above.

No Indicator
Neither needle indicator nor fill to value is used. This option can be valuable when using dynamically calculated segment bounds to indicate gauge value(s).

For traffic light style gauges the following three modes are available:

Indicate Value
Shows the gauge value by lighting up the single light corresponding to the current gauge value.

Fill to Value
Shows the gauge by lighting up the lights corresponding to all segments up until and including the segment containing the current gauge value.

Single Light
Shows the gauge value by lighting up the single light corresponding to the segment containing the current gauge value while hiding all other segment lights. Creates the effect of one single light changing colors depending on the color of the segment corresponding to the current gauge value.

Style Specifies the style of the needle for circular and linear style gauges and for the area surrounding the lights in traffic light style gauges. Several styles are available depending on the type of gauge.

Color Click the color button to specify the color of the indicator needle. Not applicable for traffic light gauges.

Reverse Direction
Select this check box to reverse the plot direction of a traffic light gauge. This option is only available for traffic light gauges.

Show Scale
Select this check box to show a scale. This group is only available for circular and linear style gauges.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Major Units

Defines the number of major units on the gauge scale.

Show Labels on Every *n* Major Unit

Select this check box to show text labels on the gauge scale. The density of labels can be entered in the edit box.

Font Press the button to set a font for the scale label text.

Minor Units per Major Unit

Defines the number of minor units between each major unit on the gauge scale.

Circular Gauge Settings

In this group, which is specific to circular style gauge charts, you specify the properties of the gauge shape.

Cylinder Thickness

The gauge is normally drawn as a solid circle or circle segment. By setting this property to a value larger than 1, a "hole" will be left in the center of the circle. The value which indicates the percentage of the radius to be left unfilled must be between 0 and 99.

Angle Span

The angle in degrees between the **Min** and **Max** values in the gauge. Must be a value between 45 and 360.

Center Angle

The angle of the gauge's center value in relation to the clock. Must be a value between 0 and 360. 0 indicates the center at the top of the gauge (12 o'clock).

Text in Chart

In the **Text in Chart** group you can add free text to the chart.

Add By pressing this button you open the **Text in Chart** button where you may create and edit free-floating texts to be displayed in the chart. See page 61 for details about the **Text in Chart** dialog.

Edit Mark an existing text in the list and click this button in order to edit its properties in the **Text in Chart** dialog.

Delete

Mark an existing text in the list and click this button in order to delete it from the list.

Reference Lines

In the **Reference Lines** group you can define reference lines intersecting the gauge background area at a given value. Reference lines

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are only available in circular and linear style gauges. A list shows all existing reference lines in the chart.

Add Opens the **Reference Lines** dialog for creation of a new reference line in the chart. See page 59 for details about the Reference Lines dialog.

Edit Mark an existing reference line in the list and click this button in order to edit its properties in the **Reference Lines** dialog. Double-clicking the reference line in the list has the same effect. See page 57 for details about the **Reference Lines** dialog.

Delete Mark an existing reference line in the list and click this button in order to delete it from the list.

Autowidth

If this check box is marked, the segment bounds will be calculated automatically based on the gauges **Min** value, **Max** value and the number of segments defined.

Relative Segment Bounds

If this option is selected the segment bounds can be entered as numbers between 0 and 1 indicating a fraction of the total range between the **Min** and **Max** values.

Hide Segment Boundaries

If this check box is marked no outline will be made in the segment boundaries of circular and linear gauges. Useful when creating background gradients with more than two colors.

Logaritmic Scale

If this check box is marked, the gauge scale will be logaritmic.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Suppress Zero-Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

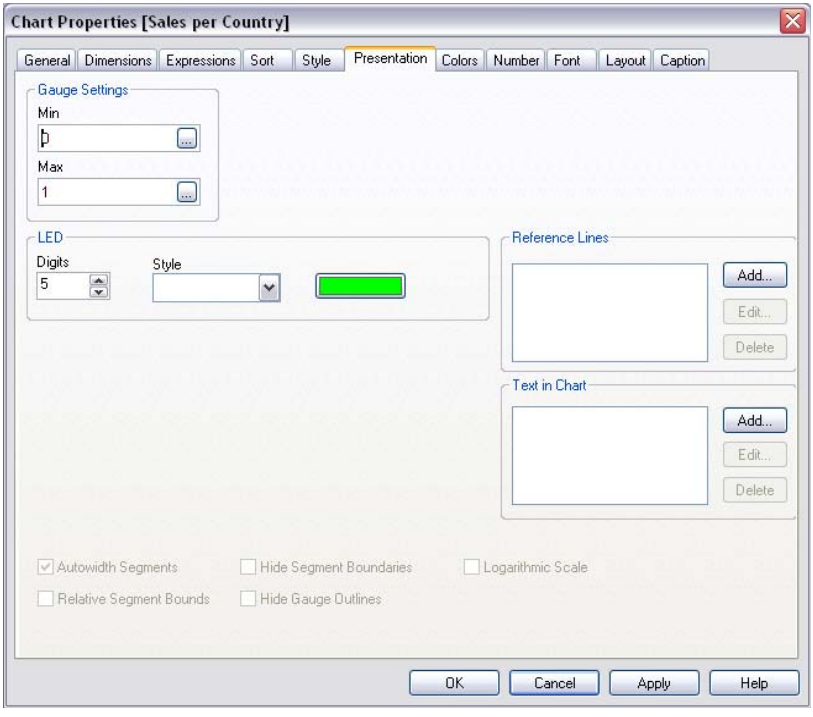


Figure 48. The Presentation page for LED gauge charts in the Chart Properties dialog

LED In the LED group, which is specific to LED style gauge charts, you set the visual properties for the LED display.

Digits Specifies the number of LED display digits shown.

Color Click the color button to specify the color of the LED segments.

Colors

In the **Colors** page, the display colors can be set. This page is identical with the **Colors** page of the bar chart (Figure 13 on page 67). Note that the color map under **Data Appearance** has no meaning in a gauge chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the chart. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73).

Layout

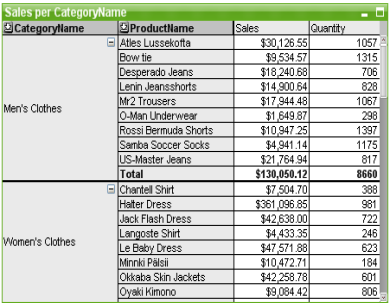
In the **Layout** page, you can specify how the gauge chart should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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12 PIVOT TABLE



Sales per CategoryName

CategoryName	ProductName	Sales	Quantity
Men's Clothes	Atles Lussekotta	$30,126.55	1057
	Bow tie	$9,534.57	1315
	Desperado Jeans	$18,240.68	706
	Lenin Jeansshorts	$14,900.64	828
	Mr2 Trousers	$17,944.48	1067
	O-Man Underwear	$1,649.87	298
	Rossi Bermuda Shorts	$10,947.25	1397
	Samba Soccer Socks	$4,941.14	1175
	US-Master Jeans	$21,764.94	817
	Total	**$130,050.12**	**8660**
Women's Clothes	Chantell Shirt	$7,504.70	388
	Halter Dress	$361,096.85	981
	Jack Flash Dress	$42,838.00	722
	Langoste Shirt	$4,433.35	246
	Le Baby Dress	$47,571.88	623
	Minnki Pälsii	$10,472.71	184
	Okkaba Skin Jackets	$42,258.78	601
	Oyaki Kimono	$9,084.42	806

Figure 49. An example of a pivot table

The pivot table is one of the most powerful tools for analyzing data. The QlikView 6 pivot table has been equipped with functionality making it more versatile and powerful than ever before.

12.1 Creation

Pivot tables are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the table. Pivot tables are logically equivalent to charts.

12.2 Using the Pivot Table

Pivoting - Moving the Dimension Fields

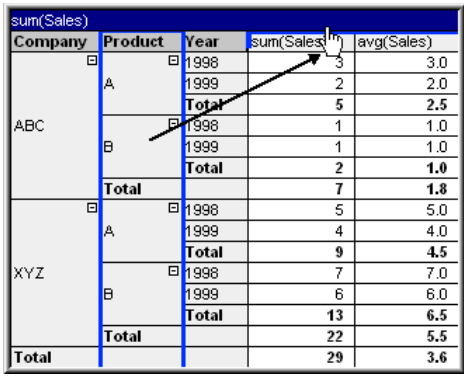
In a pivot table, the dimension fields and expressions can be shown on one vertical and one horizontal axis. Dimensions and expressions can be moved freely between or within the axes. This is called pivoting. Pivoting in QlikView is done by means of dragging and dropping with the mouse.

Note You can disable the pivoting of a pivot table by deselecting the check box **Allow Pivoting** on the **Presentation** page in the **Properties** dialog of the pivot table.

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Example:

To move the field *Product* in the pivot table below from the vertical axis to the horizontal axis, point with the mouse in the *Product* column. Press the left mouse button and keep it depressed while dragging the mouse cursor up above the expression label row. The selected column and its target are highlighted in blue while you are dragging.

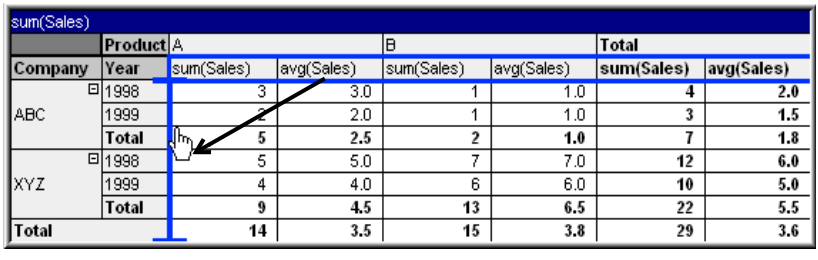


sum(Sales)				
Company	Product	Year	sum(Sales)	avg(Sales)
ABC	A	1998	3	3.0
		1999	2	2.0
		Total	5	2.5
	B	1998	1	1.0
		1999	1	1.0
		Total	2	1.0
	Total		7	1.8
XYZ	A	1998	5	5.0
		1999	4	4.0
		Total	9	4.5
	B	1998	7	7.0
		1999	6	6.0
		Total	13	6.5
	Total		22	5.5
Total			29	3.6

The result:

sum(Sales)							
	Product	A		B		Total	
Company	Year	sum(Sales)	avg(Sales)	sum(Sales)	avg(Sales)	sum(Sales)	avg(Sales)
ABC	1998	3	3.0	1	1.0	4	2.0
	1999	2	2.0	1	1.0	3	1.5
	Total	5	2.5	2	1.0	7	1.8
XYZ	1998	5	5.0	7	7.0	12	6.0
	1999	4	4.0	6	6.0	10	5.0
	Total	9	4.5	13	6.5	22	5.5
Total		14	3.5	15	3.8	29	3.6

Not only the dimension fields, but also the expression row can be pivoted:



sum(Sales)							
	Product	A		B		Total	
Company	Year	sum(Sales)	avg(Sales)	sum(Sales)	avg(Sales)	sum(Sales)	avg(Sales)
ABC	1998	3	3.0	1	1.0	4	2.0
	1999	2	2.0	1	1.0	3	1.5
	Total	5	2.5	2	1.0	7	1.8
XYZ	1998	5	5.0	7	7.0	12	6.0
	1999	4	4.0	6	6.0	10	5.0
	Total	9	4.5	13	6.5	22	5.5
Total		14	3.5	15	3.8	29	3.6

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The result:

sum(Sales)					
Company	**Year**	**Product**	A	B	**Total**
ABC	1998	sum(Sales)	3	1	**4**
		avg(Sales)	3.0	1.0	**2.0**
	1999	sum(Sales)	2	1	**3**
		avg(Sales)	2.0	1.0	**1.5**
	Total	sum(Sales)	5	2	**7**
		avg(Sales)	**2.5**	**1.0**	**1.8**
XYZ	1998	sum(Sales)	5	7	**12**
		avg(Sales)	5.0	7.0	**6.0**
	1999	sum(Sales)	4	6	**10**
		avg(Sales)	4.0	6.0	**5.0**
	Total	sum(Sales)	9	13	**22**
		avg(Sales)	**4.5**	**6.5**	**5.5**
Total		**sum(Sales)**	**14**	**15**	**29**
		avg(Sales)	**3.5**	**3.8**	**3.6**

Expanding and Collapsing the Dimension Axes

QlikView pivot tables allow you to expand and collapse dimensions on the axes by single field values. This allows you to drill down into details for one or more field values while keeping the totals for others.

Note You can disable the expand and collapse options for a pivot table by selecting the check box **Always fully expanded** on the **Presentation** page in the pivot table **Properties** dialog.

Example (expanding):

In the pivot table below, the ⊞ icons to the right of the field values in the Company column indicate that the table can be expanded for further detail.

sum(Sales)		
Company	sum(Sales)	avg(Sales)
ABC ⊞	7	1.8
XYZ ⊞	22	5.5
Total	**29**	**3.6**

A click on the first ⊞ displays the Product details for the company ABC:

sum(Sales)			
Company	**Product**	sum(Sales)	avg(Sales)
ABC ⊟	A ⊞	5	2.5
	B ⊞	2	1.0
	Total	**7**	**1.8**
XYZ ⊞		22	5.5
Total		**29**	**3.6**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Each field value can be separately expanded to show the next level. In order to expand all field values in a certain column, right-click in that column and select **Expand All** from the object menu. If you do so for the Company column in the table above, the result will be as follows:

sum(Sales)			
Company	**Product**	sum(Sales)	avg(Sales)
ABC	A	5	2.5
	B	2	1.0
	Total	**7**	**1.8**
XYZ	A	9	4.5
	B	13	6.5
	Total	**22**	**5.5**
Total		**29**	**3.6**

The ⊞ icons in the Product column indicate that another level exists. Right-click in the Product column and select **Expand All** again. The result will be:

sum(Sales)				
Company	**Product**	**Year**	sum(Sales)	avg(Sales)
ABC	A	1998	3	3.0
		1999	2	2.0
		Total	**5**	**2.5**
	B	1998	1	1.0
		1999	1	1.0
		Total	**2**	**1.0**
	Total		**7**	**1.8**
XYZ	A	1998	5	5.0
		1999	4	4.0
		Total	**9**	**4.5**
	B	1998	7	7.0
		1999	6	6.0
		Total	**13**	**6.5**
	Total		**22**	**5.5**
Total			**29**	**3.6**

As no ⊞ icons are available in the Year column, we can conclude that there are only three dimension fields available in this pivot table.

Example (collapsing):

Just as you expand with the ⊞ icons, you can collapse individual values by clicking on the ⊟ icons.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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If you click on the ⊟ icon to the right of the value A in the table above, the result will be:

sum(Sales)				
Company	Product	Year	sum(Sales)	avg(Sales)
ABC	⊟ A	⊞	5	2.5
	B	⊟ 1998	1	1.0
		1999	1	1.0
		Total	**2**	**1.0**
	Total		**7**	**1.8**
XYZ	⊟ A	⊞	9	4.5
	B	⊟ 1998	7	7.0
		1999	6	6.0
		Total	**13**	**6.5**
	Total		**22**	**5.5**
Total			**29**	**3.6**

Finally, even the first column can be collapsed, leaving only the grand total of the expression for the vertical axis. This is done by right-clicking in any of the field dimension columns and choosing **Collapse Dimension Columns** from the object menu. The result will be as follows:

sum(Sales)		
	sum(Sales)	avg(Sales)
⊞	29	3.6

From here you may expand again!

The expand and collapse possibilities apply equally for multiple dimension fields on the horizontal axis as is illustrated in the pivot table below.

sum(Sales)								
	Product	A		B		Total		
Company	Year	sum(Sales)	avg(Sales)	sum(Sales)	avg(Sales)	sum(Sales)	avg(Sales)	
ABC	⊟ 1998	3	3.0	1	1.0	**4**	**2.0**	
	1999	2	2.0	1	1.0	**3**	**1.5**	
	Total	**5**	**2.5**	**2**	**1.0**	**7**	**1.8**	
XYZ	⊟ 1998	5	5.0	7	7.0	**12**	**6.0**	
	1999	4	4.0	6	6.0	**10**	**5.0**	
	Total	**9**	**4.5**	**13**	**6.5**	**22**	**5.5**	
Total		**14**	**3.5**	**15**	**3.8**	**29**	**3.6**	

12.3 Pivot Table Object Menu

The pivot table **Object** menu is found as the **Object** menu when a pivot table is active. It can also be opened as a float menu by clicking with the right mouse button on a pivot table. The menu contains the following commands:

Properties...

Opens the **Chart Properties** dialog, from which you can set the properties of the chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Detach

Makes the table static, i.e. cuts the hot link to the selected data.

Attach Attaches a detached chart, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the table.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Fit Columns to Data

Adjusts the width of all columns in the tables to the widest data in each column. The header is included in the calculation.

Equal Columnwidth

Sets the columnwidth in the table. Only available when you right-click a dimension field.

Custom Format Cell

Opens the **Custom Format Cell** dialog (see page 158 in Book II) which lets you format cells in the column you clicked upon. The command is only available when design grid is turned on or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Change Value

Only available for expression columns containing an inputsum aggregation of an input field. Sets the cell that has been clicked in input edit mode. Equivalent to clicking the input icon in the cell.

Restore Values

Only available for expression columns containing an inputsum aggregation of an input field. Opens a cascade menu with three options.

Restore Single Value

Restores the field values underlying the cell that has been clicked to their default values from the script.

Restore Possible Values

Restores the values of all possible underlying field values to their default values from the script.

Restore All Values

Restores the values of all field values to their default values from the script.

Clear All Selections

Deselects the values of all the fields in the bar chart.

Export...

Exports the contents of the table to a file of your choice. The file formats offered include a range of delimited text file formats, HTML, XML, BIFF (native Excel format) and QVD (QlikView Data files, see in Book I).

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Full Table

Copies the table to the clipboard, complete with header and selection status.

Table Data Area

Copies only the values of the table to the clipboard.

Cell Value

Copies the text value of the list box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Values Copies the values to the clipboard in the form of a table.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Print... Opens the standard **Print** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the table to Microsoft Excel, which is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Minimize

Iconizes the chart. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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caption (if shown). This command is available only if you have selected the option **Allow Maximize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

Remove

Removes the table.

12.4 Chart Properties

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart or table, e.g. the chart type, the dimensions, titles, etc.



Once a table is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart or table etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the table can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29). A pivot table can have a large number of dimensions. The limit is set by the RAM available.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Expressions

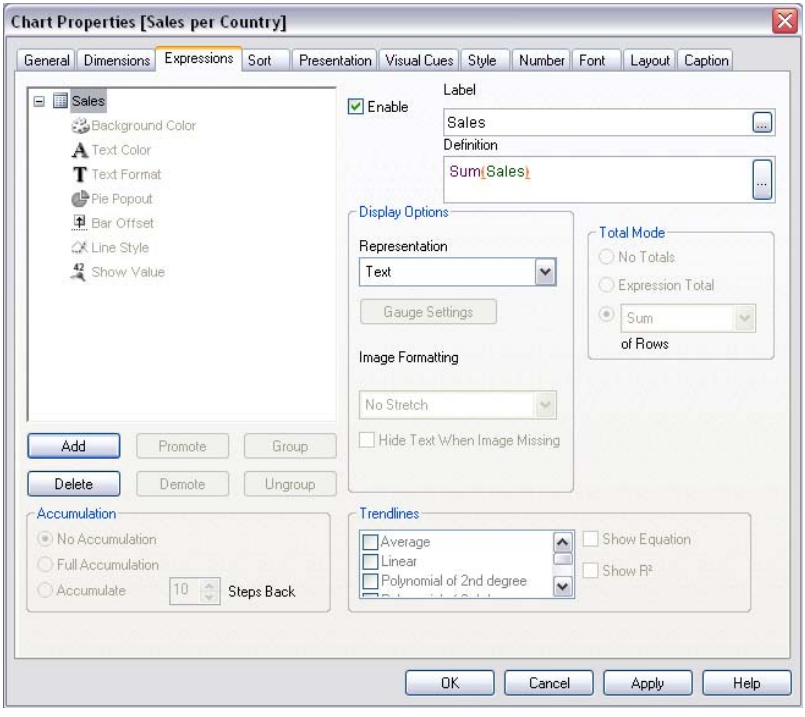


Figure 50. The Expressions page for pivot tables in the Chart Properties dialog

On the **Expressions** page you set the expressions to be displayed in the table. The Expressions page for table charts differ in a number of ways to the corresponding page for bitmap charts. As an example trendlines, accumulation, and relative expressions are not available in pivot tables.

Expressions

The upper left corner of the dialog contains a list of the chart's expressions. An expression defines the calculated contents of a chart, e.g. the data shown in an expression column in the table.

Navigating the Tree Control

The expression list is in fact a tree control with a large set of control options. In front of each expression you will find an expansion icon ⊞ . By clicking the expansion icon you open up underlying sub expressions or attribute expressions. The icon will then shift to a collapse icon ⊟ . By clicking that icon you collapse the display of

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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any sub expressions or attribute expressions. In complex cases up to three levels of expansion may be possible.

Display Options / Plot Modes
After the expansion/collapse icon on each row you will see an icon corresponding to the type of display to be used for the expression. These are normally set in the **Display Options** group (see below). There is for example one icon T for expressions plotted as plain text, one for expressions plotted as gauges in cells and so on. Only icons reflecting plot types possible in the active chart type will be shown.

Sub expressions
Certain plot options in bitmap charts make use of sub expressions, i.e. a set of two or more expressions that together define the plot symbol. If **Stock** or **Box** plot has been selected as **Display Option** for and expression in a combo chart, that expression will be displayed as an empty placeholder with four or five sub expressions when changing the chart type into a table chart. The display options in the table chart can be set individually for each of the sub expressions. All expression definitions lie within the sub expressions.

Attribute expressions
Expression data can be dynamically formatted by means of attribute expressions. Click on the '+' expansion icon in front of any expression to display the placeholders for the dimension's attribute expressions. You may choose to use any number and combination of attribute expressions on a given base expression. Formatting defined by means of attribute expression supersede all formatting implied by table style or visual cues. The available attribute expression types are:

Background Color

Click on the **Background Color** in order to define an attribute expression for calculating the table cell background color of the data point. The calculated color will have precedence over table style and visual cues. The expression used should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, white background will be used. Whenever a

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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background color attribute expression is entered for an expression, the icon will turn from gray scale to color.

Text Color

Click **Text Color** in order to define an attribute expression for calculating the table cell text color of the data point. The calculated color will have precedence over table style and visual cues. The expression used should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. Whenever a text color attribute expression is entered for an expression, the icon will turn from gray scale to color.

Text Format

Click Text Format in order to enter an attribute expression for calculating the font style of text in the table cell for each dimension cell. The calculated text format will have precedence over table style. The expression used as text format expression should return a string containing a B for bold text, I for italic text and/or U for underlined text. Whenever a text format attribute expression is entered for and expression, the color of the attribute expression placeholder will change from gray to black.

Expression Cycle Groups

Finally there is the concept of expression groups. Any number of base expression (with their respective sub expressions and attribute expressions) may be bundled together in a group. A group is shown in the list as a placeholder with a cycle icon. By expanding the group, you can see the expressions it contains. In the chart only the first expression in the list will be used for display. The expression to be shown out of the group can be changed by clicking the cycle icon in the chart or in the table expression column header. By right-clicking the cycle icon, you get a pop-up list of the available expressions for direct selection. When you cycle the group the second expression will be promoted to the top of the list and the previously active expression demoted to the bottom of the list.

You can add an expression to a group in two ways. The first method is by simply dragging an expression on top of another expression in the list (creates a new cycle group) or on top of an existing cycle

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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group in the list (adds the expression to the existing group). The second method is by selecting an expression in the list and then click on the Group button (see below). The expression will then be grouped with the expression or cycle group residing above it in the list.

You can correspondingly remove an expression from a group by dragging it out of the group in the list or by selecting it and pressing the Ungroup button (see below). If only one expression remains in the cycle group after the extraction, that expression will also be extracted and the cycle group will cease to exist.

Add By clicking this button, you get to the **Edit Expression** dialog (page 229), where it is possible to create new expressions.

Delete Deletes the selected expression.

Promote

Promotes the selected expression one step up in the list. Use this button if you want to change the order of the expressions.

Demote

Demotes the selected expression one step down in the list. Use this button if you want to change the order of the expressions.

Group It is possible to group two or more expressions, so that only one of them is displayed in the chart at any given time. The expression to be shown out of the group can be changed by clicking the cycle icon in the chart or in the table expression column header. By right-clicking the cycle icon, you get a pop-up list of the available expressions for direct selection (see the picture below). You may assign an expression to a cycle group by selecting an expression in the list and then click on the Group button. The expression will then be grouped with the expression or cycle group residing above it in the list.

Ungroup

This command is only available when an expression belonging to a cycle group has been selected in the Expressions list above. By clicking the button the expression will be moved out of the cycle group and placed as an independent expression after the cycle group in the list. If only one expression remains in the cycle group after the extraction, that expression will also be extracted and the cycle group will cease to exist.

Label The label of the expression. Enter the name you wish to display in the chart. If no text is entered, the label will be automatically set to the expression text. The text may be entered as a calculated expression for automatic update.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Definition

Shows the composition of the selected expression. It is possible to edit the expression directly in this box. By clicking the ... button the full **Edit Expression** dialog is opened.

Enable

Marking this check box will enable the selected expression. If the box is not marked, the expression will not be used at all.

Relative

Marking this check box will set the chart to show the result in percent instead of absolute numbers. This option is not available for pivot tables.

Total Mode

By selecting one of the options in this group, you decide how the total of the selected expression is to be calculated. This setting is important for relative display or when showing totals. In pivot tables Expression Total will always be used and this setting will be disabled in the dialog.

No Totals

If this option is selected no total will be calculated for the expression.

Expression Total

If this option is selected, the expression total will be calculated using all the values of the field. If, e.g., the selected column contains the average salaries for different business categories, choosing the Expression Total option will result in the average salary for all the business categories.

F(x) of Rows

If this option is selected, the individual values of each data point (each bar in a bar chart, each row in a straight table etc.) for the selected expression will be summed up aggregated using the selected aggregation function (typically summed up). This option is not available for pivot tables.

Display Options

This group defines what will be written in the table chart expression cells.

Representation

Three alternatives are given:

Text When selecting this option the expression values will always be interpreted and displayed as text.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Image
When selecting this option QlikView will try to interpret each expression value as a reference to an image. The reference may be a path to an image file on disk (e.g. `C:\Mypic.jpg`) or inside the qvw document (e.g. `qmem://<Name>/<Peter>`). If QlikView cannot interpret an expression value as a valid image reference, the value itself will be displayed.

Circular Gauge
When selecting this option QlikView will display the expression value in a circular style gauge. The gauge chart will be inscribed in the available table cell. The visual settings for the gauge can be modified via the **Gauge Settings...** button.

Linear Gauge
When selecting this option QlikView will display the expression value in a horizontal linear style gauge. The gauge chart will be inscribed in the available table cell. The visual settings for the gauge can be modified via the **Gauge Settings...** button.

Traffic Light Gauge
When selecting this option QlikView will display the expression value in a horizontal traffic light style gauge. The gauge chart will be inscribed in the available table cell. The visual settings for the gauge can be modified via the **Gauge Settings...** button.

LED Gauge
When selecting this option QlikView will display the expression value in a LED style gauge. The gauge chart will be inscribed in the available table cell. The visual settings for the gauge can be modified via the **Gauge Settings...** button.

Hide When selecting this option the expression is not shown in the table.

Gauge Settings...
Only available when one of the gauge options has been selected above. Opens a dialog for setting the properties of the gauge. This dialog is essentially equal to the **Presenta-**

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tion page of Chart Properties for gauge charts (see page 186).

Image Formatting

Only available when the image options have been selected above. This setting describes how QlikView formats the image to fit in the cell. There are four alternatives.

No Stretch

If this option is selected, the image will be shown as is, without any stretching. This may cause parts of the picture to be invisible or only part of the cell to be filled.

Fill If this option is selected, the image will be stretched to fit the cell without bothering about keeping the aspect ratio of the image.

Keep Aspect

If this option is selected, the image will be stretched as far as possible to fill the cell while keeping the aspect ratio. This typically results in areas either on both sides of or above and below which are not filled by the image.

Fill with Aspect

If this option is selected, the image will be stretched to fill the cell in both directions while keeping the aspect ratio. This typically results in cropping of the image in one direction.

Hide Text When Image Missing

If this option is selected, QlikView will not display the field value text if interpretation as an image reference fails for some reason. The cell will then be left blank.

Has Color Expression

Mark this check box to have an auxiliary expression following the selected expression utilized for calculating the cell background color of the data point. The calculated background color will have precedence over table style and visual cues. The expression used as color expression should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be

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used. An expression used as color expression is preceded by the icon in the **Expressions** list and cannot be utilized for anything else in the chart. If there is no expression already defined after the selected expression, new dummy expressions will be created automatically.

Has Text Color Expression

Mark this check box to have an auxiliary expression following the selected expression utilized for calculating the color of text in the table cell for each data point. The calculated background color will have precedence over table style and visual cues. The expression used as text color expression should return a valid color representation (a number representing the Red, Green and Blue components as defined in Visual Basic), which is typically achieved by using one of the special chart color functions (see page 413). If the result of the expression is not a valid color representation, black will be used. An expression used as color expression is preceded by the icon **?** in the **Expressions** list and cannot be utilized for anything else in the chart. If there is no expression already defined after the selected expression, new dummy expressions will be created automatically.

Has Text Format Expression

Mark this check box to have an auxiliary expression following the selected expression utilized for calculating the font style of text in the table cell for each data point. The calculated background color will have precedence over table style and visual cues. The expression used as text format expression should return a string containing a B for bold text, I for italic text and/or U for underlined text. An expression used as text format expression is preceded by the icon **?** in the **Expressions** list and cannot be utilized for anything else in the chart. If there is no expression already defined after the selected expression, new dummy expressions will be created automatically.

Note When an expression has several auxiliary expressions attached to it they will appear in the following order: Color expression, text color expression, text format expression.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sort In this page you can sort the values of the dimensions according to one of the available sort orders. This page is identical with the **Sort** page of the bar chart (Figure on page 48).

Presentation

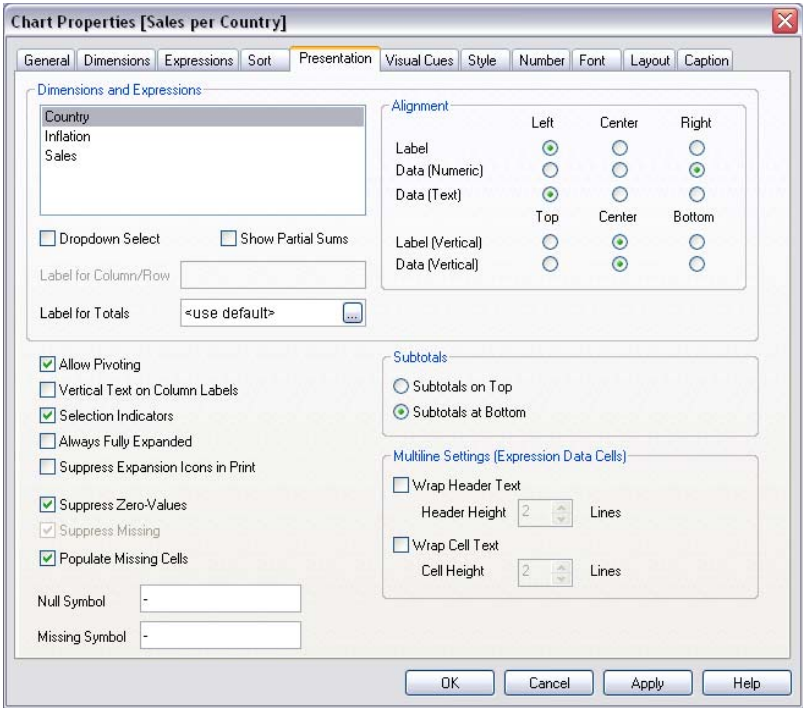


Figure 51. The Presentation page for pivot tables in the Chart Properties dialog

By changing the settings on this page, you modify the way the pivot table is presented on the screen.

Dimensions and Expressions

A list of the dimensions and expressions chosen for display in the pivot table. Selecting one from the list makes it possible to change its settings.

Drop-down Select

If this check box is selected for a field column, a drop-down icon will appear to the left in the column header. By clicking on the icon a list box showing all field values of the field will be opened over the table. You may then make

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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selections and searches in the same manner as if the field had been a row in a multi box.

Label The text entered here will be shown as title label for the selected dimension or expression, if applicable.

Label for Totals

Here you can specify the text to be shown in the label cells for totals. If no explicit label is specified, the string 'Total' will be used.

Alignment

In this group, the alignment of the expression values and their labels within the pivot table can be set. **Label**, **Data (Numeric)** and **Data (Text)** can be individually set to left-adjusted, centered or right-adjusted. When multi line cells and labels are used, the vertical alignment can be **Top**-, **Center**- or **Bottom**-adjusted.

Allow Pivoting

Deselect this check box to disable the drag-and-drop pivoting.

Selection Indicators

If this check box is selected selection indicators (beacons) will be shown in table columns containing fields with selections. For new tables this setting takes its default from the **Selection Indicators in Tables** settings on the **Objects** page of **User Preferences**.

Vertical Text

If this check box is marked, the column titles are displayed vertically.

Always Fully Expanded

If this check box is selected, all the dimensions are always fully expanded, and the expand/collapse functionality is turned off.

Suppress Expansion Icons in Print

Select this check box if you do not want the '+' and '-' icons for partial expand and collapse to be visible when printing the pivot table.

Suppress Zero Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only null values in all fields in all expressions will be disregarded in the calculation. This option is selected by default.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Turning it off can be useful only in special cases, e.g. if you want to count null values in a chart.

Populate Missing Cells

When this check box is marked, cells in cross tables representing missing combinations of dimensions will be mapped to a regular null value. Thereby it becomes possible to apply expressions testing for null and for attribute expressions and style formats to be applied. This setting is turned on by default for all pivot tables created in QlikView 7.5 and later.

Subtotals

This group contains settings for display of totals and subtotals in the pivot table.

Subtotals on Top

In this option is selected, the totals will be displayed top/left in the pivot table.

Subtotals at Bottom

If this option is selected, the totals will be displayed bottom/right in the pivot table.

Multiline Settings (Expression Data Cells)

In this group you can set the height of the expression data cells.

Wrap Text

If this check box is marked, the contents of the data cells will be wrapped in two or more lines.

Cell Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the cell should have.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Visual Cues

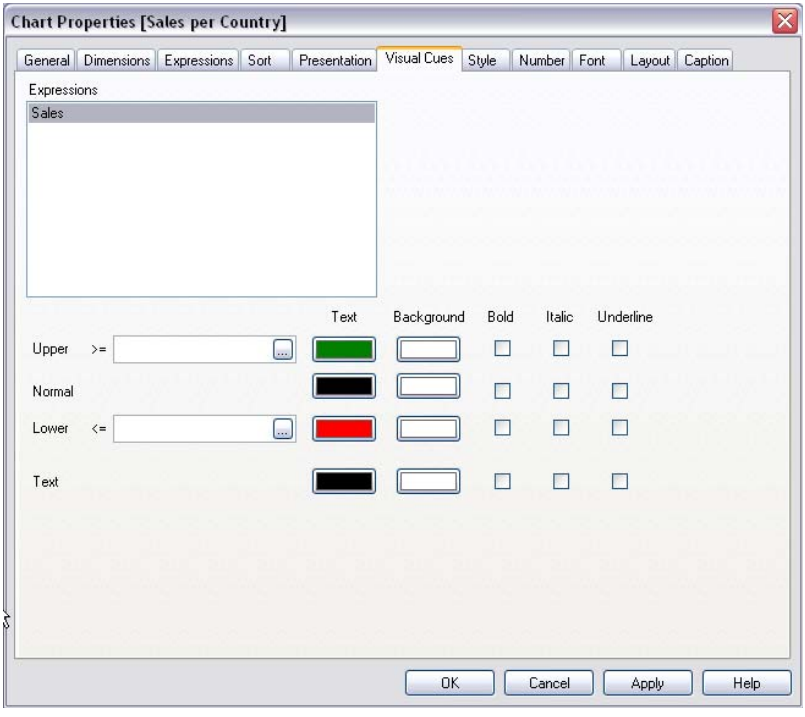


Figure 52. The Visual Cues page for pivot tables in the Chart Properties dialog.

Visual Cues are used to highlight expression values in the table. Values belonging to different value categories can be given separate color and/or font style. Up to four value categories, three different intervals for numeric data plus one for text data, can be individually formatted. Visual cues override table style settings for a given cell.

Expressions

A list of the expressions of the chart. One or more expressions can be selected for formatting of visual cues.

Upper >

Settings for the upper numeric interval value category. The numeric value above which the upper interval of numeric values begins is stated in the edit box. If this box is left empty no upper interval is defined. The limit may be defined as a calculated formula (see page 439) for dynamic update of its value. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Normal

Settings for the normal numeric interval value category. This interval is defined as all values between the limits and the limits themselves. By default, all numeric values fall within the normal interval.

Lower <

Settings for the lower numeric interval value category. The numeric value below which the lower interval of numeric values begins is stated in the edit box. If this box is left empty no lower interval is defined. The limit may be defined as a calculated formula (see page 439) for dynamic update. By clicking the **...** button the full **Edit Expression** dialog is opened for easier editing of long formulas.

Text Settings for text data. This value category is defined as all values without a valid numeric interpretation.

For each value category there are five options making it possible to give the values within the category a specific font, background color, etc.

Text The color that will be applied to the text of the values. Click the color to redefine it.

Background

The color that will be applied to the cell background. Click the color to redefine it.

Bold For each value category there is a check box which, if selected, will give values within the category bold font style.

Italic For each value category there is a check box which, if selected, will give values within the category italic font style.

Underline

For each value category there is a check box which, if selected, will give values within the category underline font style.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Style

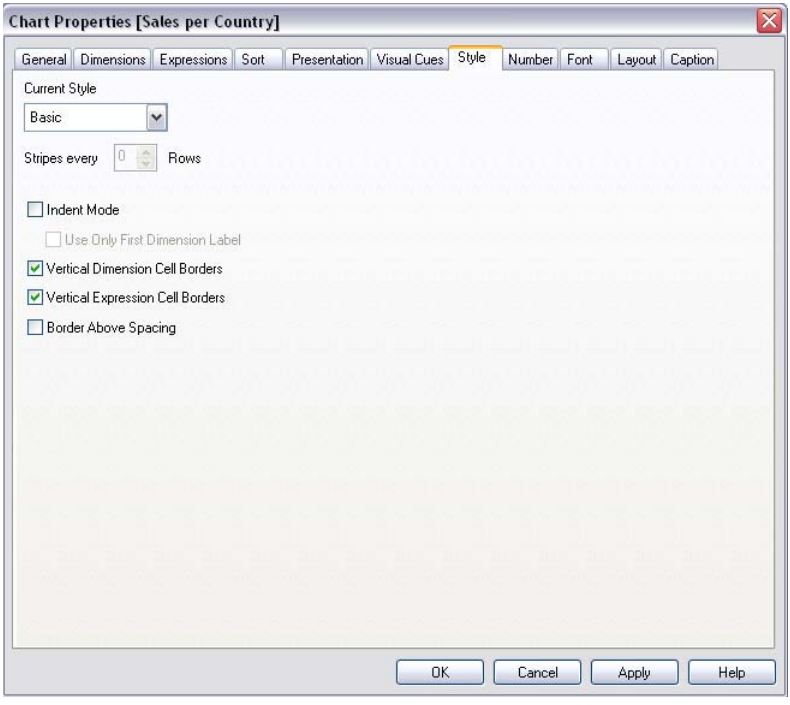


Figure 53. The Style page for pivot tables in the Chart Properties dialog

In the **Style** page, page you make settings for the table formatting style.

Current Style

You can choose an appropriate table style from the drop-down list. If the value **[Custom]** appears in the drop-down control a custom style has been applied to the table. If you change the setting back to one of the pre-defined styles, the custom formatting will be lost.

Indent Mode

If this check box is marked, the pivot table's left (column) dimensions will be displayed in indent mode. This means that the dimension values will replace the "Total" label, allowing for a compact display with just small indents between dimensions. The dimension column area will have a constant width regardless of expand/collapse operations. This setting is only valid for pivot tables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Use Only First Dimension Label

This setting is only meaningful when a pivot table is in indent mode. By marking this check box the dimension label for the first dimension will occupy the entire label row. Dimension labels for subsequent dimensions will not be shown.

Vertical Dimension Cell Borders

If this check box is deselected all vertical cell borders in dimension cells of the current style will be removed.

Vertical Expression Cell Borders

If this check box is deselected all vertical cell borders in expression cells of the current style will be removed.

Border Above Spacing

If this check box is marked dimension spacing rows (as set in the **Advanced Field Settings** dialog on the **Dimensions** page) will be preceded by the same horizontal borders as those below. Furthermore all vertical borders will be removed within the spacing area.

Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the table. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73). The font style cannot be set for pivot tables, since it is defined by the style chosen for the table (see above).

Layout

In the **Layout** page, you can specify how the pivot table should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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13 STRAIGHT TABLE



Sales per CategoryName

CategoryName	ProductName	Sales	Quantity
		$1,565,525.31	51952
Men's Clothes	Atles Lussekofta	$30,126.55	1057
Men's Clothes	Bow tie	$9,534.57	1315
Men's Clothes	Desperado Jeans	$18,240.68	706
Men's Clothes	Lenin Jeansshorts	$14,900.64	828
Men's Clothes	Mr2 Trousers	$17,944.48	1067
Men's Clothes	O-Man Underwear	$1,649.87	298
Men's Clothes	Rossi Bermuda Shorts	$10,947.25	1397
Men's Clothes	Samba Soccer Socks	$4,941.14	1175
Men's Clothes	US-Master Jeans	$21,764.94	817
Women's Clothes	Chantell Shirt	$7,504.70	388
Women's Clothes	Halter Dress	$361,096.85	981
Women's Clothes	Jack Flash Dress	$42,638.00	722
Women's Clothes	Langoste Shirt	$4,433.35	246
Women's Clothes	Le Baby Dress	$47,571.88	623
Women's Clothes	Minnki Pälsii	$10,472.71	184
Women's Clothes	Okkaba Skin Jackets	$42,258.78	601
Women's Clothes	Oyaki Kimono	$9,084.42	806

Figure 54. An example of a straight table

In opposition to the pivot table (see page 193), the straight table cannot display subtotals or serve as a cross table. On the other hand, any of its columns can be sorted and each of its rows contains one combination of dimension(s)+expression(s).

13.1 Creation

Straight tables are created by choosing **New Sheet Object** from the **Layout** menu, or by pressing the **Create Chart** button in the toolbar. This opens a wizard that will help you create the table. Straight tables are logically equivalent to charts.

13.2 Using the Straight Table

Sorting

It is possible to sort the straight table by any column: simply right-click in the column and choose **Sort** from the float menu. This is equivalent to moving the column to the top of the **Priority** list in the **Sort** page of the straight table **Properties** dialog. An alternative method is to sort by double-clicking the column header.

Rearranging the Columns

You can move the dimension columns and the expression columns by dragging and dropping them with the mouse. Point at the column title, then press

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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the mouse button and keep it depressed while dragging the column to its new position. You may mix dimension and expression columns in any order.

13.3 Straight Table Object Menu

The straight table **Object** menu is found as the **Object** menu when a straight table is active. It can also be opened as a float menu by clicking with the right mouse button on a straight table. The menu contains the following commands:

Properties...

Opens the **Chart Properties** dialog, from which you can set the properties of the table.

Detach

Makes the table static, i.e. cuts the hot link to the selected data.

Attach...

Attaches a detached table, i.e. reestablishes the hot link to the selected data.

Clone Creates a copy of the table.

Order->

This cascade menu is only available when the design grid is turned on (see page 83 in Book I) or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I). It contains four commands to set the layout layer of the sheet objects. Valid layer numbers are -127 to 127.

Bring to Front

Sets the layout layer of the sheet object to the largest value currently used by any sheet object on the current sheet.

Send to Back

Sets the layout layer of the sheet object to the smallest value currently used by any sheet object on the current sheet.

Bring Forward

Increases the layout layer of the sheet object by one. Maximum value is 127.

Send Backward

Decreases the layout layer of the sheet object by one. Minimum value is -127.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Sort Sorts the table by the column on which you clicked. When the command is used repeatedly on one column, the sort order is reversed each time.

Custom Format Cell
Opens the **Custom Format Cell** dialog (see page 158 in Book II) which lets you format cells in the column you clicked upon. The command is only available when design grid is turned on or when the **Always Show Design Menu Items** check box is marked (see page 121 in Book I).

Clear All Selections
Deselects the values of all the fields in the straight table.

Fit Columns to Data
Adjusts the width of all columns in the tables to the widest data in each column. The header is included in the calculation.

Equal Columnwidth
Sets the columnwidth of the other dimension or expression columns of the table equal to that of the column or expression that you have right-clicked on. The command works independently for dimension and expression columns.

Change Value
Only available for expression columns containing an inputsum aggregation of an input field. Sets the cell that has been clicked in input edit mode. Equivalent to clicking the input icon in the cell.

Restore Values
Only available for expression columns containing an inputsum aggregation of an input field. Opens a cascade menu with three options.

Restore Single Value
Restores the field values underlying the cell that has been clicked to their default values from the script.

Restore Possible Values
Restores the values of all possible underlying field values to their default values from the script.

Restore All Values
Restores the values of all field values to their default values from the script.

Export...
Exports the contents of the table to a file of your choice. The file formats offered include a range of delimited text file formats,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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HTML, XML, BIFF (native Excel format) and QVD (QlikView Data files, see in Book I).

Copy to Clipboard

This cascade menu contains the various copy options for the chart object.

Full Table

Copies the table to the clipboard, complete with header and selection status.

Table Data Area

Copies only the values of the table to the clipboard.

Cell Value

Copies the text value of the list box cell right-clicked upon (when invoking the **Object** menu) to the clipboard.

Image Copies an image of the chart object to the clipboard. The image will include or exclude the chart object caption and border depending on the settings in the **User Preferences** dialog, **Export** page.

Object Copies the entire chart object to the clipboard for pasting elsewhere in the layout or in another document opened within the current instance of QlikView. This alternative is only available when running QlikView Professional or Developer.

Print... Opens the standard **Print...** dialog box (see page 247), allowing you to print the table.

Print as PDF...

Opens the **Print** dialog with the QlikViewPDF printer preselected. After hitting **OK** you will be prompted for a file name for the PDF output file. This command is only available if a QlikViewPDF printer is available on the system. The QlikViewPDF printer is normally installed as part of the QlikView installation package.

Send to Excel

Exports the table to Microsoft Excel, which is automatically launched if not already running. The table will appear in a new Excel worksheet. For this functionality to work Microsoft Excel 97 or later must be installed on the computer.

Minimize

Iconizes the chart. Clicking  in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Restore

Restores a minimized or maximized chart to its previous size and location. It is also possible to restore the chart by double-clicking the minimized icon. A maximized chart can be restored by double-clicking the caption or clicking , provided that the caption is shown. This command is available only if you have selected at least one of the options **Allow Minimize** or **Allow Maximize** on the **Caption** page (see Figure 18 on page 79) and if the chart is in minimized or maximized state.

Maximize

Enlarges the chart to fill the screen. Clicking in the object caption (if shown) gives the same result. To restore the chart to its previous size and location, choose **Restore** or click in the object caption (if shown). This command is available only if you have selected the option **Allow Minimize** on the **Caption** page (see Figure 18 on page 79).

Help Opens context specific help.

(D) (P) **Remove**

Removes the table.

13.4 Chart Properties

(D) (P)

When you click the **Create Chart** button in the toolbar, the chart wizard is opened. Here you can set the properties of the chart or table, e.g. the chart type, the dimensions, titles, etc.

Once a table is created, you can change its properties at any time. Choose **Properties** from the chart **Object** menu to open the **Chart Properties** dialog. If the **Properties** command is dimmed, you probably don't have the privileges needed to perform property changes (see page 81).

When the wanted properties are set, they can be implemented with the **OK** or **Apply** button. The **OK** button also closes the dialog, whereas the **Apply** button does not.

The wizard and the **Chart Properties** dialog contain a number of pages, which are described below:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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General

On the **General** page (Figure 1 on page 17), you set the chart type, choose a name for the chart or table etc. This page is the same for all the chart types.

