WebSphere software

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IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators Volume IV: Advanced Topics

- Add Intelligent Notification Services to your enterprise applications
- Learn about clustering Everyplace Server nodes
- Enable single sign-on in Connection Manager

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First Edition (March 2005)

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Preface

This IBM® Redbook is part of a series of four volumes that are related to WebSphere Everyplace Access Version 5.0. You can use this series to plan, install, administer, and develop mobile applications to run in a WebSphere Everyplace Access Version 5.0 environment. The information that this series provides targets business-to-employee enterprise applications. However, most of the scenarios presented apply to business-to-consumer applications as well. This series provides step-by-step examples and scenarios that show you ways to integrate your enterprise applications into a WebSphere Everyplace Access environment using the WebSphere® Studio Site Developer and the Everyplace® Toolkit. This series also shows you how to extend your online and offline application capabilities to use advanced functions.

This book provides step-by-step sample scenarios that describe how to implement Intelligent Notification Services to notify Lotus® Sametime®, SMTP e-mail, and other channel deliveries. It also includes scenarios that illustrate the Location Aware Services function which provides access to location-based services from multiple vendors using available APIs. It also includes a chapter that discusses how to cluster WebSphere Everyplace Access nodes as well as how to integrate your server with IBM WebSphere Connection Manager to implement single sign-on.

Readers of this book should have a basic knowledge of Java™ technologies such as servlets, JavaBeans, Enterprise JavaBeans, and JavaServer Pages as well as XML applications and Web publishing terminology.

This book is targeted to application developers, IT architects, IT specialists, and administrators who want to install, administer, and develop enterprise applications to run on IBM WebSphere Everyplace Access.

The following are the books that are part of this series:

- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume I: Installation and Administration*, SG24-6462
- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume II: Application Development*, SG24-6463
- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume III: E-mail and Database Synchronization*, SG24-6676
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1

Intelligent Notification Services

With WebSphere Everyplace Access, you can integrate external and internal information sources in any format and deliver those sources to users in many different ways using Intelligent Notification Services. This chapter provides details on the architecture and configuration of Intelligent Notification Services. It also includes sample scenarios.

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1.1 Introduction to Intelligent Notification Services

WebSphere Everyplace Access delivers notifications to users through different delivery channels that are defined by the users based on their preferences.

A *notification* is a message that is sent to the user by the Intelligent Notification server. There are two types of notifications:

- A simple notification which can be generated by a user or an application (for example, a user sending a message using the Message Center). For details, see Chapter 2, “Simple notifications” on page 57.
- Subscription based notifications, where the user receives notifications that are based on user preferences (such as the weather forecast, news, e-mail notification based on subject, and so on).

When the system receives content, it searches for users who have subscribed to that information and delivers the information using user-defined delivery channels.

A *channel adapter* is the mechanism that delivers notifications using different types of channels, such as SMS, Instant Notification, Voice, WAP, and others. Users define which channels, how many channels, and when channels can be used.

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1.2 Intelligent Notification Services architecture

Figure 1-1 shows the overall architecture of Intelligent Notification Services.