Dimensions

On the **Dimensions** page, the dimensions to be shown in the table can be set. This page is identical with the **Dimensions** page of the bar chart (Figure 4 on page 29).

Expressions

On the **Expressions** page you set the expressions to be displayed in the table. This page is identical with the **Expressions** page of the pivot table (Figure 50 on page 202).

Sort

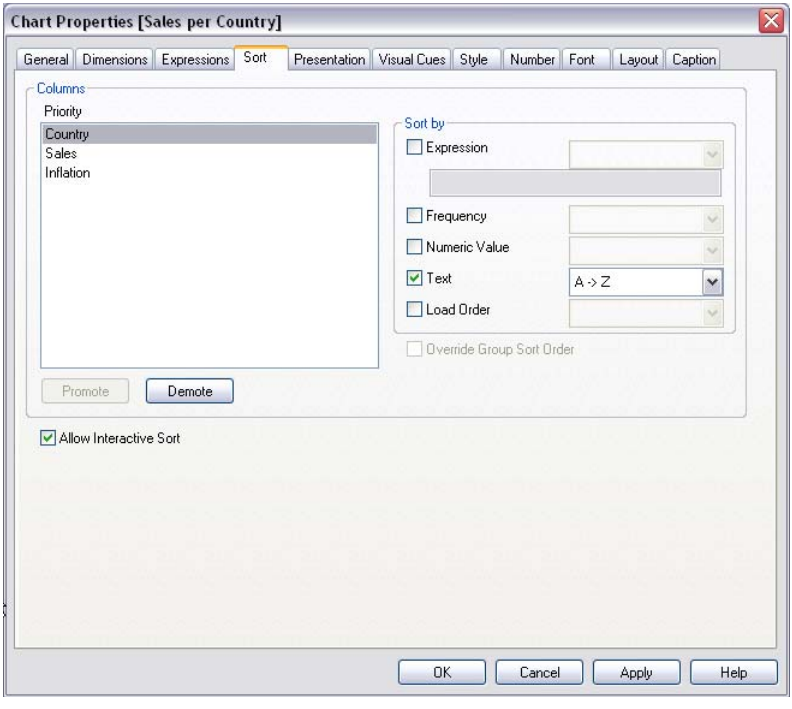


Figure 55. The Sort page for straight tables in the Chart Properties dialog

In this page you set the sort order of the columns as well as that of the column values.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Columns

In the **Columns** group you set sort options for the individual table columns.

Priority Contains the dimensions/expressions chosen as columns listed in sort priority. Selecting one of the columns makes it possible to set the sort order of its values in the **Sort by** group, as well as to change the sort priority by clicking one of the buttons **Promote** or **Demote**.

Promote

Moves the selected column one step further up in the **Priority** box above. The table is sorted according to the sort criteria set for the column at the top.

Demote

Moves the column selected one step further down in the **Priority** box above. The table is sorted according to the sort criteria set for the column at the top.

Sort by In this group, the sort order of the column values can be set.

Expression

Sorts the column values according to the expression entered into the text edit box below this sort option. This option is not available for calculated dimensions.

Frequency

Sorts the column values by frequency (number of occurrences in the table).

Numeric Value

Sorts the column values by their numeric values.

Text Sorts the column values in alphabetical order.

Load Order

Sorts the column values by the initial load order.

Override Group Sort Order

This check box is only available when a group dimension is selected in the Priority list. Normally the sort order of a group dimension is determined for each field in a group via the group properties. By marking this check box you can override any such settings on group level and apply a single sort order for the dimension, regardless of which field is active in the group.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The order of priority is **Expression**, **Frequency**, **Numeric Value**, **Text** and **Load Order**. Each of these sort criteria can be set to ascending or descending.

Allow Interactive Sort

Deselecting this check box will disable the **Sort** command of the object menu.

Presentation

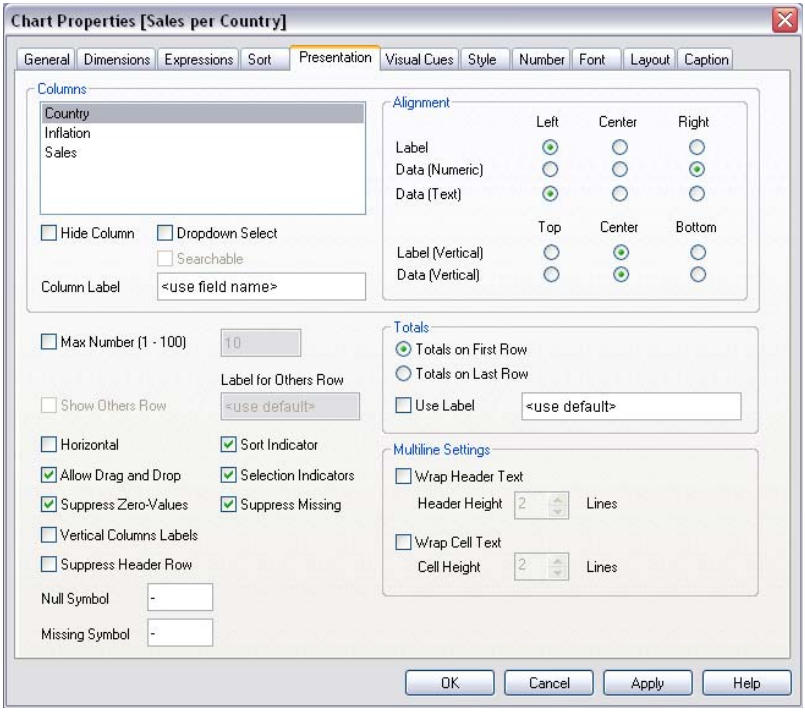


Figure 56. The Presentation page for straight tables in the Chart Properties dialog

By changing the settings on this page, you modify the way the straight table is presented on the screen.

Columns

A list of the dimensions and expressions chosen as columns. Selecting one of the columns makes it possible to change its settings.

Hide Column

By selecting this check box, the selected column will be hidden when the table is drawn in the layout. This may be

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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useful when you want to sort the table by a column which you do not want to show to the application user.

Drop-down Select

If this check box is selected for a field column, an icon will appear to the left in the column header. By clicking the icon a list box showing all field values of the field will be opened over the table. You may then make selections and searches in the same manner as if the field had been a row in a multi box.

Searchable

If this check box is selected for an expression column, a search icon will appear to the left in the column header. By clicking the icon a search box will be opened. You may then type a search criteria (e.g. >100000). When hitting ENTER all table rows with an expression value matching the search criteria will be selected.

Column Label

The text entered here will be shown on the title bar of the specific column.

Alignment

In this group, the alignment of the column values and their labels can be set. **Label**, **Data (Numeric)** and **Data (Text)** can be individually **Left**-, **Center**-, or **Right**-adjusted. When multi line cells and labels are used, the vertical alignment can be **Top**-, **Center**- or **Bottom**-adjusted.

Max Number

Here you can set the maximum number of rows to display. Rows displaying sums are not counted; however, sums will still be calculated using all the rows of the table.

Show Others Row

This option is available only if the number of displayed rows has been limited (Max Number). Mark this check box to display a row for the surplus values. The **Others** row is calculated as a simple sum of the expression values of the rows omitted by the Max Number Setting. The **Others** bar will thus only be meaningful for expressions where the **Sum of Rows** total is meaningful.

Label for Others Row

Here you can specify a label for the Others row. The label may be defined as a calculated formula (see page 439) for dynamic update.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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If nothing is specified, the default Others label found in the **Objects** page of the **User Preferences** dialog will be used (see page 90 in Book I).

Horizontal

Mark this check box to display the straight table transposed 90 degrees, so that labels from a left column and each table record becomes a column of data.

Vertical Column Labels

If this check box is marked, the column headers as vertical text.

Suppress Header Row

If this check box is marked the table will be shown without header (label) row.

Allow Drag and Drop

Deselecting this check box will disable drag and drop column moves within the table.

Sort Indicator

If this check box is selected, a sort indicator icon (arrow) will be shown in the header of the column, which is at the top of the current column sort order. The direction of the icon indicates whether the column is sorted ascending or descending.

Selection Indicators

If this check box is selected selection indicators (beacons) will be shown in table columns containing fields with selections. For new tables this setting takes its default from the **Selection Indicators in Tables** setting on the **Objects** page of **User Preferences**.

Suppress Zero Values

If this check box is marked, all combinations of the dimension fields returning zero or null from all expressions will be disregarded in the calculation. This option is selected by default.

Suppress Missing

If this check box is marked, all combinations of the dimension fields associated with only NULL values in all fields in all expressions will be disregarded in the calculation. This option is selected by default. Turning it off can be useful only in special cases, e.g. if you want to count NULL values in a chart.

Totals

This group contains settings for total display.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Totals on First Row

If this option is selected, the totals will be displayed on the first row of the table.

Totals on Last Row

If this option is selected, the totals will be displayed on the last row of the table.

Use Label

Here you can specify a label for the totals. The label may be defined as a calculated formula (see page 439) for dynamic update. If nothing is specified, the default total label found in the **Objects** page of the **User Preferences** dialog (see page 90 in Book I).

Multiline Settings

In this group you can set the height of the table header and data row cells.

Wrap Header Text

If this check box is marked, the contents of the header row cells will be wrapped in two or more lines.

Header Height (Lines)

If you have selected **Wrap Header Text**, this is where you set how many lines the header cells should have.

Wrap Text

If this check box is marked, the contents of the data cells will be wrapped in two or more lines.

Cell Height (Lines)

If you have selected **Wrap Text**, this is where you set how many lines the cell should have.

Visual Cues

Visual Cues are used to highlight expression values in the table. Values belonging to different value categories can be given separate color and/or font style. This page is identical with the **Visual Cues** page of the pivot table (Figure 52 on page 213).

Style

In the **Style** page, you can choose an appropriate table style from the drop-down list. In the edit box below, it is possible to set shaded stripes for straight tables and to specify at how long intervals these should appear. This page is identical with the **Style** page of the pivot table (Figure 53 on page 215).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Number

In the **Number** page, the display number format can be set. This page is identical with the **Number** page of the bar chart (Figure 15 on page 72).

Font

In the **Font** page, you can change the font of the text in the table. This page is identical with the **Font** page of the bar chart (Figure 16 on page 73). The font style cannot be set for straight tables, since it is defined by the style chosen for the table (see above).

Layout

In the **Layout** page, you can specify how the straight table should appear on the layout. This includes settings for shape, border and the layer on which the chart should reside. This page is identical with the **Layout** page of the bar chart (Figure 17 on page 74).

Caption

In the **Caption** page advanced settings can be made for the caption. Background and foreground (text) color can be defined with separate settings for active and inactive state. Furthermore there are settings for multi-line text and text alignment in both vertical and horizontal direction. Maximize and minimize options are also found on this page. This page is identical with the **Caption** page of the bar chart (Figure 18 on page 79).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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14 EDIT EXPRESSION

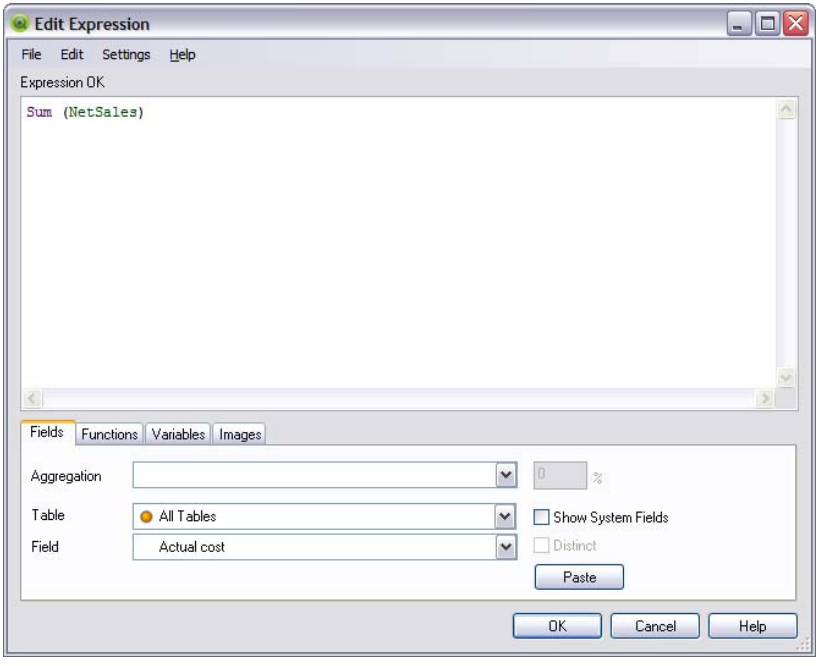


Figure 57. The Edit Expression dialog

In this dialog it is possible to define an expression for use in the QlikView layout (in charts and elsewhere), using all the operators and functions described in “chart expressions” on page 267 and forward. The dialog is fully sizeable in order to facilitate editing of large and complex expressions.

Expression

The current expression, consisting of one or several statistical functions, operators and constants. You can type an expression directly into this box or compose an expression using the buttons and boxes found in the tabs below. The expression will be color coded for syntax control.

The text above the edit control will change to reflect the correctness of the expression currently displayed. When a syntactically correct expression is present, the text will read **Expression OK**. If the expression contains syntax errors an error message will be shown. It

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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is possible to leave the dialog with a syntactically incorrect expression, but the result will be as might be expected.

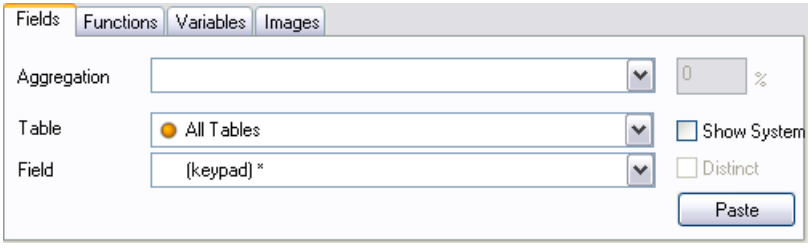
OK Accepts changes made in the expression and closes the dialog box. The changes will be saved next time the document is saved to a file. You cannot leave the dialog with the **OK** button unless the expression in the **Expression** box is valid. If you try to do so, an error message will be shown.

Cancel
Cancels the expression editing and closes the dialog box. The expression will be restored.

Help Opens the **Help** dialog for expressions.

In the bottom pane of the dialog you will find a number of tabs for various tasks in relation to the definition of QlikView expressions.

Fields



In the **Fields** tab you will find controls for pasting syntax relating to QlikView field data.

Aggregation
In this drop-down you can choose from the statistical aggregation functions available in the QlikView layout.

Table In this drop-down you may select a specific input table from which to pick fields in order to make navigation in the **Field** drop-down easier.

Field This drop-down lists all the fields available. The list may be narrowed down by selecting a specific input table in the **Table** drop-down above.

Show System Fields
If this check box is marked, the list containing the fields of the document includes the system fields.

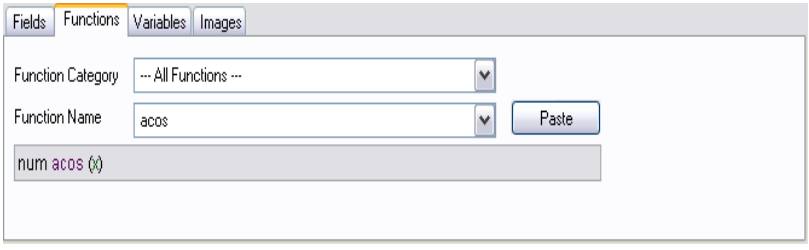
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Distinct

The statistical functions are by default calculated on the number of occurrences in the original table. Sometimes, however, you do not want to calculate duplicates. If this is the case, mark this check box before pasting the function.

Paste Pastes the selected function or just the field into the **Expression** box. A percentage can be given when using the fractile function.

Functions



In the **Functions** tab you will find controls for pasting syntax relating to QlikView general functions.

Function Category

In the drop-down you may select a category of functions in order to make navigation in the **Function Name** drop-down easier.

Function name

In the drop-down you may select a function for pasting into the expression out of all functions available in the QlikView layout. The list can be reduced to show only functions belonging to a certain category by means of a selection in the **Function Category** drop-down above.

Paste Pastes the selected function name into the **Expression** box.

At the bottom of the tab there is a pane showing the argument syntax of the function selected in the **Function Name** drop-down.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Variables



In the **Variables** tab you will find controls for pasting syntax relating to QlikView variables.

Variables

In the drop-down you will find all currently defined variables in the document.

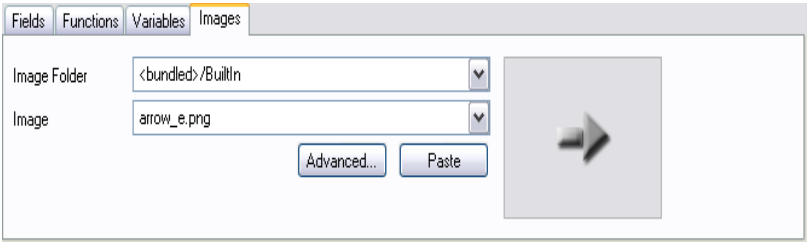
Paste Pastes the selected function into the **Expression** box.

Show System Variables

If this check box is marked, the list in the **Variables** drop-down will include the system variables.

At the bottom of the tab there is a pane showing the current value of any variable selected in the **Variables** drop-down.

Images



In the **Images** tab you will find controls for pasting syntax for accessing the pictures built into QlikView (see page 217). Note that this functionality is only relevant in certain parts of the QlikView layout,

Image Folder

In this drop-down you select the image folder.

Image In this drop-down you select the image.

Advanced...

Opens up an image browser dialog showing all the available images.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Paste Pastes the syntax for accessing the selected built-in image into the **Expression** box.

To the right on the tab there is a pane showing a preview of the image selected in the **Image** drop-down.

FILE menu

Export to Expression File...
Saves the contents of the **Expression** box in a text file to be specified in the **Save Script** dialog that appears. The file will have the extension .qve.

Insert File...
Lets you browse for a file containing an expression or part of an expression and inserts its contents into the **Expression** box at the position of the cursor.

Colormix Wizard...
Opens the **Colormix Wizard** that facilitates the creation of color mix expressions, i.e. expressions that calculate a color based on a given measure.

Print... Opens the Windows standard **Print** dialog for printing the expression. This command can also be invoked via the keyboard shortcut CTRL+P.

EDIT menu

Undo Undoes the latest change. This command can also be invoked via the keyboard shortcut CTRL+Z.

Redo Redoes the latest **Undo**.This command can also be invoked via the keyboard shortcut CTRL+Y.

Cut Exports the selected text to the clipboard.This command can also be invoked via the keyboard shortcut CTRL+X.

Copy Copies the selected text to the clipboard.This command can also be invoked via the keyboard shortcut CTRL+C.

Paste Pastes the contents of the clipboard into the dialog at the position of the cursor.This command can also be invoked via the keyboard shortcut CTRL+V.

Clear Clears the entire expression.

Select All
Selects the entire expression.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Find/Replace...

Opens a dialog allowing you to find and replace numbers or characters in the expression. This command can also be invoked via the keyboard shortcut CTRL+F.

SETTINGS menu

Configure...

Opens the **Editor** page in the **User Preferences** dialog (page 115 in Book I), where you can set the font and color of the different text types appearing in the **Expression** box.

14.1 The Colormix Wizard

With the **Colormix Wizard**, opened from the **File** menu in the **Edit Expression** dialog, it is possible to create a color mix expression, i.e. an expression that calculates a dynamic color from a given measure.

It could e.g. be a calculated index with a value around 100 displayed in a pivot table. The higher index, the better. If a specific dimension value had an index that vastly exceeded 100, one would probably want to mark this pivot table line green, whereas red probably would be the appropriate color if the index value was much lower than 100. And one would want the color change to be gradual with yellow denoting 100. In other words – you want a dynamic color.

Such a gradual color calculation can be done with the **Colormix** functions in QlikView, but it can be cumbersome to create the appropriate expression inside the Colormix function. Here, the **Colormix Wizard** can help.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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First, it is important to clarify that the color functions, hence also the **Colormix Wizard**, are only relevant to use in place where QlikView expects a color function, i.e. not in the chart expression itself, but rather in the **Background Color** expression or in the **Text Color** expression.

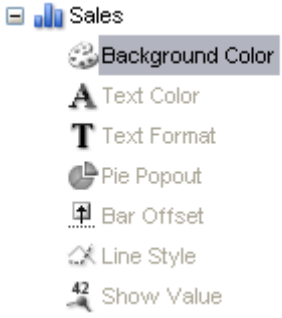


Figure 58. The Background Color expression

When you open the **Colormix Wizard** from the **File** menu in the **Edit Expression** dialog, you will first see a page describing what is needed to create a dynamic color. If you want to skip the start page when you use the wizard in the future, mark the **Don't show this page again** check box.

Click **Next** to continue.

Step One – Enter a value expression

This is the expression that will control what color QlikView will show. Typical expressions could be

- Sum(Sales) / Sum(total Sales)
- Sum(Sales) / Sum(Quota)
- Avg(Age)

Note that it is usually a value that has the same order of magnitude no matter how many or how few records you have selected. An average, a percentage or an index is usually a good measure to use.

Click **Next** to continue.

Step Two – Set upper and lower limits

In this page you need to define the upper and lower limits of the value expressions and the corresponding colors. "Limit" meaning not the maximum possible value, but the limit where the maximum color is reached.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Typical expressions could e.g. be

Value Expression	Upper limit	Lower limit
Sum(*Sales***)** / **Sum(total** *Sales***)**	**Sum(total** *Sales***)**	0
Sum(*Sales***)** / **Sum(***Quota***)**	2 (=200%)	0
Avg(*Age***)**	**Max(total** *Age***)**	**Min(total** *Age***)**

But other limits are possible of course.

If you use the color wizard within a chart, then the following two expressions are always a good choice:

- **RangeMax (top(total** <*ValueExpression*>,**1**,**NoOfRows(total)))**
- **RangeMin (top(total** <*ValueExpression*>,**1**,**NoOfRows(total)))**

These expressions will calculate the largest and the smallest row value of <*ValueExpression*> within the chart.

Auto Normalize

If this check box is marked, QlikView will try to find proper upper and lower limits. In such a case, expressions for the upper and lower levels cannot be entered manually.

Upper limit

Here an expression for an upper limit must be entered, unless the **Auto Normalize** option is checked.

Intermediate

Here it is possible to enter an expression for an intermediate level, linked to a third color.

Lower limit

Here an expression for a lower limit must be entered, unless the **Auto Normalize** option is checked.

Reverse

This button reverses the colors for the upper and lower limits.

Click **Next** to continue.

Step Three – Finalize

In this page you finalize the color mix expression

Enhanced colors

If this check box is marked, a hysteresis transformation is applied on top of the value expression. This will increase the sensitivity in the mid-range so that the color is pushed towards the Upper and Lower colors.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Value Saturation

Here it is possible to control the behavior if the value expression exceeds the upper or lower limit. If **Use Upper (Lower) color** is marked, QlikView will use the color for the maximum or the minimum. If **Use Standard color** is marked, QlikView will instead revert to the standard colors as defined on the **Colors** page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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15 THE QUICK CHART WIZARD

The **Quick Chart** feature has been developed for the user who wants to create a simple chart in a quick and easy way, without bothering about the great number of different settings and options available. The result is however always a full-blown chart - it is only the creation process that has been simplified.

When you click the **QuickChart** button in the toolbar (or choose **Create QuickChart** from the list box object menu, or **QuickChart** from the **Layout** menu), the **Quick Chart** wizard appears.

The quick chart wizard takes you through the following basic steps:

1. Select chart type
2. Define chart dimension(s)
3. Define the chart expression
4. Format chart

Depending on selections some of the above steps may be skipped.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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15.1 Starting the Quick Chart Wizard

You start the quick chart wizard either by choosing **Quick Chart Wizard** from the **Layout** menu or by clicking the button in the **Design** toolbar.

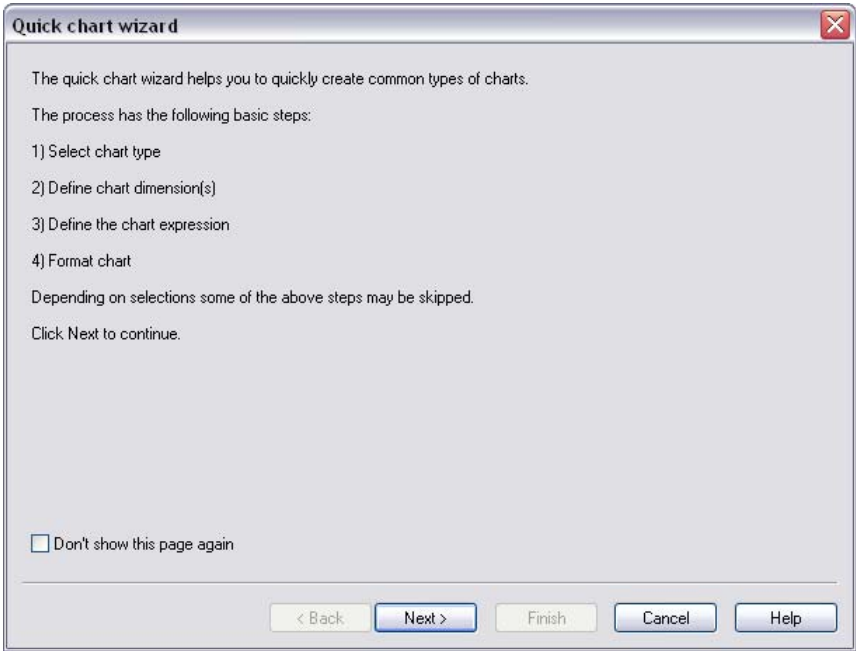


Figure 59. The start page of the quick chart wizard

The first time you start the wizard you will be met by a start page outlining the purpose of the wizard and the basic steps involved. If you want to skip the start page when you use the wizard in the future, mark the **Don't show this page again** check box.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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15.2 Pages of the Quick Chart Wizard

Step 1 - Select Chart Type

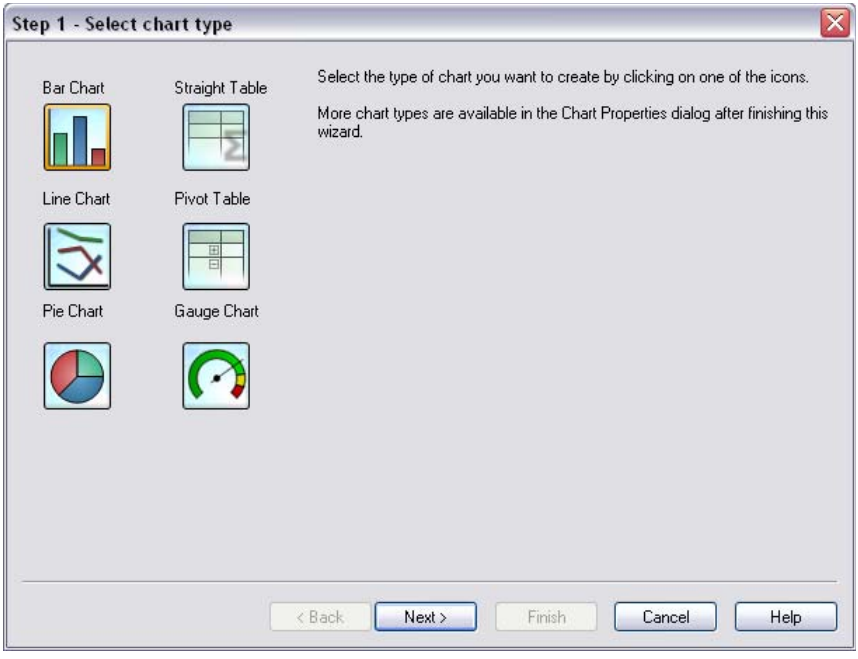


Figure 60. The first page of the quick chart wizard

Select the type of chart you want to create by clicking on one of the icons.

The chart types available are those most commonly used in QlikView. You may change the chart into any other QlikView chart type via the **Chart Properties** dialog after finishing the wizard.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 2 - Define Dimension(s)



Figure 61. The second page of the quick chart wizard

Unless you selected Gauge chart in the first step you will now come to the **Define Dimension(s)** page. Gauge charts are normally dimensionless, so this page is then automatically skipped.

Select one or more dimensions in the drop-down boxes. The dimension(s) define the values for which to calculate the chart expression(s). Dimensions are typically found to the left in table charts and on the x-axis in e.g. bar charts.

After finishing this wizard you can add more dimensions or change dimensions at any time via the **Chart Properties** dialog.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 3 - Define Expression



Figure 62. The third page of the quick chart wizard

The chart expression defines the calculated value(s) in the chart. Expressions are typically found to the right in tables and on the y-axis in e.g. bar charts.

Expressions in QlikView can range from short and simple to long and complex. This page allows you to choose between three very common base expressions or type your own expression from scratch.

Sum Choose this option if you want to see the numeric sum of a field, e.g. sum(Sales). Then choose a field to sum in the combo box below.

Average Choose this option if you want to see the numeric average (mean) of a field, e.g. avg(Score). then choose a field for the calculation in the combo box below.

Count Choose this option if you want to see the number of values in a field, e.g. count(OrderID). Then choose a field to count in the combo box below.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Custom

Choose this option if you want to type your own expression from scratch. If you need more space to edit the expressions, click on the **...** icon to open the **Edit Expression** dialog.

After finishing this wizard you can change the expression and/or add more expressions at any time via the **Chart Properties** dialog.

Click **Next** to continue.

The fourth step in the wizard allows you to adjust the format of the chart. As format settings vary between chart types, the contents of the page will be different depending on which chart type you selected in Step 1 of the wizard.

Step 4 - Chart Format (Bar Chart)

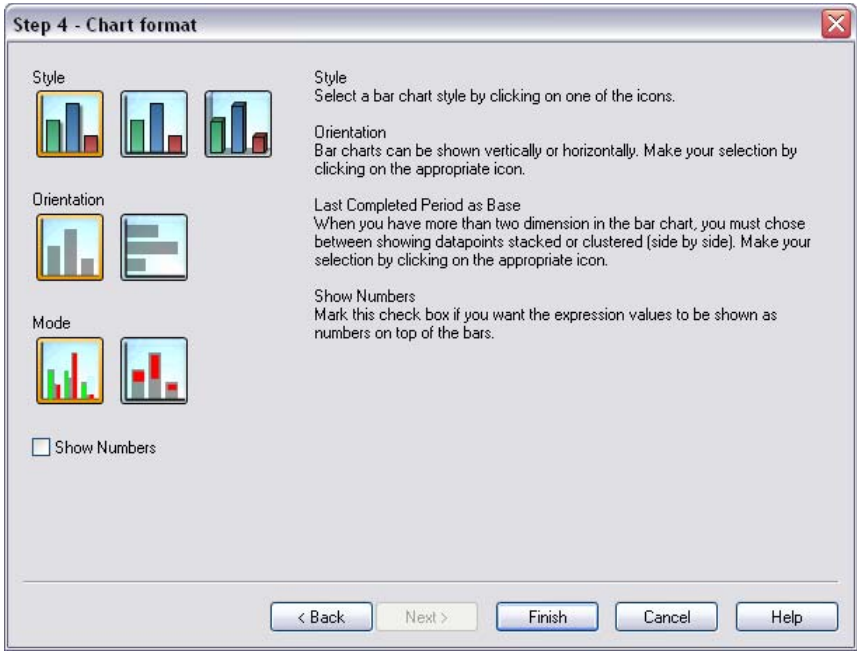


Figure 63. The fourth page of the quick chart wizard for bar charts

In this page you set formatting options for the selected chart type.

Style Select a bar chart style by clicking on one of the icons.

Orientation

Bar charts can be shown vertically or horizontally. Make your selection by clicking on the appropriate icon.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Last Completed Period as Base

When you have more than two dimensions in the bar chart you must choose between showing data points stacked or clustered (side by side). Make your selection by clicking the appropriate icon.

Show Numbers

Mark this check box if you want the expression values to be shown as numbers on top of the bars.

Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Step 4 - Chart Format (Line Chart)

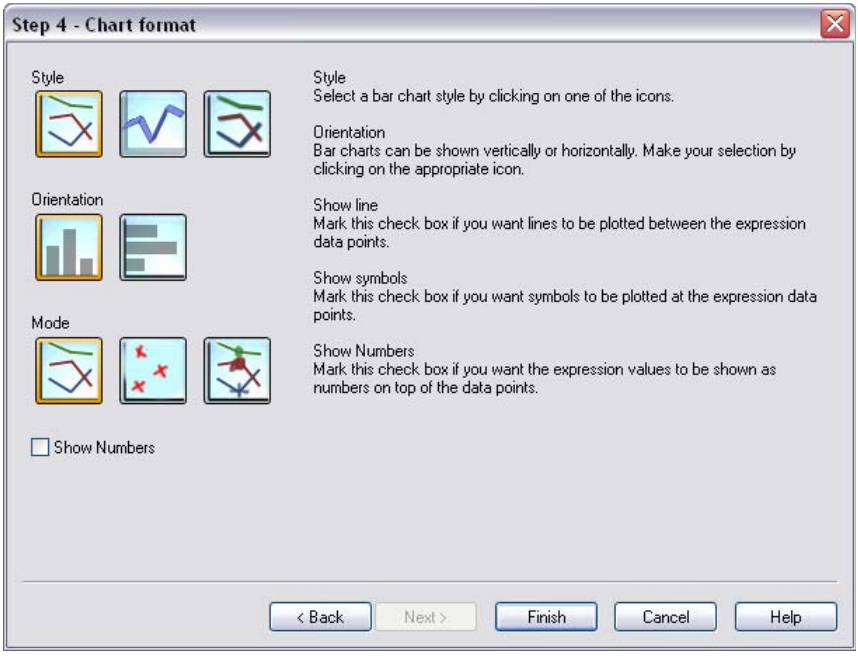


Figure 64. The fourth page of the quick chart wizard for line charts

In this page you set formatting options for the selected chart type.

Style Select a line chart style by clicking one of the icons.

Orientation

Line charts can be shown vertically or horizontally. Make your selection by clicking on the appropriate icon.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Mode You may show data points as lines, symbols or a combination of thereof. Make your selection by clicking the appropriate icon.

Show Numbers
Mark this check box if you want the expression values to be shown as numbers on top of the data points.

Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Step 4 - Chart Format (Pie Chart)

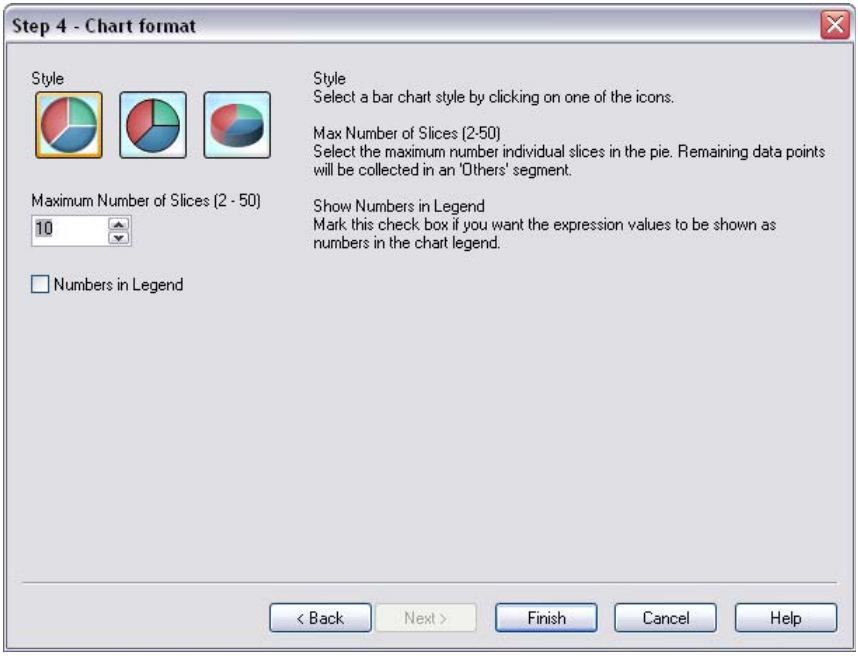


Figure 65. The fourth page of the quick chart wizard for pie charts

In this page you set formatting options for the selected chart type.

Style Select a pie chart style by clicking one of the icons.

Max Number of Slices (2-50)
Select the maximum number individual slices of the pie chart. Remaining data points will be collected in the 'Others' segment.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Show Numbers in Legend

Mark this check box if you want the expression values to be shown as numbers in the chart legend.

Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Step 4 - Chart Format (Straight Table)

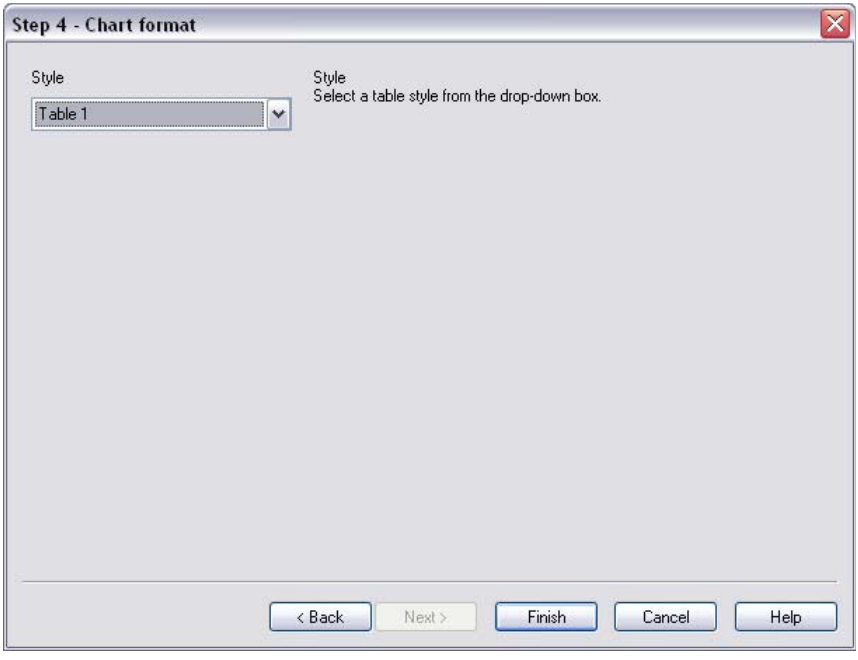


Figure 66. The fourth page of the quick chart wizard for straight tables

In this page you set formatting options for the selected chart type.

Style Select a table style from the drop-down box.

Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 4 - Chart Format (Pivot Table)

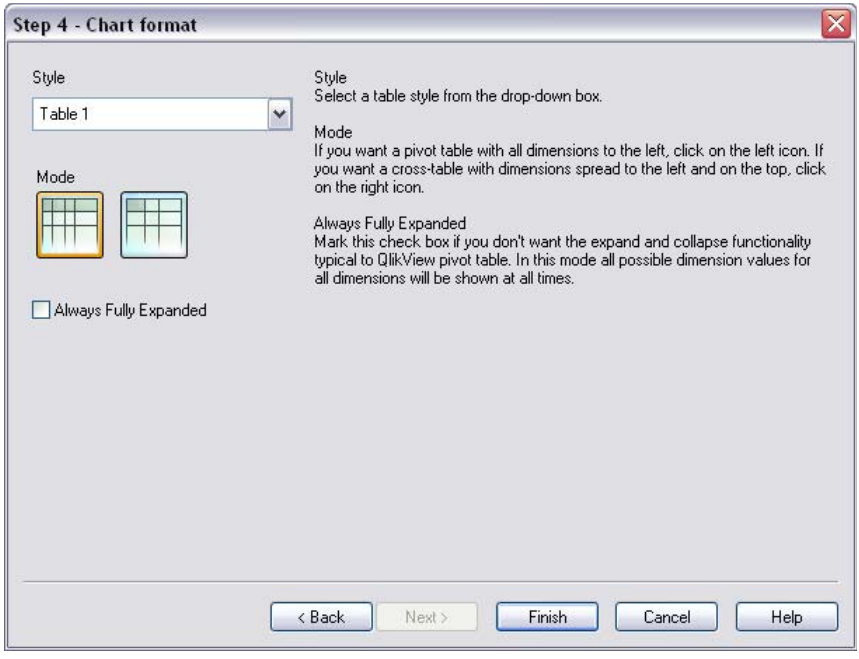


Figure 67. The fourth page of the quick chart wizard for pivot tables

In this page you set formatting options for the selected chart type.

Style Select a table style from the drop-down box.

Mode If you want a pivot table with all dimensions to the left, click the left icon. If you want a cross table with dimensions spread to the left and on the top, click the right icon.

Always Fully Expanded
Mark this check box if you do not want the expand and collapse functionality in the QlikView pivot table. In this mode all possible dimension values for all dimensions will be shown at all times.

Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 4 - Chart Format (Gauge Chart)

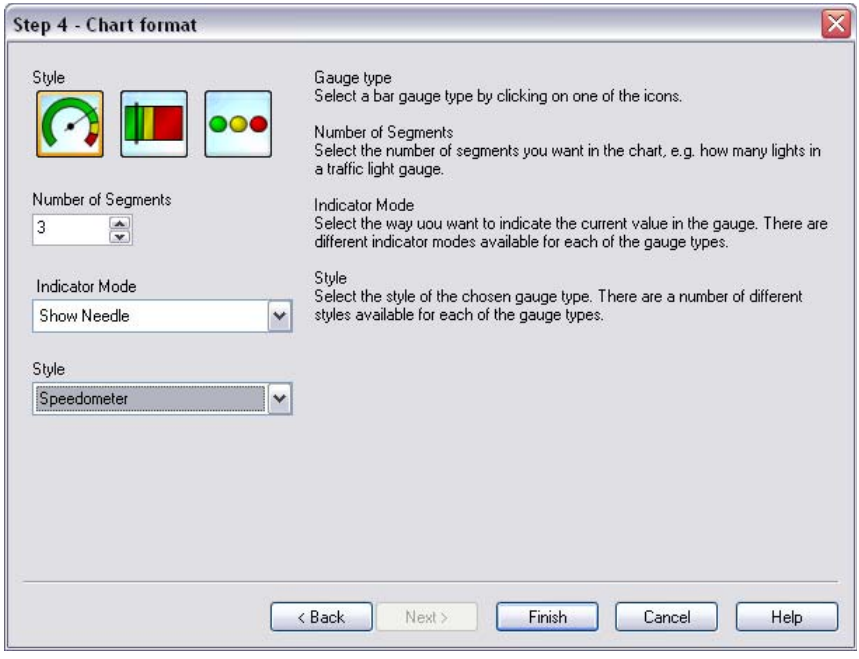


Figure 68. The fourth page of the quick chart wizard for gauge charts

In this page you set formatting options for the selected chart type.

Gauge Type
Select a bar gauge type by clicking one of the icons.

Number of Segments
Select the number of segments you want in the chart, e.g. how many lights in a traffic light gauge.

Indicator Mode
Select the way you want to indicate the current value in the gauge. There are different indicator modes available for each of the gauge types.

Style Select the style of the chosen gauge type. There are a number of different styles available for each of the gauge types.

Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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16 THE TIME CHART WIZARD

The time chart wizard helps you to build charts where a given measure (expression) should be qualified and often compared by different time periods.

As an example you may want to show an expression such as Sum(Sales) but just for the last year or the current quarter to date. Often you will also want to compare that result with the same measure for a previous period, e.g. the year before or the same quarter last year. QlikView contains a number of functions to build expressions to do just this, but to the beginner they may seem hard to master. The time chart wizard has been designed to help you with the task of enclosing your basic measure expression in suitable time qualification functions according to your specifications.

The time chart wizard takes you through the following basic steps:

1. Select chart type
2. Define chart dimension(s)
3. Define the base expression and time references
4. Select time period
5. Define period offset
6. Define comparison period
7. Column selection and presentation

Depending on selections some of the above steps may be skipped.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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16.1 Starting the Time Chart Wizard

You start the time chart wizard either by choosing **Time Chart Wizard** from the **Layout** menu or by clicking on the button in the **Design** toolbar.



Figure 69. The start page of the Time chart wizard

The first time you start the wizard you will be met by a start page outlining the purpose of the wizard and the basic steps involved. If you want to skip the start page when you use the wizard in the future, mark the **Don't show this page again** check box.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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16.2 Pages of the Time Chart Wizard

Step 1 - Select Chart Type

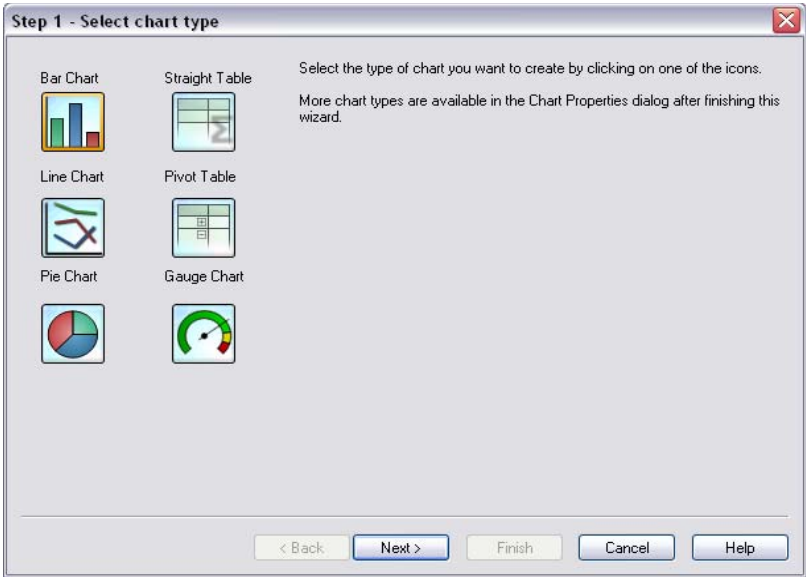


Figure 70. The first page of the Time chart wizard

Select the type of chart you want to create by clicking on one of the icons.

The chart types available are those typically used in charts involving time period qualification. You may change the chart into any other QlikView chart type via the **Chart Properties** dialog after finishing the wizard.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 2 - Define dimension(s)

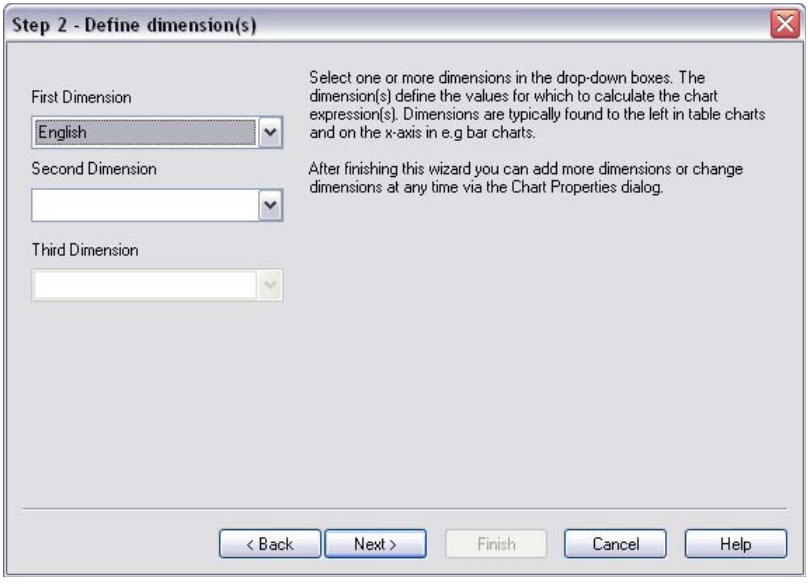


Figure 71. The second page of the time chart wizard

This page defines the chart's dimension(s).

Select one or more dimensions in the drop-down boxes. The dimension(s) define the values for which to calculate the chart expression(s). Dimensions are typically found to the left in table charts and on the x-axis in e.g. bar charts.

After finishing this wizard you can add more dimensions or change dimensions at any time via the **Chart Properties** dialog.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 3 - Expression and Time References

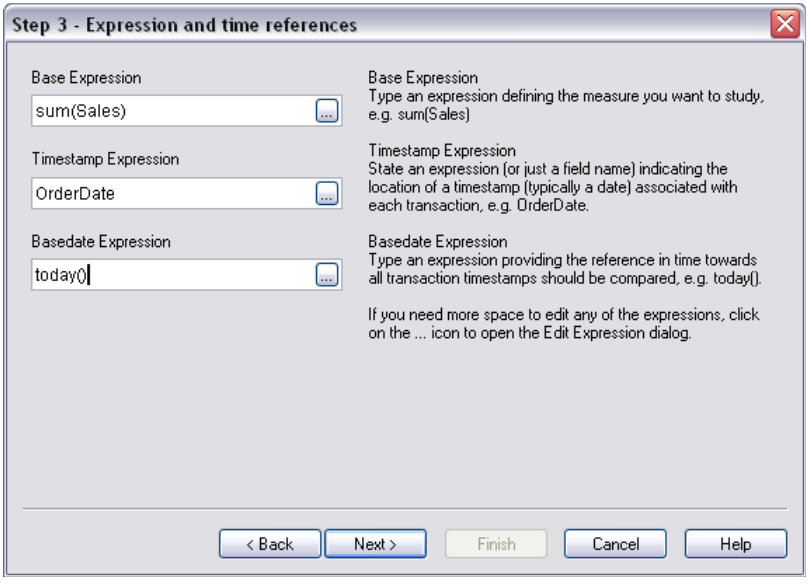


Figure 72. The third page of the Time chart wizard

This page defines the chart's underlying base expression and the time references.

Base Expression
Type an expression defining the measure you want to study, e.g. sum(Sales).

Timestamp Expression
State an expression (or just a field name) indicating the location of a timestamp (typically a date) associated with each transaction e.g. OrderDate.

Basedate Expression
Type an expression providing the reference in time towards all transaction timestamps should be compared, e.g. today().

If you need more space to edit any of the expressions, click on the **...** icon to open the **Edit Expression** dialog.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 4 - Select Time Period

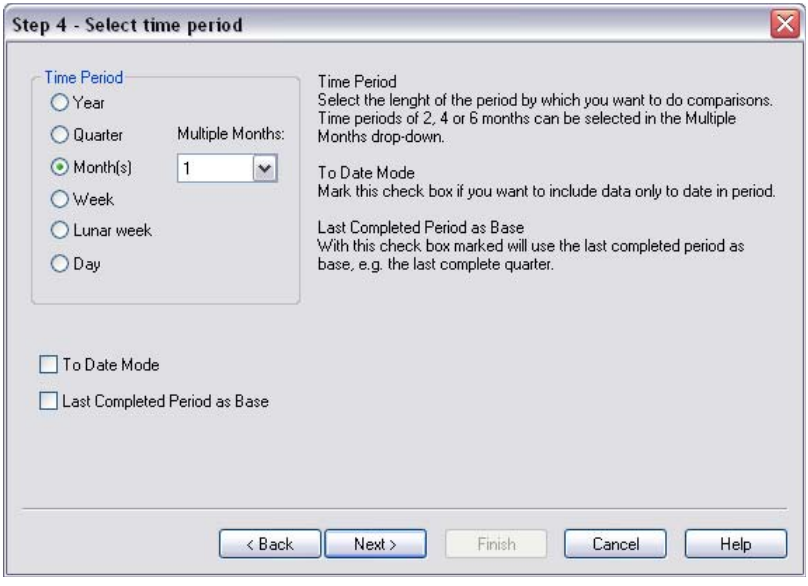


Figure 73. The fourth page of the Time chart wizard

On this page you select the basic time period unit for the chart.

Time Period

Select the length of the period by which you want to qualify the chart expression and do comparisons. When using the Month(s) option time periods of 1, 2, 3, 4, or 6 months can be selected in the Multiple Months drop-down. The value 3 can be given, but will correspond exactly to Quarter. Lunar weeks are defined as consecutive 7-day periods starting January 1st each year. There are always exactly 52 lunar weeks in a year. Lunar week 52 will thus contain 8 or 9 days.

To Date Mode

Mark this check box if you want to use date mode. For all time periods except **Day** this means that only transactions with a date value in **Timestamp Expression** up to and including the date in **Basedate Expression** (see definitions on previous page) will be included. For **Day** the exact time in **Basedate Expression** will be used as divider.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Last Completed Period as Base

With this check box marked the last completed period will be used as base, e.g. the last complete quarter.

Click **Next** to continue.

Step 5 - Period Start Offset



Figure 74. The fifth page of the Time chart wizard

In this page you may state an offset to the beginning of the chosen time period. In many cases this page can be skipped. Depending on the **Time Period** chosen in step 4 above, one of the following two options will be given:

Year Start

If you work with (fiscal) years not starting in January, you may select the first month of your (fiscal) year in this drop-down. This option is only available if the basic **Time Period** chosen in step 4 above is **Year**, **Quarter** of **Months**.

Week/Day Offset

If you want to offset the start of the week or the start of the day you can do it here. Offsets are given in days and/or fractions thereof. E.g. 1 for calendar week starting Tuesday or 0.125 for day starting 3am. This option is only available if the basic **Time Period** chosen in step 4 above is **Week**, **Lunar Week** or **Day**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Click **Next** to continue.

Step 6 - Define Comparison Period

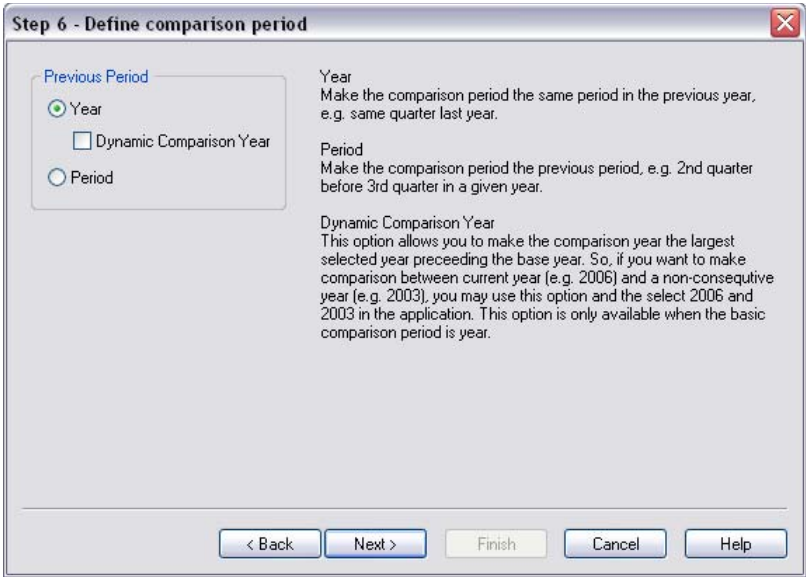


Figure 75. The sixth page of the Time chart wizard

In this page you define the comparison period. If you have chosen **Year** as main **Time Period** in step 4 above, this page is automatically skipped.

Year Make the comparison period in the previous year, e.g. same quarter last year.

Period

Make the comparison period the previous period, e.g. 2nd quarter before 3rd quarter in a given year.

Dynamic Comparison Year

This option allows you to make the comparison year the largest selected year preceding the base year. So, if you want to make comparison between the current year (e.g. 2006) and a non-consecutive year (e.g. 2003), you may use this option and select 2006 and 2003 in the application. This option is only available when the basic comparison period is year.

Click **Next** to continue.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Step 7 - Column Selection and Presentation

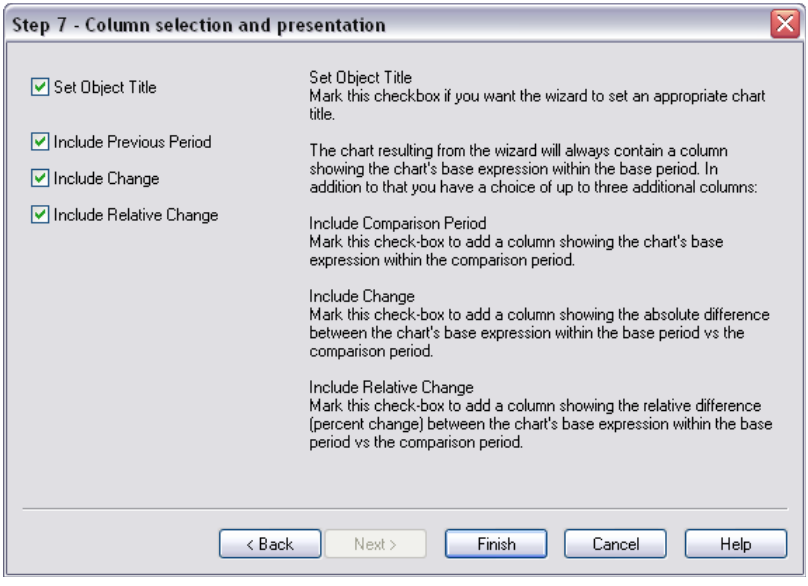


Figure 76. The final (7th) page of the Time chart wizard

In this page you choose which expression columns you want to include in the chart and whether you want the wizard to set the chart title.

Set Object Title

Mark this check box if you want the wizard to set an appropriate chart title.

The chart resulting from the wizard will always contain a column showing the chart's base expression within the base period. In addition to that you have a choice of up to three additional columns:

Include Comparison Period

Mark this check box to add a column showing the chart's base expression within the comparison period.

Include Change

Mark this check box to add a column showing the absolute difference within the comparison period.

Include Relative Change

Mark this check box to add a column showing the relative difference (percent change) between the chart's base expression within the base period vs. the comparison period.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Click **Finish** to finalize the chart and return to the layout. As mentioned before you may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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17 THE STATISTICS CHART WIZARD

The Statistics chart wizard provides guidance for those who want to apply common statistical tests on data in QlikView.

17.1 Starting the Statistics Chart Wizard

You start the statistics chart wizard by choosing **Statistics Chart Wizard** from the **Layout** menu.

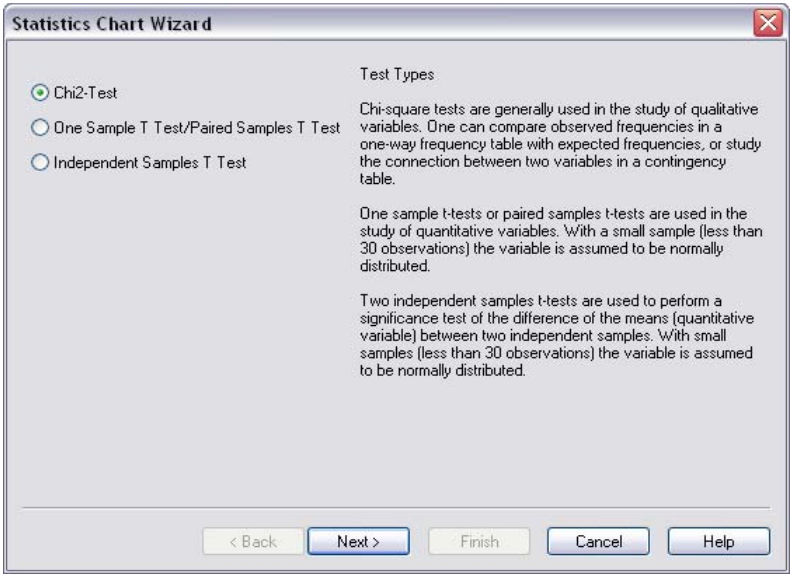


Figure 77. The start page of the Statistics chart wizard

The start page offers you a choice of statistical tests. Select the appropriate type of test and then click **Next** to continue.

Please note that QlikView supports more types of tests than those covered in the wizard. Please see the section on Statistical test functions on .

For information about statistical tests and their uses, please refer to a statistics text book.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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17.2 Chi2-Test

This option generates a straight table with values returned from a chi2 test. A chi2 test is often used to compare two sets of values and determine the probability that the two sets come from the same statistical distribution.

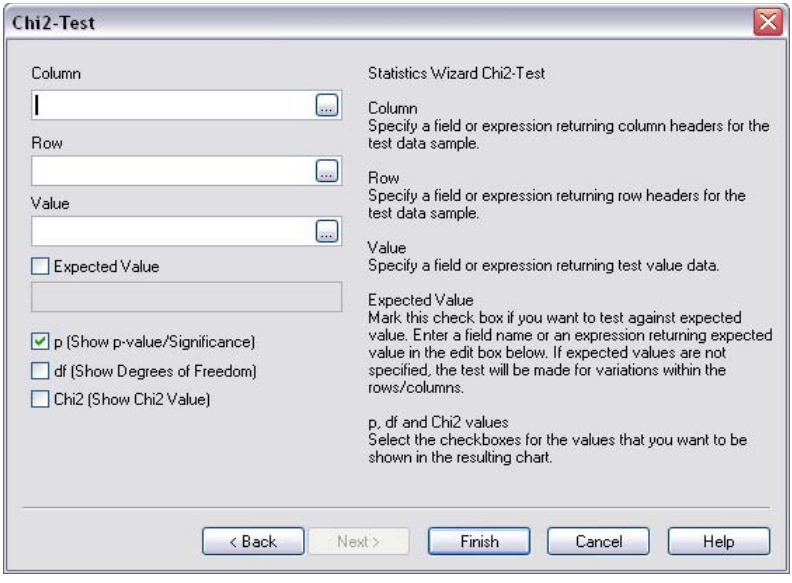


Figure 78. The chi2 test page of the statistics chart wizard

To obtain the chi2 test chart, you must specify the following:

Column
Specify a field or expression returning column headers for the test data sample.

Row Specify a field or expression returning row headers for the test data sample.

Value Specify a field or expression returning test value data.

Expected Value
Mark this check box if you want to test against expected value. Enter a field name or an expression returning expected value in the edit box below. If expected values are not specified the test will be made for variations within the rows/columns.

p (Show p-value / Significance)
Mark this check box to include the p value (significance) in the resulting chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

df (Show Degrees of Freedom)
Mark this check box to include the df value (degrees of freedom) in the resulting chart.

Chi2 (Show Chi2 Value)
Mark this check box to include the test value in the resulting chart.

Click **Finish** to finalize the chart and return to the layout. You may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

17.3 Paired t-test

This option generates a straight table with values returned from a paired student's t-test.

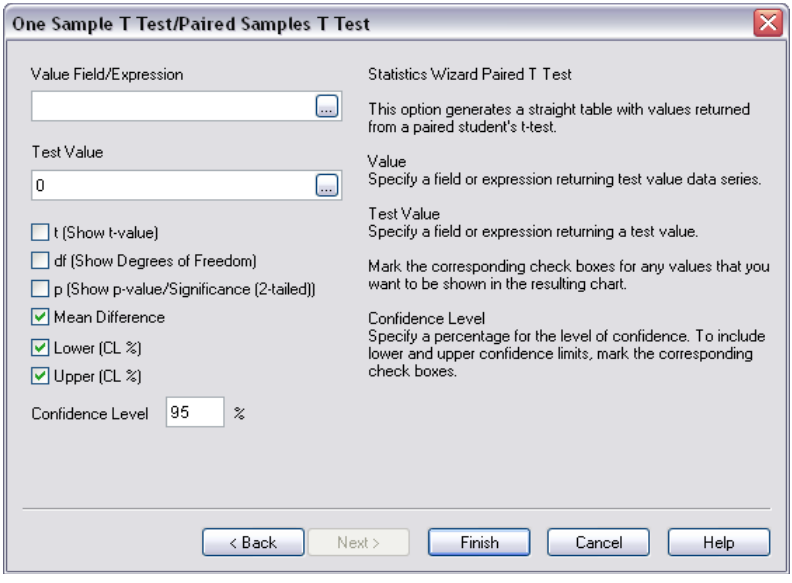


Figure 79. The paired t-test page of the Statistics chart wizard

To obtain the t-test chart, you must specify the following:

Value Field/Expression
Specify a field or expression returning test value data series.

Test Value
Specify a field or expression returning a test value.

t (Show t-value)
Mark this check box to include the t value in the resulting chart.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

df (Show Degrees of Freedom)

Mark this check box to include the df value (degrees of freedom) in the resulting chart.

p (Show p-value / Significance (2-tailed))

Mark this check box to include the p value (significance, 2-tailed) in the resulting chart..

Mean Difference

Mark this check box to include the mean difference value in the resulting chart..

Lower (CL%)

Mark this check box to include the lower limit of the confidence interval (as specified in **Confidence Level** below) in the resulting chart..

Upper (CL%)

Mark this check box to include the upper limit of the confidence interval (as specified in **Confidence Level** below) in the resulting chart..

Confidence Level

Specify a percentage for the level of confidence.

Click **Finish** to finalize the chart and return to the layout. You may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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17.4 Independent Samples t-test

This option generates a straight table with values returned from a two independent samples' student's t-test.

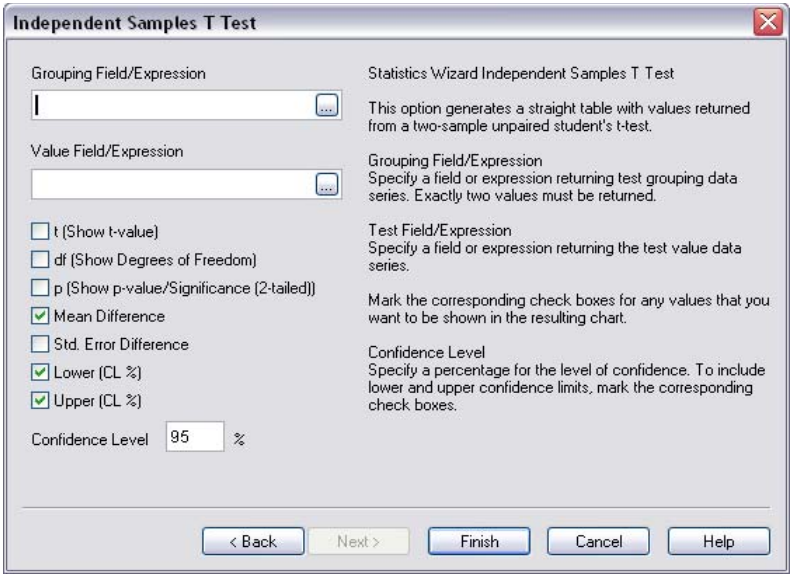


Figure 80. The independent samples t-test page of the Statistics chart wizard

To obtain the t-test chart, you must specify the following:

Grouping Field/Expression
Specify a field or expression returning test value data series. Exactly two values must be returned.

Test Field/Expression
Specify a field or expression returning the test value data series.

t (Show t-value)
Mark this check box to include the t value in the resulting chart.

df (Show Degrees of Freedom)
Mark this check box to include the df value (degrees of freedom) in the resulting chart.

p (Show p-value / Significance (2-tailed))
Mark this check box to include the p value (significance, 2-tailed) in the resulting chart..

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Mean Difference

Mark this check box to include the mean difference value in the resulting chart..

Lower (CL%)

Mark this check box to include the lower limit of the confidence interval (as specified in **Confidence Level** below) in the resulting chart..

Upper (CL%)

Mark this check box to include the upper limit of the confidence interval (as specified in **Confidence Level** below) in the resulting chart..

Confidence Level

Specify a percentage for the level of confidence.

Click **Finish** to finalize the chart and return to the layout. You may return to the chart at any time via the regular **Chart Properties** dialog to make further adjustments.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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18 CHART EXPRESSIONS



Expressions are used in charts to define the calculated data, e.g. the data shown on the y-axis in a standard bar or line chart. QlikView supports very complex expressions, involving one or more fields and most of the functions available in the script expression syntax. Please note that some differences exist between script expressions and chart expressions in terms of syntax and available functions.

Note The most important difference between script and chart expressions is the role of the aggregation functions and the use of field references. The basic rule is that any field name used in a chart expression must be enclosed by exactly one aggregation function. This means that: 1) A field name or an expression containing a field name must always be enclosed by an aggregation function. 2) An aggregation function must never have as argument an expression containing an aggregation function.

Note In a calculated formula, field names may optionally be used without an enclosing aggregation function. In that case, **only** will be used as aggregation function.

All expressions in QlikView return a number and/or a string, or a null value, whichever is appropriate. Logical functions and operators return 0 for false and -1 for true. Number to string conversions and vice versa are implicit. Logical operators and functions interpret 0 as false and all else as true. Expressions which cannot be correctly evaluated, e.g. as a result of incorrect parameters to functions, return null.

18.1 Chart Expression Syntax

The general syntax for a chart expression is:

expression ::= (*constant* |
expressionname |
operator1 expression |
expression operator2 expression |
function |
aggregationfunction |
(*expression* **)**)

where

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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constant is a string (a text, a date or a time) enclosed by single straight quotation marks, or a number. Constants are written with no thousands separator and with a decimal point as decimal separator.

expressionname is the name (label) of another expression in the same chart.

operator1 is a unary operator (working on one expression, the one to the right).

operator2 is a binary operator (working on two expressions, one on each side).

function ::= functionname **(** *parameters* **)**

parameters ::= expression { **,** *expression }*

The number and types of parameters is not arbitrary. It depends on the function used.

aggregationfunction ::= aggregationfunctionname **(** *parameters2* **)**

parameters2 ::= aggrexpr { **,** *aggrexpr }*

The number and types of parameters is not arbitrary. It depends on the function used.

aggrexpr ::= (fieldref|
operator1 aggrexpr|
aggrexpr operator2 aggrexpr|
functioninaggr|
(aggrexpression **)**)

fieldref is a field name.

functioninaggr ::= functionname **(** *parameters2* **)**

Expressions and functions can thus be nested freely, and as long as a fieldref is always enclosed by exactly one aggregation function. As long as the expression returns an interpretable value, QlikView will not give any error messages.

18.2 Variable Text Expansion

As from QlikView version 6.04 QlikView variables can be used for text expansion inside an expression in a QlikView chart or elsewhere in the QlikView layout. When used for this purpose, the variable's text value is inserted into the expression before the expression is evaluated.

When using a variable for text expansion inside a statement, the syntax

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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$(*variablename* **)**

is used. **$(** *variablename* **)** expands to the value in *variablename*. If *variablename* does not exist the expansion will be the empty string.

For numeric text macro expansion the syntax

$(*variablename* **)**

is used. **$(** *variablename* **)** always yields a legal decimal-point number reflection of the numeric value of *variablename*, possibly with exponential notation (for very large/small) numbers). If variablename does not exist or does not contain a numeric value, it will be expanded to 0 instead.

The numeric expansion is probably considerably less applicable than text expansion when used in chart expressions, but is nevertheless documented here for the sake of completeness.

Example:
The variable *x* contains the text string *sum(Sales)*.

In a chart you define the expression *$(x)/12*. The effect is exactly the same as if having the chart expresion *sum(Sales)/12*.

However, if you change the value of the variable x to *sum(Budget)*, the chart will immediately be recalculated with the expression interpreted as *sum(Budget)/12*.

18.3 Operators

There are two types of operators in QlikView, unary operators that take only one operand, and binary operators that take two operands. Most operators are binary.

Numeric Operators

All numeric operators use the numeric values of the operands and return a numeric value as result.

+ Sign for positive number (unary operator) or arithmetic addition. The binary operation returns the sum of the two operands.

- Sign for negative number (unary operator) or arithmetic subtraction. The unary operation returns the operand multiplied by -1, and the binary the difference between the two operands.

***** Arithmetic multiplication. The operation returns the product of the two operands.

/ Arithmetic division. The operation returns the ratio between the two operands.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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String Operators

Only one string operator exists. It uses the string values of the operands and returns a string as result.

& String concatenation. The operation returns a text string that consists of the two operand strings, one after another.

Example:
'abc' **&** 'xyz' returns 'abcxyz'

Logical Operators

All logical operators interpret the operands logically and return true (-1) or false (0) as result.

not Logical inverse. One of the few unary operators. The operation returns the logical inverse of the operand.

and Logical and. The operation returns the logical and of the operands.

or Logical or. The operation returns the logical or of the operands.

xor Logical exclusive or. The operation returns the logical exclusive or of the operands. I.e. like logical or, but with the difference that the result is false if both operands are true.

Relational Operators

All relational operators compare the values of the operands and return true (-1) or false (0) as result. All relational operators are binary.

< Less than. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

<= Less than or equal. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

> Greater than. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

>= Greater than or equal. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

= Equals. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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<> Not equivalent to. A numeric comparison is made if both operands can be interpreted numerically. The operation returns the logical value of the evaluation of the comparison.

follows

ASCII greater than. Returns true if the left-hand operand has a text representation which, in an ASCII comparison, comes after the text representation of right-hand operand. Unlike the > operator no attempt is made to make a numeric interpretation of the argument values before the comparison.

Examples:
'23' **follows** '111' returns true
'23' > '111' returns false

precedes

ASCII less than. Returns true if the left-hand operand has a text representation which, in an ASCII comparison, comes before the text representation of the right-hand operand. Unlike the < operator no attempt is made to make a numeric interpretation of the argument values before the comparison.

Examples:
'11' **precedes** '2' returns true
'11' < '2' returns false

Bit operators

All bit operators convert the operands to signed integers (32 bit) and return the result in that way. All operation are performed bit by bit.

bitnot Bit inverse. Unary operator. The operation returns the logical inverse of the operand performed bit by bit.

bitand Bit and. The operation returns the logical and of the operands performed bit by bit.

bitor Bit or. The operation returns the logical or of the operands performed bit by bit.

bitxor Bit exclusive or. The operation returns the logical exclusive or of the operands performed bit by bit.

>> Bit right shift. Unary operator. The operation returns the operand shifted one step to the right.

<< Bit left shift. Unary operator. The operation returns the operand shifted one step to the left.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

18.4 Aggregation Functions

The chart aggregation functions can be used on fields in chart expressions. The argument expression of one aggregation function must not contain another aggregation function.

Basic Aggregation Functions ..... page 272
String Aggregation Functions..... page 276
Counter Aggregation Functions ..... page 278
Statistical Aggregation Functions..... page 283
Financial Aggregation Functions ..... page 299
Statistical Test Functions..... page 303
Special Input Field Aggregation Function ..... page 326
Special Function for Advanced Aggregations..... page 326
Set Analysis..... page 327

Basic Aggregation Functions

sum (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **)**

Returns the aggregated sum of *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **total** qualifier may be followed by a list of one or more field names within angle brackets. These field names should be a subset of the chart dimensions. In this case the calculation will be made

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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disregarding all chart dimensions except those listed, i.e. one value will be returned for each combination of field values in the listed dimension fields. Also fields which are not currently a dimension in a chart may be included in the list. This may be useful in the case of group dimensions, where the dimension fields are not fixed. Listing all of the dimensions in the group causes the function to work when the cycle or drill-down level changes.

In previous QlikView versions, the **all** qualifier may occur before an expression. This is equivalent to using **{1} total**, i.e. in such a case, the calculation will be made over all the values of the field in the document, disregarding the chart dimensions and current selections. (The same value is always returned regardless of the logical state in the document.) If the **all** qualifier is used, a set expression cannot be used, since the **all** qualifier defines a set by itself. For legacy reasons, the **all** qualifier will still work in this QlikView version, but may be removed in coming versions.

Examples:

sum(Sales **)**

sum(Price * Quantity **)**

sum(distinct Price **)**

sum(Sales **) / sum(total** Sales **)**

returns sales within selection

sum(Sales **) / sum(total <**Month**>** Sales **)**

returns sales within selection for each Month

sum(Sales **) / sum(total <**Month,Grp**>** Sales **)**

returns sales within selection for each Month and Grp

sum(Sales **) / sum(total <**Qtr,Month,Week**>** Sales **)**

possible syntax for use with a time drill-down group

sum(Sales) / sum({1} Total Sales)

returns sales within total document

sum({BM01} Sales**)**

returns sales within the selection defined by bookmark BM01

sum({$<Year={2007,2008}>}Sales**)**

returns the sales for the current selection but just for year 2007 and 2008, i.e. the same as **Sum(**if(Year=2007 or Year=2008,Sales)**)**

Further examples of aggregate qualifiers are found on page 421.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

min (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]]expression [, rank])***

Returns the numeric minimum value of *expression* or *field* iterated over the chart dimension(s). *Rank* defaults to 1 which corresponds to the lowest value. By specifying *rank* as 2 the second lowest value will be returned. If *rank* is 3 the third lowest value will be returned and so on.

Expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

The **min** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
min(Sales **)**
min(Sales, 2**)**
min(Price*Quantity **)**
min(total Sales **)**
min({1} total Sales **)**
min(total <Country**>** Sales **)**

Further examples of aggregate qualifiers are found on page 421.

max (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression [, rank]* **)**

Returns the numeric maximum value of expression or field iterated over the chart dimension(s). *Rank* defaults to 1 which correspond to the highest value. By specifying *rank* as 2 the second highest value will be returned. If *rank* is 3 the third highest value will be returned and so on.

Expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

The **max** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
max(Sales **)**
max(Sales, 2**)**
max(Price*Quantity **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

max(total Sales **)**
max({1} total Sales **)**
max(total <Country**>** Sales **)**

Further examples of aggregate qualifiers are found on page 421.

only (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **)**

If *expression* or *field* iterated over the chart dimension(s) contains one single value, that value is returned, else NULL is returned. **Only** can return numeric values as well as text values. *Expression* must not contain aggregation functions.

The word **distinct** before an *expression* or a *field* is allowed but has no meaning.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **only** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
only(Sales **)**
only(Price*Quantity **)**
only(total Salesman **)**
only({1} total Sales **)**
only(total <District**>** Salesman **)**

Further examples of aggregate qualifiers are found on page 421.

mode(*[{set_expression}] [* **distinct** *] expression* **)**

Returns the mode value, i.e. the most commonly occurring value, of *expression* or *field* iterated over the chart dimension(s). If more than one value is equally commonly occurring, NULL is returned. **Mode** can return numeric values as well as text values. *Expression* must not contain aggregation functions.

The word **distinct** before an *expression* or a *field* is allowed but has no meaning.

Examples:
mode(Product **)**
mode(X*Y/3 **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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firstsortedvalue (*[{set_expression}][* **distinct** *] [* **total** *[<fld {, fld}>]]* *expression* **)**

returns the first value of *expression* sorted by corresponding *sort-weight* when *expression* is iterated over the chart dimension(s). *Sort-weight* should return a numeric value where the lowest value will render the corresponding value of *expression* to be sorted first. By preceding the *sort-value* expression with a minus sign, the function will return the last value instead. If more than one value of expression share the same lowest *sort-order*, the function will return Null. By stating an *n* larger than 1, you will get the *n*th value in order.

The function argument expressions must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **firstsortedvalue** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
firstsortedvalue (PurchasedArticle, OrderDate **)**
firstsortedvalue (PurchasedArticle, OrderDate, -2 **)**
firstsortedvalue (A/B, X*Y/3 **)**
firstsortedvalue (distinct PurchasedArticle, OrderDate **)**
firstsortedvalue (total PurchasedArticle, OrderDate **)**
firstsortedvalue (total <Grp> PurchasedArticle, OrderDate)

String Aggregation Functions

MinString(*[{set_expression}] [* **total** *[<fld {, fld}>]] expression* **)**

If *expression* or *field* iterated over the chart dimension(s) contains one or more values with a string representation (any text or number), the first value in text sort order is returned, else NULL is returned.

The function argument expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **total** occurs before expression the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **minstring** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
MinString(Currency **)**
MinString(Left(abc,2 **))**
MinString(total Currency **)**
MinString(total <X> Currency **)**

MaxString(*[{set_expression}][* **total** *[<fld {, fld}>]] expression* **)**
If *expression* or *field* iterated over the chart dimension(s) contains one or more values with a string representation (any text or number), the last value in text sort order is returned, else NULL is returned.

The function argument expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **total** occurs before expression the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **maxstring**function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
MaxString(Currency **)**
MaxString(Left(abc,2 **))**
MaxString(total Currency **)**
MaxString(total <X> Currency **)**

concat (*[{set_expression}][* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **)**
returns the aggregated string concatenation of all values of *expression* iterated over the chart dimension(s). Each value may be separated by the string found in *delimiter*. The order of concatenation

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

may be determined by *sort-weight*. *Sort-weight* should return a numeric value where the lowest value will render the item to be sorted first.

The function argument expressions must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **concat** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
concat(Code, ';' **)**
concat(FirstName&' '&LastName, ',')
concat(distinct Code, ';' **)**
concat(total Name, ';' , Date **)**
concat(total <Grp> Name, ';' , Date**)**

Counter Aggregation Functions

count(*[{set_expression}][* **distinct** *] [* **total** *[<fld {, fld}>]]*
expression **)**
Returns the aggregated total count of values from *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before a *field*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **count** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
count(Sales **)**
count(Price*Quantity **)**
count(distinct Price **)**
count(Sales **)** / **count(total** Sales **)**
returns share within selection
count(Sales **)** / **count(total <**Month**>** Sales **)**
returns share within selection for each Month
count(Sales **)** / **count(total <**Month,Grp**>** Sales **)**
returns share within selection for each Month and Grp
count(Sales **)** / **count(total <**Qtr,Month,Week**>** Sales **)**
possible syntax for use with a time drill-down group
count(Sales **)** / **count({1} total** Sales **)**
returns share within total document
count(Sales **)** / **count(distinct {1} total** Sales **)**

Further examples of aggregate qualifiers are found on page 421.

NumericCount (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **|** *field* **)**

Returns the aggregated numeric count of values from *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **numericcount** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
NumericCount(Sales **)**
NumericCount(Price*Quantity **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

NumericCount(distinct Price **)**
NumericCount(Sales **)** / **NumericCount(total** Sales **)**
returns share within selection
NumericCount(Sales **)** / **NumericCount(total <**Month**>** Sales **)**
returns share within selection for each Month
NumericCount(Sales **)** / **NumericCount(total <**Month,Grp**>** Sales
returns share within selection for each Month and Grp
NumericCount(Sales **)** / **NumericCount(total <**Qtr,Month,Week**>** Sales **)**
possible syntax for use with a time drill-down group
NumericCount(Sales **)** / **NumericCount({1} total** Sales **)**
returns share within total document

Further examples of aggregate qualifiers are found on page 421.

TextCount (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **|** *field* **)**

Returns the aggregated text count of values from *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **textcount** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
TextCount(Sales **)**
TextCount(Price*Quantity **)**
TextCount(distinct Price **)**
TextCount(Sales **)** / **TextCount(total** Sales **)**
returns share within selection
TextCount(Sales **)** / **TextCount(total <**Month**>** Sales **)**
returns share within selection for each Month
TextCount(Sales **)** / **TextCount(total <**Month,Grp**>** Sales **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

returns share within selection for each Month and Grp

TextCount(Sales **)** / **TextCount(total <**Qtr,Month,Week**>** Sales **)**
possible syntax for use with a time drill-down group

TextCount(Sales **)** / **TextCount({1} total** Sales **)**
returns share within total document

Further examples of aggregate qualifiers are found on page 421.

NullCount (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **|** *field* **)**

Returns the aggregated count of null values from *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **nullcount** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:
NullCount(Sales **)**
NullCount(Price*Quantity **)**
NullCount(distinct Price **)**
NullCount(Sales **) / NullCount(total** Sales **)**
returns share within selection
NullCount(Sales **) / NullCount(total <**Month**>** Sales **)**
returns share within selection for each Month
NullCount(Sales **) / NullCount(total <**Month,Grp**>** Sales **)**
returns share within selection for each Month and Grp
NullCount(Sales **) / NullCount (total <**Qtr,Month,Week**>** Sales **)**
possible syntax for use with a time drill-down group
NullCount(Sales **) / NullCount({1} total** Sales **)**
returns share within total document

Further examples of aggregate qualifiers are found on page 421.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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MissingCount (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]]* *expression* **|** *field* **)**

Returns the aggregated count of missing values from *expression* or *field* iterated over the chart dimension(s). Missing values are all non-numeric values, including null values. *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **missingcount** function supports sets and the **total** qualifier as described under the **sum** aggregation function, page 272.

Examples:

MissingCount(Sales **)**

MissingCount(if(Price>10, Price, 'invalid' **))**

MissingCount(distinct Price **)**

MissingCount(Sales **) / MissingCount(total** Sales **)**

returns share within selection

MissingCount(Sales **) / MissingCount(total <**Month**>** Sales **)**

returns share within selection for each Month

MissingCount(Sales **) / MissingCount(total <**Month,Grp**>** Sales **)**

returns share within selection for each Month and Grp

MissingCount(Sales **) / MissingCount(total <Q**tr,Month,Week**>** Sales **)**

possible syntax for use with a time drill-down group

MissingCount(Sales **) / MissingCount({1} total** Sales **)**

returns share within total document

Further examples of aggregate qualifiers are found on page 421.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Statistical Aggregation Functions

avg (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **|** *field* **)**

Returns the aggregated average of *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of record can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of *field* values will be disregarded.

If the word **total** occurs before an *expression*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **total** qualifier may be followed by a list of one or more field names within angle brackets. These field names should be a subset of the chart dimensions. In this case the calculation will be made disregarding all chart dimensions except those listed, i.e. one value will be returned for each combination of field values in the listed dimension fields. Also fields which are not currently a dimension in a chart may be included in the list. This may be useful in the case of group dimensions, where the dimension fields are not fixed. Listing all of the dimensions in the group causes the function to work when the cycle or drill-down level changes.

In previous QlikView versions, the **all** qualifier may occur before an expression. This is equivalent to using "**{1} total**", i.e. in such a case, the calculation will be made over all the values of the field in the document, disregarding the chart dimensions and current selections. (The same value is always returned regardless of the logical state in the document.) For legacy reasons, **all** will still work. However, if the **all** qualifier is used, a set expression cannot be used, since the **all** qualifier defines a set by itself.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
avg(Sales **)**
avg(X*Y/3 **)**
avg(distinct Price **)**
avg(total Sales **)**
avg({1} total Sales **)**
avg(total <Grp**>** Price **)**

Further examples of aggregate qualifiers are found on page 421.

stdev(*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **|** *field* **)**

Returns the aggregated standard deviation of *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before a *field*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **stdev** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
stdev(Sales **)**
stdev(X*Y/3 **)**
stdev(distinct Price **)**
stdev(total Sales **)**
stdev({1} total Sales **)**
stdev(total <Grp**>** Sales **)**

Further examples of aggregate qualifiers are found on page 421.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

median (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]]* *expression* **)**
returns the aggregated median of *expression* iterated over the chart dimension(s).

Expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **median** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
median(X **)**
median(X*Y/3 **)**
median(total X **)**
median(total <Group> Price **)**

fractile (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]]* *expression, fractile* **)**
returns the aggregated *fractile* of *expression* iterated over the chart dimension(s).

The function argument expressions must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **fractile** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
fractile(Sales, 0.75 **)**
fractile(X*Y/3, 0.9 **)**
fractile(total Price, 0.25 **)**
fractile(total <Group> Price **)**

skew(*[{set_expression}][* **distinct** *] [* **total** *[<fld {, fld}>]] expression | field* **)**

Returns the aggregated skewness of *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 431) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before a *field*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **skew** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
skew(Sales **)**
skew(X*Y/3 **)**
skew(distinct Price **)**
skew(total Sales **)**
skew({1} total Sales **)**
skew(total <Grp**>** Sales **)**

Further examples of aggregate qualifiers are found on page 421.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

kurtosis(*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **|** *field***)**

Returns the aggregated kurtosis of *expression* or *field* iterated over the chart dimension(s). *Expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 431) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **distinct** occurs before an *expression*, duplicates resulting from the evaluation of the *expression* will be disregarded.

If the word **distinct** occurs before a *field*, duplicates of field values will be disregarded.

If the word **total** occurs before a *field*, the calculation will be made over all possible values given the current selections, but disregarding the chart dimensions.

The **kurtosis** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
kurtosis(Sales **)**
kurtosis(X*Y/3 **)**
kurtosis(distinct Price **)**
kurtosis(total Sales **)**
kurtosis({1} total Sales **)**
kurtosis(total <Grp**>** Sales **)**

Further examples of aggregate qualifiers are found on page 421.

correl (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] x-expression, y-expression* **)**

returns the aggregated correlation coefficient for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded. See also the **rangecorrel** function (page 344).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **correl** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
correl(Payments, Dates **)**
correl(A/B, X*Y/3 **)**
correl(total Payments, Dates **)**
correl(total <Grp> Payments, Dates**)**

sterr (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **)**
returns the aggregated standard error (stdev/sqrt(n)) for a series of values represented by *expression* iterated over the chart dimension(s). Text values, null values and missing values will be disregarded.

Expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **distinct** occurs before the function argument, duplicates resulting from the evaluation of the function argument will be disregarded.

If the word **total** occurs before the function argument the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The **sterr** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
sterr(X **)**
sterr(X*Y/3 **)**
sterr(total X **)**
sterr(total <Z> X**)**

steyx (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression* **)**

returns the aggregated standard error of the predicted y-value for each x-value in the regression for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **steyx** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
steyx(Y, X **)**
steyx(A/B, X*Y/3 **)**
steyx(total Y, X **)**
steyx(total <Z> Y, X**)**

linest_m (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated m value (slope) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_m** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_m(Y, X **)**
linest_m(A/B, X*Y/3 **)**
linest_m(total Y, X **)**
linest_m(total <Z> Y, X**)**
linest_m(Y, X, 0 **)**
linest_m(Y, X, 1, 1 **)**

linest_b (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated b value (y-intercept) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_b** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_b(Y, X **)**
linest_b(A/B, X*Y/3 **)**
linest_b(total Y, X **)**
linest_b(total <Z> Y, X**)**
linest_b(Y, X, 0 **)**
linest_b(Y, X, 1, 1 **)**

linest_r2 (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated r2 value (coefficient of determination) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_r2** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283..

Examples:
linest_r2(Y, X **)**
linest_r2(A/B, X*Y/3 **)**
linest_r2(total Y, X **)**
linest_r2(total <Z> Y, X**)**
linest_r2(Y, X, 0 **)**
linest_r2(Y, X, 1, 1 **)**

linest_sem (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated standard error of the m value of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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is possible to force the regression line to pass through a single fixed coordinate.

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_sem** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_sem(Y, X **)**
linest_sem(A/B, X*Y/3 **)**
linest_sem(total Y, X **)**
linest_sem(total <Z> Y, X**)**
linest_sem(Y, X, 0 **)**
linest_sem(Y, X, 1, 1 **)**

linest_seb (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression*, *x-expression [, y0 [, x0]]* **)**

returns the aggregated standard error of the b value of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_seb** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_seb(Y, X **)**
linest_seb(A/B, X*Y/3 **)**
linest_seb(total Y, X **)**
linest_seb(total <Z> Y, X**)**
linest_seb(Y, X, 0 **)**
linest_seb(Y, X, 1, 1 **)**

linest_sey (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated standard error of the y estimate of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Page 1.407/

Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_sey** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_sey(Y, X **)**
linest_sey(A/B, X*Y/3 **)**
linest_sey(total Y, X **)**
linest_sey(total <Z> Y, X**)**
linest_sey(Y, X, 0 **)**
linest_sey(Y, X, 1, 1 **)**

linest_df (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated degrees of freedom of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_df** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_df(Y, X **)**
linest_df(A/B, X*Y/3 **)**
linest_df(total Y, X **)**
linest_df(total <Z> Y, X**)**
linest_df(Y, X, 0 **)**
linest_df(Y, X, 1, 1 **)**

linest_f (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated F statistic (r2/(1-r2)) of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_f** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_f(Y, X **)**
linest_f(A/B, X*Y/3 **)**
linest_f(total Y, X **)**
linest_f(total <Z> Y, X**)**
linest_f(Y, X, 0 **)**
linest_f(Y, X, 1, 1 **)**

linest_ssreg (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]***)**

returns the aggregated regression sum of squares of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression.Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_ssreg** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_ssreg(Y, X **)**
linest_ssreg(A/B, X*Y/3 **)**
linest_ssreg(total Y, X **)**
linest_ssreg(total <Z> Y, X**)**
linest_ssreg(Y, X, 0 **)**
linest_ssreg(Y, X, 1, 1 **)**

linest_ssresid (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] y-expression, x-expression [, y0 [, x0]]* **)**

returns the aggregated residual sum of squares of a linear regression defined by the equation y=mx+b for a series of coordinates represented by paired numbers in *x-expression* and *y-expression* iterated over the chart dimension(s). Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair to be disregarded.

An optional value *y0* may be stated forcing the regression line to pass through the y-axis at a given point. By stating both *y0* and *x0* it is possible to force the regression line to pass through a single fixed coordinate.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Unless both *y0* and *x0* are stated, the function requires at least two valid data-pairs to calculate. If *y0* and *x0* are stated, a single data pair will do.

X-expression and *y-expression* must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **linest_ssresid** function supports sets and the **total** qualifier as described under the **avg** aggregation function, page 283.

Examples:
linest_ssresid(Y, X **)**
linest_ssresid(A/B, X*Y/3 **)**
linest_ssresid(total Y, X **)**
linest_ssresid(total <Z> Y, X **)**
linest_ssresid(Y, X, 0 **)**
linest_ssresid(Y, X, 1, 1 **)**

Financial Aggregation Functions

irr(*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] expression* **)**
returns the aggregated internal rate of return for a series of cash flows represented by the numbers in expression iterated over the chart dimension(s). These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.The function needs at least one positive and one negative value to calculate. Text values, null values and missing values are disregarded. See also the **rangeirr** function (page 345).

Expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

If the word **total** occurs before expression the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **total** qualifier may be followed by a list of one or more field names within angle brackets. These field names should be a subset of the chart dimension variables. In this case the calculation will be made disregarding all chart dimension variables except those listed, i.e. one value will be returned for each combination of field values in the listed dimension fields. Also fields which are not currently a dimension in a chart may be included in the list. This may be useful in the case of group dimensions, where the dimension fields are not fixed. Listing all of the variables in the group causes the function to work when the cycle or drill-down level changes.

In previous QlikView versions, the **all** qualifier may occur before an expression. This is equivalent to using **{1} total**, i.e. in such a case, the calculation will be made over all the values of the field in the document, disregarding the chart dimensions and current selections. (The same value is always returned regardless of the logical state in the document.) For legacy reasons, **all** will still work. However, if the **all** qualifier is used, a set expression cannot be used, since the **all** qualifier defines a set by itself.

Examples:
irr(Payments **)**
irr(X*Y/3 **)**
irr(total Payments **)**
irr(total <Grp> Payments **)**

xirr (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] valueexpression, dateexpression* **)**

returns the aggregated internal rate of return for a schedule of cash flows (that is not necessarily periodic) represented by paired numbers in valueexpression and dateexpression iterated over the chart dimension(s). All payments are discounted based on a 365-day year. Text values, null values and missing values in any or both pieces of

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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a data-pair will result in the entire data-pair being disregarded. See also the **rangexirr** function (page 345).

Valueexpression and dateexpression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **xirr** function supports sets and the **total** qualifier as described under the **irr** aggregation function, page 299.

Examples:
xirr(Payments, Dates **)**
xirr(A/B, X*Y/3 **)**
xirr(total Payments, Dates **)**
xirr(total <Grp> Payments, Dates**)**

npv (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] rate, expression* **)**
returns the aggregated net present value of an investment based on a discount rate and a series of future payments (negative values) and incomes (positive values) represented by the numbers in expression iterated over the chart dimension(s). The result has a default number format of money. Rate is the interest rate per period. The payments and incomes are assumed to occur at the end of each period.Text values, null values and missing values are disregarded. See also the **rangenpv** function (page 345).

Rate and expression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression.Read more about “Set Analysis” on page 327.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **npv** function supports sets and the **total** qualifier as described under the **irr** aggregation function, page 299.

Examples:
npv(0.1, Payments **)**
npv(0.1, X*Y/3 **)**
npv(total 0.1, Payments **)**
npv(total <Grp> 0.1, Payments **)**

xnpv (*[{set_expression}] [* **distinct** *] [* **total** *[<fld {, fld}>]] rate, valueexpression, dateexpression* **)**

returns the aggregated net present value for a schedule of cash flows (not necessarily periodic) represented by paired numbers in valueexpression and dateexpression iterated over the chart dimension(s). Rate is the interest rate per period. The result has a default number format of money. All payments are discounted based on a 365-day year. Text values, null values and missing values in any or both pieces of a data-pair will result in the entire data-pair being disregarded. See also the **rangexnpv** function (page 345).

Rate, valueexpression and dateexpression must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression.Read more about “Set Analysis” on page 327.

If the word **total** occurs before a field the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **xnpv** function supports sets and the **total** qualifier as described under the **irr** aggregation function, page 299.