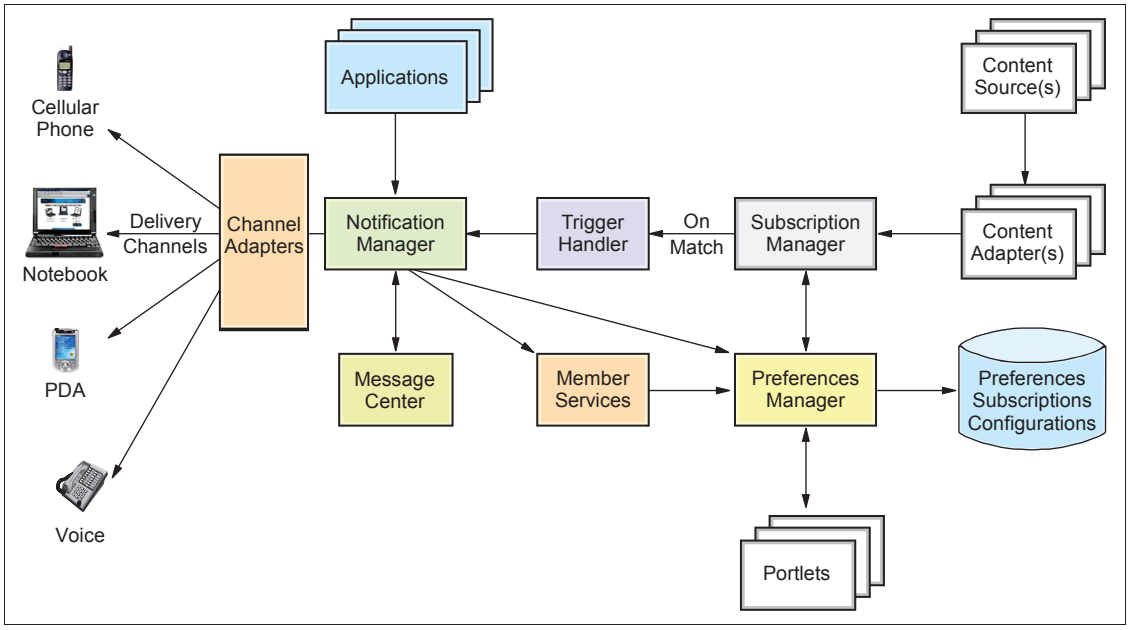

Figure 1-1 Intelligent Notification Services architecture

As shown in Figure 1-1, there are many components that work together for providing notifications to users. The following sections discuss these different components in detail.

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1.2.1 Subscription Manager

The Subscription Manager receives data from different content sources using content adapters and subscriptions from Intelligent Notification Services users. Figure 1-2 illustrates the components of the Subscription Manager.

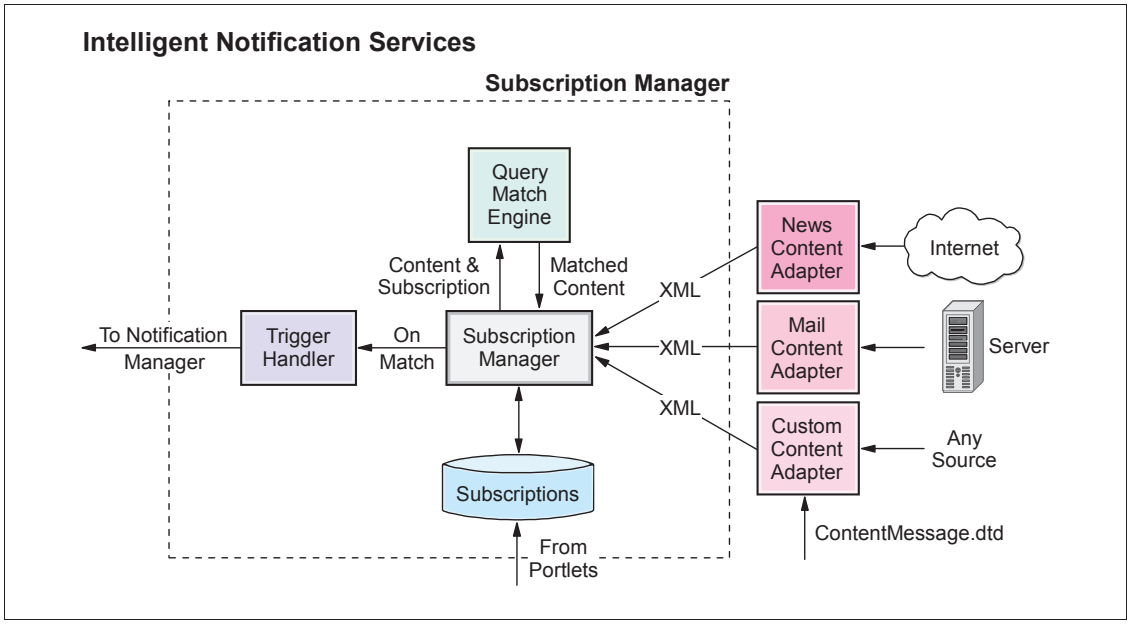

Figure 1-2 Components of Subscription Manager

When the Subscription Manager gets the information from the sources, it matches the content against the subscription criteria. Then, the Subscription Manager fires a trigger which handles the match and notifies the user about the event using the Notification Manager. Because the content is provided in Extensible Markup Language (XML) format, this matching is based on XML fields. User portlets provide the fields to match to the Subscription Manager.