Examples:
xnpv(0.1, Payments, Dates **)**
xnpv(0.1, A/B, X*Y/3 **)**
xnpv(total 0.1, Payments, Dates **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

xnpv(total <Grp> 0.1, Payments, Dates**)**

Statistical Test Functions

The following three functions apply to chi2-tests.

chi2test_p (*[{set_expression}][* **total** *[<fld {,fld}>]] col, row, observed_value [, expected_value]* **)**

returns the aggregated chi2-test p value (significance) for one or two series of values iterated over the chart dimension(s). The test can be done either on the values in *observed_value* testing for variations within the specified *col* and *row* matrix or by comparing values in *observed_value* with corresponding values in *expected_values*. Text values, null values and missing values in the value expressions will result in the function returning null.

The function argument expressions must not contain aggregation functions, unless these inner aggregations contain the **total** qualifier. For more advanced nested aggregations, please use the **aggr** function (see page 326) in combination with calculated dimensions (see page 32).

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by set analysis.Read more about “Set Analysis” on page 327.

If the word **total** occurs before the function arguments the calculation will be made over all possible values given the current selections but disregarding the chart dimension variables.

The **total** qualifier may be followed by a list of one or more field names within angle brackets. These field names should be a subset of the chart dimension variables. In this case the calculation will be made disregarding all chart dimension variables except those listed, i.e. one value will be returned for each combination of field values in the listed dimension fields. Also fields which are not currently a dimension in a chart may be included in the list. This may be useful in the case of group dimensions, where the dimension fields are not fixed. Listing all of the variables in the group causes the function to work when the cycle or drill-down level changes.

In previous QlikView versions, the **all** qualifier may occur before an expression. This is equivalent to using **{1} total**, i.e. in such a case, the calculation will be made over all the values of the field in the document, disregarding the chart dimensions and current selections.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

(The same value is always returned regardless of the logical state in the document.) For legacy reasons, **all** will still work. However, if the **all** qualifier is used, a set expression cannot be used, since the **all** qualifier defines a set by itself.

Examples:
chi2test_p(Grp, Grade, Count **)**
chi2test_p(Gender, Description, Observed, Expected **)**

chi2test_df(*[{set_expression}][* **total** *[<fld {,fld}>]]col, row, observed_value [, expected_value]* **)**

returns the aggregated chi2-test df value (degrees of freedom) for one or two series of values iterated over the chart dimension(s). See the **chi2test_p** function, page 303, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
chi2test_df(Grp, Grade, Count **)**
chi2test_df(Gender, Description, Observed, Expected **)**

chi2test_chi2 (*[{set_expression}][* **total** *[<fld {,fld}>]] col, row, observed_value [, expected_value]* **)**

returns the aggregated chi2-test value for one or two series of values iterated over the chart dimension(s). See the **chi2test_p** function, page 303, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
chi2test_chi2(Grp, Grade, Count)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

chi2test_chi2(Gender, Description, Observed, Expected **)**

The following eight functions apply to two independent samples' student's t-tests.

TTest_t (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, eq_var = true]* **)**

returns the aggregated t value for two independent series of values iterated over the chart dimension(s). The values should be returned by *value* and be logically grouped via exactly two values in *group*. If *eq_var* is specified as false, separate variances of the two samples will be assumed, else equal variances between the samples will be assumed. Text values, null values and missing values in *value* will result in the function returning null.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_t(Group, Value **)**
ttest_t(Group, Value, false **)**

TTest_df (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, eq_var = true]* **)**

returns the aggregated student's t-test df value (degrees of freedom) for two independent series of values iterated over the chart dimension(s). See the **TTest_t** function, page 305, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Examples:
ttest_df(Group, Value **)**
ttest_df(Group, Value, false **)**

TTest_sig (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, eq_var = true]* **)**

returns the aggregated student's t-test 2-tailed level of significance for two independent series of values iterated over the chart dimension(s). See the **TTest_t** function, page 305, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_sig(Group, Value **)**
ttest_sig(Group, Value, false **)**

TTest_dif (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, eq_var = true]* **)**

returns the aggregated student's t-test mean difference for two independent series of values iterated over the chart dimension(s). See the **TTest_t** function, page 305, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function apply.This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_dif(Group, Value **)**
ttest_dif(Group, Value, false **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTest_sterr (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, eq_var = true]* **)**

returns the aggregated student's t-test standard error of the mean difference for two independent series of values iterated over the chart dimension(s). See the **TTest_t** function, page 305, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_sterr(Group, Value **)**
ttest_sterr(Group, Value, false **)**

TTest_conf (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, sig = 0.025 [, eq_var = true]]* **)**

returns the aggregated t value for two independent series of values iterated over the chart dimension(s). The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTest_t** function, page 305, for descriptions of the other arguments.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_conf(Group, Value **)**
ttest_conf(Group, Value, false **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTest_lower (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, sig = 0.025 [, eq_var = true]]* **)**

returns the aggregated value for the lower end of the confidence interval for two independent series of values iterated over the chart dimension(s). See the **TTest_t**, page 305, and **TTest_conf**, page 307, functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_lower(Group, Value **)**
ttest_lower(Group, Value, false **)**

TTest_upper (*[{set_expression}][* **total** *[<fld {,fld}>]] group, value [, sig = 0.025 [, eq_var = true]]* **)**

returns the aggregated value for the upper end of the confidence interval for two independent series of values iterated over the chart dimension(s). See the **TTest_t**, page 305, and **TTest_conf**, page 307, functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest_upper(Group, Value **)**
ttest_upper(Group, Value, false **)**

The following eight functions apply to independent two-sample student's t-tests where the input data series is given in weighted two-column format.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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TTestw_t (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, eq_var = true]* **)**

returns the aggregated t value for two independent series of values iterated over the chart dimension(s). The values should be returned by *value* and be logically grouped via exactly two values in *group*. Each value in *value* can be counted one or more times according to a corresponding weight value in *weight*. If *eq_var* is specified as false, separate variances of the two samples will be assumed, else equal variances between the samples will be assumed. Text values, null values and missing values in *value* will result in the function returning null.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_t(Weight, Group, Value **)**
TTestw_t(Weight, Group, Value, false **)**

TTestw_df (*[{set_expression}][* **total** *[<fld {,fld}>] weight, group, value [, eq_var = true]* **)**

returns the aggregated student's t-test df value (degrees of freedom) for two independent series of values iterated over the chart dimension(s). See the **TTestw_t** function**,** page 309**,** for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_df(Weight, Group, Value **)**
TTestw_df(Weight, Group, Value, false **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTestw_sig (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, eq_var = true]* **)**

returns the aggregated student's t-test 2-tailed level of significance for two independent series of values iterated over the chart dimension(s). See the **TTestw_t** function**,** page 309**,** for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_sig(Weight, Group, Value **)**
TTestw_sig(Weight, Group, Value, false **)**

TTestw_dif (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, eq_var = true]* **)**

returns the aggregated student's t-test mean difference for two independent series of values iterated over the chart dimension(s). See the **TTestw_t** function**,** page 309**,** for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_dif(Weight, Group, Value **)**
TTestw_dif(Weight, Group, Value, false **)**

TTestw_sterr (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, eq_var = true]* **)**

returns the aggregated student's t-test standard error of the mean difference for two independent series of values iterated over the chart

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

dimension(s). See the **TTestw_t** function, page 309, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_sterr(Weight, Group, Value **)**
TTestw_sterr(Weight, Group, Value, false **)**

TTestw_conf (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, sig = 0.025 [, eq_var = true]]* **)**

returns the aggregated t value for two independent series of values iterated over the chart dimension(s). The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTestw_t** function, page 309, for descriptions of the other arguments.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_conf(Weight, Group, Value **)**
TTestw_conf(Weight, Group, Value, false **)**

TTestw_lower (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, sig = 0.025 [, eq_var = true]]* **)**

returns the aggregated value for the lower end of the confidence interval for two independent series of values iterated over the chart dimension(s). See the **TTestw_t,** page 309, and **TTestw_conf,** page 311, functions for argument descriptions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_lower(Weight, Group, Value **)**
TTestw_lower(Weight, Group, Value, false **)**

TTestw_upper (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, group, value [, sig = 0.025 [, eq_var = true]]* **)**
returns the aggregated value for the upper end of the confidence interval for two independent series of values iterated over the chart dimension(s). See the **TTestw_t,** page 309**,** and **TTestw_conf,** page 311**,** functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
TTestw_upper(Weight, Group, Value **)**
TTestw_upper(Weight, Group, Value, false **)**

The following eight functions apply to one-sample student's t-tests.

TTest1_t (*[{set_expression}][* **total** *[<fld {,fld}>]] value* **)**
returns the aggregated t value for a series of values iterated over the chart dimension(s). The values should be returned by *value*. Text values, null values and missing values in *value* will result in the function returning null.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ttest1_t(Value **)**

TTest1_df (*[{set_expression}][* **total** *[<fld {,fld}>]] value* **)**
returns the aggregated student's t-test df value (degrees of freedom) for a series of values iterated over the chart dimension(s). See the **TTest1_t** function, page 312, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ttest1_df(Value **)**

TTest1_sig (*[{set_expression}] [* **total** *[<fld {,fld}>]] value* **)**
returns the aggregated student's t-test 2-tailed level of significance for a series of values iterated over the chart dimension(s). See the **TTest1_t** function, page 312, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ttest1_sig(Value **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

TTest1_dif (*[{set_expression}][* **total** *[<fld {,fld}>]] value* **)**

returns the aggregated student's t-test mean difference for a series of values iterated over the chart dimension(s). See the **TTest1_t** function, page 312, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ttest1_dif(Value **)**

TTest1_sterr (*[{set_expression}][* **total** *[<fld {,fld}>]] value* **)**

returns the aggregated student's t-test standard error of the mean difference for a series of values iterated over the chart dimension(s). See the **TTest1_t** function, page 312, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ttest1_sterr(Value **)**

TTest1_conf (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sig = 0.025]* **)**

returns the aggregated t value for a series of values iterated over the chart dimension(s). The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTest1_t** function, page 312, for descriptions of the other arguments.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1_conf(Value **)**
ttest1_conf(Value, 0.005 **)**

TTest1_lower (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sig = 0.025]* **)**

returns the aggregated value for the lower end of the confidence interval for a series of values iterated over the chart dimension(s). See the **TTest1_t**, page 312, and **TTest1_conf**, page 314, functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1_lower(Value **)**
ttest1_lower(Value, 0.005 **)**

TTest1_upper (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sig = 0.025]* **)**

returns the aggregated value for the upper end of the confidence interval for a series of values iterated over the chart dimension(s). See the **TTest1_t**, page 312, and **TTest1_conf**, page 314, functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1_upper(Value **)**
ttest1_upper(Value, 0.005 **)**

The following eight functions apply to one-sample student's t-tests where the input data series is given in weighted two-column format.

TTest1w_t (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value* **)**

returns the aggregated t value for a series of values iterated over the chart dimension(s). The values should be returned by *value*. Each value in *value* can be counted one or more times according to a corresponding weight value in *weight*. Text values, null values and missing values in *value* will result in the function returning null.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_t(Weight, Value **)**

TTest1w_df (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value* **)**

returns the aggregated student's t-test df value (degrees of freedom) for a series of values iterated over the chart dimension(s). See the **TTest1w_t** function, page 316, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
ttest1w_df(Weight, Value **)**

TTest1w_sig (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value* **)**
returns the aggregated student's t-test 2-tailed level of significance for a series of values iterated over the chart dimension(s). See the **TTest1w_t** function, page 316, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_sig(Weight, Value **)**

TTest1w_dif (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value* **)**
returns the aggregated student's t-test mean difference for a series of values iterated over the chart dimension(s). See the **TTest1w_t** function, page 316, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_dif(Weight, Value **)**

TTest1w_sterr (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value* **)**
returns the aggregated student's t-test standard error of the mean difference for a series of values iterated over the chart dimension(s). See the **TTest1w_t** function, page 316, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_sterr(Weight, Value **)**

TTest1w_conf (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sig = 0.025]* **)**

returns the aggregated t value for a series of values iterated over the chart dimension(s). The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **TTest1w_t** function, page 316, for descriptions of the other arguments.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_conf(Weight, Value **)**
ttest1w_conf(Weight, Value, 0.005 **)**

TTest1w_lower (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sig = 0.025]* **)**

returns the aggregated value for the lower end of the confidence interval for a series of values iterated over the chart dimension(s). See the **TTest1w_t**, page 316, and **TTest1w_conf** , page 318, functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_lower(Weight, Value **)**
ttest1w_lower(Weight, Value, 0.005 **)**

TTest1w_upper (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sig = 0.025]* **)**

returns the aggregated value for the upper end of the confidence interval for a series of values iterated over the chart dimension(s). See the **TTest1w_t**, page 316, and **TTest1w_conf** , page 318, functions for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ttest1w_upper(Weight, Value **)**
ttest1w_upper(Weight, Value, 0.005 **)**

The following five functions apply to z-tests.

ZTest_z (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sigma]* **)**

returns the aggregated z value for a series of values iterated over the chart dimension(s). The values should be returned by *value*. A population mean of 0 is assumed. If you want the test to be performed around another mean, subtract that value from the sample values. If known, the standard deviation can be stated in *sigma*. If *sigma* is omitted the actual sample standard deviation will be used. Text values, null values and missing values in *value* will result in the function returning null.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ztest_z(Value-TestValue **)**

ZTest_sig (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sigma]* **)**
returns the aggregated z-test 2-tailed level of significance for a series of values iterated over the chart dimension(s). See the **ZTest_z** function, page 319, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ztest_sig(Value-TestValue**)**

ZTest_dif (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sigma]* **)**
returns the aggregated z-test mean difference for a series of values iterated over the chart dimension(s). See the **ZTest_z** function, page 319, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ztest_dif(Value-TestValue**)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ZTest_sterr (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sigma]* **)**

returns the aggregated z-test standard error of the mean difference for a series of values iterated over the chart dimension(s). See the **ZTest_z** function, page 319, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Example:
ztest_sterr(Value-TestValue**)**

ZTest_conf (*[{set_expression}][* **total** *[<fld {,fld}>]] value [, sigma [, sig = 0.025]* **)**

returns the aggregated z value for a series of values iterated over the chart dimension(s). The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **ZTest_z** function, page 319, for descriptions of the other arguments.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about "Set Analysis" on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ztest_conf(Value-TestValue**)**

The following five functions apply to z-tests where the input data series is given in weighted two-column format.

ZTestw_z (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sigma]* **)**

returns the aggregated z value for a series of values iterated over the chart dimension(s). The values should be returned by *value*. A sample mean of 0 is assumed. If you want the test to be performed

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

around another mean, subtract that value from the sample values. Each value in *value* can be counted one or more times according to a corresponding weight value in *weight*. If known, the standard deviation can be stated in *sigma*. If *sigma* is omitted the actual sample standard deviation will be used. Text values, null values and missing values in *value* will result in the function returning null.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ztestw_z(Weight, Value-TestValue**)**

ZTestw_sig (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sigma]* **)**

returns the aggregated z-test 2-tailed level of significance for a series of values iterated over the chart dimension(s). See the **ZTestw_z** function, page 321, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ztestw_sig(Weight, Value-TestValue**)**

ZTestw_dif (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sigma]* **)**

returns the aggregated z-test mean difference for a series of values iterated over the chart dimension(s). See the **ZTestw_z** function, page 321, function for argument descriptions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ztestw_dif(Weight, Value-TestValue**)**

ZTestw_sterr (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sigma]* **)**

returns the aggregated z-test standard error of the mean difference for a series of values iterated over the chart dimension(s). See the **ZTestw_z** function, page 321, for argument descriptions.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ztestw_sterr(Weight, Value-TestValue**)**

ZTestw_conf (*[{set_expression}][* **total** *[<fld {,fld}>]] weight, value [, sigma] [, sig = 0.025]* **)**

returns the aggregated z value for a series of values iterated over the chart dimension(s). The two-tailed level of significance can be specified in *sig*. If omitted *sig* will be set to 0.025, resulting in a 95% confidence interval. See the **ZTestw_z** function, page 321, for descriptions of the other arguments.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The same limitations with regard to nested aggregation as those listed under the **chi2test_p** function, page 303, apply. This function supports sets and the **total** qualifier in the same manner as described under the **chi2test_p** function, page 303.

Examples:
ztestw_conf(Weight, Value-TestValue**)**

Special Input Field Aggregation Function

inputsum (*inputfield [, distribution_mode][{set_expression}]* **)**

Returns the aggregated sum of *inputfield* iterated over the chart dimension(s). *Inputfield* must be a field name of a field properly declared as an input field in the script.

When this aggregation function is used as expression in a table chart, it will be possible to edit the aggregated sum interactively. When hovering over the expression cell you will see an input icon. Clicking the icon sets the cell in input edit mode. It is possible to use up/down arrow keys to move between cells while staying in input edit mode. The change in the aggregated sum will be distributed to the underlying field values using the chosen *distribution_mode*. The entire QlikView document will automatically recalculate whenever new values are entered.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The *distribution_mode* parameter can have the following values:

'+ 'Default mode. Equal parts of the change is distributed to all the underlying values.

'* 'The change is distributed proportionally (to existing values) to the underlying values.

'= 'The value entered is given to all the underlying values.

'/ 'The value is divided equally between underlying values, without regard to previous distribution but keeping previous sum.

The *distribution_mode* values above can be amended with the following modifiers:

T E.g. '+T'. Will cause a compensation of the entered change over the other selected values in the input field (keeping the grand total intact).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

A E.g. '+A'. Will cause a compensation of the entered change over all other values (keeping the grand total intact).

Examples:
inputsum(Budget **)**
inputsum(Budget, '+' **)**
inputsum(Budget, '*' **)**
inputsum(Budget, '=' **)**
inputsum(Budget, '/' **)**
inputsum(Budget, '+T' **)**
inputsum(Budget, '+A' **)**

inputavg (*inputfield [, distribution_mode][{set_expression}]* **)**

Returns the aggregated average of *inputfield* iterated over the chart dimension(s). *Inputfield* must be a field name of a field properly declared as an input field in the script.

When this aggregation function is used as expression in a table chart, it will be possible to edit the aggregated value interactively. When hovering over the expression cell you will see an input icon. Clicking the icon sets the cell in input edit mode. It is possible to use up/down arrow keys to move between cells while staying in input edit mode. The change in the aggregated value will be distributed to the underlying field values using the chosen *distribution_mode*. The entire QlikView document will automatically recalculate whenever new values are entered.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

The *distribution_mode* parameter can have the following values:

'+ 'Default mode. Equal parts of the change is distributed to all the underlying values.

'* 'The change is distributed proportionally (to existing val ues) to the underlying values.

'= 'The value entered is given to all the underlying values.

'/ 'The value is divided equally between underlying values, without regard to previous distribution but keeping previ ous average.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The *distribution_mode* values above can be amended with the following modifiers:

T E.g. '+T'. Will cause a compensation of the entered change over the other selected values in the input field (keeping the grand total intact).

A E.g. '+A'. Will cause a compensation of the entered change over all other values (keeping the grand total intact).

Examples:
inputavg(Budget **)**
inputavg (Budget, '+' **)**
inputavg (Budget, '*' **)**
inputavg (Budget, '=' **)**
inputavg (Budget, '/' **)**
inputavg (Budget, '+T' **)**
inputavg (Budget, '+A' **)**

Special Function for Advanced Aggregations

aggr (*[***distinct** | **nodistinct** *] [{set_expression}] expression {, dimension}* **)**
returns a set of values of *expression* calculated over *dimensions*. The result can be compared to the expression column of a 'local chart', evaluated in the context where the **aggr** function resides. Each *dimension* must be a single field. It may not be an expression (calculated dimension).

If the *expression* argument is preceded by the **nodistinct** qualifier, each combination of dimension values may generate more than one return value, depending on underlying data structure. If the *expression* argument is preceded by the **distinct** qualifier or if no qualifier is used at all, each combination of dimension values will generate only one return value.

By default, the aggregation function will aggregate over the set of possible records defined by the selection. An alternative set of records can be defined by a set expression. Read more about “Set Analysis” on page 327.

By using this function in calculated dimensions (see page 32) it is possible to achieve nested chart aggregation.

When used in chart expressions it is possible to achieve sum of rows totals in a pivot table (see page 433).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
aggr(sum(Sales), Country)
aggr(nodistinct sum(Sales), Country)
aggr(sum(Sales), Country, Region)
count(aggr(sum(Sales**),** Country **))**

Set Analysis

Sets can be used in aggregation functions. Aggregation functions normally aggregate over the set of possible records defined by the current selection. But an alternative set of records can be defined by a set expression. Hence, a set is conceptually similar to a selection.

A set expression is always enclosed in curly brackets when used, e.g. **{BM01}**.

Set Identifiers

There is a constant that can be used to denote a record set; **1**. It represents the full set of all the records in the application.

The **$** sign represents the records of the current selection. The set expression **{$}** is thus the equivalent of not stating a set expression. **{1-$}** defines the inverse of the current selection, i.e. everything that the current selections excludes.

Selections from the Back/Forward stack can be used as set identifiers, by use of the dollar symbol: **$1** represents the previous selection, i.e. equivalent to pressing the **Back** button. Similarly, **$_1** represents one step forward, i.e. equivalent to pressing the **Forward** button. Any unsigned integer can be used in the **Back** and **Forward** notations, i.e. **$0** represents the current selection.

Finally, bookmarks can be used as set identifiers. Either the bookmark ID or the bookmark name can be used, e.g. **BM01** or **MyBookmark**.

Examples:

sum({$} Sales**)**
returns sales for the current selection, i.e. the same as **sum(**Sales**)**.
sum({$1} Sales**)**
returns sales for the previous selection.
sum({$_2} Sales**)**
returns sales for the 2nd next selection, i.e. two steps forward. Only relevant if you just made two **Back** operations.
sum({1} Sales**)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

returns the total sales within the application, disregarding the selection but not the dimension. If used in a chart with e.g. Products as dimension, each product will get a different value.

sum({1} Total Sales**)**

returns total sales within the application, disregarding both selection and dimension. I.e. the same as **sum(**All Sales**)**.

sum({BM01} Sales**)**

returns sales for the bookmark BM01.

sum({MyBookMark} Sales**)**

returns sales for the bookmark MyBookMark.

Set Operators

Several set operators that can be used in set expressions exist. All set operators use sets as operands, as described above, and return a set as result.

\+ Union. This binary operation returns a set consisting of the records that belong to any of the two set operands.

– Exclusion. This binary operation returns a set of the records that belong only to the first of the two set operands. Also, when used as a unary operator, it returns the complement set.

* Intersection. This binary operation returns a set consisting of the records that belong to both of the two set operands.

/ Symmetric difference (XOR). This binary operation returns a set consisting of the records that belong to either, but not both of the two set operands.

The order of precedence is 1) Unary minus (complement), 2) Intersection and Symmetric difference, and 3) Union and Exclusion. Within a group, the expression is evaluated from left to right. Alternative orders can be defined by standard brackets, which may be necessary since the set operators do not commute, e.g. A+(B-C) is different from (A+B)-C which in turn is different from (A-C)+B.

Examples:

sum({1-$} Sales**)**

returns sales for everything excluded by the current selection.

sum({$*BM01} Sales**)**

returns sales for the intersection between the current selection and bookmark BM01.

sum({-($+BM01)} Sales**)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

returns sales excluded by current selection and bookmark BM01.

Note The use of set operators in combination with basic aggregation expressions involving fields from multiple QlikView tables may cause unpredictable results and should be avoided. E.g. if *Quantity* and *Price* are fields from different tables, then the expression **sum(**{$*BM01}Quantity*Price**)** should be avoided.

Set Modifiers

A set can be modified by an additional or a changed selection. Such a modification can be written in the set expression. The modifier consists of one or several field names, each followed by a selection that should be made on the field, all enclosed by < and >. E.g. <Year={2007+2008},Region={US}>. Field names and field values can, be quoted as usual, e.g. <[Sales Region]={'West coast', 'South America'}>.

There are several ways to define the selection: A simple case is a selection based on the selected values of another field, e.g. <OrderDate = DeliveryDate>. This modifier will take the selected values from *DeliveryDate* and apply those as a selection on *OrderDate*. If there are many distinct values – more than a couple of hundred – then this operation is CPU intense and should be avoided.

The most common case, however, is a selection based on a field value list enclosed in curly brackets, the values separated by commas, e.g. <Year = {2007, 2008}>. The curly brackets here define an element set, where the elements can be either field values or searches of field values. A search is always defined by the use of double quotes, e.g. <Ingredient = {"*Garlic*"}> will select all ingredients including the string 'garlic'. Searches are case-insensitive and are made also over excluded values.

Empty element sets, either explicitly e.g. <Product = {}> or implicitly e.g. <Product = {"Perpetuum Mobile"}> (a search with no hits) mean no product, i.e. they will result in a set of records that are not associated with any product. Note that this set cannot be achieved through usual selections, unless a selection is made in another field, e.g. *TransactionID*.

Further, the selection within a field can be defined using set operators and several element sets, e.g. the modifier <Year = {"20*",

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1997} - {2000}> will select all years beginning with “20” in addition to “1997”, except for “2000”.

The above notation defines new selections, disregarding the current selection in the field. However, if you want to base your selection on the current selection in the field and add field values, you may for example want a modifier <Year = Year + {2007, 2008}>. A short and equivalent way to write this is <Year += {2007, 2008}>, i.e. the assignment operator implicitly defines a union. Implicit intersections, exclusions and symmetric differences can also be defined using “*=”, “–=” and “/=”.

Finally, for fields in **and**-mode, there is also the possibility of forced exclusion. If you want to force exclusion of specific field values, you will need to use “~” in front of the field name.

A set modifier can be used on a set identifier or on its own. It cannot be used on a set expression. When used on a set identifier, the modifier must be written immediately after the set identifier, e.g. {$<Year = {2007, 2008}>}. When used on its own, it is interpreted as a modification of the current selection.

Hence, the full syntax (not including the optional use of standard brackets) is

set_modifier ::= **<** *field_selection {, field_selection }* **>**

field_selection ::= fieldname [**=** | **+=** | **–=** | ***=** | **/=** *] element_set*

element_set ::= fieldname | **{** *element {* **,** *element }* **}** | *element_set set_operator element_set*

element ::= fieldvalue | **"** *search_mask* **"**

Examples - Basic:

sum({1<Region= {US} >} Sales **)**
returns the sales for the region US disregarding the current selection.
sum({$<Region = >} Sales **)**
returns the sales for the current selection, but with the selection in *Region* removed.
sum({<Region = >} Sales **)**
returns the same as the example immediately above. When the set to modify is omitted, $ is assumed.

Note The syntax in the two previous examples is interpreted as no selections in *Region*, i.e. all regions given other selections will be possible. It is not

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

equivalent to the syntax <Region = {}> (or any other text on the right side of the equal sign implicitly resulting in an empty element set) which is interpreted as no region.

sum({$<Year = {2000}, Region = {US, SE, DE, UK, FR}>} Sales **)**
returns the sales for the current selection, but with new selections both in *Year* and in *Region*.

sum({$<~Ingredient = {"*garlic*"}>} Sales **)**
returns the sales for the current selection, but with a forced exclusion of all *Ingredients* containing the string 'garlic'.

Examples – Using set operators:

sum({$<Product = Product + {OurProduct1} – {OurProduct2} >} Sales **)**
returns the sales for the current selection, but with the product *OurProduct1* added to the list of selected products and *OurProduct2* removed from the list of selected products.

sum({$<Year = Year + ({"20*",1997} – {2000}) >} Sales **)**
returns the sales for the current selection but with additional selections in the field *Year*: 1997 and all that begin with *20* – however, not 2000. Note that if 2000 is included in the current selection, it will still be included after the modification.

sum({$<Year = (Year + {"20*",1997}) – {2000} >} Sales **)**
returns almost the same as above, but here 2000 will be excluded, even if it initially is included in the current selection. The example shows the importance of sometimes using brackets to define an order of precedence.

Examples – Using searches:

sum({$<Year = {"2*"}>} Sales **)**
returns the sales for the current selection, but with all years beginning with the digit *2*, i.e. most likely year 2000 and onwards, selected in the field *Year*.

sum({$<Year = {"2*","198*"}>} Sales **)**
as above, but now the 1980:s are also included in the selection.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

sum({$<Year = {">1978<2004"}>} Sales **)**
as above, but now with a numeric search so that an arbitrary range can be specified.

sum({$<Year = {"*"} – {2000}, Product = {"*bearing*"} >} Sales **)**
returns the sales for the current selection but with a new selection in *Year*: all years except 2000; and only for products containing the string 'bearing'.

Examples – Using assignments with implicit set operations:

sum({$<Product += {OurProduct1, OurProduct2} >} Sales **)**
returns the sales for the current selection, but using an implicit union to add the products *OurProduct1* and *OurProduct2* to the list of selected products.

sum({$<Year += {"20*",1997} – {2000} >} Sales **)**
returns the sales for the current selection but using an implicit union to add a number of years in the selection: 1997 and all that begin with *20* – however, not 2000. Note that if 2000 is included in the current selection, it will still be included after the modification. Same as <Year=Year + ({"20*",1997}–{2000})>

sum({$<Product *= {OurProduct1} >} Sales **)**
returns the sales for the current selection, but only for the intersection of currently selected products and the product *OurProduct1*.

Examples – Using dollar-sign expansions:

sum({$<Year = {$(#vLastYear)}>} Sales **)**
returns the sales for the previous year in relation to the current selection. Here, a variable **`vLastYear`** containing the relevant year is used in a dollar-sign expansion.

sum({$<Year = {$(#=Only(Year)-1)}>} Sales **)**
returns the sales for the previous year in relation to the current selection. Here, a dollar-sign expansion is used to calculate previous year.

Examples – Advanced:

sum({$–1<Product = {"*Internal*", "*Domestic*"}>} Sales **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

returns the sales for the current selection, excluding transactions pertaining to products with the string ‘Internal’ or ‘Domestic’ in the product name.

sum({$<Customer = {“=Sum({1<Year = {2007}>} Sales) > 1000000”}>} Sales **)**
returns the sales for the current selection, but with a new selection in the *Customer* field: only customers who during 2007 had a total sales of more than 1,000,000.

18.5 Synthetic Dimension Functions

ValueList (*value {, value }* **)**

returns a set of listed values which, when used in a calculated dimension, will form a synthetic dimension. In charts with a synthetic dimension created with the **valuelist** function it is possible to reference the dimension value corresponding to a specific expression cell by restating the **valuelist** function with the same parameters in the chart expression. The function may of course be used anywhere in the layout, but apart from when used for synthetic dimensions it will only be meaningful inside an aggregation function.

Examples:
valuelist (1, 10, 100 **)**
valuelist ('a', 'xyz', 55 **)**

ValueLoop(*from [, to [, step = 1]]* **)**

returns a set of iterated values which, when used in a calculated dimension, will form a synthetic dimension. The values generated will start with the from value and end with the to value including intermediate values in increments of step. In charts with a synthetic dimension created with the **valueloop** function it is possible to reference the dimension value corresponding to a specific expression cell by restating the **valueloop** function with the same parameters in the chart expression. The function may of course be used anywhere in the layout, but apart from when used for synthetic dimensions it will only be meaningful inside an aggregation function.

Examples:
valueloop (1, 3 **)** returns the values 1, 2 and 3
valueloop (1, 5, 2 **)** returns the values 1, 3 and 5
valueloop (11 **)** returns the value 11

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

18.6 Other Functions

Functions can have different numbers of parameters as well as different types of parameters. In the functions below, the parameters are expressions where x should be interpreted as a real valued number, n as an integer and s as a string.

QlikView chart expressions support close to one hundred standard functions, apart from the aggregation functions described above. The functions have been divided into groups as follows:

General numeric functions ..... page 334
Range functions ..... page 338
Exponential and logarithmic functions ..... page 347
Trigonometric and hyperbolic functions ..... page 347
Statistical distribution functions ..... page 348
Financial functions ..... page 350
Mathematical constants and parameter-free functions ..... page 354
String functions ..... page 355
Inter-record functions ..... page 359
Document functions ..... page 373
Ranking functions ..... page 374
Conditional functions ..... page 377
Logical functions ..... page 379
Null functions ..... page 379
System functions ..... page 379
Date and time functions ..... page 382
Number interpretation functions ..... page 405
Formatting functions ..... page 409
Color functions ..... page 413

General Numeric Functions

div(*x1* , *x2* **)**

Integer division. Both parameters are interpreted as real numbers, i.e. they do not have to be integers. The result is the integer part of the result of the arithmetic division, a real number.

Examples:
div(7,2 **)** returns 3

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net
Page 1.447/

div(9,3 **)** returns 3
div(-4,3 **)** returns -1
div(4,-3 **)** returns -1
div(-4,-3 **)** returns 1

mod(*x1 , x2* **)**

Mathematical modula function. Both parameters must have integer values. x2 must be greater than 0. The result is the mathematical modula function, i.e. the non-negative remainder of an integer division.

Examples:
mod(7,2 **)** returns 1
mod(9,3 **)** returns 0
mod(-4,3 **)** returns 2
mod(4,-3 **)** returns NULL
mod(-4,-3 **)** returns NULL

fmod(*x1 , x2* **)**

Generalized modula function. Both parameters are interpreted as real numbers, i.e. they do not have to be integers. The result is the remainder of the integer division, a real number.

Examples:
fmod(7,2 **)** returns 1
fmod(9,3 **)** returns 0
fmod(-4,3 **)** returns -1
fmod(4,-3 **)** returns 1
fmod(-4,-3 **)** returns -1

ceil(*x [, base [, offset]]* **)**

Rounding of *x* upwards to the nearest multiple of *base* with an offset of *offset*. The result is a number.

Examples:
ceil(2.4 **)** returns 3
ceil(2.6 **)** returns 3
ceil(3.88 , 0.1 **)** returns 3.9
ceil(3.88 , 5 **)** returns 5
ceil(1.1 , 1 , 0.5 **)** returns 1.5

floor(*x [, base [, offset]]* **)**

Rounding of *x* downwards to the nearest multiple of base with an offset of *offset*. The result is a number.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
floor(2.4 **)** returns 2
floor(2.6 **)** returns 2
floor(3.88 , 0.1 **)** returns 3.8
floor(3.88 , 5 **)** returns 0
floor(1.1 , 1 , 0.5 **)** returns 0.5

frac(*x* **)**

Returns the fraction part of *x*. The fraction is defined in such a way that **frac(** *x* **)**+**floor(** *x* **)**=*x*.

Examples:
frac(11.43 **) returns 0.43**
frac(-1.4 **) returns 0.6**

round(*x [, step [, offset]]* **)**

Rounding of *x* upwards or downwards n number of steps with an offset of *offset*. The result is a number. If *x* is exactly in the middle of an interval, it is rounded upwards.
Examples:
round(2.4 **)** returns 2
round(2.6 **)** returns 3
round(2.5 **)** returns 3
round(3.88 , 0.1 **)** returns 3.9
round(3.88 , 5 **)** returns 5
round(1.1 , 1 , 0.5 **)** returns 1.5

fabs(*x* **)**

The absolute value of *x*. The result is a positive number.

Examples:
fabs(2.4 **)** returns 2.4
fabs(-3.8 **)** returns 3.8

sign(*x* **)**

Returns 1, 0, or -1 depending on whether x is a positive number, 0, or a negative number. If no numeric value is found, NULL is returned.

Examples:
sign(66 **)** returns 1
sign(0 **)** returns 0
sign(-234 **)** returns -1

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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numsum(*expr1 [, expr2, … exprN]* **)**
Obsolete. Superseded by range function **rangesum.**

numcount(*expr1 [, expr2, … exprN]* **)**
Obsolete. Superseded by range function **rangenumericcount**.

numavg(*expr1 [, expr2, … exprN]* **)**
Obsolete. Superseded by range function **rangeavg**.

nummin(*expr1 [, expr2, … exprN]* **)**
Obsolete. Superseded by range function **rangemin**.

nummax(*expr1 [, expr2, … exprN]* **)**
Obsolete. Superseded by range function **rangemax**.

fact(*n* **)**
Returns the factorial of a positive integer *n*. If the number n is not an integer it will be truncated. Non-positive numbers will return NULL.

Examples:
fact(1 **)** returns 1
fact(5 **)** returns 120 (1*2*3*4*5 = 120)
fact(-5 **)** returns NULL

combin(*n1, n2* **)**
Returns the number of combinations of *n2* items that can be picked from a group of *n1* items. The order in which the items are picked is not significant. Non-integer arguments will be truncated.

Example:
How many combinations of seven numbers can be picked from a total of 35 lotto numbers?
combin(35,7 **)** returns 6 724 520

permut(*n1, n2* **)**
Returns the number of permutations of *n2* items that can be selected from a group of *n1* items. The order in which the items are picked is significant. Non-integer arguments will be truncated.

Example:
In how many ways could the gold, silver and bronze medals be distributed after a 100m final with 8 participants?
permut(8,3 **)** returns 336

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

even(*n* **)**

Returns true if *n* is an even integer, false if *n* is an odd integer and NULL if *n* is not an integer.

Examples:
even(3 **)** returns false
even(2*10 **)** returns true
even(3.14 **)** returns NULL

odd(*n* **)**

Returns true if *n* is an odd integer, false if *n* is an even integer and NULL if *n* is not an integer.

Examples:
odd(3 **)** returns true
odd(2*10 **)** returns false
odd(3.14 **)** returns NULL

bitcount(*i* **)**

Returns the number of set bits in *i*. I will be interpreted as a signed 32-bit integer

Examples:
bitcount(3 **)** returns 2
bitcount(-1 **)** returns 32
bitcount(*n* **)**+**bitcount(bitnot** *n* **)** returns 32 (as long as n is a valid integer)

Range Functions

rangesum(*expr1 [, expr2, … exprN]* **)**

Returns the sum of a range of 1 to N arguments. As opposed to the + operator, **rangesum** will treat all non-numeric values as 0.

Examples:
rangesum(1,2,4 **)** returns 7
rangesum(1,'xyz'**)** returns 1
rangesum(null() **)** returns 0

rangesum (above(count(x**)**,-1,-3**))** returns the sum of the three results of the count(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangeavg(*expr1 [, expr2, … exprN]* **)**

Returns the average of a range of 1 to N arguments. If no numeric value is found, NULL is returned.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangeavg(1,2,4 **)** 2.33333333
rangeavg(1,'xyz'**)** returns 1
rangeavg(null(), 'abc' **)** returns NULL

rangeavg (above(count(x**)**,-1,-3**)** returns a sliding average of the result of the inner count(x) expression calculated the current row and two rows above the current row.

rangecount(*expr1 [, expr2, … exprN]* **)**

Returns the number of values found within a range of 1 to N arguments. Null values are not counted.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangecount (1,2,4**)** returns 3
rangecount (2,'xyz'**)** returns 2
rangecount (null()**)** returns 0

rangecount (above(sum(x**)**,-1,3**))** returns the number of values within the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangemin(*expr1 [, expr2, … exprN]* **)**

Returns the lowest numeric value found within a range 1 to N arguments. If no numeric value is found, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangemin (1,2,4**)** returns 1
rangemin (1,'xyz'**)** returns 1
rangemin (null(), 'abc'**)** returns NULL

rangemin (min(sum(x**)**,-1,3**))** returns the lowest of the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangemax(*expr1 [, expr2, … exprN]* **)**

Returns the highest numeric values found within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangemax (1,2,4**)** returns 4
rangemax (1,'xyz'**)** returns 1
rangemax (null(), 'abc'**)** returns NULL

rangemax (max(sum(x**)**,-1,3**))** returns the highest of the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangestdev(*expr1 [, expr2, … exprN]* **)**

Returns the standard deviation within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangestdev (1,2,4**)** returns 1.5275252316519
rangestdev (null()**)** returns NULL

rangestdev (above(count(x**)**,0,3**))** returns a sliding standard deviation of the result of the inner count(x) expression calculated on the current row and two rows above the current row.

rangeskew(*expr1 [, expr2, … exprN]* **)**

Returns the skewness within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangeskew (1,2,4**)** returns 0.93521952958283

rangeskew (above(count(x**)**,0,3**))** returns a sliding skewness of the result of the inner count(x) expression calculated on the current row and two rows above the current row.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangekurtosis(*expr1 [, expr2, … exprN]* **)**

Returns the kurtosis within a range of 1 to N arguments. If no numeric value is found, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangekurtosis (1,2,4,7**)** returns -0.28571428571429

rangekurtosis (above(count(x**)**,0,3**))** returns a sliding kurtosis of the result of the inner count(x) expression calculated on the current row and two rows above the current row.

rangefractile(*fractile, expr1 [, expr2, … exprN]* **)**

Returns the number of numeric values found within a range of 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangefractile (0.25,1,2,4,6**)** returns 1.5

rangefractile (0.5, above(sum(x**)**,-1,3**))** returns the median of the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangenumericcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of numeric values found within a range of 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangenumericcount (1,2,4**)** returns 3
rangenumericcount (2,'xyz'**)** returns 1
rangenumericcount (null()**)** returns 0

rangenumericcount (above(sum(x**)**,-1,3**))** returns the number of numeric values within the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangetextcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of text values found within a range of 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangetextcount (1,2,4**)** returns 0
rangetextcount (2,'xyz'**)** returns 1
rangetextcount (null()**)** returns 0

rangetextcount (above(sum(x**)**,-1,3**))** returns the number of text values within the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangenullcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of numeric values found within a range of 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangenullcount (1,2,4**)** returns 0
rangenullcount (2,'xyz'**)** returns 0
rangenullcount (null(),null()**)** returns 2

rangenullcount (above(sum(x**)**,-1,3**))** returns the number of null values within the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangemissingcount(*expr1 [, expr2, … exprN]* **)**

Returns the number of non-numeric values (including null values) found among 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangemissingcount (1,2,4**)** returns 0
rangemissingcount (2,'xyz'**)** returns 1

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangemissingcount (null()**)** returns 1

rangemissingcount (above(sum(x**)**,-1,3**))** returns the number of non-numeric values within the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangemode(*expr1 [, expr2, … exprN]* **)**

Returns the mode value, i.e. the most commonly occurring value within a range of 1 to N arguments. If more than one value shares the highest frequency, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangemode (1,2,9,2,4**)** returns 2
rangemode ('a',4,'a',4**)** returns NULL
rangemode (null()**)** returns NULL

rangemode (above(sum(x**)**,-1,3**))** returns the most commonly occurring value within the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangeonly(*expr1 [, expr2, … exprN]* **)**

If exactly one non-null value exists among the range of N expressions, that value will be returned. In all other cases, NULL is returned.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangeonly (1,2,4**)** returns NULL
rangeonly (1,'xyz'**)** returns NULL
rangeonly (null(), 'abc'**)** returns 'abc'

rangeonly (above(sum(x),-1,3**))** uses the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row. If they contain exactly one value, that value will be returned.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangeminstring(*expr1 [, expr2, … exprN]* **)**

Returns the first text value in text sort order found among 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangeminstring (1,2,4**)** returns 1
rangeminstring ('xyz','abc'**)** returns 'abc'
rangeminstring (null()**)** returns NULL

rangeminstring (above(sum(x**)**,-1,3**))** returns the first (in text sort order) of the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangemaxstring(*expr1 [, expr2, … exprN]* **)**

Returns the last text value in text sort order found among 1 to N arguments.

The argument expressions of this function may contain inter-record functions with a third optional parameter, which in themselves return a range of values.

Examples:
rangemaxstring (1,2,4**)** returns 4
rangemaxstring ('xyz','abc'**)** returns 'xyz'
rangemaxstring (null()**)** returns NULL

rangemaxstring (above(sum(x**)**,-1,3**))** returns the last (in text sort order) of the three results of the sum(x) function evaluated on the row below the current row, the current row and the row above the current row.

rangecorrel(*x-value, y-value {,x-value, y-value}***)**

returns correlation coefficient for a series of coordinates.

X-value is a single value or a range of values as returned by an inter-record function with a third optional parameter (page 367).

Y-value is a single value or a range of values as returned by an inter-record function with a third optional parameter (see page 351). Each value or range of values must correspond to an *x-value* or a range of *x-values*.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The function needs at least two pairs of coordinates to calculate. Text values, null values and missing values are disregarded.

rangeirr(*value {,value}***)**

returns the internal rate of return for a series of cash flows represented by the numbers in values. These cash flows do not have to be even, as they would be for an annuity. However, the cash flows must occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.

Value is a single value or a range of values as returned by an inter-record function with a third optional parameter (see page 351). The function needs at least one positive and one negative value to calculate. Text values, null values and missing values are disregarded.

Examples:
rangeirr(-70000,12000,15000,18000,21000,26000) returns 0,0866
rangeirr(**above**(**sum**(value), 0, 10))
rangeirr(**above**(**total** value, 0, **rowno**(**total**)))

rangenpv (*rate*, *value {,value}* **)**

returns the net present value of an investment based on a discount rate and a series of future payments (negative values) and incomes (positive values). The result has a default number format of money.

Rate is the interest rate per period.

Value is a payment or income occurring at the end of each period. Each *value* may be a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). Text values, null values and missing values are disregarded.

Examples:
rangenpv(0.1,-10000,3000,4200,6800) returns 1188,44
rangenpv(0.05, **above**(**sum**(value), 0, 10))
rangenpv(0.05, **above**(**total** value, 0, **rowno**(**total**)))

rangexirr(*value*, *date {,value, date}*)

returns the internal rate of return for a schedule of cash flows that is not necessarily periodic. To calculate the internal rate of return for a series of periodic cash flows, use the **rangeirr** function.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Value is a cash flow or a series of cash flows that corresponds to a schedule of payments in dates. Each *value* may be a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). Text values, null values and missing values are disregarded. All payments are discounted based on a 365-day year. The series of values must contain at least one positive and one negative value.

Date is a payment date or a schedule of payment dates that corresponds to the cash flow payments.

Examples:
rangexirr(-2500,'2008-01-01',2750,'2008-09-01') returns 0,1532
rangexirr (**above**(**sum**(value), 0, 10), **above**(date, 0, 10))
rangexirr(**above**(**total** value,0,**rowno**(**total**)),
above(**total** date,0,**rowno**(**total**)))

rangexnpv(*rate, value, date {,value, date}*)

Returns the net present value for a schedule of cash flows that is not necessarily periodic. The result has a default number format of money. To calculate the net present value for a series of periodic cash flows, use the **rangenpv** function.

Rate is the interest rate per period.

Value is a cash flow or a series of cash flows that corresponds to a schedule of payments in dates. Each *value* may be a single value or a range of values as returned by an inter-record function with a third optional parameter (see page x). Text values, null values and missing values are disregarded. All payments are discounted based on a 365-day year. The series of values must contain at least one positive and one negative value.

Date is a payment date or a schedule of payment dates that corresponds to the cash flow payments.

Examples:
rangexnpv(0.1, -2500,'2008-01-01',2750,'2008-09-01') returns 80,25
rangexnpv (0.1, **above**(**sum**(value), 0, 10), **above**(date, 0, 10))
rangexnpv(0.1, **above**(**total** value,0,**rowno**(**total**)),
above(**total** date,0,**rowno**(**total**)))

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Exponential and Logarithmic Functions

exp(*x* **)** Exponential function, with the base of the natural logarithm *e* as base. The result is a positive number.

log(*x* **)** The natural logarithm of *x*. The function is only defined if x>0. The result is a number.

log10(*x* **)**
The 10-logarithm (base 10) of *x*. The function is only defined if x>0. The result is a number.

sqrt(*x* **)** Square root of *x*. The function is only defined if x >= 0. The result is a positive number.

sqr(*x* **)** Square of x. The result is a number.

pow(*x*,*y*)
Returns *x* to the power of y. The result is a number.

Trigonometric and Hyperbolic Functions

All angles are measured in radians.

cos(*x*) Cosine of *x*. The result is a number between -1 and 1.

acos(*x*)
Arcus cosine of *x*. The function is only defined if -1 <= x <= 1. The result is a number between 0 and π.

sin(*x*) Sine of *x*. The result is a number between -1 and 1.

asin(*x*)
Arcus sine of *x*. The function is only defined if -1 <= x <= 1. The result is a number between -π/2 and π/2.

tan(*x*) Tangent of *x*. The result is a number.

atan(*x*)
Arcus tangent of *x*. The result is a number between -π/2 and π/2.

atan2(*y*,*x*)

Two-dimensional generalization of the arcus tangent function. Returns the angle between the origin and the point represented by the coordinates x and y. The result is a number between -π and +π .

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

cosh(*x*)

Cosine hyberbolicus of *x*. The result is a positive number.

sinh(*x*)

Sine hyberbolicus of *x*. The result is a number.

tanh(*x* **)**

Tangent hyberbolicus of *x*. The result is a number.

Statistical Distribution Functions

The statistical distribution functions described below are all implemented in QlikView using the Cephes library. For references and details on algorithms used, accuracy etc., please see http://www.netlib.org/cephes/. The Cephes function library is used by permission.

chidist (*value, degrees_freedom* **)**

returns the one-tailed probability of the chi-squared distribution.

The χ^2 distribution is associated with a χ^2 test. *Value* is the value at which you want to evaluate the distribution. *Value* must not be negative. *Degrees_freedom* is a positive integer stating the number of degrees of freedom. Both arguments must be numeric, else null will be returned. This function is related to the **chiinv** function in the following way:
If *prob* = **chidist(***value,df***),** then **chiinv(***prob, df***)** = *value*.

Example:
chdist(8, 15 **)** returns 0.9237827

chiinv (*prob, degrees_freedom* **)**

returns the inverse of the one-tailed probability of the chi-squared distribution. *Prob* is a probability associated with the chi-squared distribution. It must be a number between 0 and 1. *Degrees_freedom* is an integer stating the number of degrees of freedom. Both arguments must be numeric, else null will be returned. This function is related to the **chidist** function in the following way:
If *prob* = **chidist(***value,df***)**, then **chiinv(***prob, df***)** = *value*.

Example:
chiinv(0.9237827, 15 **)** returns 8.0000001

normdist (*value, mean, standard_dev* **)**

returns the cumulative normal distribution for the specified mean and standard deviation. *Value* is the value at which you want to evaluate the distribution. *Mean* is a value stating the arithmetic mean for the distribution. *Standard_dev* is a positive value stating the stan-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

dard deviation of the distribution. All arguments must be numeric, else null will be returned. If *mean* = 0 and *standard_dev* = 1, the function returns the standard normal distribution. This function is related to the **norminv** function in the following way:
If *prob* = **normdist(***value, m, sd***)**, then **norminv(***prob, m, sd***)** = *value*.

Example:
chdist(0.5, 0, 1 **)** returns 0.6914625

norminv (*prob, mean, standard_dev* **)**

returns the inverse of the normal cumulative distribution for the specified mean and standard deviation. *Prob* is a probability associated with the normal distribution. It must be a number between 0 and 1. *Mean* is a value stating the arithmetic mean for the distribution. *Standard_dev* is a positive value stating the standard deviation of the distribution. All arguments must be numeric, else null will be returned. This function is related to the **normdist** function in the following way:
If *prob* = **normdist**(*value, m, sd***)**, then **norminv(***prob, m, sd***)** = *value*.

Example:
norminv(0.6914625, 0, 1 **)** returns 0.4999717

tdist (*value, degrees_freedom, tails* **)**

returns the probability for the Student t-distribution where a numeric value is a calculated value of t for which the probability is to be computed. *Value* is the value at which you want to evaluate the distribution and must not be negative. *Degrees_freedom* is a positive integer stating the number of degrees of freedom. *Tails* must be either 1 (one-tailed distribution) or 2 (two-tailed distribution). All arguments must be numeric, else null will be returned. This function is related to the **tinv** function in the following way:
If *prob* = **tdist(***value, df ,2***)**, then **tinv(***prob, df***)** = *value*.

Example:
chdist(1, 30, 2) returns 0.3253086

tinv (*prob, degrees_freedom* **)**

returns the t-value of the Student's t-distribution as a function of the probability and the degrees of freedom. *Prob* is a two-tailed probability associated with the t-distribution. It must be a number between 0 and 1. *Degrees_freedom* is an integer stating the number of degrees of freedom. Both arguments must be numeric, else null

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

will be returned. This function is related to the **tdist** function in the following way:
If *prob* = **tdist(***value*, *df* ,*2***)**, then **tinv(***prob*, *df***)** = *value*.

Example:
tinv(0.3253086, 30 **)** returns 1

fdist (*value*, *degrees_freedom1*, *degrees_freedom2* **)**
returns the F-distribution.. *Value* is the value at which you want to evaluate the distribution. *Value* must not be negative. *Degrees_freedom1* is a positive integer stating the number of numerator degrees of freedom. *Degrees_freedom2* is a positive integer stating the number of denominator degrees of freedom. All arguments must be numeric, else null will be returned. This function is related to the **finv** function in the following way:
If *prob* = **fdist(***value*, *df1*, *df2***)**, then **finv(***prob*, *df1*, *df2***)** = *value*.

Example:
fdist(15, 8, 6 **)** returns 0.0019369

finv (*prob*, *degrees_freedom1*, *degrees_freedom2* **)**
returns the inverse of the F-distribution. *Prob* is a probability associated with the F-distribution and must be a number between 0 and 1. *Degrees_freedom* is an integer stating the number of degrees of freedom. All arguments must be numeric, else null will be returned. This function is related to the **fdist** function in the following way:
If *prob* = **fdist(***value*, *df1*, *df2***)**, then **finv(***prob*, *df1*, *df2***)** = *value*.

Example:
finv(0.0019369, 8, 5 **)** returns 15.0000197

Financial Functions

Note When using the financial functions described below, it is vital to be consistent about the units you use for specifying *rate* and *nper*. If you make monthly payments on a five-year loan at 6% annual interest, use 0.005 (6%/12) for *rate* and 60 (5*12) for *nper*. If you make annual payments on the same loan, use 6% for *rate* and 5 for *nper*. In all the functions, cash you pay out is represented by negative numbers. Cash you receive is represented by positive numbers.

BlackAndSchole(*strike*, *time_left*, *underlying_price*, *vol*, *risk_free_rate*, *type*)
Returns the theoretical value of an option according to Black and Schole's unmodified formula (European style options).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Strike is the future purchase price of the stock.

Time_left is the number of time periods remaining.

Underlying_price is the current value of the stock.

Vol is the volatility in % per time period.

Risk_free_rate is the risk free rate in % per time period.

Type is 'c', 'call' or any non-zero numeric value for call-options and 'p', 'put' or 0 for put-options..

Example:
The theoretical price of an option to buy in 4 years at a value of 130 a share which is today worth 68.5 assuming a volatility of 40% per year and a risk-free interest rate of 4%?

blackandschole(130, 4, 68.5, 0.4, 0.04, 'call' **)** returns11.245…

The following approximation is used to calculate the inverse of the normal cumulative distribution in the Black and Schole formula:

For x>*0*

$$\int_{-\infty}^{x} e^{-u^2/2}du \approx \sqrt{2\pi} \quad - (b_1k+b_2k^2+b_3k^3)e^{-x^2/2}$$

$$k = \frac{1}{1+0.33267x} \qquad b = \begin{pmatrix} 0.4361836 \\ -0.1201676 \\ 0.937298 \end{pmatrix}$$

For x<0
f(x)=1 - f(-x).

fv(*rate, nper, pmt [, pv [, type]]*)
Returns the future value of an investment based on periodic, constant payments and a constant interest rate. The result has a default number format of money.

Rate is the interest rate per period.

Nper is the total number of payment periods in an annuity.

Pmt is the payment made each period. It cannot change over the life of the annuity. If pmt is omitted, you must include the *pv* argument.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now. If *pv* is omitted, it is assumed to be 0 (zero), and you must include the *pmt* argument.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Example:
You pay a new VCR by 36 monthly installments of $20. The interest rate is 6% per annum. The bill comes at the end of the month. What is the total value of the money you invested when the last bill has been paid?

fv(0.005,36,-20 **)** returns $786.72

nper(*rate, pmt, pv [, fv [, type]]*)

Returns the number of periods for an investment based on periodic, constant payments and a constant interest rate.

Rate is the interest rate per period.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *pv* argument.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If fv is omitted, it is assumed to be 0.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Example:
You want to sell a VCR by monthly installments of $20. The interest rate is 6% per annum. The bill comes at the end of the month. How many periods are required if value of the money you have received after the last bill has been paid should equal $786.72?

nper(0.005,-20,0,786.72 **)** returns 36

pmt(*rate, nper, pv [, fv [, type]]*)

Returns the payment for a loan based on constant payments and a constant interest rate. The result has a default number format of money.

Rate is the interest rate per period.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Nper is the total number of payment periods in an annuity.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, it is assumed to be 0.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

To find the total amount paid over the duration of the loan, multiply the returned pmt value by nper.

Examples:
The following formula returns the monthly payment on a $20,000 loan at an annual rate of 10 percent that you must pay off in 8 months:

pmt(0.1/12, 8, 20000 **)** returns -$2594.66

For the same loan, if payments are due at the beginning of the period, the payment is:

pmt(0.1/12, 8, 20000, 0, 1 **)** returns -$2573.21

pv(*rate, nper, pmt [, fv [, type]]*)

Returns the present value of an investment. The result has a default number format of money. The present value is the total amount that a series of future payments is worth now. For example, when you borrow money, the loan amount is the present value to the lender.

Rate is the interest rate per period.

Nper is the total number of payment periods in an annuity.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *fv* argument.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, you must include the *pmt* argument.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Example:
What is the present value of $100 paid to you at the end of each month during a five year period? The interest rate is 7%.

pv(0.07/12, 12*5, 100, 0, 0 **)** returns -$5050.20

rate(*nper, pmt, pv [, fv [, type]]* **)**
Returns the interest rate per period of an annuity.

Nper is the total number of payment periods in an annuity.

Pmt is the payment made each period. It cannot change over the life of the annuity. If *pmt* is omitted, you must include the *fv* argument.

Pv is the present value, or the lump-sum amount that a series of future payments is worth right now.

Fv is the future value, or a cash balance you want to attain after the last payment is made. If *fv* is omitted, it is assumed to be 0.

Type should be 0 if payments are due at the end of the period or 1 if payments are due at the beginning of the period. If *type* is omitted, it is assumed to be 0.

Rate is calculated by iteration and can have zero or more solutions. If the successive results of **rate** do not converge, a NULL value will be returned.

Example:
What is the interest rate of a five-year $10,000 annuity loan with monthly payments of $300?

rate(60,-300,10000 **)** returns 2.18%

This is the monthly rate, which has to be multiplied with 12 in order to get the annual rate, in this case 26.1%.

Mathematical Constants and Parameter-Free Functions

These functions do not have any parameters. The parentheses are however still needed.

e( ) Base of the natural logarithms, e. The function returns 2.71828...

pi( ) The function returns 3.14159...

rand( ) Returns a random number between 0 and 1.

true( ) Returns a dual value with text value ’true’ and numeric value -1, which can be used as logical true in expressions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

false( ) Returns a dual value with text value 'false' and numeric value 0, which can be used as logical false in expressions.

String Functions

ord(*s* **)**

ASCII number of first character of string *s*. The result is an integer.

Example:

ord('A' **)** returns the number 65

chr(*n* **)** The ASCII character corresponding to number *n*. The result is a string.

Example:
chr(65 **)** returns the string 'A'

len(*s* **)** Length of string *s*. The result is an integer.

Example:
len(Name **)** where Name = 'Peter' returns 5.

left(*s* , *n* **)**

Substring of the string *s*. The result is a string consisting of the first *n* characters of *s*.

Examples:
left('abcdef',3 **) r**eturns 'abc'
left(Date, 4 **)** where Date = 1997-07-14 returns 1997

For a more complicated example, see the **index** function below.

right(*s* , *n* **)**

Substring of the string *s*. The result is a string consisting of the last *n* characters of *s*.

Examples:
right('abcdef',3 **)** returns 'def'
right(Date,2 **)** where Date = 1997-07-14 returns 14.

mid(*s* , *n1 (, n2)* **)**

Substring of the string *s*. The result is the string starting at character *n1* with the length of *n2* characters. If *n2* is omitted, the function returns the rightmost part of the string starting at character *n1*. The positions in the string are numbered from 1 and up.

Examples:
mid('abcdef',3 **)** returns 'cdef'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

mid('abcdef',3, 2 **)** returns 'cd'
mid(Date,3 **)** where Date = 970714 returns 0714
mid(Date,3,2 **)** where Date = 970714 returns 07

For a more complicated example, see the **index** function below.

index(*s1 , s2 [, n]* **)**

Position of a substring. This function gives the starting position of the *n*:th occurrence of substring *s2* in string *s1*. If *n* is omitted, the first occurrence is assumed. If *n* is negative, the search is made starting from the end of string *s1*. The result is an integer. The positions in the string are numbered from 1 and up.

Examples:
index('abcdefg', 'cd' **)** returns 3
index('abcdabcd', 'b', 2 **)** returns 6
index('abcdabcd', 'b', -2 **)** returns 2
left(Date, **index(** Date,'-' **)** -1 **)**
where Date = 1997-07-14 returns 1997
mid(Date, **index(** Date, '-', 2 **)** -2, 2 **)**
where Date = 1997-07-14 returns 07

upper(*text expression* **)**

Forces upper case for all the data in the expression.

Example:
upper('abcD' **)** returns 'ABCD'

lower(*text expression* **)**

Forces lower case for all the data in the expression.

Example:
lower('abcD' **)** returns 'abcd'

capitalize(*s* **)**

Returns the string s with all words capitalized.

Example:
capitalize('my little pony' **)** returns 'My Little Pony'
capitalize('AA bb cC Dd' **)** returns 'Aa Bb Cc Dd'

repeat(*s, n* **)**

Forms a string consisting of the string s repeated n times.

Example:
repeat('*', rating **)** where rating = 4 returns '****'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ltrim(*s* **)**

Returns the string s trimmed of any leading spaces.

Examples:
ltrim (' abc'**)** returns 'abc'
ltrim ('abc '**)** returns 'abc '

rtrim(*s* **)**

Returns the string s trimmed of any trailing spaces.

Examples:
rtrim (' abc'**)** returns ' abc'
rtrim ('abc '**)** returns 'abc'

trim(*s* **)**

Returns the string *s* trimmed of any leading and trailing spaces.

Examples:
trim (' abc'**)** returns 'abc'
trim ('abc '**)** returns 'abc'
trim (' abc '**)** returns 'abc'

KeepChar(*s1, s2* **)**

Returns the string *s1* less all characters not contained in string *s2*.

Example:
keepchar('a1b2c3' , '123' **)** returns '123'

PurgeChar(*s1, s2* **)**

Returns the string *s1* less all characters contained in string s2.

Example:
purgechar('a1b2c3' , '123' **)** returns 'abc'.

replace (*string*, *fromstring*, *tostring* **)**

Returns a *string* after replacing all occurrences of a given substring within the string with another substring. The function is non-recursive and works from left to right.

String is the original string.

fromstring is a string which may occur one or more times within *string*.

tostring is the string which will replace all occurences of *fromstring* within *string*.

Example:
replace('abccde','cc','xyz')

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

subfield(*s, 'delimiter' , index* **)**

This chart function returns a given substring from a larger string (*s*) with delimiters (**'***delimiter***'**). *Index* is an optional integer denoting which of the substrings should be returned.

Examples:
subfield(S, ';' ,2**)** returns 'cde' if S is 'abc;cde;efg'
subfield(S, ':' ,1**)** returns NULL if S is an empty string
subfield(S, ':' ,1**)** returns an empty string if S is ':'

info(*field* **)**

Returns external info as linked by an **info load** or **info select** statement for a given field. If no external info is available for the field, NULL is returned. The external info is returned in the form of a text string. If the info item is a file, the file name is returned as a string.

TextBetween (*s, beforetext, aftertext [, n]* **)**

Returns the text between the *n*:th occurrence of *beforetext* and the immediately following occurrence of *aftertext* within the string s.

Examples:
TextBetween('<abc>', '<', '>'**)** returns 'abc'
TextBetween('<abc><de>', '<', '>',2**)** returns 'de'

findoneof (*text, characterset* [, *n*] **)**

returns the position of the *n*th occurence in the string text of any of the characters found in the string *characterset*. If *n* is omitted the position of the first occurence is returned. If there is no match 0 is returned.

Examples:
findoneof('my example text string', 'et%s'**)** returns 4
findoneof('my example text string', 'et%s', 3**)** returns 12
findoneof('my example text string', '¤%s&'**)** returns 0'

substringcount(*text , substring* **)**

Returns the number of times the string substring appears within the string text. The result is an integer. If there is no match, 0 is returned.

Example:
substringcount ('abcdefgcdxyz' , 'cd' **)** returns 2

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Inter-Record Functions

fieldvalue(*fieldname*, *n* **)**

Returns the field value found in position *n* of the field *fieldname* (by load order). *Fieldname* must be given as a string value, e.g. the field name must be enclosed by single quotes. The first field value is returned for *n*=1. If *n* is larger than the number of field values, NULL is returned.

Example:
fieldvalue('Helptext', 5 **)**

fieldvaluecount (*fieldname* **)**

Returns the number of distinct values in a field. Fieldname must be given as a string (e.g. a quoted literal).

fieldindex(fieldname, value **)**

Returns the position of the field value in the field fieldname (by load order). If value cannot be found among the field values of the field fieldname, 0 is returned.Fieldname must be given as a string value, e.g. the field name must be enclosed by single quotes.

Note The position of the field's first field value is 1. The use of this function in chart expressions on fields with many field values may be somewhat expensive in terms of memory usage.

Example:
fieldindex('Name', 'John Doe' **)**

above(*[* **total** *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with the chart's dimension values as they appear on the row above the current row within a column segment in a table or, in the case of image charts, in the chart's straight table equivalent.

On the first row of a column segment a NULL value will be returned, as there is no row above.

If the chart is one-dimensional or if the expression is preceded by the qualifier **total**, the current column segment is always equal to the entire column.

If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same val-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



ues as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

The inter field sort order for pivot tables is defined simply by the order of the dimensions from the left to the right, while for other chart types it can be manipulated on the **Sort** page of the **Chart Properties** dialog.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved up to rows further above the current row. E.g. if *offset* is 2, the function returns the value of *expression* evaluated with the chart's dimensions as they appear two rows above the current row.

A negative *offset* makes the **above** function equivalent to the **below** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* rows of the table going upwards from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
sum(Sales **)/above(sum(** Sales **))**
above(sum(Sales **)**, 2 **)**
above(total sum(Sales **))**

rangeavg (above(sum(x **)**,1,3,**))** returns an average of the three results of the sum(x) function evaluated on the three rows immediately above the current row.

More detailed examples on the use of chart inter-record functions are found on page 425.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

below(*[* **total** *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with the chart's dimension values as they appear on the row below the current row within a column segment in a table or, in the case of image charts, in the chart's straight table equivalent.

On the last row of a column segment a NULL value will be returned, as there is no row below.

If the chart is one-dimensional or if the is preceded by the qualifier **total**, the current column segment is always equal to the entire column.

If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same values as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

The inter field sort order for pivot tables is defined simply by the order of the dimensions from the left to the right, while for other chart types it can be manipulated on the **Sort** page of the **Chart Properties** dialog.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved down to rows further below the current row. E.g. if offset is 2, the function returns the value of *expression* evaluated with the chart's dimensions as they appear two rows below the current row.

A negative *offset* makes the **below** function equivalent to the **above** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* rows of the table going downwards from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
below(sum(Sales **))**
below(sum(Sales **)**, 2 **)**
below(total sum(Sales **))**

rangeavg (below(sum(x),1,3**))** returns an average of the three results of the sum(x) function evaluated on the three rows immediately below the current row.

More detailed examples on the use of chart inter-record functions are found on page 425.

top(*[* total *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with the chart's dimension values as they appear on the first row of the column segment in a table or, in the case of image charts, in the chart's straight table equivalent.

If the chart is one-dimensional or if the *expression* is preceded by the qualifier **total**, the current column segment is always equal to the entire column.

If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same values as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

The inter field sort order for pivot tables is defined simply by the order of the dimensions from the left to the right, while for other chart types it can be manipulated on the **Sort** page of the **Chart Properties** dialog.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved down to rows below the top row. E.g. if *offset* is 2, the function returns the value of expression evaluated with the chart's dimensions as they appear on the second row as defined above.

A negative *offset* makes the **top** function equivalent to the **bottom** function with the corresponding positive *offset*. An offset of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* rows of the table going downwards from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

The **top** function will only be evaluated in total rows if the total in question has a clear relation to one specific column segment. In all other cases NULL will be returned.

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
sum(Sales **)/top(sum(** Sales **))**
top(sum(Sales **)**, 2 **)**
top(total sum(Sales **))**

rangeavg (top(sum(x **)**,1,5 **))** returns an average of the results of the sum(x) function evaluated on the five top rows of the table.

More detailed examples on the use of chart inter-record functions are found on page 425.

bottom(*[* **total** *] expression [, offset[,n]]* **)**

Returns the value of *expression* evaluated with the chart's dimension values as they appear on the last row of the column segment in a table or, in the case of image charts, in the chart's straight table equivalent.

If the chart is one-dimensional or if the *expression* is preceded by the qualifier **total**, the current column segment is always equal to the entire column.

If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same values as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

The inter field sort order for pivot tables is defined simply by the order of the dimensions from the left to the right, while for other chart types it can be manipulated on the **Sort** page of the **Chart Properties** dialog.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved up to rows above the bottom row. E.g. if *offset* is 2, the function returns the value of *expression* evaluated with the chart's dimensions as they appear on the second row from the bottom as defined above.

A negative *offset* makes the **bottom** function equivalent to the **top** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1, the function will return not one value but a range of *n* values, one for each of *n* rows of the table going upwards from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

The **bottom** function will only be evaluated in total rows if the total in question has a clear relation to one specific column segment. In all other cases NULL will be returned.

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
bottom(sum(Sales **))**
bottom(sum(Sales **)**, 2 **)**
bottom(total sum(Sales **))**

rangeavg (bottom(sum(x **)**,1,5**))** returns an average of the results of the sum(x) function evaluated on the five bottom rows of the table.

More detailed examples on the use of chart inter-record functions are found on page 425.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

before(*[* total *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with a pivot table's dimension values as they appear in the column before the current column within a row segment in the pivot table. This function returns NULL in all chart types except pivot tables.

In the first column of a row segment a NULL value will be returned, as there is no column before it.

If the table is one-dimensional or if the *expression* is preceded by the qualifier **total**, the current row segment is always equal to the entire row.

If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The inter field sort order for horizontal dimensions in pivot tables is defined simply by the order of the dimensions from top to bottom.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved to columns further to the left from the current column. E.g. if *offset* is 2, the function returns the value of *expression* evaluated with the chart's dimensions as they appear two columns to the left from the current column.

A negative *offset* makes the **before** function equivalent to the **after** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* columns of the table going to the left from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
before(sum(Sales **))**
before(sum(Sales **)**, 2 **)**
before(total sum(Sales **))**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

rangeavg (before(sum(x **),**1,3 **))** returns an average of the three results of the sum(x) function evaluated in the three columns immediately to the left of the current column.

More detailed examples on the use of chart inter-record functions are found on page 425.

after(*[* total *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with a pivot table's dimension values as they appear in the column after the current column within a row segment in the pivot table. This function returns NULL in all chart types except pivot tables.

In the last column of a row segment a NULL value will be returned, as there is no column after it.

If the table is one-dimensional or if the expression is preceded by the qualifier **total**, the current row segment is always equal to the entire row.

If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The inter field sort order for horizontal dimensions in pivot tables is defined simply by the order of the dimensions from top to bottom.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved to columns further to the right from the current column. E.g. if *offset* is 2, the function returns the value of *expression* evaluated with the chart's dimensions as they appear two columns to the right from the current column.

A negative *offset* makes the **after** function equivalent to the **before** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* columns of the table going to the right from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
after(sum(Sales **))**
after(sum(Sales **)**, 2 **)**
after(total sum(Sales **))**

rangeavg (after(sum(x **),**1,3 **))** returns an average of the three results of the sum(x) function evaluated in the three columns immediately to the right of the current column.

More detailed examples on the use of chart inter-record functions are found on page 425.

first(*[* total *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with a pivot table's dimension values as they appear in the first column of the current row segment in the pivot table. This function returns NULL in all chart types except pivot tables.

If the table is one-dimensional or if the expression is preceded by the qualifier **total**, the current row segment is always equal to the entire row.

If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The inter field sort order for horizontal dimensions in pivot tables is defined simply by the order of the dimensions from top to bottom. By specifying an *offset* greater than 1, the evaluation of *expression* may be moved to columns on the right-hand side of the first column. E.g. if *offset* is 2, the function returns the value of expression evaluated with the chart's dimensions as they appear in the second column as defined above.

A negative *offset* makes the **first** function equivalent to the **last** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* col-

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

umns of the table going to the right from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

The **first** function will only be evaluated in total rows if the total in question has a clear relation to one specific row segment. In all other cases NULL will be returned.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
first(sum(Sales **))**
first(sum(Sales **)**, 2 **)**
first(total sum(Sales **))**

rangeavg (first(sum(x **)** ,1,5 **))** returns an average of the results of the sum(x) function evaluated on the five leftmost columns of the table.

More detailed examples on the use of chart inter-record functions are found on page 425.

last(*[* **total** *] expression [, offset [,n]]* **)**

Returns the value of *expression* evaluated with a pivot table's dimension values as they appear in the last column of the current row segment in the pivot table. This function returns NULL in all chart types except pivot tables.

If the table is one-dimensional or if the *expression* is preceded by the qualifier **total**, the current row segment is always equal to the entire row.

If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The inter field sort order for horizontal dimensions in pivot tables is defined simply by the order of the dimensions from top to bottom.

By specifying an *offset* greater than 1, the evaluation of *expression* may be moved to columns on the left-hand side of the first column. E.g. if *offset* is 2, the function returns the value of *expression* evaluated with the chart's dimensions as they appear in the second last column as defined above.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

A negative *offset* makes the **last** function equivalent to the **last** function with the corresponding positive *offset*. An *offset* of 0 will evaluate the expression on the row of the expression itself. Recursive calls will return NULL.

By specifying a third parameter *n* greater than 1 the function will return not one value but a range of *n* values, one for each of *n* columns of the table going to the left from the cell originally pointed at by the function. The function can in this form be used as an argument to any of the special range functions (see page 338).

The **last** function will only be evaluated in total rows if the total in question has a clear relation to one specific row segment. In all other cases NULL will be returned.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
last(sum(Sales **))**
last(sum(Sales **)**, 2 **)**
last(total sum(Sales **))**

rangeavg (last(sum(x**)**,1,5**))** returns an average of the results of the sum(x) function evaluated on the five rightmost columns of the table.

More detailed examples on the use of chart inter-record functions are found on page 425.

RowNo(*[* total *]* **)**

Returns the number of the current row within the current column segment in a table or, in the case of image charts, within the chart's straight table equivalent. The first row has number 1.

If the chart is one-dimensional or if the qualifier **total** appears as argument, the current column segment is always equal to the entire column.

If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same values as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

The inter field sort order for pivot tables is defined simply by the order of the dimensions from the left to the right, while for other

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

chart types it can be manipulated on the **Sort** page of the **Chart Properties** dialog.

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:

if(rowno()=1, 0, **sum(** Sales **)/above(sum(** Sales **)))**

More detailed examples on the use of chart inter-record functions are found on page 425.

ColumnNo(*[* **total** *]* **)**

Returns the number of the current row within the current row segment in a pivot table. The first column has number 1.

If the table is one-dimensional or if the qualifier **total** appears as argument, the current row segment is always equal to the entire row.

If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The inter field sort order for horizontal dimensions in pivot tables is defined simply by the order of the dimensions from top to bottom.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
if(columnno()=1, 0, **sum(** Sales **)/before(sum(** Sales **)))**

More detailed examples on the use of chart inter-record functions are found on page 425.

NoOfRows(*[* **total** *]* **)**

Returns the number of rows within the current column segment in a table or, in the case of image charts, within the chart's straight table equivalent.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If the chart is one-dimensional or if the qualifier **total** appears as argument, the current column segment is always equal to the entire column.

If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same values as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

The inter field sort order for pivot tables is defined simply by the order of the dimensions from the left to the right, while for other chart types it can be manipulated on the **Sort** page of the **Chart Properties** dialog.

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Note Suppression of zero values is automatically disabled when this function is used.

Examples:
if(rowno()=noofrows(), 0**, after(sum(** Sales **)))**

More detailed examples on the use of chart inter-record functions are found on page 425.

NoOfColumns(*[* **total** *]* **)**

Returns the number of columns in the current row segment of a pivot table.

If the table is one-dimensional or if the qualifier **total** appears as argument, the current row segment is always equal to the entire row.

If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The inter field sort order for horizontal dimensions in pivot tables is defined simply by the order of the dimensions from top to bottom.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Note Sorting on Y-values in charts and sorting by expression columns in straight tables is not allowed when using this function in any of the chart's expressions.

Examples:
if(columnno()=noofcolumns(), 0**, after(sum(** Sales **)))**

More detailed examples on the use of chart inter-record functions are found on page 425.

dimensionality ( )

returns the number of dimension columns that have non-aggregation content, i.e. do not contain partial sums or collapsed aggregates.

A typical use is in attribute expressions, when you want to apply different cell formatting depending on aggregation level of data.

This function is only available in charts. For all chart types except pivot tables it will return the number of dimensions in all rows except the total, which will be 0.

Example:
For a pivot table with three dimension columns to the left the following would be returned:
3 for all ordinary data cells
2 for 1st level partial sums and entries not expanded in the 3rd column
1st for 2nd level partial and entries only expanded in the 1st column.
0 for grand total cell.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Dimensionality ()

Pivot table

Country	Team	Salesman	dimensionality()
Denmark	Copenhagen	Preben	3
		Total	2
	Total		1
Germany			1
Sweden	Gothenburg	John	3
		Total	2
	Lund		2
	Total		1
Total			0

Straight table

Country	Team	Salesman	dimensionality()
			0
Denmark	Copenhagen	Preben	3
Germany	Berlin	Helga	3
Sweden	Gothenburg	John	3
Sweden	Lund	Ann	3
Sweden	Lund	Peter	3

secondarydimensionality ( )

returns the number of dimension pivot table rows that have non-aggregation content, i.e. do not contain partial sums or collapsed aggregates. This function is the equivalent of the dimensionality () function for horizontal pivot table dimensions.

The secondarydimensionality() function always returns 0 when used outside of pivot tables.

Example:

Pivot table

Country		Denmark		Germany
Salesman		Total	Preben	
Team			Total	Copenhagen	
	0	1	2	3	1

Document Functions

ReportComment(*report_number*)

Returns the comment of the report with the specified number within the active document.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ReportName(*report_number***)**
Returns the name of the report with the specified number within the active document.

ReportID(*report_number***)**
Returns the id of the report with the specified number within the active document.

ReportNumber(*report_id_or_name***)**
Returns the number of the report with the specified id or name within the active document.

NoOfReports()
Returns the number of reports in the active document.

Ranking Functions

rank(*[***total***] expression [, mode [, format]]* **)**
Evaluates *expression*, compares the result with the result on the other rows within the current column segment and returns the ranking of the current row within the segment. For image charts the current column segment is defined as it appears in the chart's straight table equivalent.

If the chart is one-dimensional or if the expression is preceded by the qualifier **total**, the current column segment is always equal to the entire column. If the table or table equivalent has multiple vertical dimensions, the current column segment will include only rows with the same values as the current row in all dimension columns except for the column showing the last dimension in the inter field sort order.

The ranking is returned as a dual value, which in the case where each row has a unique ranking will be an integer between 1 and the number of rows in the current column segment.

In a case where several rows share the same ranking, the text and number representations can be controlled as follows:

The second parameter *mode* specifies the number representation of the function result

mode
0 (default)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If all ranks within the sharing group fall on the low side of the middle value of the entire ranking, all rows get the lowest rank within the sharing group.

If all ranks within the sharing group fall on the high side of the middle value of the entire ranking, all rows in the group get the highest rank within the sharing group.

If ranks within the sharing group span over the middle value of the entire ranking, all rows in the group get a value corresponding to the average of the top and bottom ranking in the entire column segment.

1 lowest rank on all rows in the group

2 average rank on all rows in the group

3 highest rank on all rows in the group

4 lowest rank on first row, then increment by one for each row in the group

The third parameter format specifies the text representation of the function result

format
0 (default)
low value&'-'&high value on all rows in the group (e.g. '3-4')

1 low value on all rows in the group

2 low value on first row, blank on the following rows in the group

The order of rows for mode 4 and format 2 is the determined by the sort order of the chart dimensions.

Note Suppression of zero values is automatically disabled when this function is used. NULL values are disregarded.

Examples:
rank(sum(Sales **))**
rank(sum(Sales **)**, 2 **)**
rank(sum(Sales **)**, 0, 1 **)**

More detailed examples of the use of ranking functions are found on page 422.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

hrank(*[***total***] expression [, mode [, format]]* **)**

Evaluates *expression*, compares the result with the result in the other columns within the current row segment of a pivot table and returns the ranking of the current column within the segment.

This function works only in pivot tables and returns NULL in all other types of charts.

If the pivot table is one-dimensional or if the expression is preceded by the qualifier **total**, the current row segment is always equal to the entire row. If the pivot table has multiple horizontal dimensions, the current row segment will include only columns with the same values as the current column in all dimension rows except for the row showing the last horizontal dimension of the inter field sort order.

The ranking is returned as a dual value, which in the case where each column has a unique ranking will be an integer between 1 and the number of columns in the current row segment.

In a case where several columns share the same ranking, the text and number representations can be controlled as follows:

The second parameter mode specifies the number representation of the function result

mode

0 (default)If all ranks within the sharing group fall on the low side of the middle value of the entire ranking, all rows in the group get the lowest rank within the sharing group.

If all ranks within the sharing group fall on the high side of the middle value of the entire ranking, all rows in the group get the highest rank within the sharing group.

If ranks within the sharing group span over the middle value of the entire ranking, all rows in the group get a value corresponding to the average of the top and bottom ranking in the entire row segment.

1 lowest rank on all rows in the group

2 average rank on all rows in the group

3 highest rank on all rows in the group

4 lowest rank on first row, then increment by one for each row in the group

The third parameter format specifies the text representation of the function result

format

0 (default)low value&'-'&high value on all rows in the group (e.g. '3-4')

1 low value on all rows in the group

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

2 low value on first row, blank on the following rows in the group

The order of rows for mode 4 and format 2 is the determined by the sort order of the chart dimensions.

Note Suppression of zero values is automatically disabled when this function is used. NULL values are disregarded.

Examples:
hrank(sum(Sales **))**
hrank(sum(Sales **)**, 2 **)**
hrank(sum(Sales **)**, 0, 1 **)**

More detailed examples of the use of ranking functions are found on page 422.

vrank(*[***total***] expression [, mode [, format]]* **)**
This function is identical with the **rank** function.

Conditional Functions

if(*condition , then [, else[* **)**
The three parameters *condition*, *then* and *else* are all expressions. The first one, *condition*, is interpreted logically. The two other ones, *then* and *else*, can be of any type. They should preferably be of the same type. If *condition* is true, the function returns the value of the expression *then*. If *condition* is false, the function returns the value of the expression *else*. If the *else* expression is omitted and *condition* is false, null is returned.

Example:
if(Amount >= 0, 'OK', 'Alarm' **)**

alt(*case1 [, case2 , case3 , ...] , otherwise* **)**
The **alt** function returns the first of the parameters that has a valid number representation. If no such match is found, the last parameter will be returned. Any number of parameters can be used.

Example:
alt(date#(dat,'YYYY/MM/DD' **)**,
date#(dat,'MM/DD/YYYY' **)**,
date#(dat,'MM/DD/YY'),
'No valid date')

will test if the dimension *dat* contains a date according to any of the three specified date formats. If so, it will return the original string

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

and a valid number representation of a date. If no match is found, the text 'No valid date' will be returned (without any valid number representation).

pick(*n, expr1 [, expr2,...exprN]*)

Returns the *n*:th expression in the list. *n* is an integer between 1 and *N*.

Examples:

pick(2, 'A', 'B', 4 **)** returns 'B'

pick(3, 'A', 'B', 4 **)** returns 4

match(*s, expr1 [, expr2, ...exprN]* **)**

Compares the string *s* to a list of strings or string expressions. The result of the comparison is an integer indicating which of the comparison strings/expressions matched. If no match is found, 0 is returned. The match function performs a case sensitive comparison.

Examples:

match(M , 'Jan' , 'Feb' , 'Mar')
where M is 'Feb' returns 2

match(M , 'Jan' , 'Feb' , 'Mar')
where M is 'Apr' or 'jan' returns 0

mixmatch(*s, expr1 [, expr2, ...exprN]* **)**

Compares the string *s* to a list of strings or string expressions. The result of the comparison is an integer indicating which of the comparison strings/expressions matched. If no match is found, 0 is returned. The **mixmatch** function performs a case insensitive comparison.

Example:

mixmatch(M , 'Jan' , 'Feb' , 'Mar' **)**
where M is 'jan' returns 1

wildmatch(*s, expr1 [, expr2, ...exprN]* **)**

Compares the string *s* to a list of strings or string expressions. The result of the comparison is an integer indicating which of the comparison strings/expressions that matched. If no match is found, 0 is returned. The wildmatch function performs a case insensitive comparison. The wildcard characters * and ? are allowed in the comparison string.

Examples:

wildmatch(M , 'ja*' , 'fe?' , 'mar' **)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



where M is 'January' returns 1

wildmatch(M , 'ja*' , 'fe?' , 'mar' **)**

where M is 'fex' returns 2

class(*expression, interval [, label [, offset]]* **)**

Creates a classification of *expressions*. The bin width is determined by the number set as *interval*. The result is shown as a<=x<b, where *a* and *b* are the upper and lower limits of the bin. The *x* can be replaced by an arbitrary string stated in *label*. 0 is normally the default starting point of the classification. This can be changed by adding an *offset*.

Examples:

class(var,10 **)** with var = 23 returns '20<=x<30'

class(var,5,'value' **)** with var = 23 returns '20<= value <25'

class(var,10,'x',5 **)** with var = 23 returns '15<=x<25'

Logical Functions

IsNum(*expr* **)**

Returns -1 (true) if the expression can be interpreted as a number, otherwise 0 (false).

IsText(*expr* **)**

Returns -1 (true) if the expression has a text representation, otherwise 0 (false).

Null Functions

Null( ) Returns a real NULL value.

IsNull(*expr* **)**

Returns -1 (true) if expr returns NULL, otherwise 0 (false).

System Functions

OSuser( )

Returns a string containing the name of the current user as returned by the operating system.

QVuser( )

Returns a string containing the name of the current QlikView user as defined in a **section access**.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

qlikviewversion( )

Returns the full QlikView version and build number (e.g. 7.52.3797.0409.3) as a string. This function is only available in QlikView builds after 7.52.3795.

ComputerName( )

Returns a string containing the name of the computer as returned by the operating system.

ReloadTime( )

Returns a timestamp for the last finished execution of the script.

SqlValue(*datasource, selectstatement [, type]*)

Returns the value in the first column of the first row returned by **selectstatement**. Datasource must be a predefined ODBC or OLEDB data source. The third parameter type must be either 'ODBC' or 'OLEDB'. If omitted **type='ODBC'** is assumed.

Examples:

sqlvalue ('NorthWind', 'select CompanyName from Customers where CustomerID=' &chr(39)&Variable1&chr(39))

sqlvalue ('NorthWind', 'select CompanyName from Customers where CustomerID= ' & chr(39) & only(MyQvField) &chr(39) , 'OLEDB')

Note The use of this function can cause delays due to response times in the external database.

GetCurrentField(*groupname* **)**

returns the name of the field currently active in the group named *groupname*.

Example:
getcurrentfield(MyGroup)

GetCurrentSelections(*[recordsep [, tagsep [, valuesep [, maxvalues=6]]]]* **)**

returns a selection stamp of the current selections in the document. *Recordsep* is the separator between lines (fields) in the selection stamp and defaults to chr(13). *Tagsep* is the delimiter between field name and values and defaults to ': '. *Valuesep* is the delimiter between selected values and defaults to ', '. *Maxvalues* is the highest

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

number of individual values that will be displayed for any one field before 'x of y' notation is used instead.

Examples:
getcurrentselections()
getcurrentselections (chr(13), '=', ';')
getcurrentselections (chr(13), '=', ';', 10)

GetFieldSelections(*fieldname [, valuesep [, maxvalues=6]]* **)**

returns a string containing the current selections in a given field. *Valuesep* is the delimiter between selected values and defaults to ', '. *Maxvalues* is the highest number of individual values that will be displayed before 'x of y' notation is used instead.

Examples:
getfieldselections(Country)
getfieldselections (Country, ';')
getfieldselections (Country, ',' , 10)

GetSelectedCount(*fieldname [, includeexcluded=false]* **)**

returns the number of selected values in the field named *fieldname*. If *includeexcluded* is stated as true, the count will include selected values which are excluded by selections in another field

Examples:
getselectedcount(Customers)
getselectedcount(Customers, true)

GetPossibleCount(*fieldname* **)**

returns the number of possible values in the field named *fieldname*.

Example:
getpossiblecount(Customers)

GetExcludedCount(*fieldname* **)**

returns the number of excluded values in the field named *fieldname*.

Example:
getexcludedcount(Customers)

GetAlternativeCount(*fieldname* **)**

returns the number of alternative values in the field named *fieldname*.

Example:
getalternativecount(Customers)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

GetNotSelectedCount(*fieldname [, includeexcluded=false]* **)**

returns the number of not-selected values in the field named *fieldname*. The field must be in and-mode for this function to be relevant. If *includeexcluded* is stated as true, the count will include selected values which are excluded by selections in another field

Examples:
getnotselectedcount(Country)
getnotselectedcount(Country, true)

Date and Time Functions

In the following examples, the default date format YYYY-MM-DD (ISO standard) is assumed. See further in “number format dialogs” on page 285ff in Book II for a description of date and time formats in QlikView.

day(*date* **)**

Day. The result is a number.

Example:
day(Date **)** where Date = 1971-10-30 returns 30

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. To solve this problem, you can either change the settings or use the **date#** interpretation function (see under “Number Interpretation Functions” on page 405). For further information about date and time functions see page 280 in Book II.

week(*date* **)**

Week number. The result is a number. A week begins on Monday. Week #1 is the first week with four or more days in the new year.

Example:
week(Date **)** where Date = 1971-10-30 returns 43

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

month(*date*)

Month. The result is a text string, but can be formatted as a number.

Example:
month(Date **)** where Date = 1971-10-30 returns Oct

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

year(*date* **)**

Year. The result is a number.

Example:
year(Date **)** where Date = 1971-10-30 returns 1971

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

weekyear(*date* **)**

The year to which the week number belongs. The week number ranges between 1 and approximately 52. Some years week #1 starts in December, e.g. December 1997. Other years start with week #53 of previous year, e.g. January 1999. For those few days when the week number belongs to another year, the functions **year** and **weekyear** will return different values.

Examples:
weekyear(Date **)** where Date = 1996-12-30 returns 1997
weekyear(Date **)** where Date = 1997-01-02 returns 1997
weekyear(Date **)** where Date = 1997-12-30 returns 1997
weekyear(Date **)** where Date = 1999-01-02 returns 1998

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

weekday(*date* **)**

Week day. The result is a number between 0-6 (0=Monday).

Example:
weekday(Date **)** where Date = 1971-10-30 returns 5

If the date format used does not correspond to the one set in your operating system, QlikView will not be able to make a correct interpretation. See above under **day**.

MakeDate(*YYYY [, MM [, DD]]* **)**

Returns a date calculated from the year *YYYY*, the month number *MM* and the day number *DD*. If no month number is stated, 1 (January) is assumed. If no day number is stated, 1 (the 1st) is assumed.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Examples:
(date format YYYY-MM-DD assumed)
makedate(1999 **)** returns 1999-01-01
makedate(99 **)** returns 0099-01-01
makedate(1992, 12 **)** returns 1992-12-01
makedate(1999, 2, 14 **)** returns 1999-02-14

MakeWeekDate(*YYYY , WW [, D]* **)**

Returns a date calculated from the year *YYYY*, the week number *WW* and the day-of-week *D*, where 0 denotes Monday and 6 denotes Sunday. Week number 1 is the first week containing four days or more of the year. If no day-of-week is stated, 0 (Monday) is assumed.

Examples:
(date format YYYY-MM-DD assumed)
makeweekdate(1999,6,6 **)** returns 1999-02-14
makeweekdate(99,6 **)** returns 0099-02-02

MakeTime(*hh [, mm [, ss [.fff]]]* **)**

Returns a time calculated from the hour *hh*, the minute *mm* and the second *ss* with fraction *fff* down to a millisecond. If no minute is stated, 00 is assumed. If no second is stated, 00 is assumed. If no fraction of seconds is stated, .000 is assumed.

Examples:
(time format hh:mm:ss assumed)
maketime(22 **)** returns 22:00:00
maketime(22, 17 **)** returns 22:17:00
maketime(22, 17, 52 **)** returns 22:17:52

hour(*expr* **)**

Returns an integer representing the hour when the fraction of *expr* is interpreted as a time according to the standard number interpretation.

Examples:
(time format hh:mm:ss assumed)
hour(time **)** returns 9 when time='09:14:36'
hour(0.5555 **)** returns 13 (0.5555 = 13:19:55)

minute(*expr* **)**

Returns an integer representing the minute when the fraction of *expr* is interpreted as a time according to the standard number interpretation.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
(time format hh:mm:ss assumed)
minute(time **)** returns 14 when time='09:14:36'
minute(0.5555 **)** returns 19 (0.5555 = 13:19:55)

second(*expr* **)**

Returns an integer representing the second when the fraction of *expr* is interpreted as a time according to the standard number interpretation.

Examples:
(time format hh:mm:ss assumed)
second(time **)** returns 36 when time='09:14:36'
second(0.5555 **)** returns 55 (0.5555 = 13:19:55)

now(*[timer_mode]* **)**

Returns a timestamp from the system clock. The *timer_mode* may have the following values:

0 Time at script run
1 Time at function call
2 Time when the document was opened

Default *timer_mode* is 1. The *timer_mode=1* should be used with caution, since it polls the operating system every second and hence could slow down the system.

today(*[timer_mode]* **)**

Returns the date from the system clock. The *timer_mode* may have the following values:

0 Date at script run
1 Date at function call
2 Date when the document was opened

Default *timer_mode* is 2. The *timer_mode=1* should be used with caution, since it polls the operating system every second and hence could slow down the system.

LocalTime(*[timezone [, ignoreDST]]* **)**

Returns a timestamp of the current time from the system clock for a specified time zone. The *timezone* is specified as a string containing any of the geographical places listed under Time Zone in the Windows Control Panel for Date and Time or as a string in the form 'GMT+hh:mm'. If no *timezone* is specified the local time will be returned. If *ignoreDST* is true daylight savings time will be ignored.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
localtime ('Paris')
localtime ('GMT+01:00')
localtime ('Paris', true)
localtime ()

yeartodate(*date [, yearoffset [, firstmonth [, todaydate]]]* **)**

Returns true if *date* falls within the year to date, else false. If none of the optional parameters are used, the year to date means any date within one calendar year from January 1 up to and including the date of the last script execution.

By specifying a *yearoffset* (0 if omitted), the function can be transposed to return true for the same period in another year. Negative yearoffset indicates previous years while a positive value indicates coming years. Last year to date is achieved by specifying *yearoffset* = -1.

By specifying a *firstmonth* between 1 and 12 (1 if omitted), the beginning of the year may be moved forward to the first day of any month. If you e.g. want to work with a fiscal year starting May 1, you may specify *firstmonth* = 5.

By specifying a *todaydate* (time of last script execution if omitted), you may move the day used as the upper boundary of the period.

Examples:
assume last reload time = 1999-11-18
yeartodate('1998-11-18' **)** returns false
yeartodate('1999-02-01' **)** returns true
yeartodate('1999-11-18' **)** returns true
yeartodate('1999-11-19' **)** returns false
yeartodate('1998-11-18', -1 **)** returns true
yeartodate('1999-11-18', -1 **)** returns false
yeartodate('1999-04-30', 0, 5 **)** returns false
yeartodate('1999-05-01', 0, 5 **)** returns true

DayNumberOfYear(*date[,firstmonth]***)**

Returns the day number of the year according to a timestamp with the first millisecond of the first day of the year containing *date*. The function always uses years based on 366 days.

By specifying a *firstmonth* between 1 and 12 (1 if omitted), the beginning of the year may be moved forward to the first day of any

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

month. If you e.g. want to work with a fiscal year starting March 1, you may specify *firstmonth* = 3.

Examples:
DayNumberOfYear(date**)** returns the day number counted from the first of the year.
DayNumberOfYear(date,3**)** returns the number of the day as counted from the first of March.

DayNumberOfQuarter(*date[,firstmonth]***)**

Returns the day number of the quarter according to a timestamp with the first millisecond of the first day of the quarter containing *date*. The function always uses years based on 366 days.

By specifying a *firstmonth* between 1 and 12 (1 if omitted), the beginning of the year may be moved forward to the first day of any month. If you e.g. want to work with a fiscal year starting March 1, you may specify *firstmonth* = 3.

Examples:
DayNumberOfQuarter(Date) returns the day number of the quarter counted from the first day of the first quarter.
DayNumberOfQuarter(Date,3**)** returns the day number of the quarter counted from the first of March

AddMonths(*startdate, n [, mode]***)**

Returns the date occurring *n* months after *startdate* or, if *n* is negative, the date occuring *n* months before *startdate*.

By specifying a *mode* (0 if omitted) the date is set to either the unmodified day of the specified month (mode=0) or the calculated day as derived from the end of the month (mode=1).

Examples:

addmonths ('2003-01-29',3**)**	returns '2003-04-29'
addmonths ('2003-01-29',3,0**)**	returns '2003-04-29'
addmonths ('2003-01-29',3,1**)**	returns '2003-04-28'
addmonths ('2003-01-29',1,0**)**	returns '2003-02-28'
addmonths ('2003-01-29',1,1**)**	returns '2003-02-26'
addmonths ('2003-02-28',1,0**)**	returns '2003-03-28'
addmonths ('2003-02-28',1,1**)**	returns '2003-03-31'

YearStart(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the first date of the year containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer,

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

where the value 0 indicates the year which contains *date*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Example:
yearstart ('2001-10-19' **)** returns '2001-01-01' with an underlying numeric value corresponding to '2001-01-01 00:00:00.000'
yearstart ('2001-10-19', -1) returns '2000-01-01' with an underlying numeric value corresponding to '2000-01-01 00:00:00.000'
yearstart ('2001-10-19', 0, 4) returns '2001-04-01' with an underlying numeric value corresponding to '2001-04-01 00:00:00.000'

YearEnd(*date [, shift = 0 [, first_month_of_year = 1]*] **)**
Returns a value corresponding to a timestamp with the last millisecond of the last date of the year containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the year which contains *date*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Example:
yearend ('2001-10-19' **)** returns '2001-12-31' with an underlying numeric value corresponding to '2001-12-31 23:59:59.999'
yearend ('2001-10-19', -1 **)** returns '2000-12-31' with an underlying numeric value corresponding to '2000-12-31 23:59:59.999'
yearend ('2001-10-19', 0, 4 **)** returns '2002-03-31' with an underlying numeric value corresponding to '2002-03-31 23:59:59.999'

YearName(*date [, shift = 0 [, first_month_of_year = 1]]* **)**
Returns a four-digit year as display value with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the year containing *date*. *Shift* is an integer, where the value 0 indicates the year which contains *date*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*. The display value will then be a string showing two years.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
yearname ('2001-10-19'**)** returns '2001' with an underlying numeric value corresponding to '2001-01-01 00:00:00.000'
yearname ('2001-10-19', -1 **)** returns '2000' with an underlying numeric value corresponding to '2000-01-01 00:00:00.000'
yearname ('2001-10-19', 0, 4 **)** returns '2001-2002' with an underlying numeric value corresponding to '2001-04-01 00:00:00.000'

QuarterStart(*date [, shift = 0 [, first_month_of_year = 1]]* **)**
Returns a value corresponding to a timestamp with the first millisecond of the quarter containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the quarter which contains *date*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
quarterstart ('2005-10-29' **)** returns '2005-10-01' with an underlying numeric value corresponding to '2005-10-01 00:00:00.000'
quarterstart ('2005-10-29', -1 **)** returns '2005-07-01' with an underlying numeric value corresponding to '2005-07-01 00:00:00.000'
quarterstart ('2005-10-29', 0, 3 **)** returns '2005-09-01' with an underlying numeric value corresponding to '2005-09-01 00:00:00.000'

QuarterEnd(*date [, shift = 0 [, first_month_of_year = 1]]* **)**
Returns a value corresponding to a timestamp with the last millisecond of the quarter containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the quarter which contains *date*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
quarterend ('2005-10-29' **)** returns '2005-12-31' with an underlying numeric value corresponding to '2005-12-31 23:59:59.999'
quarterend('2005-10-29', -1 **)** returns '2005-09-30' with an underlying numeric value corresponding to '2005-09-30 23:59:59.999'
quarterend ('2005-10-29', 0, 3 **)** returns '2005-11-30' with an underlying numeric value corresponding to '2005-11-30 23:59:59.999'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

QuarterName(*date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a display value showing the months of the quarter (formatted according to the MonthNames script variable) and year with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the quarter. *Shift* is an integer, where the value 0 indicates the quarter which contains *date*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:

quartername ('2005-10-29' **)** returns 'Oct-Dec 2005' with an underlying numeric value corresponding to '2005-10-01 00:00:00.000'

quartername ('2005-10-29', -1 **)** returns 'Jul-Sep 2005' with an underlying numeric value corresponding to '2005-07-01 00:00:00.000'

quartername ('2005-10-29', 0, 3 **)** returns 'Sep-Nov 2005' with an underlying numeric value corresponding to '2005-09-01 00:00:00.000'

MonthStart(*date [, shift = 0]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the first date of the month containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the month which contains *date*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:

monthstart ('2001-10-19' **)** returns '2001-10-01' with an underlying numeric value corresponding to '2001-10-01 00:00:00.000'

monthstart ('2001-10-19', -1 **)** returns '2001-09-01' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'

MonthEnd(*date [, shift = 0]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the last date of the month containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the month which contains *date*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Examples:
monthend ('2001-02-19' **)** returns '2001-02-28' with an underlying numeric value corresponding to '2001-02-28 23:59:59.999'
monthend ('2001-02-19', -1 **)** returns '2001-01-31' with an underlying numeric value corresponding to '2001-01-31 23:59:59.999'

MonthName(*date [, shift = 0]* **)**

Returns a display value showing the month (formatted according to the MonthNames script variable) and year with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the month. *Shift* is an integer, where the value 0 indicates the month which contains *date*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:
monthname ('2001-10-19' **)** returns 'Oct 2001' with an underlying numeric value corresponding to '2001-10-01 00:00:00.000'
monthname ('2001-10-19', -1 **)** returns 'Sep 2001' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'

MonthsStart(*n, date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the *n* month period (starting from January 1st) containing *date*. The default output format will be the DateFormat set in the script. N must be (1), 2, (3), 4 or 6. *Shift* is an integer, where the value 0 indicates the period which contains *date*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
monthsstart (4, '2001-10-19' **)** returns '2001-09-01' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'
monthsstart (4, '2001-10-19', -1 **)** returns '2001-05-01' with an underlying numeric value corresponding to '2001-05-01 00:00:00.000'
monthsstart (4, '2001-10-19', 0, 2 **)** returns '2001-10-01' with an underlying numeric value corresponding to '2001-10-01 00:00:00.000'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

MonthsEnd(*n, date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the *n* month period (starting from January 1st) containing *date*. The default output format will be the DateFormat set in the script. N must be (1), 2, (3), 4 or 6. *Shift* is an integer, where the value 0 indicates the period which contains *date*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

monthsend (4, '2001-07-19' **)** returns '2001-08-31' with an underlying numeric value corresponding to '2001-08-31 23:59:59.999'

monthsend (4, '2001-10-19', -1 **)** returns '2001-08-31' with an underlying numeric value corresponding to '2001-08-31 23:59:59.999'

monthsend (4, '2001-10-19', 0, 2 **)** returns '2002-01-31' with an underlying numeric value corresponding to '2002-01-31 23:59:59.999'

MonthsName(*n, date [, shift = 0 [, first_month_of_year = 1]]* **)**

Returns a display value showing the months of the period (formatted according to the MonthNames script variable) and year with an underlying numeric value corresponding to a timestamp with the first millisecond of the *n* month period (starting from January 1st) containing *date*. N must be (1), 2, (3), 4 or 6. *Shift* is an integer, where the value 0 indicates the period which contains *date*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:

monthsname (4, '2001-10-19' **)** returns 'Sep-Dec 2001' with an underlying numeric value corresponding to '2001-09-01 00:00:00.000'

monthsname (4, '2001-10-19', -1 **)** returns 'May-Aug 2001' with an underlying numeric value corresponding to '2001-05-01 00:00:00.000'

monthsname (4, '2001-10-19', 0, 2 **)** returns 'Oct-Jan 2002' with an underlying numeric value corresponding to '2001-10-01 **00:00:00.000'**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

WeekStart(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the first date (Monday) of the calendar week containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the week which contains *date*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:

weekstart ('2006-01-12' **)** returns '2006-01-09' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'
weekstart ('2006-01-12', -1 **)** returns '2006-01-02' with an underlying numeric value corresponding to '2006-01-02 00:00:00.000'
weekstart ('2006-01-12', 0, 1 **)** returns '2006-01-10' with an underlying numeric value corresponding to '2006-01-10 00:00:00.000'

WeekEnd(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the last date (Sunday) of the calendar week containing *date*. The default output format will be the DateFormat set in the script.. *Shift* is an integer, where the value 0 indicates the week which contains *date*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:

weekend ('2006-01-12' **)** returns '2006-01-15' with an underlying numeric value corresponding to '2006-01-15 23:59:59.999'
weekend ('2006-01-12', -1 **)** returns '2006-01-08' with an underlying numeric value corresponding to '2006-01-08 23:59:59.999'
weekend ('2006-01-12', 0, 1 **)** returns '2006-01-16' with an underlying numeric value corresponding to '2006-01-16 23:59:59.999'

WeekName(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a display value showing the year and week number with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the week containing *date*. *Shift* is an integer, where the value 0 indicates the week which contains *date*. Negative values in *shift* indicate preceding weeks and positive

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
weekname ('2006-01-12' **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'
weekname ('2006-01-12', -1 **)** returns '2006/01' with an underlying numeric value corresponding to '2006-01-02 00:00:00.000'
weekname ('2006-01-12', 0, 1 **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-10 00:00:00.000'

LunarweekStart(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the lunar week (consecutive 7 day periods starting on January 1st each year) containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the lunar week which contains *date*. Negative values in *shift* indicate preceding lunar weeks and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in *weekoffset*. This may be given as a real number indicating days and/or fractions of a day.

Examples:
lunarweekstart ('2006-01-12' **)** returns '2006-01-08' with an underlying numeric value corresponding to '2006-01-08 00:00:00.000'
lunarweekstart ('2006-01-12', -1 **)** returns '2006-01-01' with an underlying numeric value corresponding to '2006-01-01 00:00:00.000'
lunarweekstart ('2006-01-12', 0, 1 **)** returns 2006-01-09' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'

LunarweekEnd(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the lunar week (consecutive 7 day periods starting on January 1st each year) containing *date*. The default output format will be the DateFormat set in the script. *Shift* is an integer, where the value 0 indicates the lunar week which contains *date*. Negative values in *shift* indicate preceding lunar weeks and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in *week-*

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

offset. This may be given as a real number indicating days and/or fractions of a day.

Examples:
lunarweekend ('2006-01-12' **)** returns '2006-01-14' with an underlying numeric value corresponding to '2006-01-14 23:59:59.999'
lunarweekend ('2006-01-12', -1 **)** returns '2006-01-07' with an underlying numeric value corresponding to '2006-01-07 23:59:59.999'
lunarweekend ('2006-01-12', 0, 1 **)** returns '2006-01-15' with an underlying numeric value corresponding to '2006-01-15 23:59:59.999'

LunarWeekName(*date [, shift = 0 [,weekoffset = 0]]* **)**

Returns a display value showing the year and week number with an underlying numeric value corresponding to a timestamp with the first millisecond of the first date of the lunar week (consecutive 7 day periods starting on January 1st each year) containing *date*. *Shift* is an integer, where the value 0 indicates the lunar week which contains date. Negative values in *shift* indicate preceding lunar weeks and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in weekoffset. This may be given as a real number indicating days and/or fractions of a day.

Examples:
lunarweekname ('2006-01-12' **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-08 00:00:00.000'
lunarweekname ('2006-01-12', -1 **)** returns '2006/01' with an underlying numeric value corresponding to '2006-01-01 00:00:00.000'
lunarweekname ('2006-01-12', 0, 1 **)** returns '2006/02' with an underlying numeric value corresponding to '2006-01-09 00:00:00.000'

DayStart(*timestamp [, shift = 0 [, dayoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the first millisecond of the day contained in *timestamp*. The default output format will be the TimestampFormat set in the script. *Shift* is an integer, where the value 0 indicates the day which contains *date*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in *dayoffset*, e.g 0.125 to denote 3am.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Examples:

daystart ('2006-01-25 16:45' **)** returns '2006-01-25 00:00:00' with an underlying numeric value corresponding to '2006-01-25 00:00:00.000'

daystart ('2006-01-25 16:45', -1 **)** returns '2006-01-24 00:00:00' with an underlying numeric value corresponding to '2006-01-24 00:00:00.000'

daystart ('2006-01-25 16:45', 0, 0.5 **)** returns '2006-01-25 12:00:00' with an underlying numeric value corresponding to '2006-01-25 12:00:00.000'

DayEnd(*timestamp [, shift = 0 [, dayoffset = 0]]* **)**

Returns a value corresponding to a timestamp with the last millisecond of the day contained in *timestamp*. The default output format will be the TimestampFormat set in the script. *Shift* is an integer, where the value 0 indicates the day which contains *date*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in *dayoffset*, e.g 0.125 to denote 3am.

Examples:

dayend ('2006-01-25 16:45' **)** returns '2006-01-25 23:59:59' with an underlying numeric value corresponding to '2006-01-25 23:59:59.999'

dayend ('2006-01-25 16:45', -1 **)** returns '2006-01-24 23:59:59' with an underlying numeric value corresponding to '2006-01-24 23:59:59.999'

dayend ('2006-01-25 16:45', 0, 0.5 **)** returns '2006-01-26 11:59:59' with an underlying numeric value corresponding to '2006-01-26 11:59:59.999'

DayName(*timestamp [, shift = 0 [, dayoffset = 0]]* **)**

Returns a display value showing the date with an underlying numeric value corresponding to a timestamp with the first millisecond of the day containing *timestamp*. *Shift* is an integer, where the value 0 indicates the day which contains date. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in *dayoffset*, e.g 0.125 to denote 3am.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Examples:
dayname ('2006-01-25 16:45') returns '2006-01-25' with an underlying numeric value corresponding to '2006-01-25 00:00:00.000'
dayname ('2006-01-25 16:45', -1) returns '2006-01-24' with an underlying numeric value corresponding to '2006-01-24 00:00:00.000'
dayname ('2006-01-25 16:45', 0, 0.5) returns '2006-01-25' with an underlying numeric value corresponding to '2006-01-25 12:00:00.000'

timezone ( )
returns the name of the current time zone as defined in Windows.

Example:
timezone ( )

GMT ( ) returns the current Greenwich Mean Time as derived from the system clock and Windows time settings.

Example:
gmt ( )

daylightsaving ( )
returns the current adjustment for daylight saving time as defined in Windows.

Example:
daylightsaving ( )

setdateyear (*timestamp*, *year***)**
returns a timestamp based on *timestamp* but with the year replaced with *year*.
timestamp is a standard QlikView timestamp (often just a date).
year is a four-digit year.

Examples:
setdateyear('2005-10-29', 2006) returns '2006-10-29'
setdateyear('2005-10-29 04:26', 2006) returns '2006-10-29 04:26'

setdateyearmonth (*timestamp*, *year*, *month***)**
returns a timestamp based on *timestamp* but with the year replaced with *year*.
year is a four-digit year.
timestamp is a one- or two-digit month.

Examples:
setdateyearmonth('2005-10-29', 2006, 3) returns '2006-03-29'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

setdateyearmonth('2005-10-29 04:26', 2006, 3) returns '2006-03-29 04:26'

InYear (*date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the year containing *basedate*. The year can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the year which contains *basedate*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
inyear ('2006-01-25', '2006-01-01', 0 **)** returns true
inyear ('2005-01-25', '2006-01-01', 0 **)** returns false
inyear ('2006-01-25', '2006-01-01', -1 **)** returns false
inyear ('2005-01-25', '2006-01-01', -1 **)** returns true
inyear ('2006-01-25', '2006-07-01', 0, 3 **)** returns false
inyear ('2006-03-25', '2006-07-01', 0, 3 **)** returns true

InYearToDate (*date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the part of year containing *basedate* up until and including the last millisecond of *basedate*. The year can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the year which contains *basedate*. Negative values in *shift* indicate preceding years and positive values indicate succeeding years. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
inyeartodate ('2006-01-25', '2006-02-01', 0 **)** returns true
inyeartodate ('2006-01-25', '2006-01-01', 0 **)** returns false
inyeartodate ('2005-01-25', '2006-02-01', -1 **)** returns true

InQuarter (*date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the quarter containing *basedate*. The quarter can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the quarter which contains *basedate*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year.*

Examples:
inquarter ('2006-01-25', '2006-01-01', 0 **)** returns true

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

inquarter ('2006-01-25', '2006-04-01', 0 **)** returns false
inquarter ('2006-01-25', '2006-01-01', -1 **)** returns false

inquarter ('2005-12-25', '2006-01-01', -1 **)** returns true
inquarter ('2006-01-25', '2006-03-01', 0, 3 **)** returns false
inquarter ('2006-03-25', '2006-03-01', 0, 3 **)** returns true

InQuarterToDate (*date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the part of the quarter containing *basedate* up until and including the last millisecond of basedate. The quarter can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the quarter which contains *basedate*. Negative values in *shift* indicate preceding quarters and positive values indicate succeeding quarters. If you want to work with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inquartertodate ('2006-01-25', '2006-01-25', 0 **)** returns true
inquartertodate ('2006-01-25', '2006-01-24', 0 **)** returns false
inquartertodate ('2005-12-25', '2006-02-01', -1 **)** returns false

InMonth (*date, basedate , shift* **)**
returns true if *date* lies inside the month containing *basedate*. The month can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the month which contains *basedate*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:
inmonth ('2006-01-25', '2006-01-01', 0 **)** returns true
inmonth ('2006-01-25', '2006-04-01', 0 **)** returns false
inmonth ('2006-01-25', '2006-01-01', -1 **)** returns false
inmonth ('2005-12-25', '2006-01-01', -1 **)** returns true

InMonthToDate (*date, basedate , shift* **)**
returns true if *date* lies inside the part of month containing *basedate* up until and including the last millisecond of *basedate*. The month can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the month which contains *basedate*. Negative values in *shift* indicate preceding months and positive values indicate succeeding months.

Examples:
inmonthtodate ('2006-01-25', '2006-01-25', 0 **)** returns true
inmonthtodate ('2006-01-25', '2006-01-24', 0 **)** returns false

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

inmonthtodate ('2006-01-25', '2006-02-28', -1 **)** returns true

InMonths (*n, date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the *n* month period (aligned from January 1st) containing basedate. *N* must be (1), 2, (3), 4 or 6. The period can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the period which contains *basedate*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inmonths (4, '2006-01-25', '2006-01-01', 0 **)** returns true
inmonths (4, '2006-01-25', '2006-05-01', 0 **)** returns false
inmonths (4, '2006-01-25', '2006-01-01', -1 **)** returns false
inmonths (4, '2005-12-25', '2006-01-01', -1 **)** returns true
inmonths (4, '2006-01-25', '2006-03-01', 0, 3 **)** returns false
inmonths (4, '2006-04-25', '2006-03-01', 0, 3 **)** returns true

InMonthsToDate (*n, date, basedate , shift [, first_month_of_year = 1]* **)**
returns true if *date* lies inside the part of the *n* month period (aligned from January 1st) containing *basedate* up until and including the last millisecond of *basedate*. *N* must be (1), 2, (3), 4 or 6. The period can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the period which contains *basedate*. Negative values in *shift* indicate preceding periods and positive values indicate succeeding periods. If you want to align with (fiscal) years not starting in January, you may indicate a value between 2 and 12 in *first_month_of_year*.

Examples:
inmonthstodate (4, '2006-01-25', '2006-04-25', 0 **)** returns true
inmonthstodate (4, '2006-04-25', '2006-04-24', 0 **)** returns false
inmonthstodate (4, '2005-11-25', '2006-02-01', -1 **)** returns true

InWeek (*date, basedate , shift [, weekstart]* **)**
returns true if *date* lies inside the week containing *basedate*. The week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the week which contains *basedate*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in *weekstart*. This may be given as a real number indicating days and/or fractions of a day.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:
inweek ('2006-01-12', '2006-01-14', 0 **)** returns true
inweek ('2006-01-12', '2006-01-20', 0 **)** returns false
inweek ('2006-01-12', '2006-01-14', -1 **)** returns false
inweek ('2006-01-07', '2006-01-14', -1 **)** returns true
inweek ('2006-01-12', '2006-01-09', 0, 3 **)** returns false

InWeekToDate (*date, basedate , shift [, weekstart]* **)**
returns true if *date* lies inside the part of week containing *basedate* up until and including the last millisecond of *basedate*. The week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the week which contains *basedate*. Negative values in *shift* indicate preceding weeks and positive values indicate succeeding weeks. If you want to work with weeks not starting midnight between Sunday and Monday, you may indicate an offset in days in weekstart. This may be given as a real number indicating days and/or fractions of a day.

Examples:
inweektodate ('2006-01-12', '2006-01-12', 0 **)** returns true
inweektodate ('2006-01-12', '2006-01-11', 0 **)** returns false
inweektodate ('2006-01-12', '2006-01-05', -1 **)** returns true

InLunarWeek (*date, basedate , shift [, weekstart]* **)**
returns true if *date* lies inside the lunar week (consecutive 7 day periods starting on January 1st each year) containing *basedate*. The lunar week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the lunar week which contains basedate. Negative values in *shift* indicate preceding lunar week s and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in week-start. This may be given as a real number indicating days and/or fractions of a day.

Examples:
inlunarweek ('2006-01-12', '2006-01-14', 0 **)** returns true
inlunarweek ('2006-01-12', '2006-01-20', 0 **)** returns false
inlunarweek ('2006-01-12', '2006-01-14', -1 **)** returns false
inlunarweek ('2006-01-07', '2006-01-14', -1 **)** returns true
inlunarweek ('2006-01-11', '2006-01-08', 0, 3 **)** returns false

InLunarWeekToDate (*date, basedate , shift [, weekstart]* **)**
returns true if *date* lies inside the part of lunar week (consecutive 7 day periods starting on January 1st each year) containing *basedate*

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

up until and including the last millisecond of *basedate*. The lunar week can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the lunar week which contains *basedate*. Negative values in *shift* indicate preceding lunar week s and positive values indicate succeeding lunar weeks. If you want to work with an offset for the start of the lunar weeks, you may indicate an offset in days in week-start. This may be given as a real number indicating days and/or fractions of a day.

Examples:
inlunarweektodate ('2006-01-12', '2006-01-12', 0 **)** returns true
inlunarweektodate ('2006-01-12', '2006-01-11', 0 **)** returns false
inlunarweektodate ('2006-01-12', '2006-01-05', -1 **)** returns true

InDay (*timestamp, basetimestamp , shift [, daystart]* **)**
returns true if *timestamp* lies inside the day containing *basetimestamp*. The day can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the day which contains *basetimestamp*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in daystart, e.g 0.125 to denote 3am.

Examples:
inday ('2006-01-12 12:23', '2006-01-12 00:00', 0 **)** returns true
inday ('2006-01-12 12:23', '2006-01-13 00:00', 0 **)** returns false
inday ('2006-01-12 12:23', '2006-01-12 00:00', -1 **)** returns false
inday ('2006-01-11 12:23', '2006-01-12 00:00', -1 **)** returns true
inday ('2006-01-12 12:23', '2006-01-12 00:00', 0, 0.5 **)** returns false
inday ('2006-01-12 11:23', '2006-01-12 00:00', 0, 0.5 **)** returns true

InDayToTime (*timestamp, basetimestamp , shift [, daystart]***)**
returns true if *timestamp* lies inside the part of day containing *basetimestamp* up until and including the exact millisecond of *basetimestamp*. The day can be offset by *shift*. *Shift* is an integer, where the value 0 indicates the day which contains *basetimestamp*. Negative values in *shift* indicate preceding days and positive values indicate succeeding days. If you want to work with days not starting midnight, you may indicate an offset in fraction of a day in daystart, e.g 0.125 to denote 3am.

Examples:
indaytotime ('2006-01-12 12:23', '2006-01-12 23:59', 0 **)** returns true

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

indaytotime ('2006-01-12 12:23', '2006-01-12 00:00', 0 **)** returns false
indaytotime ('2006-01-11 12:23', '2006-01-12 23:59', -1 **)** returns true

age(*timestamp, date_of_birth* **)**

Returns the age at the time of *timestamp* (in completed years) of a someone born on *date_of_birth*.

Example:
age('2007-01-25', '2005-10-29'**)** returns 1
age('2007-10-29', '2005-10-29'**)** returns 2

networkdays(*start_date, end_date {, holiday}* **)**

Returns the number of working days (Monday-Friday) between and including *start_date* and *end_date* taking into account any optionally listed *holidays*. All parameters should be valid dates or timestamps.

Example:
networkdays ('2007-02-19', '2007-03-01'**)** returns 9
networkdays ('2006-12-18', '2006-12-31', '2006-12-25', '2006-12-26'**)** returns 8

firstworkdate(*end_date, no_of_workdays {, holiday}* **)**

Returns the latest starting date to achieve *number_of_workdays* (Monday-Friday) ending no later than *end_date* taking into account any optionally listed holidays. *End_date* and *number_of_workdays* should be valid dates or timestamps.

Example:
firstworkdate ('2007-03-01', 9**)** returns '2007-02-19'
firstworkdate ('2006-12-31', 8, '2006-12-25', '2006-12-26'**)** returns '2006-12-18'

lastworkdate(*start_date, no_of_workdays {, holiday}* **)**

Returns the earliest ending date to achieve *number_of_workdays* (Monday-Friday) if starting at *start_date* taking into account any optionally listed holidays. *Start_date* and *number_of_workdays* should be valid dates or timestamps.

Example:
lastworkdate ('2007-02-19', 9**)** returns '2007-03-01'
lastworkdate ('2006-12-18', 8, '2006-12-25', '2006-12-26'**)** returns '2006-12-29'

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

ConvertToLocalTime(*timestamp [, place [, ignore_dst=false]]]***)**

Converts a UTC or GMT timestamp to local time as a dual value. The place can be any of a number of cities, places and time zones around the world, e.g. Abu Dhabi, Adelaide, Alaska, Almaty, Amsterdam, Arizona, Astana, Athens, Atlantic Time (Canada), Auckland, Azores, Baghdad, Baku, Bangkok, Beijing, Belgrade, Berlin, Bern, Bogota, Brasilia, Bratislava, Brisbane, Brussels, Bucharest, Budapest, Buenos Aires, Cairo, Canberra, Cape Verde Is., Caracas, Casablanca, Central America, Central Time (US & Canada), Chennai, Chihuahua, Chongqing, Copenhagen, Darwin, Dhaka, Eastern Time (US & Canada), Edinburgh, Ekaterinburg, Fiji, Georgetown, Greenland, Greenwich Mean Time : Dublin, Guadalajara, Guam, Hanoi, Harare, Hawaii, Helsinki, Hobart, Hong Kong, Indiana (East), International Date Line West, Irkutsk, Islamabad, Istanbul, Jakarta, Jerusalem, Kabul, Kamchatka, Karachi, Kathmandu, Kolkata, Krasnoyarsk, Kuala Lumpur, Kuwait, Kyiv, La Paz, Lima, Lisbon, Ljubljana, London, Madrid, Magadan, Marshall Is., Mazatlan, Melbourne, Mexico City, Mid-Atlantic, Midway Island, Minsk, Monrovia, Monterrey, Moscow, Mountain Time (US & Canada), Mumbai, Muscat, Nairobi, New Caledonia, New Delhi, Newfoundland, Novosibirsk, Nuku'alofa, Nuku´alofa, Osaka, Pacific Time (US & Canada), Paris, Perth, Port Moresby, Prague, Pretoria,Quito, Rangoon, Riga, Riyadh, Rome, Samoa, Santiago, Sapporo, Sarajevo, Saskatchewan, Seoul, Singapore, Skopje, Sofia, Solomon Is., Sri Jayawardenepura, St. Petersburg, Stockholm, Sydney, Taipei, Tallinn, Tashkent, Tbilisi, Tehran, Tijuana, Tokyo, Ulaan Bataar, Urumqi, Warsaw, Wellington, West Central Africa, Vienna, Vilnius, Vladivostok, Volgograd, Yakutsk, Yerevan or Zagreb. Also GMT, GMT-01:00, GMT+04:00 etc. are valid places.

The resulting time is adjusted for daylight savings time, unless the third parameter is set to 1 or true().

Examples:

ConvertToLocalTime('2007-11-10 23:59:00','Paris'**)** returns '2007-11-11 00:59:00' and the corresponding internal timestamp representation.

ConvertToLocalTime(UTC(), 'GMT-05:00'**)** returns the time for the North American east coast, e.g. New York.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Number Interpretation Functions

The interpretation functions are a set of functions to interpret a field content or an expression. With these functions it is possible to state the data type, decimal separator, thousands separator etc. used.

If no interpretation functions are used, QlikView interprets the data as a mix of numbers, dates, times, time stamps and strings, using the default settings for number format, date format and time format defined by script variables and by the operating system.

In order to understand the examples in this section, you should first study the part “number format dialogs” on page 285 in Book II.

Note For reasons of clarity, all number representations are given with decimal point as decimal separator.

num#(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **num#** function evaluates the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. Decimal separator and thousands separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the default number format set in the operating system is used.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
number format	# ##0,#	#,##0.#

num#(*A,'#'*) where A=35,648.375 returns

Setting 1		Setting 2	
string	number	string	number
35,648.375	-	35648.375	35648.375

num#(*A, '#.#' , '.' , ',')* where A=35,648.375 returns

Setting 1 and 2	
string	number
35,648.375	35648.375

num#(*A, '#,#' , ',' , '.')* where A=35648.375 returns

Setting 1 and 2		
string	number	Note!

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

35648.375	35648375	The number represent.!

num#(*A,'abc#,#'*) where A=abc123,4 returns

Setting 1		Setting 2	
string	number	string	number
abc123,4	123.4	abc123,4	1234

money#(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **money#** function evaluates the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. Decimal separator and thousands separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the default number format set in the operating system is used.

The **money#** function generally behaves just like the **num#** function but takes its default values for decimal and thousand separator from the script variables for money format or the system settings for currency.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
money format	# ##0,00 kr	$ #,##0.00

money#(*A,'# ##0,00 kr'*) where A=35 648,37 kr returns

Setting 1		Setting 2	
string	number	string	number
35 648.37 kr	35648.37	35 648.37 kr	3564837

money#(*A, '$#' , '.' , ',')* where A=$35,648.37 returns

Setting 1 and 2	
string	number
$35,648.37	35648.37

date#(*expression [, format-code]* **)**

The **date#** function evaluates the *expression* as a date according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the default date format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY

date#(*A*) where A=8/6/97 returns

Setting 1		Setting 2	
string	number	string	number
8/6/97	-	8/6/97	35648

date#(*A,'YYYY.MM.DD'*) where A=1997.08.06 returns

Setting 1 and 2	
string	number
1997.08.06	35648

time#(*expression [, format-code]* **)**

The **time#** function evaluates the *expression* as a time according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the default time format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
time format	hh:mm:ss	hh.mm.ss

time#(*A*) where A=09:00:00 returns

Setting 1		Setting 2	
string	number	string	number
09:00:00	0.375	09:00:00	-

time#(*A,'hh.mm')* where A=09.00 returns

Setting 1 and 2	
string	number
09.00	0.375

timestamp#(*expression [, format-code]* **)**

The **timestamp#** function evaluates the expression as a date and a time according to the string given as format-code. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the default date and time formats set in the operating system are used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY
time format	hh:mm:ss	hh:mm:ss

timestamp#(*A***)** where A=8/6/97 09:00:00 returns

Setting 1		Setting 2	
string	number	string	number
8/6/97 09:00:00	-	8/6/97 09:00:00	35648.375

timestamp#(*A,'YYYY-MM-DD hh_mm***)** where A=1997-08-06 09_00 returns

Setting 1 and 2	
string	number
1997-08-06 09_00	35648.375

interval#(*expression [, format-code]* **)**

The **interval#** function evaluates the expression as a time interval according to the string given as a format-code. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the time format set in the operating system is used.

The **interval#** function generally behaves just like the **time#** function but while times can never be greater than 23:59:59 (numeric value 0.99999) or smaller than 00:00:00 (numeric value 0.00000) an interval may have any value.

Examples:

The examples below assume the following operating system settings:

short date format	YY-MM-DD
time format	hh:mm:ss
number decimal format	.

interval#(*A,'D hh:mm'***)** where A=1 09:00 returns

string	number
1 09:00	1.375

interval#(*A-B***)** where A=97-08-06 09:00:00 and B=97-08-05 00:00:00 returns

string	number

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

1.375	1.375

text(*expr* **)**

The **text** function forces the *expression* to be treated as text, even if a numeric interpretation is possible.

Examples:

text(*A*) where A=1234 returns

string	number
1234	-

text(*pi()*) returns

string	number
3.1415926535898	-

Formatting Functions

The formatting functions are a set of functions to set the display format of a field or an expression. With these functions it is possible to set decimal separator, thousands separator etc. The easiest way to format numbers, times and dates is however in the number format dialog, see page 291 in Book II.

In order to understand the examples in this section, you should first study the chapter “number format dialogs” on page 285 in Book II.

Note For reasons of clarity all number representations are given with decimal point as decimal separator.

num(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **num** function formats the expression numerically according to the string given as format-code. For a description of the format-code, see page 291 in Book II. Decimal separator and thousands separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the number format set in the operating system is used.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
number format	# ##0,#	#,##0.#

num(*A , '0.0'*) where A=35648.375 returns

Setting 1		Setting 2	
string	number	string	number

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

35 648 375	35648375	35648.375	35648.375

num(*A , '#,##0.##' , '.' , ',')* where A=35648 returns

Setting 1 and 2

string	number
35,648.00	35648

num(*pi() , '0,00'*) returns

Setting 1		Setting 2	
string	number	string	number
3,14	3.141592653	003	3.141592653

money(*expression [, format-code [, decimal-sep [, thousands-sep]]]* **)**

The **money** function formats the *expression* numerically according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. Decimal separator and thousands separator can be set as third and fourth parameters. If the parameters 2-4 are omitted, the number format set in the operating system is used.

Examples:

The examples below assume the two following default settings:

	Default setting 1	Default setting 2
money format	kr # ##0,00	$ #,##0.00

money(*A*) where A=35648 returns

Setting 1		Setting 2	
string	number	string	number
kr 35 648,00	35648.00	$ 35,648.00	35648.00

money(*A , '#,##0 -' , '.' , ',')* where A=3564800 returns

Setting 1 and 2

string	number
3,564,800 -	3564800

date(*expression [, format-code]* **)**

The **date** function formats the expression as a date according to the string given as format-code. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the date format set in the operating system is used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY

date(*A***)** where A=35648 returns

Setting 1		Setting 2	
string	number	string	number
97-08-06	35648	8/6/97	35648

date(*A, 'YY-MM-DD'***)** where A=35648 returns

Setting 1 and 2	
string	number
97-08-06	35648

date(*A, 'DD.MM.YYYY'***)** where A=35648.375 return

Setting 1 and 2	
string	number
06.08.1997	35648.375

date(*A,'YY.MM.DD'***)** where A=8/6/97 returns

Setting 1		Setting 2	
string	number	string	number
<NULL>	(nothing)	97.08.06	35648

time(*expression [, format-code]* **)**

The **time** function formats the *expression* as a time according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the time format set in the operating system is used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
time format	hh:mm:ss	hh.mm.ss

time(*A***)** where A=0.375 returns

Setting 1		Setting 2	
string	number	string	number
09:00:00	0.375	09.00.00	0.375

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

time(*A*) where A=35648.375 returns

Setting 1		Setting 2	
string	number	string	number
09:00:00	35648.375	09.00.00	35648.375

time(*A,'hh-mm'*) where A=0.99999 returns

Setting 1 and 2	
string	number
23-59	0.99999

timestamp(*expression [, format-code]* **)**

The **timestamp** function formats the *expression* as a date and a time according to the string given as *format-code*. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the date and time formats set in the operating system are used.

Examples:

The examples below assume the two following operating system settings:

	Default setting 1	Default setting 2
date format	YY-MM-DD	M/D/YY
time format	hh:mm:ss	hh:mm:ss

timestamp(*A*) where A=35648.375 returns

Setting 1		Setting 2	
string	number	string	number
97-08-06 09:00:00	35648.375	8/6/97 09:00:00	35648.375

timestamp(*A,'YYYY-MM-DD hh.mm'*) where A=35648 returns

Setting 1 and 2	
string	number
1997-08-06 00.00	35648

interval(*expression [, format-code]* **)**

The **interval** function formats the *expression* as a time interval according to the string given as a *format-code*. For a description of the format-code, see page 291 in Book II. If the format code is omitted, the time format set in the operating system is used.

Intervals may be formatted as a time, as days or as a combination of days, hours, minutes, seconds and fractions of seconds.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Examples:

The examples below assume the following operating system settings:

short date format	YY-MM-DD
time format	hh:mm:ss
number decimal format	.

interval(*A*) where A=0.375 return

string	number
09:00:00	0.375

interval(*A***)** where A=1.375 returns

string	number
33:00:00	1.375

interval(*A, 'D hh:mm'***)** where A=1.375 returns

string	number
1 09:00	1.375

interval(*A-B, 'D hh:mm'***)** where A=97-08-06 09:00:00 and B=96-08-06 00:00:00 returns

string	number
365 09:00	365.375

Chart Color Functions

These functions can be used in color expressions in sheet object properties supporting calculated color in image charts.

color(*n* **)**

Returns the color representation of color number *n* in the relevant chart color map. The color representation is a dual value where the text representation comes in the form of 'RGB(r, g, b)' where r, g and b are numbers between 0 and 255 representing the red, green and blue color value respectively. The number representation is an integer representing the red, green and blue components as defined in Visual Basic. Outside the calculated color expression in the **Color** page of the **Chart Properties** dialog, this function always returns black.

RGB(*e1, e2, e3* **)**

Returns the color representation of a color defined by the red component *e1*, the green component *e2* and the blue component *e3*. All

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

three parameters must be expressions evaluating to integers in the range between 0 and 255. The color representation is a dual value where the text representation comes in the form of 'RGB(r, g, b)' where r, g and b are numbers between 0 and 255 representing the red, green and blue color value respectively. The number representation is an integer representing the red, green and blue components as defined in Visual Basic.

ARGB(*alpha, e1, e2, e3* **)**

Returns the color representation of a color defined by the red component e1, the green component e2 and the blue component e3 with an alpha-factor (opacity) of *alpha*. All four parameters must be expressions evaluating to integers in the range between 0 and 255. The color representation is a dual value where the text representation comes in the form of 'ARGB(a ,r, g, b)' where a, r, g and b are numbers between 0 and 255 representing the alpha, red, green and blue color value respectively. The number representation is an integer representing the alpha, red, green and blue components as defined in Visual Basic.

colormix1(*Value, ColorZero, ColorOne* **)**

returns an RGB color representation from a gradient between two colors based on a value between 0 and 1. If the value is equal to zero the first color will be returned. If it is 1, the second color is returned and if it is in between the appropriate intermediate shading is returned.

Value is a real number between 0 and 1.

ColorZero is a valid RGB color representation for the color to be associated with the low end of the interval.

ColorOne is a valid RGB color representation for the color to be associated with the high end of the interval.

Example:
colormix1(x, **black** (), **red**()**)**

colormix2(*Value, ColorMinusOne, ColorOne [,ColorZero]* **)**

returns an RGB color representation from a gradient between two colors based on a value between -1 and 1 with the possibility to specify an intermediate color for the center position. If the value is equal to -1 the first color will be returned. If it is 1, the second color is returned and if it is in between the appropriate intermediate shading is returned.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Value is a real number between -1 and 1.

ColorMinusOne is a valid RGB color representation for the color to be associated with the high end of the interval.

ColorOne is a valid RGB color representation for the color to be associated with the high end of the interval.

ColorZero is a optional valid RGB color representation for the color to be associated with the center of the interval.

Examples:
colormix1(x, **red** (), **green**()**)** returns colors from red to green via brown

colormix1(x, **red** (), **green**(), **black**()**)** returns colors from red to green via black

Note Alpha-factors have no effect in QlikView Java clients.

Note The RGB, HSL and SYSCOLOR functions always return a color with the alpha value of 255 (opaque).

HSL (*hue*, *saturation*, *luminosity***)**
Returns the color representation of a color defined by a *hue* value between 0 and 1, a *saturation* value between 0 and 1 and a *luminosity* value between 0 and 1. The color representation is a dual value where the text representation comes in the form of 'RGB(r, g, b)' where r, g and b are numbers between 0 and 255 representing the red, green and blue color value respectively. The number representation is an integer representing the red, green and blue components as defined in Visual Basic.

black(*[alpha]***)**
Returns the RGB color representation for black (RGB 0,0,0). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

darkgray(*[alpha]***)**
Returns the RGB color representation for dark gray (RGB 128,128,128). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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lightgray(*[alpha]***)**

Returns the RGB color representation for light gray (RGB 192,192,192). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

white(*[alpha]***)**

Returns the RGB color representation for white (RGB 255,255,255). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

blue(*[alpha]***)**

Returns the RGB color representation for blue (RGB 0,0,128). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

lightblue(*[alpha]***)**

Returns the RGB color representation for light blue (RGB 0,0,255) Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

green(*[alpha]***)**

Returns the RGB color representation for green (RGB 0,128,0). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

lightgreen(*[alpha]***)**

Returns the RGB color representation for light green (RGB 0,255,0). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

cyan(*[alpha]***)**

Returns the RGB color representation for cyan (RGB 0,128,128). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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lightcyan(*[alpha]***)**

Returns the RGB color representation for light cyan (RGB 0,255,255). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

red(*[alpha]***)**

Returns the RGB color representation for red (RGB 128,0,0). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

lightred(*[alpha]***)**

Returns the RGB color representation for light red (RGB 255,0,0). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

magenta(*[alpha]***)**

Returns the RGB color representation for magenta (RGB 128,0,128). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

lightmagenta(*[alpha]***)**

Returns the RGB color representation for light magenta (RGB 255,0,255). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

brown(*[alpha]***)**

Returns the RGB color representation for brown (RGB 128,128,0). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

yellow(*[alpha]***)**

Returns the RGB color representation for yellow (RGB 255,255,0).Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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qliktechblue(*[alpha]***)**

Returns the RGB color representation for qliktech blue (RGB 8,18,90). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

qliktechgray(*[alpha]***)**

Returns the RGB color representation for qliktech gray (RGB 158,148,137). Optionally a parameter for alpha-factor can be given. An *alpha* of 0 corresponds to full transparency. An *alpha* of 255 corresponds to full opacity.

syscolor(*nr***)**

Returns the RGB color representation for the Windows system color *nr*, where nr corresponds to the parameter to the Windows API function GetSysColor(*nr*). Some values for *nr* are:

0	COLOR_SCROLLBAR
1	COLOR_BACKGROUND
2	COLOR_ACTIVECAPTION
3	COLOR_INACTIVECAPTION
4	COLOR_MENU
5	COLOR_WINDOW
6	COLOR_WINDOWFRAME
7	COLOR_MENUTEXT
8	COLOR_WINDOWTEXT
9	COLOR_CAPTIONTEXT
10	COLOR_ACTIVEBORDER
11	COLOR_INACTIVEBORDER
12	COLOR_APPWORKSPACE
13	COLOR_HIGHLIGHT
14	COLOR_HIGHLIGHTTEXT
15	COLOR_BTNFACE
16	COLOR_BTNSHADOW
17	COLOR_GRAYTEXT

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

18 COLOR_BTNTEXT

19 COLOR_INACTIVECAPTIONTEXT

20 COLOR_BTNHIGHLIGHT

21 COLOR_3DDKSHADOW

22 COLOR_3DLIGHT

23 COLOR_INFOTEXT

24 COLOR_INFOBK

26 COLOR_HOTLIGHT (Win2000)

27 COLOR_GRADIENTACTIVECAPTION (Win2000)

28 COLOR_GRADIENTINACTIVECAPTION (Win2000)

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

19 EXAMPLES

This chapter contains further examples illustrating functions and expressions in QlikView.

19.1 Examples of Aggregate Qualifiers

These examples are made with the **sum** function, but could be applied on all chart aggregation functions supporting set definitions and the **total** qualifier.

Example 1:

Study the following table when no selections are made:

Qualifiers for aggregation

Month	Grp	sum(Val)	sum(total Val)	sum({1} total Val)
		21	21	21
1	A	1	21	21
1	B	2	21	21
2	A	3	21	21
2	B	4	21	21
3	A	5	21	21
3	B	6	21	21

The second and third expression columns will have the same number in all rows. This number equals the calculated total in the first expression column.

Now let's select only Month 1 and 2. The result will look as follows:

Month	Grp	sum(Val)	sum(total Val)	sum({1} total Val)
		10	10	21
1	A	1	10	21
1	B	2	10	21
2	A	3	10	21
2	B	4	10	21

The result of the fifth column remains unchanged, since the set definition disregards current selections. The second expression with the **total** qualifier will display the new total of 10, which is still equal to the total in the first expression (third column).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example 2:
Study the following table:

Partial totals in aggregation

Month	Grp	sum(Val)	sum(total Val)	sum(total<Month> Val)	sum(total<Grp> Val)
		21	21	21	21
1	A	1	21	3	9
1	B	2	21	3	12
2	A	3	21	7	9
2	B	4	21	7	12
3	A	5	21	11	9
3	B	6	21	11	12

In the third expression column *sum(total<Month> Val)* one total is calculated for each Month.

In the fourth expression column *sum(total<Grp> Val)* one total is calculated for each Grp.

19.2 Examples of Ranking Functions
The examples below are made with the **rank** (**vrank**) function but could be applied in a similar manner to the **hrank** function. It should however be noted that the **hrank** function is only relevant in pivot tables.

Example 1:
Study the two single-dimension straight tables below:

Single dimension RANK

Month	sum(Val)	rank(sum(Val))
	110	-
1	17	3
2	9	7
3	22	1
4	16	4
5	10	6
6	5	8
7	11	5
8	20	2

Sorted by ranking column

Month	sum(Val)	rank(sum(Val))
	110	-
3	22	1
8	20	2
1	17	3
4	16	4
7	11	5
5	10	6
2	9	7
6	5	8

The two tables are the same but the left table is sorted by the first column while the right table is sorted by the last column. This example shows the basic functionality of **rank**. The highest value has the highest rank (lowest ranking number).

The **rank** functions always return NULL in total rows.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example 2:

Study the two-dimensional pivot table below:

Two dimension RANK and the effect of total				
Group	Month	sum(Val)	rank(sum(Val))	rank(total sum(Val))
A ⊟	1	17	2	3
	4	16	3	4
	7	11	4	5
	8	20	1	2
	Total	64	-	-
B ⊟	2	9	3	7
	3	22	1	1
	5	10	2	6
	6	5	4	8
	Total	46	-	-
Total		110	-	-

This table is based on the same data as the two tables in the first example. You can now see how the current column segment is limited to rows with the same value in the *Group* column in the multi-dimensional case. Months within group A are ranked separately form months in group B. By introducing the **total** qualifier, an overall ranking can again be achieved.

Example 3:

This example will demonstrate the effect of the different modes for the numeric representation of the ranking. Study the table below:

The effect of the mode parameter on the result number representation							
Month	sum(X)	rank(sum(X))	mode=0	mode=1	mode=2	mode=3	mode=4
	86	-	-	-	-	-	-
4	20	1	1	1	1	1	1
2	12	2-3	2	2	2.5	3	2
7	12	2-3	2	2	2.5	3	3
3	10	4-5	4.5	4	4.5	5	5
5	10	4-5	4.5	4	4.5	5	4
8	9	6	6	6	6	6	6
6	7	7	7	7	7	7	7
1	6	8	8	8	8	8	8

The third column shows the ranking in text representations while columns 4-8 shows the number representation of the same ranking in different modes. The expression in each column is

num(rank(sum(*X* **),** *mode* **))**

where *mode* is 0 to 4.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Mode 0 (default)
Rows 2 and 3 share ranking but are clearly on the lower half of the total ranking. Their number representation therefore is rounded downwards to 2. Rows 4 and 5 share ranking but fall just over the middle of the ranking table and therefore get a number representation of the average of the first and last rank in the column ((1+8)/2 = 4.5). This mode is especially useful when you want to use visual cues to mark the highest and lowest ranking data within a group.

Mode 1
In both cases the lower ranking figure within the group is used, which is 2 for rows 2 and 3, and 4 for rows 4 and 5.

Mode 2
In both cases the average of the low and high ranking within the group is used, which is 2.5 ((2+3)/2) for rows 2 and 3, and 4.5 ((4+5)/2) for rows 4 and 5.

Mode 3
In both cases the higher ranking figure within the group is used, which is 3 for rows 2 and 3, and 5 for rows 4 and 5.

Mode 4
Each row gets its own distinct numeric value. The order within the groups sharing a ranking is determined by the sort order of the chart's dimensions.

Example 4:

This example will demonstrate the effect of the different formats for the text representation of the ranking function. Study the table below:

The effect of the format parameter on the result text representation

Month	sum(X)	rank(sum(X),0,0)	rank(sum(X),0,1)	rank(sum(X),0,2)
	86	-	-	-
4	20	1	1	1
2	12	2-3	2	2
7	12	2-3	2	
3	10	4-5	4	
5	10	4-5	4	4
8	9	6	6	6
6	7	7	7	7
1	6	8	8	8

Columns 3-5 show the text representation of the same ranking function with different values in the format parameter.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Format 0 (default)
Rows sharing ranking are shown as 'low value – high value', e.g. '2-3' and '4-5'.

Format 1
Rows sharing ranking always get the number of the lowest rank as text representation, in this case e.g. 2 for rows 2 and 3.

Format 2
One row in each group sharing the same ranking gets the low rank number as text representation, while the other rows within the group get a blank string. The order within the groups sharing a ranking is determined by the sort order of the charts dimensions.

19.3 Examples of Chart Inter-Record Functions

Top Function

The examples below are made with the **top** function but could be applied in a similar manner to the **bottom**, **first** and **last** functions. It should however be noted that the **first** and **last** functions are only relevant in pivot tables.

Example 1:
Study the single-dimension straight table below:

Single-dimension straight table - top

Month	sum(Val)	top(sum(Val))	sum(Val)/top(sum(Val))
	21	3	700%
1	3	3	100%
2	7	3	233%
3	11	3	367%

In the single-dimension case the **top** function will always refer to the first data row of the table (the total row is not counted).

Note that expressions using the **top** function will be properly evaluated also in the total row since the total has a clear relation to a specific column segment, in this case the entire column.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example 2:
Study the table below. It is a two-dimensional straight table sorted primarily on Grp:

Two-dimension straight table - effect of total qualifier

Month	Grp	sum(Val)	top(sum(Val))	top(total sum(Val))
		21	-	1
1	A	1	1	1
2	A	3	1	1
3	A	5	1	1
1	B	2	2	1
2	B	4	2	1
3	B	6	2	1

The **top** function without the **total** qualifier will now return the expression evaluated on the top row within the innermost sort group (*Grp* dimension in this case). One value will be returned for *Grp*=A and one for *Grp*=B.

By using the **total** qualifier in a multi-dimensional case you may again refer to the absolute top row of the table with the same value being returned for all rows.

The expression using the **top** function without the **total** qualifier will evaluate to NULL in the total row, since it cannot be clearly associated with a specific column segment.

The expression using the **top** function with the **total** qualifier will of course be evaluated for the column segment spanning the entire column.

Now let's convert the same table to a pivot table with all totals turned on (below):

Two-dimension pivot table - effect of total qualifier

Month	Grp	sum(Val)	top(sum(Val))	top(total sum(Val))
1 ⊟	A	1	1	1
	B	2	1	1
	Total	3	1	-
2 ⊟	A	3	3	1
	B	4	3	1
	Total	7	3	-
3 ⊟	A	5	5	1
	B	6	5	1
	Total	11	5	-
Total		21	-	1

The expression using the **top** function without the **total** qualifier will evaluate to NULL in the grand total row, since it cannot be clearly associated with

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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a specific column segment. However all the partial sums will be evaluated for each column segment.

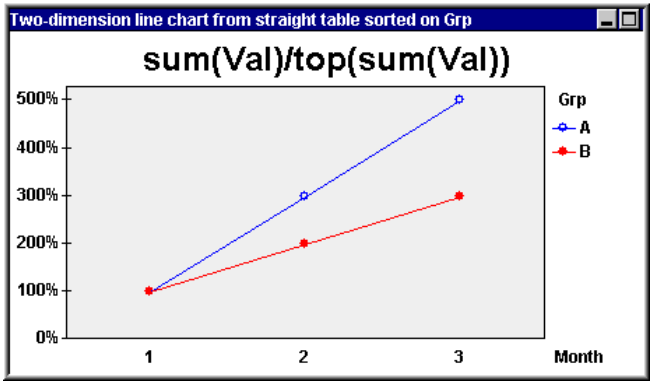
The expression using the **top** function with the **total** qualifier will lack values in the partial totals but will return a value in the grand total row.

Example 3:
Study the table below:

Two-dimension straight table - sort on Grp

Month	Grp	sum(Val)	top(sum(Val))	sum(Val)/top(sum(Val))
		21	-	-
1	A	1	1	100%
2	A	3	1	300%
3	A	5	1	500%
1	B	2	2	100%
2	B	4	2	200%
3	B	6	2	300%

If one deletes the two first expressions and converts the table to a line chart the result will look as follows:



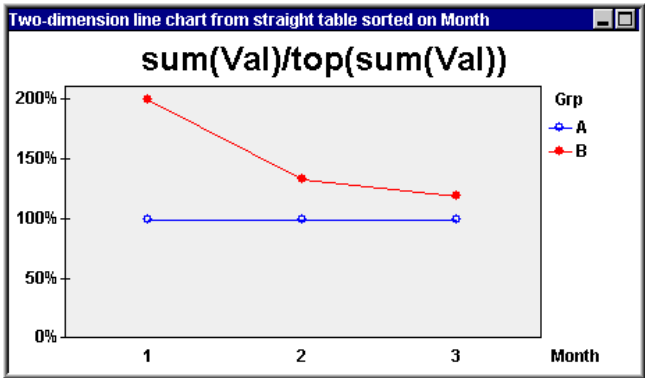
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Finally we may change the inter-field sort order so that the chart is sorted primarily on *Month*. The original table would then look as follows:

Two-dimension straight table - sort on Month

Month	Grp	sum(Val)	top(sum(Val))	sum(Val)/top(sum(Val))
		21	-	-
1	A	1	1	100%
1	B	2	1	200%
2	A	3	3	100%
2	B	4	3	133%
3	A	5	5	100%
3	B	6	5	120%

It is however possible to change the inter-field sort order directly in the line chart below by double-clicking on Month in the **Sort** page of the **Chart Properties** dialog. The line chart will then look as below:



Above Function

The examples below are made with the **above** function but could be applied in a similar manner to the **below**, **before** and **after** functions. It should however be noted that the **before** and **after** functions are only relevant in pivot tables.

Example 1:

Study the single-dimensional straight table below:

Single-dimension straight table - above

Month	sum(Val)	above(sum(Val))	sum(Val)/above(sum(Val))
	21	-	-
1	3	-	-
2	7	3	233%
3	11	7	157%

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The third column shows the expression sum(Val) evaluated one row above the current row, which can be confirmed by comparing with the values for sum(Val) in the second column. On the first row the **above** function will return NULL, as there is no row above on which to evaluate the expression. The **above** function always returns NULL on all total rows.

The fourth column demonstrates the most typical use of this function, i.e. to calculate the difference between e.g. different time periods.

Example 2:
Study the two-dimensional pivot table below:

Two-dimension pivot table - effect of total qualifier

Grp	Month	sum(Val)	above(sum(Val))	above(total sum(Val))
A ⊟	1	1	-	-
	2	3	1	1
	3	5	3	3
	Total	9	-	-
B ⊟	1	2	-	5
	2	4	2	2
	3	6	4	4
	Total	12	-	-
Total		21	-	-

The **above** function without the **total** qualifier (fourth column) will only act within each sort group. A NULL value will be returned on the top row of each column segment.

When adding a **total** qualifier (fifth column), the entire column will be regarded as one column segment. Only the very top row will return NULL. All total rows are disregarded and return NULL in themselves.

RowNo and NoOfRows

The example below is made with the **RowNo** and **NoOfRows** functions but could be applied in a similar manner to the **ColumnNo** and **NoOfColumns** functions. It should however be noted that the **ColumnNo** and **NoOfColumns** functions are only relevant in pivot tables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example 1:
Study the two-dimensional pivot table below:

rowno() and noofrows()

Month	Grp	rowno()	rowno(total)	noofrows()	noofrows(total)
1 ⊟	A	1	1	2	6
	B	2	2	2	6
	Total	0	-	2	-
2 ⊟	A	1	3	2	6
	B	2	4	2	6
	Total	0	-	2	-
3 ⊟	A	1	5	2	6
	B	2	6	2	6
	Total	0	-	2	-
Total		-	0	-	6

Column 3

The **RowNo** function without the **total** qualifier will return the row number within each sort group column segment. In subtotals rows the row number 0 will be returned, since these totals clearly belong to a specific column segment. In the grand total row NULL will be returned.

Column 4

The **RowNo** function with the **total** qualifier will return the row number within the entire column. In subtotals rows a NULL value will be returned. In the grand total row 0 will be returned.

Column 5

The **NoOfRows** function without the **total** qualifier will return the number of data rows within each sort group column segment. In subtotal rows the same number as in the data rows above will be returned. In the grand total row NULL will be returned.

Column 6

The **NoOfRows** function with the **total** qualifier will return the number of data rows within the entire column, which is also what will be returned in the grand total row. In subtotal rows NULL will be returned.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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20 NESTED AGGREGATIONS AND RELATED ISSUES

This chapter exemplifies some important techniques in relation to nested aggregations and the use of **aggr** function in charts.

20.1 Nested Aggregations with total Qualifier

As a general rule, it is not allowed to nest aggregations in a QlikView chart expression. From version 7.5 there is however one very important exception to this rule. As long as you use the **total** qualifier in the inner aggregation function, the nesting is allowed.

Say for example that you want to calculate the sum of the field Sales, but only include transactions with and OrderDate equal to the last year. The last year can be obtained via the aggregation function max(total year(OrderDate)).

An aggregation as follows would then do the job:

sum(if(year(OrderDate**)**=**max(total year(**OrderDate**))**, Sales**)**.

The inclusion of the **total** qualifier is absolutely necessary for this kind of nesting to be accepted by QlikView, but then again also necessary for the desired comparison. The need for this type of nesting is quite common and should be used wherever suitable.

20.2 Nested Aggregations with the aggr Function

Nesting with total is not always enough. For more generic nesting capabilities you will have to use the **aggr** function in combination with calculated dimensions. Let us look at a small example:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The following data has been read from the script:

Original data from script	
SalesRep	Customer
Donna Brown	Bechtel Corporation
Karl Anderson	Berkeley Design
Donna Brown	Capitolnet Marketing Group (CMG)
Karl Anderson	Chas T. Main, Inc.
Karl Anderson	Degolyer and MacNaughton
Lisa Taylor	ediSys
John Doe	Fimetrics Systems
Kathy Clinton	HCS
Lisa Taylor	Homestead Custom
Lisa Taylor	Illuminati
John Doe	Metro-Goldwyn-Mayer, Inc.
Lisa Taylor	Onetouch Interactive
Peggie Hurt	Savetz Publishing
William Fisher	TECC
William Fisher	VA Research
Lisa Taylor	XYZ Operations

Figure 81. The data from the script

An obvious question given this data would be: “How many customers does each sales rep have?”. This is easily done in a standard chart:

First question: How many customer does each sales rep have?	
SalesRep	count(Customer)
Donna Brown	2
John Doe	2
Karl Anderson	3
Kathy Clinton	1
Lisa Taylor	5
Peggie Hurt	1
William Fisher	2

Figure 82. The first order of aggregation

Now however, let us ask a couple of new questions based on the knowledge just gained: “How many sales reps only have one single customer? How many have three or more?”. If we disregard the fact that you in this simple case can count the numbers in the expression columns by hand, these are types of questions that require a second order of aggregation. The data necessary to make the calculation does not exist in the original fields, nor can it be directly calculated from them.

We must simply find a way to use the expression column in the chart above as a dimension in a new chart. The answer lies in the **aggr** function. By stating

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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=aggr(count(Customer**)**,SalesRep**)**

as dimension we can essentially perform the calculation of the first chart as an 'inner chart calculation' in a new chart. The new chart could then be given the expression

count(distinct SalesRep**)**

and the trick is complete. The distinct qualifier is necessary, since QlikView will count the number of lines in the underlying table. The resulting table will look like below:

2nd question: How many salesreps have 1, 2, 3 etc customers?	
=aggr(count(Customer),SalesRep)	count(distinct SalesRep)
1	2
2	3
3	1
5	1

Figure 83. The second order of aggregation

Two things to be noted:

The second chart does in no way require the presence of the first chart. It is fully self-contained with the first order aggregation defined within its dimension.

The possibilities of nesting do not end here. The dimension arguments of the **aggr** function may of course contain calculated dimensions, which in turn make use of the **aggr** function. It should however be relatively easy to loose track of what you are doing when passing the third level of aggregation.

20.3 Sum of rows in Pivot Tables

The QlikView straight table has a choice for its totals between a simple sum of rows and a calculated expression total. The QlikView pivot table lacks this choice. Pivot table totals are always calculated as expression total.

This is normally a good thing, since it is a rather rare occasion that a sum of rows total is relevant when the two differ. You should exercise extreme care when using sum of rows on any type of aggregation other than pure sums.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Let’s say that we have a school contest where three person teams get points by their grades in three different classes. The team may select the highest score within a group for each individual class and then add the three top scores together for a total. The following data has been read from the script:

Original data from script

Class	Name	Score
English	John	5
English	Karen	1
English	Lisa	4
History	John	3
History	Karen	3
History	Lisa	2
Math	John	3
Math	Karen	3
Math	Lisa	4

Figure 84. The data from the script

We must now make a chart with Class as dimension and **max(**Score**)** as expression. A straight table with sum of rows will look as follows:

Straight table with sum of rows

Class	max(Score)
History	3
Math	4
English	5
	12

Figure 85. Sum of rows in straight table

If we for some reason want to display this in a pivot table (not much use here, but if we had more dimensions it may make sense), we run into problems. The straight table above converted into a pivot table would look like as follows:

Pivot table with expression total

Class	max(Score)
English	5
History	3
Math	4
Total	5

Figure 86. Expression total in pivot table

In this specific case the total of 12 is clearly what we want and 5 is equally wrong for our purposes. Again the **aggr** function comes to our rescue. In this case we use it in the expression, not in the dimension.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The original expression is enclosed in an **aggr** function, using the surrounding chart's dimension also as dimension in the **aggr** function. Then we use this bundle as argument to a **sum** aggregation. The result will look as follows:

Pivot table with sum of rows	
Class	sum(aggr(max(Score),Class))
English	5
History	3
Math	4
Total	12

Figure 87. Sum of rows in pivot table

As you see the total is again the one desired. What happened?

Well the beauty of the **aggr** function is that in the individual rows it will evaluate to only a single value. This is because the dimension obviously only has one possible value. This is because the dimension obviously only has one possible value on each ordinary data row. Since the inner dimension and expression are the same as for the surrounding chart, each value will of course be exactly the same as the result without the enclosing **sum** and **aggr** functions.

For the total row however, the **aggr** function will return three values, one for each value of the dimension field. These will in turn be summed by the **sum** aggregation. while formally still being an expression total, the result equals that of sum of rows.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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20.4 Linear Regression in Table Charts

Linear regression trend lines can be shown in QlikView bitmap charts by means of the **Trendlines** option in the **Expressions** page of the **Chart Properties**. It is also possible to display the regression equation.

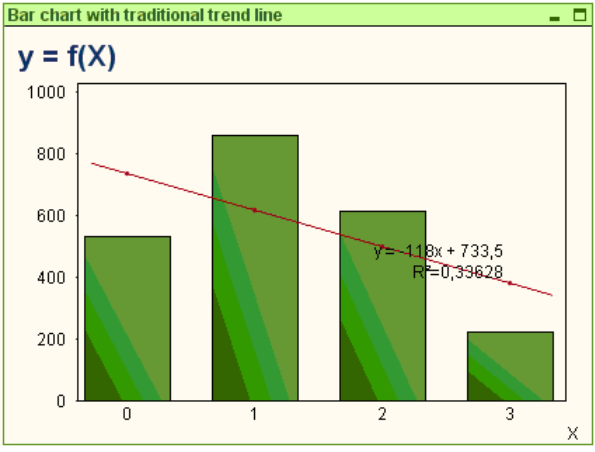


Figure 88. A bar chart with a traditional trendline

However, if you want to display the regression data in e.g. a table chart, the regression must be calculated. The **linest_m** and **linest_b** aggregation functions will give you the required slope and y-intercept values of the linear regression.

To calculate correctly, these functions need to have the entire chart aggregation (expression iterated over dimension) as input. This can be achieved by defining an **aggr** function containing the same base expression and dimension(s) as the containing chart. The **aggr** function is then used as parameters to the **linest** aggregations. The resulting expression could look like follows:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

linest_m(total aggr(Y,X**),**X**)***X **+ linest_b(total aggr(**Y,X**),**X**)**

The only function is implied around all occurrences of X and Y. The linest aggregations should be made with the total qualifier, else would the regression parameters be calculated per data point rather than for the whole set of data. The result can be seen in the combo chart below.

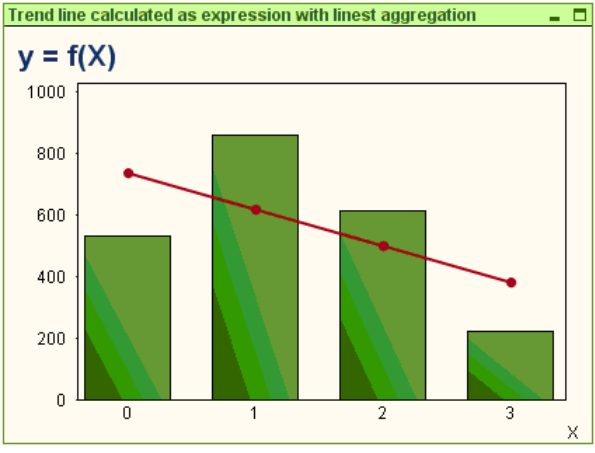


Figure 89. The same data as combo chart with the regression as a regular line expression

Note that the trend line here is not a traditional QlikView trend line, but a regular expression plotted as a line. You can see the difference from the fact that the expression plot, as opposed to a traditional trend line, is not extrapolated outside the first and last data points.

This chart can be converted into a straight table where the regression values are shown in cells.

Trend line calculated as expression with linest aggregation

X	Y	linreg y=mx+b	R2	m	b
0	533	733,5	0,33628	-118,0	733,5
1	859	615,5	0,33628	-118,0	733,5
2	612	497,5	0,33628	-118,0	733,5
3	222	379,5	0,33628	-118,0	733,5

Figure 90. The calculated regression values in straight table format

In the straight table above three extra columns have been added to show the m, b and R^2 values. These of course are constant for all table rows. The expressions needed would like follows, in order of appearance:

linest_r2(total aggr(Y,X**),**X**)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

linest_m(total aggr(Y,X),X**)**
linest_b(total aggr(Y,X),X**)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

21 CALCULATED FORMULAS



In the property dialogs of the QlikView sheets and sheet objects, there are a number of properties allowing fixed text labels or fixed numbers. These are typically used as labels, window titles, chart titles and in some cases as fixed numeric limits.

For many of the property entries mentioned above, it is possible to enter a calculated expression rather than a constant text or number. This feature is called calculated formula. Wherever a calculated formula can be used, this is indicated on the relevant place in this manual.

Examples of properties which can use calculated formulas are window titles for all sheet objects, sheet names, chart titles, number units for axes in charts and the numeric limits for visual cues in straight/pivot tables.

21.1 Entering a Calculated Formula

Calculated formulas are entered according to the following syntax:

= *expression*

For the syntax of allowed expressions, see the section below.

The equal sign in the first position of the entry indicates that the remainder should be interpreted as an expression. QlikView will try to evaluate the expression. If this is not possible, e.g. because of incorrect syntax, the entire label including the equal sign will be displayed.

Calculated formulas can also be generated in the **Edit Expression** dialog which opens when clicking on the **...** button beside the edit box (see further on page 229).

21.2 Expression Syntax for Calculated Formulas

The syntax for *expression* in calculated labels is virtually equal to that of chart expressions (see page 267). There are however a few exceptions:

- As there are no dimensions to iterate over, the aggregation functions will essentially behave as if used in chart expressions with the **total** qualifier before all field names. The **total** qualifier is thus optional and has no special meaning in calculated formulas.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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- In a calculated formula, field names may optionally be used without an enclosing aggregation function. In that case, **only** will be used as aggregation function.

  Example:

  ```
  = Currency
  ```

  is equal to

  ```
  = only(Currency)
  ```

21.3 Error Messages

If a calculated formula cannot be correctly evaluated by QlikView, the formula itself will be returned, followed by two slashes and an error message.

Example:

```
= mode(x) //out of object memory
```

Each calculated formula requires a certain amount of memory. In order not to use excessive memory, a limit on the allowed memory allocation for each calculated label has been put in to the program. If you enter a too complex expression, QlikView will return the expression followed by the error message "// out of object memory". You can solve this problem by increasing the memory allocated (see page 142 in Book I).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

22 FIELD GROUPS

D P A

One main difference between QlikView and many other database viewers, OLAP tools etc. is that in QlikView there is no need to predefine any hierarchies in the input data. The unique associative logic of QlikView gives you the complete freedom to access any field as a full dimension in any order you like. For most purposes this freedom is extremely powerful.

However, there are occasions when a predefined hierarchy could actually help you to display data more efficiently. QlikView therefore offers the possibility to define groups of fields. The groups can be hierarchic (drill-down) or non-hierarchic (cyclic).

Groups are created in the **Groups** page of the **Document Properties** dialog. They can be used in charts, where they appear together with the available fields in the dimension drop-down boxes on the **Dimension** (see page 29).

Any fields can be grouped together.

Drill-down groups are marked with an  icon,

while cyclic groups are displayed with an  icon.

22.1 Hierarchic Groups (Drill-Down)

When several fields form a natural hierarchy, it makes sense to create a drill-down group. Typical examples of hierarchic groups could be:

Time:Year, Quarter, Month

or

Geography: Continent, Country, State, City

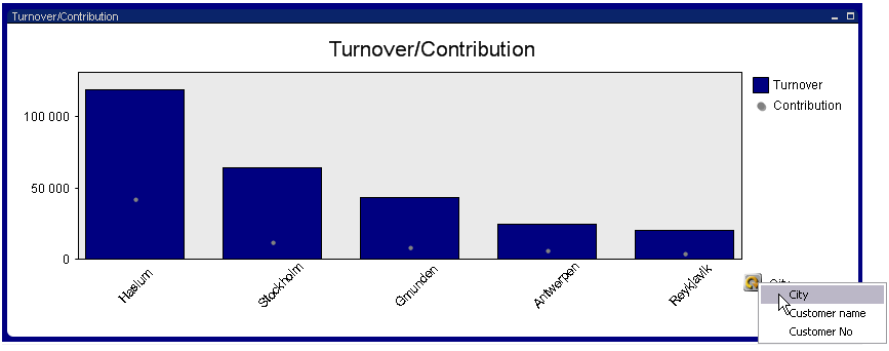
When a drill-down group is used as a dimension in a chart, the chart will use the first field in the group's list of fields that has more than one possible value. If selections are made that cause the field to have only one possible value, the next field in the list will be used instead, provided that it has more than one possible value. If no field in the list has more than one possible value, the last field will be used anyway.

In the first example above, Year will be used as chart dimension until a single year is selected. The chart will then show Quarter. If a single quarter is selected, the chart will switch to Month.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

As selections disappear, so that more than one value becomes possible in the upper fields of the group's field list, the chart will automatically be drilled back up. Forced drill-up can be achieved by clicking on the drill-up icon in the chart.

22.2 Non-Hierarchic Groups (Cyclic)



Sometimes it may be useful to group also fields which do not form a natural hierarchy or even have nothing in common at all. The reason would be to enable the user to make quick changes of the data to be displayed in a chart.

Any fields can be grouped together in a cyclic group. When a cyclic group is used as a dimension in a chart, the chart will initially use the first field in the group's list of fields. The user may then switch to another field by clicking the cycle icon in the chart. The fields are used in the order they appear in the group's field list. When the last field in the list has been used, the turn goes back to the first field. The chart may be cycled indefinitely

It is also possible to right-click on the cycle icon, in which case a list of the fields in the cyclic group is displayed for direct selection (see the picture above).

Cyclic groups should not be confused with cyclic display of expressions in charts.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

23 CUSTOM ERROR MESSAGES

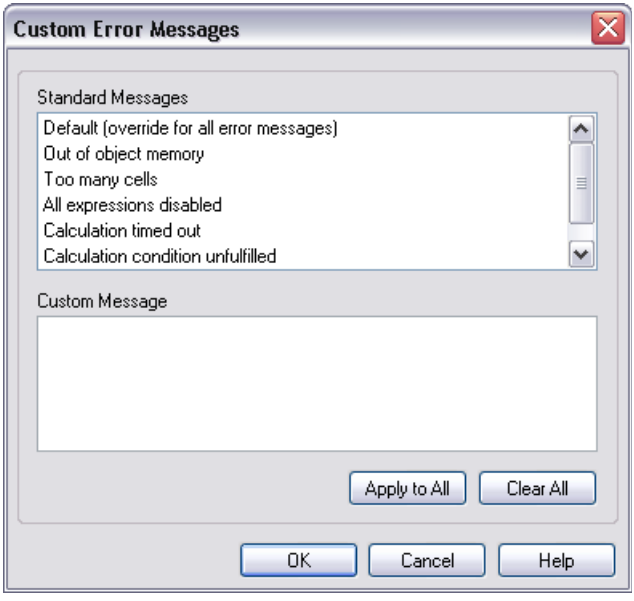


Figure 91. The Custom Error Messages dialog.

QlikView offers the possibility of customizing error messages in charts and table boxes. The **Custom Error Message** dialog is opened via the **Error Messages** button, which is found on the **General** page of the **Chart Properties** dialog, as well as on the **General** page of the **Table Box Properties** dialog.

Standard Messages

List of the standard error messages. To customize a message, select it and type a text of your choice in the **Custom Message** text box. If you wish all the messages to be the same, select **Default (override for all error messages)**, then type your text.

Custom Message

Here you enter the text to be shown instead of the standard message selected above. If you wish all the messages to be the same, select **Default (override for all error messages)** under Standard Messages, then type your text. The text may be a calculated formula.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Apply to All Objects

Click this button to apply the custom messages to all the calculated objects of the document

Clear All

Click this button to clear all the custom error messages.

Help Provides help on this dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

GLOSSARY

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

GLOSSARY

absolute path

The location of a file, folder or directory on a disk, as seen from the root or the top level. See also relative path.

active

A window, dialog box, tabbed sheet or list box that is currently in use. Also called current.

access restriction

Method to restrict access of a QlikView document for different users of user groups

aggr function

The **Aggr( )** function is a function that is used for nested aggregations. Its first parameter must be an aggregation function – the inner aggregation function. The result is a set of records that in turn can be aggregated by an outer aggregation function. Example: **Sum(Aggr(Count(…), ...))**.

aggregation function

An aggregation function is a function that operates on a set of values – several records - to return a single scalar value. Examples: **Sum( )**, **Count( )**, **Avg( )**. Aggregation functions must be used in charts. They can also be used in the script when the “group by” clause is used. See also Range function and Scalar function.

AJAX Shorthand for "Asynchronous JavaScript and XML", is a development technique for creating interactive web applications. See also QlikView AJAX zero footprint client.

alert An alert is an entity that can send or show a warning message if a specific condition is fulfilled, e.g. when something in the data is different from what it should be.

alternative value

A field value that is excluded by a selection in the same list box, but not by selections made in other list boxes. The cell is gray by default, but can be made to be colored white, just like optional cells, by enabling **Show Alternatives** in the **List Box Properties** dialog.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

application

Software designed to carry out a specific kind of activity, such as user access in a database. An application could be a combination of a program and a document. In this manual application usually means a program, such as Excel or QlikView, but could sometimes also denote a specific solution programmed as a QlikView document.

blue

Color of a cell that is locked.

bookmark

A saved set of selections which can be recalled by a user and shared with other users.

bookmark object

A sheet object where bookmarks can be created, deleted and recalled.

calculated dimension

A dimension where the set of values are not defined by the values of a field, but rather by the possible values of an expression.

chart

A common name for bar charts, pie charts, funnel charts, line charts, grid charts, scatter plots, pivot tables and straight tables. Charts show aggregated values of the data, i.e. one item in a chart (a cell in a pivot table, a bar in a bar chart, etc.) corresponds to several records in the logical tables.

circular reference

A structure in the data model where the keys between at least three tables form a circle. The logic then inferred is usually ambiguous and the circlular reference needs to be broken. QlikView does this by setting one of the tables as loosely coupled.

clear selections

An operation that resets a QlikView application to a state where no selections are made, i.e. no field values are excluded.

column

Term commonly used instead of field in databases.

concatenate (1)

An operation that uses two tables and combines them into one. The two tables are merely added to each other, i.e. data are not changed and the produced table contains the same number of records as the original tables

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

together. Several concatenate operations can be performed sequentially, so that the produced table is the concatenation of several tables.

concatenate (2)

An operation that uses two text strings and combines them into one. The operator used for this is the ampersand “&”.

cross table

A table with two or more dimensions, where some dimensions are vertical and some are horizontal. QlikView can use cross tables as input tables. QlikView can also display pivot tables as cross tables.

crosstable

A QlikView script prefix used to load cross tables.

current selections box

A sheet object that shows selections in the fields and their logical status.

custom object

A placeholder sheet object for custom OCX controls in QlikView controls.

csv File extension for comma separated value files. Used when a table is stored as a text file.

DBMS

DataBase Management System. The database program used in the storage and modification of data in the database.

data source

A name for a physical database, defined through the ODBC interface.

delimiter

A character or code that marks the beginning or end of an item, such as a sentence, paragraph, page, record, field or word. This word is sometimes used instead of ‘separator’.

dialog box

A window that lets you select options and activate those options by choosing the appropriate command buttons. Some dialog boxes display warnings and messages you need before taking action.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

dimension

A chart dimension is the set of values for the chart to iterate over when it calculates the values for its expression(s). In the simple case one could say that it is what appears on the x-axis in a standard bar chart. Normally a dimension consists of a field but it may also be a group or a calculated expression.

document

A QlikView file saved in binary format having the default extension qvw. Also called QlikView file.

driver

A program that runs in the background and takes care of the communication with a peripheral device such as a printer or monitor, or with another program.

dual fields

Fields that have both textual and numeric representations, e.g. dates, months, formatted numbers, etc.

edit script dialog

The text editor where the load script is edited.

excluded

Field value that cannot be chosen or selected without changing one or more previous selections. The cell is colored gray to show its status.

expression

A formula. Expressions can be used in a number of places in QlikView: In the load script, in charts, as dynamic labels, in text boxes, etc.

field

Equivalent to column in database. In QlikView, a field is typically represented by a list box (see also value and list box).

font

The typesetting for letters and characters. Fonts are described by name, appearance and size, as in "Arial bold 10pt".

forced exclusion

Also called **not** selection. Can only be made in **and** list boxes. It is made by keeping the mouse button depressed until the cell turns red.

format painter

The paint brush on the tool bar. It can be used to transfer properties from one sheet object to an other.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



formatting
Dual fields need formatting and often this needs to be explicitly done using the format( ) function.

generic
A QlikView script prefix used to unpack and load generic databases.

gray Color of a cell that is excluded.

green Color of a cell that has been selected.

help, html help
The normal Windows help that is invoked from the Help menu or by hitting the F1 key.

hidden script
A part of the load script that can be hidden and password protected.

in-memory analysis
Term for BI tools that hold the entire data set in primary memory and calculate all necessary aggregations on demand.

input box
A sheet object that is used for entering data into QlikView variables and displaying their values.

input field
A field that is declared as an Input field can be used for input. Good for planning, forecasting and budgeting.

intervalmatch
A QlikView script prefix used to match discrete values to intervals.

join An operation that uses two tables and combines them into one. The records of the table produced are combinations of records in the two original tables, usually such that the two records contributing to any given combination in the produced table have a common value for one or several common fields, a so called natural join. In QlikView, joins can be made in the script, producing logical tables. Inner join, Left join, Right join and Outer join are all possible operations.

keep A script operation that uses two tables. Just as a join, the keep operation will keep the values that have matches in the other table, but it will not merge the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



two tables into one. Inner keep, Left keep and Right keep are all possible operations

key field

A field that exists in two tables and connects the two.

line/arrow object

A sheet object used for adding lines or arrows to the layout. Line/arrow objects can be moved around and positioned anywhere in the sheet area, even to areas covered by other sheet objects.

list box

A sheet object that displays a list of field values. When a list is too long to display all choices, it will have a scroll bar, so that you can view additional items (see also field and value).

load

The script statement used to load data from files or from **select** statements. **Load** statements are evaluated by QlikView, as opposed to **Select** statements that are evaluated by the ODBC driver or the OLE DB provider.

locked

A field value can be locked so that it does not become deselected by mistake. The layout can also be locked so that it is not altered by mistake.

log file

A file that, like a log book, logs everything that happens during a script execution.

logical table

Tables with data that QlikView evaluates. The logical tables are the tables produced when the script is executed.

mapping

A QlikView script prefix that enables the script developer to use lookup tables.

module

A dialog where your VBScript macros can be entered, tested and stored.

multi box

A two-column sheet object, in which each row in the first column contains a field name, and the second contains a drop-down with the corresponding field values.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

nested aggregation

A calculation using a two-step aggregation. See **aggr** function.

OCX replacement control

A windowless OCX control which is incorporated into the QlikView layout via a custom object. OCX replacement controls can be programmed by the user or by third parties. See also custom object.

OLE DB

Object Linking and Embedding for Databases. A way for applications to communicate with databases. Different types of data sources can be read via this interface, notably ODBC data sources.

ODBC

Open DataBase Connectivity. A way for applications to communicate with databases. An ODBC driver is one or several system dynamic-link libraries (DLL) that allow ODBC-enabled programs such as QlikView to access specified data sources and retrieve data created in another format, such as dBASE.

optional

A field value that can be chosen or selected without changing the status of any previous selection. The cell is colored white to show its status, just like alternative cells.

path The location of a file, folder or directory on a disk. See absolute/relative path.

pivot table

A sheet object that allows several dimensions, several expressions with aggregated data, pivoting and grouping.

primary memory

The memory that the computer uses for programs that are running. Usually in the form of RAM. Desktop computers sold when this manual is written have typically 512 - 2048 MB of primary memory.

QlikView AccessPoint

Single point of access to corporate QlikView documents. Requires QlikView Publisher.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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QlikView AJAX zero footprint client

A lightweight object-based client to the QlikView Server that is based on the AJAX technology.

QlikView Analyzer

QlikView license for access to QlikView documents published by QlikView Server. Possibility for script reload but no layout or design possibilities.

QlikView Developer

QlikView license for access to QlikView documents published by QlikView Server access to documents offline and tools for creating new QlikView documents. Full script reload or layout design possibilities.

QlikView Java client

Java client for access to QlikView documents published by QlikView Server.

QlikView Java Objects client

Object-based Java client for access to QlikView documents published by QlikView Server. Provides better design possibilities than QlikView Java client.

QlikView OCX

QlikView packaged as an ActiveX component for integration into third party software. Not to be confounded with OCX replacement controls.

QlikView Plug-In

Short for QlikView Analyzer for Microsoft Internet Explorer.

QlikView Professional

QlikView license for access to QlikView documents published by QlikView Server and local documents offline. Possibilities for script reload and layout design.

QlikView Publisher

Administrative tool for automated reload and publishing of QlikView documents. Can be used as stand-alone or together with one or more of the other components in the QlikView Administrator suite.

QlikView Server

Software for publishing QlikView documents to online users using a client-server architecture.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Page 1.567/

QlikX Object-based QlikView OCX for integration into other products or into web sites.

qvd file

A native QlikView file format. A qvd file contains one data table, no layout and no security. It is basically a “binary csv file”, optimized for fast loading.

RAM Abbreviation of Random Access Memory. Usually synonymous to primary memory.

range function

A range function is a function that operates on a set of values – several parameters - to return a single scalar value. See also Aggregation function and Scalar function.

record

Equivalent to a row in a table.

red Color of a cell that has been explicitly excluded by the user.

relative path

The location of a file, folder or directory on a disk, as seen from a specified directory, usually the directory of the QlikView document. See also absolute path.

reload

The QlikView script needs to be run in order to refresh data in the QlikView application. This can be done manually or automatically using a scheduled task or using the QlikView Publisher.

resident

A table that has been loaded in the script can be accessed using a **Load … resident** statement in the script.

report

With “report” one usually refers to a static paper or pdf report. A QlikView document is in that sense in itself not a report.

report editor

QlikView has a built-in report editor in which one can prepare standard paper reports for printing.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

reserved fields

Fields used in the access restriction management: *USERID*, *PASSWORD*, *SERIAL ACCESS*, *NTNAME*, *NTDOMAINSID*, *NTSID* and *OMIT*.

RTF format

Rich Text Format. A method of encoding formatted text for easy transfer between applications. A file saved in RTF format keeps attributes like font, style etc.

scalar function

A scalar function is a function that operates on a single value to return a single scalar value. Examples: chr( ), sin( ), applymap( ). See also Aggregation function and Range function.

script

A description of what data to load. The script is a small program that is run by QlikView. When executed, it connects your QlikView document to one or several data sources or opens text files and reads the specified information into QlikView. The data source and the fields to be included are defined here.

section access

A section of the QlikView load script that can be used for access restriction.

select

Selection of field values by clicking them is the very essence of QlikView. Select is also a SQL statement used in most query tools.

semantic

A QlikView script prefix used to load semantic links. These are used for linking one selection to an other. E.g. self-references within a field.

separator

A character or code that separates one column or field from the next. Sometimes referred to as delimiter.

sheet

A QlikView screen initially contains an empty sheet with a tab (name tag) attached to it. Different objects, such as list boxes or charts, can be put on the sheet, and several sheets can be created in a document.

slider/calender object

A sheet object which can be used to select values in a field or set values to one or two variables.

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SQL Structured Query Language. A standard for making queries in relational databases.

start page

When starting QlikView, you will as the first window see a start page where you can access examples, favorites and recently used documents and connections.

statement

A script command can also be called statement. All statements must end with semicolons ";".

statistics box

A sheet object that displays a set of statistical entities, calculated on the possible field values of the corresponding field.

stored procedures

Programs that are stored in, and run on Databases.

straight table

A sheet object that allows several dimensions, several expressions with aggregated data and have good sorting capabilities.

synthetic keys

Keys between tables that are generated internally by QlikView in cases where there are several keys linking the tables. Synthetic keys are sometimes an indication of a poorly or even incorrectly designed data model.

system fields

Fields generated by QlikView. The system fields contain information on the origin of the fields that have been read into QlikView. This information can be used to identify the files or tables of the data source where a specific field name is to be found.

system variables

Parameters generated by QlikView in the script for special purposes, e.g. definitions of document number formats

tabbed sheet

See sheet.

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tab in script

The script can be split up onto several tabs. This improves the structure and facilitates navigation in the script.

table box

A sheet object that contains a record oriented view of data. Any set of fields can be chosen as columns, and possible combinations of field values are shown on different lines.

theme

A file containing the properties and look and feel of a document, sheet or object. Themes can be created and used from inside QlikView.

URL Universal Resource Locator. A general address of the type used on the World Wide Web.

variable

A named entity which can be given one single value. Variables can be used in the script and in expressions in charts and other sheet objects.

wizard

A series of dialogs to help the user achieve a given goal, e.g. creating a chart.

X64 Computer architecture for 64-bit technology.

XML Extended Markup Language. More complex than html, but not as complex as SGML. One XML file can contain one or several tables.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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APPENDIX

- **Limitations and Requirements**
- **Keyboard Command Shortcuts**
- **Frequently Asked Questions**
- **Data Protection**
- **Sharing Documents**
- **Backus-Naur Formalism (Syntax Notation)**

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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A LIMITATIONS AND REQUIREMENTS

A.1 Limitations of the Amount of Data to be Loaded

The amount of data that can be loaded into a QlikView document is very large. It is primarily limited by the amount of primary memory of the computer. However, there are some inherent limitations in QlikView that one must be aware of when building very large documents.

A QlikView document cannot have more than:

Number of fields	only limited by RAM
Number of tables	only limited by RAM
Number of distinct values in one field	2 000 000 000

Each table, loaded through one script statement, or concatenated through several script statements, cannot have more than:

Number of cells	only limited by RAM
Number of rows	2 000 000 000

In practice, when QlikView is run on a standard modern PC with say 512MB of RAM half a few million rows of typical transaction data can be handled. In large servers with 64-bit QlikView, multi-core processor(s) and several Gigabytes of RAM up to 600 million rows (full transaction detail level without aggregation) are handled in customer applications at the time of writing (April 2007).

A.2 System Requirements

This version of QlikView is designed to run on an IBM PC compatible computer running Windows™. This section describes the hardware and software requirements to run QlikView on your computer.

IBM PC Compatible Computers

Hardware

You need a computer with

- a Pentium II processor or higher. (Pentium ®4 or better recommended.) QlikView makes full use of modern multi-core processor architecture and we thus strongly recommend using such processors.
- graphics hardware supporting color XGA resolution, or better.

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- a monitor with a resolution of at least 1024 x 768.
- a mouse or an equivalent pointing device supported by MS Windows.
- a CD-ROM drive (if installation is to be made from CD).
- a hard disk with at least 150 MB of free disk space.
- enough primary memory (see below).

Operating System

You need one of the following operating systems:

- Microsoft® Windows 2000™; or
- Microsoft® Windows 2000™ Server; or
- Microsoft® Windows Server 2003™; or
- Microsoft® Windows XP™ or
- Windows Vista;

Additional Requirements for QlikView x64

- Processor supporting the x64 architecture (includes AMD Athlon 64, AMD Opteron 64, Intel Xeon EM64T and Intel Pentium with x64 extension)
- 2 GB RAM
- Windows XP Professional x64 Edition™; or
- Windows Server 2003 x64 Edition™

Note QlikView 8 does not ship in a native IA-64 (Itanium) version. The 32-bit version will run on Itanium based machines with Windows, but performance can be expected to be poor. For native 64-bit Itanium support we refer you to use QlikView version 7.xx.

Note The installation requires the presence of Microsoft® MDAC 2.5 or later. This is automatically installed with e.g. Microsoft Office and all versions of Microsoft Internet Explorer 5.5 and later

Memory

Primary Memory

Although it is possible to run QlikView with less memory, the use of a computer with at least 512 MB for 32-bit Windows and 2 GB for 64-bit Windows is recommended.

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The amount of memory you need for QlikView depends on the amount of data you load, and on the data structure. Too little primary memory will drastically affect the performance of QlikView in a negative way.

If you notice that your computer accesses the hard disk every time you make a selection in QlikView, you either have too many programs running, or too little primary memory.

Virtual Memory

Make sure that your swap file (the virtual memory) is large enough. The swap file should in principle be as large as possible. However, if you have limited disk space, or a lot of primary memory, you may want a smaller swap file or no swap file.

The system usually takes care of the swap file size dynamically. However, if you have too little free space on the hard disk, you may get problems with your swap file getting too small. In such a case, you can fix the size of the swap file. This is done in the **Virtual memory** dialog, which is accessed from the task bar: choose **Settings**, **Control Panel**, **System**, **Performance**, **Virtual Memory**.

Note 32-bit Windows sets a limit of 2 GB logical address space for any one program running (3 GB for Windows Advanced Server). QlikView can never make use of more memory than this, regardless of the size of physical memory in the computer. This limitation does not exist when running QlikView 64-bit edition. QlikView 64-bit edition requires a computer with Intel Itanium® or Itanium 2® running Microsoft Windows 64-bit edition.

Note Defragment the hard disk before changing the swap file settings. It usually leads to a larger contiguous free hard disk area and thus a larger possible swap file. (Not needed if Windows NT with NTFS is used.)

A.3 Dynamic Link Libraries (dll's) Needed

In the windows system directories of all the clients there must be a number of dll's. They are all installed during the installation procedure. For information on the dll's required, see the ReadMe file in your QlikView directory. QlikView uses Windows

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Installer and msi technology for installation, which ensures that the correct versions of system dll’s are always used.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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B KEYBOARD COMMAND SHORTCUTS

In this chapter you will find a list of the different keyboard command shortcuts available in QlikView.

B.1 File Menu Command Shortcuts

CTRL+N
Equivalent to **New** on the **File** menu.



CTRL+O
Equivalent to **Open...** on the **File** menu.



CTRL+SHIFT+O
Equivalent to **Open in Server...** on the **File** menu.

CTRL+S
Equivalent to **Save** on the **File** menu.



F12 Equivalent to **Save As...** on the **File** menu.

CTRL+P
Equivalent to **Print...** on the **File** menu.



CTRL+SHIFT+P
Equivalent to **Print As PDF...** on the **File** menu.



CTRL+E
Equivalent to **Edit Script...** on the **File** menu.



CTRL+R
Equivalent to **Reload** on the **File** menu.



CTRL+SHIFT+R
Equivalent to **Partial Reload** on the **File** menu.

CTRL+T
Equivalent to **Table Viewer...** on the **File** menu.



CTRL+M
Equivalent to **Edit Module...** on the **File** menu.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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B.2 Edit Menu Command Shortcuts

CTRL+Z
Equivalent to **Undo Layout Change** on the **Edit** menu.



CTRL+Y
Equivalent to **Redo Layout Change** on the **Edit** menu.



CTRL+X
Equivalent to **Cut** on the **Edit** menu.



CTRL+C
Equivalent to **Copy** on the **Edit** menu.



CTRL+V
Equivalent to **Paste** on the **Edit** menu.



DEL Equivalent to **Remove** on the **Edit** menu.

CTRL+A
Equivalent to **Activate All** on the **Edit** menu.

CTRL+F
Equivalent to **Search** on the **Edit** menu.



SHIFT+CTRL+F
Equivalent to **Fuzzy Search** on the **Edit** menu.

B.3 View Menu Command Shortcuts

CTRL+Q
Equivalent to **Current Selections...** on the **View** menu.



CTRL+G
Toggles layout design grid none->black->white->none.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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B.4 Selections Menu Commands Shortcuts

SHIFT+LEFTARROW
Equivalent to **Back** on the **Selections** menu.



SHIFT+RIGHTARROW
Equivalent to **Forward** on the **Selections** menu.



CTRL+SHIFT+L
Equivalent to **Lock** on the **Selections** menu (locks all selections).



CTRL+SHIFT+U
Equivalent to **Unlock** on the **Selections** menu (unlocks all selections).



CTRL+SHIFT+D
Equivalent to **Clear** on the **Selections** menu (clears all selections).



B.5 Settings Menu Command Shortcuts

CTRL+ALT+U
Equivalent to **User Preferences...** on the **Settings** menu.



CTRL+ALT+D
Equivalent to **Document Properties...** on the **Settings** menu.



CTRL+ALT+S
Equivalent to **Sheet Properties...** on the **Settings** menu.



CTRL+ALT+V
Equivalent to **Variable Overview...** on the **Settings** menu.



CTRL+ALT+A
Equivalent to **Alerts...** on the **Settings** menu.



B.6 Bookmarks Menu Command Shortcuts

CTRL+B
Equivalent to **Add Bookmark...** on the **Bookmarks** menu.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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CTRL+SHIFT+B
Equivalent to **More...** on the **Bookmarks** menu.



B.7 Object Menu Command Shortcuts (List box, Statistics box and Open Multi Box)

CTRL+L
Equivalent to **Lock** on the **Object** menu (locks selections in active object).

CTRL+U
Equivalent to **Unlock** on the **Object** menu (unlocks selections in active object).

CTRL+D
Equivalent to **Clear** on the **Object** menu (clears selections in active object).

ALT+ENTER
Equivalent to **Properties...** on the **Object** menu (opens the **Properties** dialog in active object).

B.8 F Key Keyboard Shortcuts

F1 Activates context sensitive help.

F3 Enters search mode if a searchable object is activated.

F6 Activates the sheet tab to the left of the currently active tab.

F7 Activates the sheet tab to the right of the currently active tab.

F12 Equivalent to **Save As...** on the **File** menu.

CTRL+F6
Activates the leftmost sheet tab.

CTRL+F7
Activates the rightmost sheet tab.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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C APPLICATION PERFORMANCE OPTIMIZATION

C.1 Introduction

With small or medium sized QlikView applications you generally don't have to worry too much about the design of the application for reasons of performance. As the amount of data grows, both time and memory constraints may become very evident if the application is poorly designed. If you are lucky, some simple design alterations can give you very substantial gains in performance. This appendix points out a few common pit falls and suggests remedies for them.

In general performance is improved by moving the "problem" from application objects to the script driven database. This is often a trade off situation. Response time is enhanced and ad hoc capability is diminished. The recommendations below should not be seen as universally beneficial. Use them when they improve the general state of the application or when they make that little bit of difference that makes or breaks.

The following is a list of examples of applied methods for the handling of the problems above. They are meant to illustrate the problem and point at useful QlikView functionality. It is not possible to give a general recommendation as to which method is best, but the order of the examples is an indication.

C.2 Count (Distinct 'FieldName')

Count(distinct fieldname) is generally speaking a performance consuming operation, especially for test fields. When possible, replace the *count ()* and the distinct qualifier with sum() by assigning the value '1' to each distinct occurrence as it is read in the script.

The script could look as follows:

```
Load
   Alfa,
   if (peek('Alfa')=Alfa,0,1) as Flag1,
   Num
resident table_1
order by Alfa Asc;
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Here the “peek“ compares the value of Alfa being read with that previously read. If the values are the same, “Flag“ is set to 0. If they are different, “Flag” is set to 1. The number of distinct values will then be equal to sum(Flag). Please note that the list has to be ordered and that when using “order by“ in a load resident QlikView orders the list before starting to read.

Another method:

```
Load distinct
Alfa,
Alfa as AlfaDist
resident table_1;
```

Now Count(DistinctAlfa) can be replaced by a simple count: Count(AlfaDist). Notice that Alfa is reade twice, once with the original name to link to the original table, once with a new name to allow Count(). (Linking fields is not allowed in Count()). All other fields must also be left out as they would degrade the distinct clause. A third method is to give each distinct value of “Alfa“ a numeric value:

table_2:

```
Load
   Alfa,
   Autonumber(Alfa) as AlfaNum,
   Num
resident table_1;
```

Count(Distinct AlfaNum) is a cheaper operation than Count(Distinct Alfa) since the comparison is of numeric values. An ever cheaper method is to find the last (or largest) result of the autonumber function.

```
set AlfaDistinctCount = peek( 'AlfaNum', -1, 'table_2'
);
```

in the script or as expression:

```
max( AlfaNum)
```

in a layout object.

C.3 If (Condition(Text),....)

If clauses involving text comparisons is generally expensive. Solutions can be to map text to numbers e.g. by using *autonumber* (see examples in the previous section) and/ or do the test in the script.

The testing of text strings is slower than numeric testing. Consider the expression

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
If (Alfa= 'ABC', 'ABC', left (Alfa, 2))
```

The test could be done directly in the script without losing any flexibility.

```
Load
*,
   If (Alfa = 'ABC', 1, 0) as Flag
resident table_1 ;
```

The expression becomes

```
If ( Flag = 1,'ABC', left (Alfa, 2))
```

and the test is much simpler.

C.4 Sum (If (Condition, 'FieldName'…))

Here the aggregation is independent of the table dimensions and the result is distributed over the dimensions of the table. The problem can be treated either by doing the test in the script and aggregating in the table or by doing the whole operation in the script. There are numerous techniques for this e.g. *interval match*, *group by*, *peek*, *if....then....else*.

This case involves two steps namely the testing of "Condition" and the aggregation of the result. If we take the previous example and add the aggregation

```
Sum ( If (Alfa= 'ABC',  Num*1.25 , Num) )

Load
*,
   If (Alfa = 'ABC', 1, 0) as Flag
resident table_1 ;
```

The expression becomes

```
Sum ( If ( Flag = 1, Num* 1.25 , Num ) )
```

The aggregation can also be done directly in the script as follows:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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```
table_2:
Load
*,
   If (Alfa = 'ABC', 1, 0) as Flag
resident table_1 ;

table_3:
Load
   Alfa,
If ( Flag = 1, Num* 1.25  , Num ) as NewNum
resident table_2 ;

table_4:
Load
   Alfa,
Sum( NewNum ) as SumNum
resident table_3
 group by Alfa ;
```

Note The aggregation is done over Alfa as this is the dimension in the test.

C.5 If (Condition, Sum('FieldName')..)

This construction is included here only to emphasize the difference to the previous case. This aggregation is completely contextual and generally speaking does not cause performance problems.

C.6 If (Condition1, Sum('FieldName'), If (Condition2, Sum('FieldName')……..

The logic of nested *If...then else...* is conceptually easy but can often become troublesome to administer. We have seen cases with hundreds of nesting levels. This is both memory as well as CPU intensive. The "Conditions" can often be replaced by transforming them. A typical example is aggregating *quantity*price* where price is variable. This can be handled by "extended interval match". If two conditions, e.g.

"*A* **AND** *B*"

are to be satisfied the test might be replaced by a condition "*C*".

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Example:

```
sum((GAC12_STD_COST * GAC15_EXCHANGE_RATE) *
GIV24_DISP_QTY)

Replaces

Sum(
   If((GAC12_EFCT_DT<= GIV23_REJ_DT and
      GAC12_EXPIRE_DT>GIV23_REJ_DT) and
       (GAC15_EFCT_DT<= GIV23_REJ_DT and
GAC15_EXPIRE_DT>GIV23_REJ_DT),
GAC12_STD_COST * GAC15_EXCHANGE_RATE) *
GIV24_DISP_QTY,
Null()))
and

 Sum(
If(GAC12_EFCT_DT<= GIV23_REJ_DT,
If(GAC12_EXPIRE_DT>GIV23_REJ_DT,
If(GAC15_EFCT_DT<= GIV23_REJ_DT,
If(GAC15_EXPIRE_DT>GIV23_REJ_DT,
(GAC12_STD_COST * GAC15_EXCHANGE_RATE) *
GIV24_DISP_QTY,
Null())))))
```

by reading the fields `GAC12_STD_COST and GAC15_EXCHANGE_RATE` as slowly changing dimensions. (Please see page page 483 in Book I).

C.7 Sorting text

QlikView automatically evaluates if a *Field* is to be treated as *numeric*, *text* or *general*. Fields evaluated as *text* will be sorted as *text* which is the slowest sort operation. This can be replaced manually to sort by load order. If sorting of list boxes etc is not needed, turn it off.

C.8 Dynamic captions and text objects

Dynamically calculated expressions can be entered almost anywhere where you can enter text. The resources required for evaluation of an expression is however dependent on its environment. Expressions in charts and tables that are defined in the expressions dialog are only calculated when the object is visible and data changes. They are e.g. not calculated when the object is minimized.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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On the other hand, if the object title is calculated this calculation is performed every time any change occurs. There are also numerous ways of defining show conditions, calculation conditions etc. These tests will also be performed at all times.

Some expressions are more expensive than others and become even more expensive the more frequently they have to be evaluated. The introduction of asynchronous calculation has shifted the behavior and maybe these effects have become more noticeble in your applications.

The time functions e.g. **Now()** and **Today()** will be evaluated whenever a recalculation is required. Especially the **Now()** function can become quite costly since it causes a recalculation of the application every second.

For example:

```
If ( ReloadTime()+3>Now(), 'Old Data', 'New Data')
```

Here one might consider

```
If ( ReloadTime()+3>Today(), 'Old Data', 'New Data')
```

As a simple test, put the expressions into text boxes. Then try sizing the text box with **Now()** in it.

C.9 Macro triggers (“on change“)

Macros can be set to be triggered by almost any event taking place in the application. Beware of cascading or recursive events where one event triggers the next which in turn...

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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D FREQUENTLY ASKED QUESTIONS

D.1 Installation

Q: What are the requirements for installing QlikView?

A: The QlikView installation package uses Windows installer technique and you must have version 2.0 or higher running on your system. If the package isn't deployed by a system administrator with a deployment tool, the account that is to run the installation must have administrator privileges.

Q: What is Windows installer?

A: The Windows installer is standard developed by Microsoft for software installation, modification, repair and removal. The installation package, also known as the msi, comprises of a database and the files to be installed.

Q: Why does QlikView use msi and Windows installer for installation?

A: The Windows installer and msi packages guarantees that the program is installed in a way that does not create conflicts with other programs or with Windows. It also facilitates correct uninstall, should you want to remove QlikView at a later point in time. Windows Installer and msi packages is the installation method recommended by Microsoft and is required for all certification of software products with Windows.

Q: How do I determine what version of Windows installer I have?

A: In the "Windows\system32" folder find the file called "msi.dll", open properties and go to the "version" page.

Q: I have an old version of Windows installer, where can I obtain the latest?

A: The latest version can be found on Microsoft's home page.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Q: Can the installation overwrite important system files?

A: No, the overwriting of files is handled by the Windows installer service itself which uses the Windows File Protection rules. To read more about these rules, see Microsoft's home page.

Q: Where can I find more information about Windows installer?

A: There are several good home pages on the Internet about Windows installer. Here are a few:

msdn.microsoft.com
www.appdeploy.com
www.wise.com

D.2 QlikView Documents

Q: How much RAM do I need? Is there a simple way to relate RAM requirements to data volume?

A: No, it depends on the data structure and the type of data. The more rows of data and the wider each record is in terms of number of fields the more RAM is needed. If a field contains many different distinct values more RAM is required than if the number of distinct values is low. Certain charts may demand a large portion of RAM while being calculated.

Q: What is the theoretical limit of document size in QlikView

A: In a 32-bit Windows environment QlikView can never be given more than 2 GB of virtual memory (3 GB on Windows Advanced Server) so that is a very definite limit. It is impossible to translate this limit to a certain number of records (see question above). With QlikView 64-bit edition the 2GB limitation disappears. Typically QlikView uses 3-4 times as much memory during script execution as when working in the layout. Running the script in QlikView 64-bit edition but using the document in a 32-bit QlikView can therefore be a workable solution in many cases.

Q: I have 2 GB of RAM available but my 1 GB document gives me an "Out of memory" error message when opening. What is wrong?

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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A: Each table in a QlikView document requires allocation of a contiguous chunk of memory. If memory is fragmented, e.g. by loaded dll's, the allocation will fail and a correct error message will be shown. This behavior may vary between different computers.

Q: How large documents are actually run in QlikView by real users?

A: When QlikView is run on a standard modern PC with say 512MB of RAM a few million rows of typical transaction data can be handled. In large servers with 64-bit QlikView and several Gigabytes of RAM up to one billion rows (full transaction detail level without aggregation) are handled in customer applications at the time of writing (May 2008).

Q: Can I run documents created in old QlikView versions in later versions of QlikView?

A: Yes, you can read all files created in version 4 and later. If you need to convert files from earlier versions of QlikView, you need QlikView 4. Contact your program vendor for a free copy. QlikView 7 shares file format with QlikView 6.

Q: Can I run documents created in QlikView 8 in earlier versions of QlikView?

A: Usually yes! QlikView 8 files can be used directly by QlikView 7 and 6. QlikView 8 can also save files in QlikView 7 and 6formats, but the formatting and functionality not supported in the earlier version will be lost.

D.3 Scripts and Loading Data

Q: Is it possible to use more than one Binary statement in a QlikView script?

A: No unfortunately not. Binary load uses very special logic to read the data already processed once into QlikView in another QlikView document. The "unpacking" used requires a "clean slate" in memory which is the reason why a Binary statement must be the very first statement in the script. Therefore it is also impossible to use Binary

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

more than once in a script. However you can use QVD files to consolidate data from multiple QlikView documents at the same speed as with Binary.

Q: Is the only requirement for an automatic join that the field names are the same?

A: Yes! Such a join is called an association.

Q: Can I achieve an automatic join between two fields with different field names?

A: Yes, but you must rename one of the fields in the script using an **alias** statement or an **as** clause.

Q: Can I use **where** clauses, **group by** clauses and other SQL-like syntax on text files?

A: QlikView offers you a rich script language for text files including large parts of SQL syntax and a number of additional features.

Q: Can I use **where** clauses, **group by** clauses and other SQL-like syntax on binary QlikView files?

A: No.

Q: What is the difference between an *association* between logical tables, a **load** or **select** statement preceded by a **join** qualifier, and a **join** within a **select** statement?

A: An *association* is a join between logical tables which is evaluated when you click on a field value in your document. QlikView makes this association automatically when two different tables have a field in common. The two latter joins are made during script execution and result in new logical tables. In these cases, QlikView does not load the original tables as logical tables.

Furthermore, a join within a **select** statement will usually only load those records whose key field value is found in both tables (*inner join*), whereas the two former joins also include records whose key field value is found in only one of the tables (*full outer join*).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Q: How do I load data from fix-record text files?

A: Use the table file wizard in QlikView.

Q: Can I update a QlikView document by loading only the data that have changed?

A: Yes, see the chapter QVD files page 503 in Book I for instructions on how to make incremental reloads.

Q: Can I read tables from web pages into QlikView?

A: Yes, the table file wizard makes it possible to extract tables when they are coded as tables in HTML. If the HTML page does not contain nicely formatted table tags it is still usually quite possible to extract data using e.g. the **subfield** and **textbetween** script functions.

D.4 QlikView Logic

Q: Why is it impossible to show frequency in certain list boxes?

A: The list box in which this problem occurs contains a field which is common to more than one input table. It is therefore impossible for QlikView to know how to calculate frequency and other statistical entities for the field. You can solve the problem by loading the field an extra time from its main table (the one for which you want to show frequency), but under a new name, and show frequency for that field within the list box instead. By using the label feature, the end user does not have to notice the trick.

Q: Why does my statistics box come up with just a lot of n/a?

A: The statistics box contains a field which is common to more than one input table. See the answer to the previous question.

Q: Why doesn't QlikView allow me to use a certain field in an expression in a chart?

A: The field is common to more than one input table. See the answer to the two previous questions.

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Q: How can I display the number of distinct values in a statistics box?

A: Use the **distinct** clause in your **load** / **select** statements.

Q: When is the **and** mode option in the **List Box Properties** dialog enabled?

A: The **and** mode option is only allowed under very strict conditions, imposed by the theory behind the QlikView logic. In order to be used in **and** mode, the field must:

- exist in only one logical table,
- be the second field of only two fields in that table and
- contain no duplicate records.
- be the second column.
- it must be proceeded by a distinct qualifier.

Q: Can I mix **and** and **or** logic for value selections within a list box?

A: No, the associative logic prohibits this.

Q: Can I have **or** logic between list boxes?

A: Only indirectly. An advanced alternative is to use semantic links to transfer selections made in a list box to another field. You may then change the selections in the original box and CTRL-click on the semantic link to achieve **or** between the two selections. The final result can be transferred by means of reversing the semantic link.

Q: Is it possible to link more than one info file to a value, e.g. a picture and a text file?

A: Yes, but only when duplicates of the field are used. Each field in QlikView can only be linked to one info file.

Q: Why are for instance '002', '02' and '2' sometimes interpreted as the same value by QlikView?

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A: All the values in the example share the same numeric value. As a rule, QlikView will try a numeric interpretation of any data. If a numeric interpretation is possible, it will be used for the association. If you use the interpretation function **text()** on a field in the script, however, the values will be treated strictly as text values. The values in the example above will then be interpreted as three different values.

Q: What is a "loop" or circular table structure?

A: When it is possible to follow the field associations in a never ending circle through the table structure, this is called a loop. Another way of describing the phenomenon is that there are two or more different routes through the table structure between two specific fields. Loops should be avoided as far as possible since they may cause ambiguities in the way data is interpreted. In many cases loops are a result of poor database design, but in other cases they may be unavoidable. QlikView will issue a warning if it finds a loop while executing the script and force you to resolve the problem with the help of loosely coupled tables.

D.5 Layout

Q: Why cannot sheet objects without caption be sized on the top?

A: When you turn off the caption for a sheet object the upper border will be used for moving the sheet object around. Use the upper corners to size instead.

Q: Why can't I expand my table to the right when I try to drag the border?

A: There are two handles on the right border of a table. If you drag the border of a table, you size the outer limits of what can be shown in the table. However, you can never make the outer frame larger than the sum of the widths of all columns in the table. The sizing of the rightmost column is made by putting the cursor just to the left of the outer border. You must however make sure that the outer frame does not fall in the middle of the column. If that is the case, use the scroll bar to position the column's right border at the outer frame. Use the design grid to see the actual outer frame of a sheet object.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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Q: Can I change the name of a field in sheet objects in a QlikView document?

A: Yes, you can set a label for each field in each sheet object.

Q: Which sheet objects can be minimized?

A: All types of sheet objects can be minimized, but the option is set to off by default for objects such as buttons, text objects and line/arrow objects.

Q: Can I move minimized objects on the sheet?

A: Yes, they can be moved freely and placed anywhere on the sheet and also sized within certain limits.

D.6 Sharing QlikView Documents with Other People

Q: Can I put my document on a server and share it with other people?

A: Yes, as long as the receivers have a registered QlikView license and access to the server directory.

Q: Can I use QlikView in real client/server mode?

A: Yes, you need a QlikView Server.

Q: Can I put my document as a link on a web page and let others access it over the net?

A: Yes, as long as the receivers have a registered QlikView license and access to the web page.

Q: Can I e-mail my document to other people?

A: Yes, as long as the receivers have a registered QlikView license.

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Q: Can I prevent certain people from using my document?

A: Yes, you can add a "Section Access" to the document to define who may use it.

Q: Can I prevent other people from seeing/changing the script?

A: Yes, the "Section Access" can give some people ADMIN access level while keeping other people off the script in USER access level.

Q: Where do I store information on access rights?

A: In a text file on a protected unit, as an **inline** statement in the script or as a table in a database.

Q: Is there an automated way to create personalized copies to a large group of users?

A: Yes, you need a QlikView Publisher.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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E DATA PROTECTION ISSUES

Most of the discussion below assumes that there is an existing database management system (DBMS) and that QlikView is used as an output tool. The arguments, however, still hold true when the raw data are in the form of text files.

E.1 Data Security and Integrity

Data protection usually means several different things. It can mean protecting entered data from being altered or destroyed by mistake, making sure that data is entered in a correct way or preventing the data from being shared by unauthorized people.

The terms integrity and security are often used in this context and although the two concepts seem similar at a first glance, they are in fact quite different. Security refers to the protection of data against unauthorized access, whereas integrity refers to the validity of data, i.e.:

- Security involves assuring that the users are allowed to do what they are trying to do.
- Integrity involves assuring that what the users are trying to do is correct.

We will mostly discuss data security, since the tools for data integrity are provided by the DBMS.

E.2 The Right to Alter Data

The first step in security is to make sure that users cannot erase or change data inadvertently. For multi-user systems this implies using an operating system and a database management system with adequate protection. Examples of such operating systems for PCs are Windows NT or Novell. Examples of such database management systems are ORACLE, SQL Server or Informix.

If data are not protected by the operating system, it will always be possible to delete data by mistake. This is true even if the file is password protected.

The next step is to set up privileges for the authorized users. In a correctly set up system it should be impossible to do anything with the data unless the correct tools are used, i.e. tools that can check whether you are authorized to do what you are trying to do.

For the single user most of the security problems do not exist. It is thus often sufficient to make regular back-ups of the data files.

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E.3 Data Integrity

Data integrity implies a structured data flow. Data entry procedures must be set up to make sure that data are entered in a uniform way. A good way to do this is to design forms with the DBMS. Forms also prevent users from entering non valid values, e.g. nonexistent customer numbers, into a database.

When working with single-user databases, one must also be careful not to have more than one person using the database at a time. Multi-user databases can, as the name implies, handle several people editing the database simultaneously.

Another aspect related to this issue is the following: One must always know if a file or a database is the original or a copy. If this is not the case, someone will most certainly start entering data into a copy of the database.

E.4 The Right to View Data

The final issue in data security concerns the security when handling confidential information. If the security issues above concern the right to alter data, this point rather concerns the right to view data. Most database management systems have means to prevent people from looking at data residing in the database. They cannot, however, prevent people from looking at a copy of the data found in a QlikView file. For this purpose, QlikView has its own means of preventing unauthorized people from viewing data. One must, however, be aware of the fact that the QlikView access restriction tool only concerns the right to see data. QlikView can never prevent users from destroying data with other tools. Only the operating system can.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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F USING QLIKVIEW DOCUMENTS AS AN INFORMATION SERVER

F.1 Information Server

It can sometimes be practical to use an information server. This is a server that acts as an intermediate step between the database and the end users. It could be a stand-alone server, but it could just as well be a set of directories on a common file server containing the original QlikView documents. At least some of the following advice concerning the information server should be taken:

- The operating system should be one in which it is possible to protect files by setting different access rights for different users, e.g. Windows NT.
- All original QlikView documents should be read-only. This means that end users can fetch documents but cannot by mistake destroy them.
- Updates of QlikView files should be run as batch jobs during the night, usually daily, weekly or monthly.
- If text files are extracted from the original database and used as input files for QlikView, they should be stored in a directory that is not shared by the end users. In this way the information cannot be shared by unauthorized people.
- The QlikView internal access restriction should be used on QlikView files.
- If the database containing the access rights is a file stored on the information server, this file must also be protected by the access restriction set by the operating system.

F.2 Extracting Data via ODBC/OLEDB

If there is a stable ODBC or OLEDB driver for the DBMS available, you can usually extract data in a single step process:

1. Define an ODBC or OLEDB data source on the information server. This needs to be done only once.
2. Run QlikView on the information server, using data from the ODBC or OLEDB data source as input; then create QlikView files that end users can use.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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F.3 Extracting Data From AS/400 With Router

When the data reside in an AS/400 connected to the PC network via a router, it is usually a good idea to import data into QlikView in a two step process:

1. Extract data from the AS/400 to files on an information server. Several SQL based query tools exist, e.g. Netsoft Transfer, IBM Client Access, etc. An appropriate file format to use on the information server is the DIF format. Most AS/400 transfer tools can create DIF files.
2. Run QlikView on the information server, using the DIF files as input; then create QlikView files that end users can use.

F.4 Extracting Data From Mainframe, AS/400 etc. Without Router

When the data reside in a mainframe, an S/36 or an AS/400 without a router, it is usually a good idea to import data into QlikView in a three step process:

1. Query the database in a standard way on the mainframe, e.g. by the use of a COBOL program, generating files on the mainframe. The file format can e.g. be fix-record or DIF.
2. Transfer the files to the information server on the PC network using the normal ways of communication between the two networks.
3. Run QlikView on the information server, using the generated files as input; then create QlikView files that end users can use.

F.5 Using QlikView Binary Files

An additional step when creating the QlikView files can be added if end users want more freedom to create their own layout, their own buttons and graphs:

The QlikView file created on the information server can be seen as a file master from which the end users can load data into their local files. This is done by using the **binary** statement, a statement loading the data but not the layout. The created layout will thus remain while the data are updated.

F.6 Aggregation

When the amount of data becomes too large, it is no longer practical to load all of it into QlikView. One can also argue that most end users do not need to see all the

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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details in the data. In both cases, it might be useful to aggregate data over some relevant entities like in the following example.

Example - sales statistics

For many companies the order register contains several millions of order lines each year. It can then be interesting to sum the ordered amount and the number of units instead of showing each individual order line in QlikView. The summation can be made for e.g. each month, each product and each customer. Information about product groups, regions, year, etc. can still be used. With this solution, the amount of data extracted to QlikView will decrease drastically as will the search times.

This summation is called aggregation. Detailed information on the script syntax is found in Book I, under “Load” on page 319 and under “Aggregation Functions” on page 368.

F.7 Sharing QlikView Documents in Workgroups

When building a QlikView document, one is often confronted with the issue of how to structure the information flow. Questions like "Where do I put the original?", "How do I prevent end users from destroying the QlikView document?" and "How do I create automatic updates?" arise. In this chapter some of these topics will be discussed.

QlikView documents can easily be distributed and shared between the members of a workgroup, the employees of a company or any other group; the only restriction naturally being that each recipient must have his/her own registered license of QlikView.

This appendix is meant to give you an idea of different ways currently used by QlikView users around the world to distribute their documents.

F.8 Mailing QlikView Documents

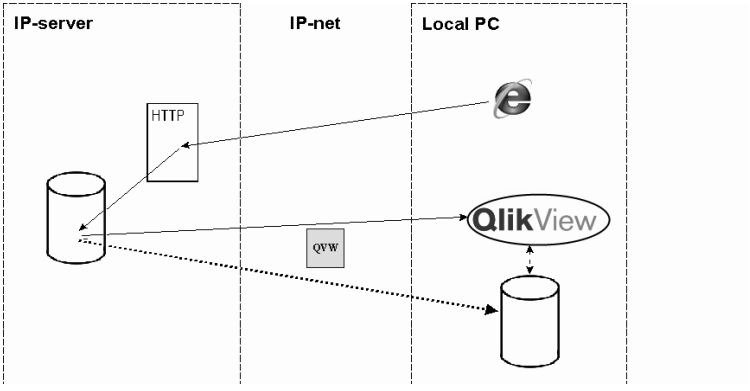
A simple but sometimes efficient approach is, of course, to mail QlikView .qvw files via regular mail on diskettes or more likely via e-mail. This is quite straightforward and requires no further comment.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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F.9 Posting QlikView Documents on a Web Page

A QlikView document can be posted as a link on a web page on an Intranet or on the Internet. The QlikView document file is updated and stored on the server. The recipients use their web browser to access the page and click on the link. The file can be opened by QlikView directly from the web server or stored on the recipients' local disk.

The principle is illustrated in the picture below.

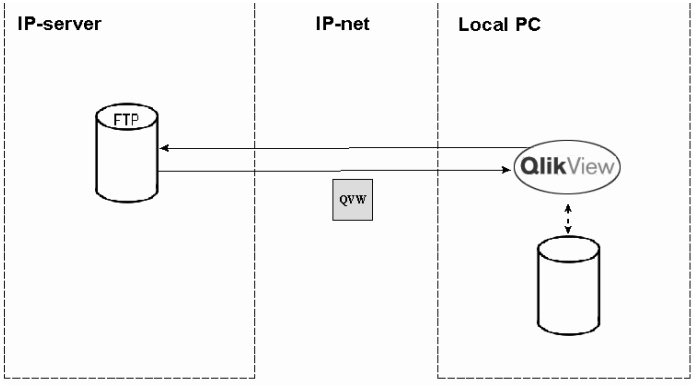


F.10 Posting QlikView Documents on an FTP Server

QlikView documents can be stored in an FTP server and downloaded by recipients over an Intranet or the Internet. The QlikView document file is updated and stored on the server. The recipients use the built-in FTP browser in QlikView to access the document. The file is opened by QlikView directly from the FTP server and can then be stored on the recipients' local disks.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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The principle is illustrated in the picture below.



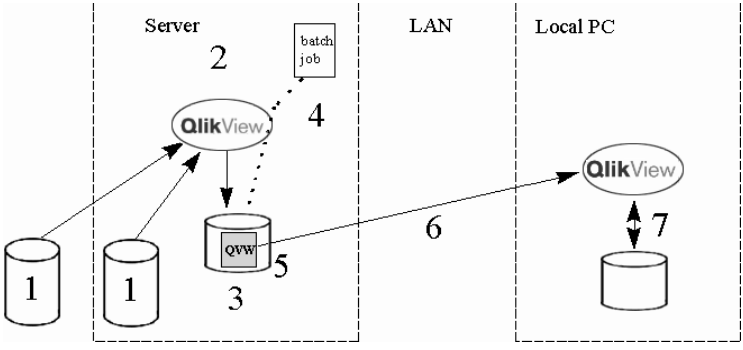
F.11 QlikView Document on Server - Basic Setup

The most obvious and common way to share documents between users is to put the document file on a server in a Local Area Network. A typical setup works in the following way:

1. The database(s) containing the original data reside on the server or are accessible from the server.
2. The server has its own QlikView license and software for controlling batch jobs.
3. The document resides on the server and includes a section access, which gives only the system administrator and the server QlikView license ADMIN access, leaving everyone else on USER level.
4. At regular intervals (e.g. every night at 2 PM) a batch job is started, which updates the document by running the script in batch mode and saving the document with the new data.
5. The batch job either includes making copies of the document and saving those on different locations accessible to the end users or only stores the original in a read-only directory on the server.
6. The end users can access the QlikView document but typically not see or execute the script (because they only have USER level access rights).

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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7 The end user can save the document locally on his/her computer and can make temporary additions to the layout, e.g. make new charts. These will however be lost each time the document on the server is updated, since the end user cannot reload data.



Some advantages of this setup are:

- Only one access per day or so is made to the original databases. This reduces both costs for extra simultaneous users and response times in the databases.
- All end users are forced to use the same document.
- All end users are guaranteed to find updated versions on the server.

F.12 QlikView Document on Server - Advanced Setup

In some cases there are larger demands on data security. You may also want to allow users to make additions to the document without losing the possibility to reload data. If so, the following setup could be a solution.

1 The database(s) containing the original data reside on the server or are accessible from the server.

2 The server has its own QlikView license and software for controlling batch jobs.

3 A main document (e.g. *a.qvw*) resides on the server. It includes a section access, which prohibits opening unless it is opened by the QlikView license on the server.

4 At regular intervals (e.g. every night at 2 PM) a batch job is started, which updates the main document by running the script in batch mode and saving the document with the new data.

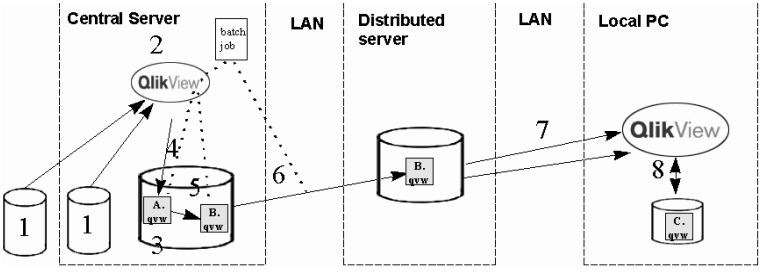
Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

5 A second document for distribution (e.g. *b.qvw*) resides on the same server. The two documents are identical in everything except the script and access restrictions. The script of the second document contains a **binary** statement loading the associative database from the first document. In the script of the second document there is no reference to the original data sources and it will thus reveal nothing about the structure, passwords etc. of the database. The second document is automatically updated by the batch job as soon as the main document has been updated.

6 The batch job finally copies the second document from the restricted central servers to one or more locations on servers and/or workstations on the local network.

7 The end user can access the application from the server and possibly save a local copy on his/her workstation.

8 The end user can make additions to the layout and/or add own data to his locally saved document. By changing the script slightly, to make the **binary** statement point at the document on the accessible server, data can be reloaded without own additions being lost.



Some advantages of this setup are:

- Only one access per day or so is made to the original databases. This reduces both costs for extra simultaneous users and response times in the databases.
- Super secure. No end user can even see the structure of the original databases.
- All end users are guaranteed to find updated versions on the server.
- End users can make their own additions to the document and still reload data without losing anything.

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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F.13 Customized QlikView Documents

It is quite possible that one would want to automatically deliver different subsets of one large QlikView document to different persons in an organization. Let us assume that you would like to spread information from the company budget system. You would then probably want to make a separate QlikView document to the manager in charge of each cost center.

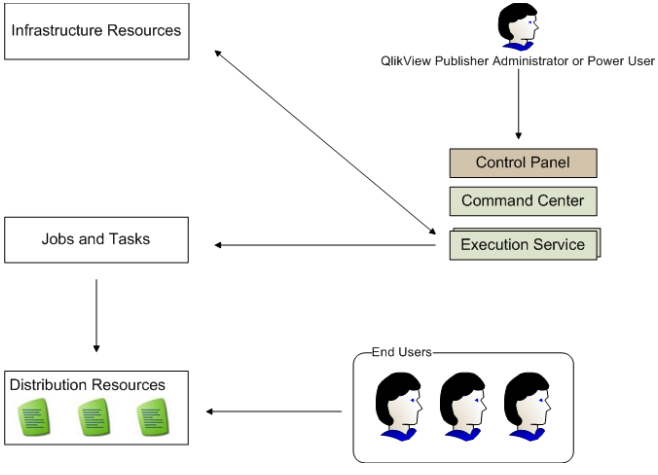
QlikView offers ways of automating this task by means of dividing one large document into several subsets and storing them at predefined locations. For more information about how to achieve this, please contact your local QlikTech organization.

F.14 QlikView Server

QlikView documents can be shared in a real client/server environment either with QlikView as a client or with Java clients running in standard web browsers. Contact your vendor for information on QlikView Server.

F.15 QlikView Publisher

The update and subdivision of QlikView documents can be automated via the QlikView Publisher. This product features a central repository for documents and users combined with an administration panel and a factory module. Using the QlikView AccessPoint you may also create a single point of access for users to all QlikView documents. Contact your vendor for information on QlikView Publisher and QlikView AccessPoint.



Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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G BACKUS-NAUR FORMALISM

The QlikView command line syntax (page 67 in Book I) and script syntax (page 291 in Book I) are described in a notation called Backus-Naur Formalism, or BNF code. Here follows a short description of the BNF code used in this manual:

Symbol Should be interpreted as

|	Logical or: the symbol on either side can be used.
( )	Brackets defining precedence: used for structuring the BNF syntax.
[ ]	Square brackets: enclosed items are optional.
{ }	Braces: enclosed items may be repeated zero or more times.
symbol	A non-terminal syntactic category: can be divided further into other symbols, e.g. compounds of the above, other non-terminal symbols, text strings, etc.
::=	Marks the beginning of a block that defines a symbol.
load	A terminal symbol consisting of a text string. Should be written as it is into the script.

Non-terminal symbols are indicated by italic type and all terminal symbols are printed in a bold face font. E.g. "(" should be interpreted as a bracket defining precedence, whereas "**(**" should be interpreted as a character that should be printed in the script.

Example:

The description of the **alias** statement is:

alias *fieldname* **as** *aliasname { , fieldname* as *aliasname }*

This should be interpreted as the text string "alias", followed by an arbitrary field name, followed by the text string "as", followed by an arbitrary alias name. Any number of additional combinations of "fieldname **as** aliasname" may be given, separated by commas.

E.g. the following statements are correct:

```
alias a as first;
alias a as first, b as second;
alias a as first, b as second, c as third;
```

And the following statements are not correct:

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

```
alias a as first b as second;
alias a as first {, b as second};
```


Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

INDEX

Symbols

&
    logical operator in chart expr. 270
& (string concatenation) 270
<$Endrange 492
<$Startrange 487

A

above
    function in chart 359
Accumulation (in chart) 46
acos
    function in chart 347
AddMonths
    function in chart 386
after
    function in chart 366
age
    function in chart 402
aggr
    special function for advanced aggregations in chart 326
Aggregation functions
    in chart expressions 272, 419
alt
    function in chart 377
and
    logical operator in chart expr. 270
ARGB
    function in chart 413
Arrows
    in scatter charts 127
AS/400
    extracting data from 486
asin
    function in chart 347
atan
    function in chart 347
atan2
    function in chart 347
avg
    statistical aggregation function in chart 283

B

Backcast 66
Bar Chart 25–82
Bar charts
    Bar Settings 52
Bar Offset 39
before
    function in chart 365
below
    function in chart 361
bitcount
    general numeric function in chart 338
BlackAndSchole
    function in chart 350
Border 74
    in chart layout 75
bottom
    function in chart 363

C

Calculated formulas 437
capitalize
    function in chart 356
Caption
    in charts 79
    in sheet objects 79
ceil
    general numeric function in chart 335
Chart 13–442
    border 74
    calculation condition for 18
    drill-down 439
    expressions 267–418
Chart Expression Syntax 267
Chart Texts 61
chidist
    statistical distribution function in chart 348
chiinv
    statistical distribution function in chart 348
chr
    function in chart 355
class

function in chart 379
Color
function in chart 412
in chart 67
Color functions
in chart expressions 412
Color Map
current 70
Color map
document default 70
QlikView default 71
sheet default 70
Colormix Wizard 234
colormix1
function in chart 413
colormix2
function in chart 414
ColumnNo
function in chart 370
combin
general numeric function in chart 337
Combo chart 95–106
ComputerName
function in chart 380
concat
string aggregation function in chart ... 277
Conditional functions
in chart expressions 377
ConvertToLocalTime
function in chart 403
correl
statistical aggregation function in chart 287
cos
function in chart 347
cosh
function in chart 348
count
counter aggregation function in chart 278
Creating
a bar chart 25
a chart 15
a line chart 83
Custom Error Messages 441
Cyclic
groups 440

D

Data
security 483–484
date
formatting function in chart 410
interpretation function in chart 406
Date functions
in chart expressions 382
day
function in chart 382
DayEnd
function in chart 395
DayName
function in chart 396
DayStart
function in chart 395
dimensionality
function in chart 372
div
general numeric function in chart 334
Drill-down chart 439

E

e, base of natural logarithms 354
Edit Expression dialog 229
Equation
Show 47
Error messages
custom 441
even
general numeric function in chart 338
Examples
of aggregate qualifiers 419
of chart inter-record functions 423
of ranking functions 420
exp
function in chart 347
Exponential functions
in chart expressions 347
Expressions
edit ~ in chart 229
in chart 267–418
Extracting data
from AS/400 486
from mainframe 486

F

fabs
general numeric function in chart 336

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

fact
general numeric function in chart 337
false
function in chart 355
FAQ 473
Fast 20
fdist
statistical distribution function in chart 350
Field groups 439
fieldindex
function in chart 359
fieldvalue
function in chart 359
fieldvaluecount
function in chart 359
Financial 299
Financial functions
in chart expressions 350
findoneof
function in chart 358
finv
statistical distribution function in chart 350
first
function in chart 367
firstsortedvalue
basic aggregation function in chart 276
firstworkdate
function in chart 402
floor
general numeric function in chart 335
fmod
general numeric function in chart 335
follows
relational operator in chart 271
Forecast 66
Formatting functions
in chart expressions 408
frac
general numeric function in chart 336
fractile
statistical aggregation function in chart 285
Frame
color settings 68
Functions in chart expressions
aggregation 272, 419
color 412
conditional 377
date and time 382
exponential 347
financial 350
formatting 408
hyperbolic 347
interpretation 404
inter-record 359, 423
logarithmic 347
logical 379
mathematical constants 354
null 379
numeric 334
other 334
range 338
ranking 374, 420
statistical distribution 348
string 355
synthetic dimension 333
system 379
trigonometric 347
Funnel chart ??– 167
fv
function in chart 351

G

Gauge chart 181–192
GetAlternativeCount
function in chart 381
GetCurrentField
function in chart 380
GetCurrentSelections
function in chart 380
GetExcludedCount
function in chart 381
GetFieldSelections
function in chart 381
GetNotSelectedCount
function in chart 382
GetPossibleCount
function in chart 381
GetSelectedCount
function in chart 381
grid 137
Grid chart 137–147
Groups
cyclic 440
hierarchic 439
non-hierarchic 440

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

Groups of fields 439

H

Help Text
in charts 82
Hierarchic groups 439
Highlight 115
in combo chart 103
in line charts 91
in scatter chart 128
hour
function in chart 384
hrank
function in chart 376
HSL
function in chart 414
Hyperbolic functions
in chart expressions 347

I

if
function in chart 377
InDay
function in chart 401
InDayToTime
function in chart 402
index
function in chart 356
info function in chart 358
InLunarWeek
function in chart 400
InLunarWeekToDate
function in chart 401
InMonth
function in chart 398
InMonths
function in chart 399
InMonthsToDate
function in chart 399
InMonthToDate
function in chart 399
inputavg 325
inputsum 324
InQuarter
function in chart 398
InQuarterToDate
function in chart 398
Interpretation functions
in chart expressions 404
Inter-record functions
in chart expressions 359, 423
interval
formatting function in chart 412
interpretation function in chart 407
InWeek
function in chart 400
InWeekToDate
function in chart 400
InYear
function in chart 397
InYearToDate
function in chart 397
irr
financial aggregation function in chart
.....299
IsNull
function in chart 379
IsNum
function in chart 379
IsText
function in chart 379

K

KeepChar
function in chart 357
kurtosis
statistical aggregation function in chart
.....287

L

last
function in chart 368
lastworkdate
function in chart 403
left
function in chart 355
Legend Settings dialog 57
len
function in chart 355
Line chart 83–94
Line Style
in Bar chart 39
Line/Symbol Settings
in bar charts 54
in line charts 90, 103
linest_b
statistical aggregation function in chart
.....290

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net
Page 1.613/

linest_df
statistical aggregation function in chart 294, 295
linest_f
statistical aggregation function in chart 296
linest_m
statistical aggregation function in chart 289
linest_r2
statistical aggregation function in chart 291
linest_seb
statistical aggregation function in chart 293
linest_sem
statistical aggregation function in chart 292
linest_sey
statistical aggregation function in chart 294
linest_ssreg
statistical aggregation function in chart 297
linest_ssresid
statistical aggregation function in chart 298
List box ??– 81
LocalTime
function in chart 385
log
function in chart 347
log10
function in chart 347
Logarithmic functions
in chart expressions 347
Logical functions
in chart expressions 379
lower
function in chart 356
ltrim
function in chart 357
LunarweekEnd
function in chart 394
LunarWeekName
function in chart 394
LunarweekStart
function in chart 393

M

MakeDate
function in chart 383
MakeTime
function in chart 384
MakeWeekDate
function in chart 384
match
function in chart 378
Mathematical constants
in chart expressions 354
max
basic aggregation function in chart 274
MaxString
string aggregation function in chart ... 277
median
statistical aggregation function in chart 285
Memory
requirements 460
mid
function in chart 355
min
basic aggregation function in chart 274
MinString
string aggregation function in chart ... 276
minute
function in chart 384
MissingCount
counter aggregation function in chart . 282
mixmatch
function in chart 378
mod
general numeric function in chart 335
mode
aggregation function in chart 275
money
formatting function in chart 409
interpretation function in chart 405
month
function in chart 382
MonthEnd
function in chart 390
MonthName
function in chart 390

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

MonthsEnd
function in chart 391
MonthsName
function in chart 391
MonthsStart
function in chart 390
MonthStart
function in chart 389

N

networkdays
function in chart 402
Non-hierarchic groups 440
NoOfColumns
function in chart 371
NoOfRows
function in chart 370
normdist
statistical distribution function in chart 348
norminv
statistical distribution function in chart 349
not
logical operator in chart expr. 270
now
function in chart 385
nper
function in chart 352
npv
financial aggregation function in chart 301
Null
function in chart 379
Null functions
in chart expressions 379
NullCount
counter aggregation function in chart 281
num
formatting function in chart 408
interpretation function in chart 404
Numbers on Data Points
in bar charts 55
in combo charts 105
in line chart 92
Numeric functions
in chart expressions 334
NumericCount
counter aggregation function in chart 279

O

Object menu
for bar chart 25
for block chart 169
for chart 15
for combo chart 95
for gauge chart 181
for grid chart 137
for line chart 83
for pie chart 149
for pivot table 197
for radar chart 107
for scatter chart 119
for straight table 218
odd
general numeric function in chart 338
only
basic aggregation function in chart 275
Operating system
requirements 459, 460
Operators in chart expressions
bit 271
logical 270
numeric 269
relational 270
string 270
or
logical operator in chart expr. 270
ord
function in chart 355
OSuser
function in chart 379
Other functions
in chart expressions 334

P

permut
general numeric function in chart 337
pi 354
pick
function in chart 378
Pie chart .....149–157, 159–??
Pie popout 38
Pivot table 193–216
using 193
pmt

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

function in chart 352
Pop-up Labels
for dimension values in bar charts .54
for dimension values in combo charts 103
for dimension values in grid charts 144
for dimension values in line charts 91
for dimension values in pie charts 155
for dimension values in scatter charts 128
pow
function in chart 347
precedes
relational operator in chart 271
PurgeChar
function in chart 357
pv
function in chart 353

Q

QlikView Default
color map 71
QlikView Publisher 492
QlikView Server 492
qlikviewversion
function in chart 380
QuarterEnd
function in chart 388
QuarterName
function in chart 389
QuarterStart
function in chart 388
QVuser
function in chart 379

R

Radar Chart 107–117
rand
function in chart 354
Range functions
in chart expressions 338
rangeavg
function in chart expressions 338
rangecorrel
function in chart expression 344
rangecount
function in chart expression 339
rangefractile
function in chart expression 341
rangeirr
function in chart expression 345
rangekurtosis
function in chart expression 341
rangemax
function in chart expression 340
rangemaxstring
function in chart expression 344
rangemin
function in chart expression 339
rangeminstring
function in chart expression 344
rangemissingcount
function in chart expression 342
rangemode
function in chart 343
rangenullcount
function in chart expression 342
rangenumericcount
function in chart expression 341
rangeonly
function in chart 343
rangeskew
function in chart expression 340
rangestdev
function in chart expression 340
rangesum
function in chart expressions 338
rangetextcount
function in chart expression 342
rank
function in chart 374
Ranking functions
in chart expressions 374, 420
rate
function in chart 354
Reference Lines dialog 130
ReloadTime
function in chart 380
repeat
function in chart 356
replace
function in script 357
RGB
function in chart 413
right
function in chart 355
round

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net

general numeric function in chart 336
RowNo
function in chart 369
rtrim
function in chart 357

S

Scatter chart 119–135
second
function in chart 385
secondarydimensionality
function in chart 373
Security
data protection issues 483–484
Set Expressions 327
setdateyear
function in chart 396
setdateyearmonth
function in chart 397
Show R2 47
Show value
in bar chart 39
sign
general numeric function in chart 336
sin
function in chart 347
sinh
function in chart 348
skew
aggregation function in chart 286
SqlValue 380
sqrt
function in chart 347
Statistical Aggregation Functions 283
Statistical distribution functions
in chart expressions 348
stdev
statistical aggregation function in chart 284
sterr
statistical aggregation function in chart 288
steyx
statistical aggregation function in chart 289
Straight table 217–228
using 217
String functions
in chart expressions 355
subfield
function in chart 358
substringcount
function in chart 358
Synthetic dimension functions
in chart expressions 333
syscolor
function in chart 417
System
requirements 459
System functions
in chart expressions 379

T

tan
function in chart 347
tanh
function in chart 348
tdist
statistical distribution function in chart 349
text
function in chart 408
textbetween
function in chart 358
TextCount
counter aggregation function in chart . 280
The Advanced Color Map dialog 70
time
formatting function in chart 410
interpretation function in chart 406
Time Chart Wizard 251–260
Time functions
in chart expressions 382
timestamp
formatting function in chart 411
interpretation function in chart 407
tinv
statistical distribution function in chart 349
Title 21
Title settings dialog 282
today
function in chart 385
top
function in chart 362
Trend lines 46
Trigonometric functions
in chart expressions 347

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
OnlineNotary.net



Page 1.617/

trim
function in chart 357
Troubleshooting (FAQ) 473
true
function in chart 354

U

upper
function in chart 356
Use borders 75

V

valuelist
synthetic dimension function in chart 333
valueloop
synthetic dimension function in chart 333
Virtual memory 461
vrank
function in chart 377

W

Waterfall charts 39
week
function in chart 382
weekday
function in chart 383
WeekEnd
function in chart 392
WeekName
function in chart 393
WeekStart
function in chart 392
weekyear
function in chart 383
wildmatch
function in chart 378

X

xirr
financial aggregation function in chart 300
xnpv
financial aggregation function in chart 302
xor
logical operator in chart expr. 270

Y

year
function in chart 383
year2date
function in chart 386
YearEnd
function in chart 387
YearName
function in chart 388
YearStart
function in chart 387

Z

Zero on Bars 54

Document Id: 5E760930-662F-11EF-9D90-11F900EE2A31
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JURAT ATTACHMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF Texas }

COUNTY OF Tarrant }

The foregoing instrument was subscribed and sworn before me this date of 08/29/2024, by Nathaniel Frank-White

This notarial act was an online notarization.



(Notary Seal)

Notary's Signature _____

Registration No.: 133645929

Commission Expiration Date: March 15, 2026