Every time that the Subscription Manager receives data, the query match engine seeks for a match (not only for data, but also if data has to be sent once or always, for example). If a match occurs, it calls the trigger handler, sending the matched user and the original XML data source.

Data provided by the content adapters to the Subscription Manager are stored temporarily in the system but after the matching process is dropped.

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1.2.2 Content adapter

A content adapter is an application that captures data from any information source and converts that data into a format that the Subscription Manager can read. Figure 1-3 illustrates the components of a content adapter.

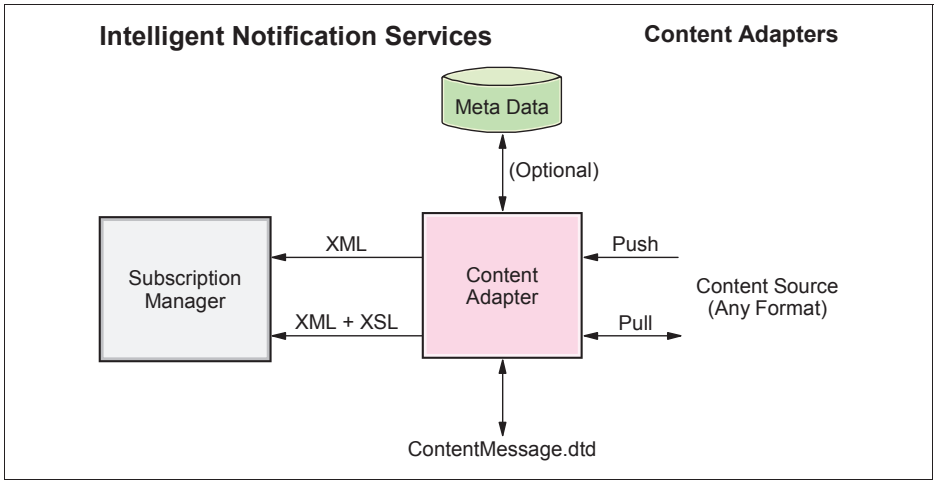

Figure 1-3 Components of a content adapter

After converting the data to the correct format, the content adapter publishes the data to the Subscription Manager for matching against user subscriptions. All the data that is published to the Subscription Manager must be in a readable form that is based on a specific XML document. When submitted to the subscription manager, the XML document must conform the predefined document type definition (DTD) that is defined in the file ContentMessage.dtd. You can find this file at:

```
<your.installation.of.WebSphere.Everyplace.Access>\INS\samples\sm
```

If the content adapter cannot transform the XML file into a suitable XML document for the Subscription Manager, it could send, along with the XML file, an XML style sheet in Extensible Stylesheet Language (XSL). The Subscription Manager can then format the XML file for the content adapter.

A content adapter communicates with Intelligent Notification Services, but it is not a part of Intelligent Notification Services. Therefore, to communicate with the Subscription Manager, you need to deploy custom content adapters as one of the following:

- WebSphere Application Server J2EE client application
- WebSphere Application Server enterprise application

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When developing content adapters, there are different strategies for deployment. However, the most common strategy is to run the content adapter periodically to retrieve data and to feed the Subscription Manager. WebSphere Everyplace Access provides several content adapters, such as Mail and Calendar Services for Lotus Domino and Exchange (versions 5.5 and 2000).

As an example, WebSphere Everyplace Access comes with two adapters: one for news and one for weather and stocks. Portlets for creating the subscription for each user as well as source code are also provided.

1.2.3 Preferences Manager

The Preferences Manager receives information from users, via portlets or batch load, regarding subscriptions (which subscriptions are needed, the way they must be delivered, and all related parameters), delivery channels, preferences on delivery channels, and message rules for each user. The Preferences Manager stores this information and communicates it to the Subscription Manager. Using the Subscription Manager, some other services have access to user profiles, subscriptions, preferences, and so forth.

1.2.4 Member Services

One of the main advantages of Intelligent Notification Services is that it can send information, instead of a user, to a group of users. Member Services stores information about all the groups in the system, with special attention to All Users Group which is created by default by the system and cannot be removed. The remainder of groups in the system must belong to a user. Only the user can modify that group. Any user can create a group, but the group cannot be shared.

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1.2.5 Notification Manager

The Notification Manager assures the delivery of messages to users. Figure 1-4 illustrates the components of the Notification Manager.

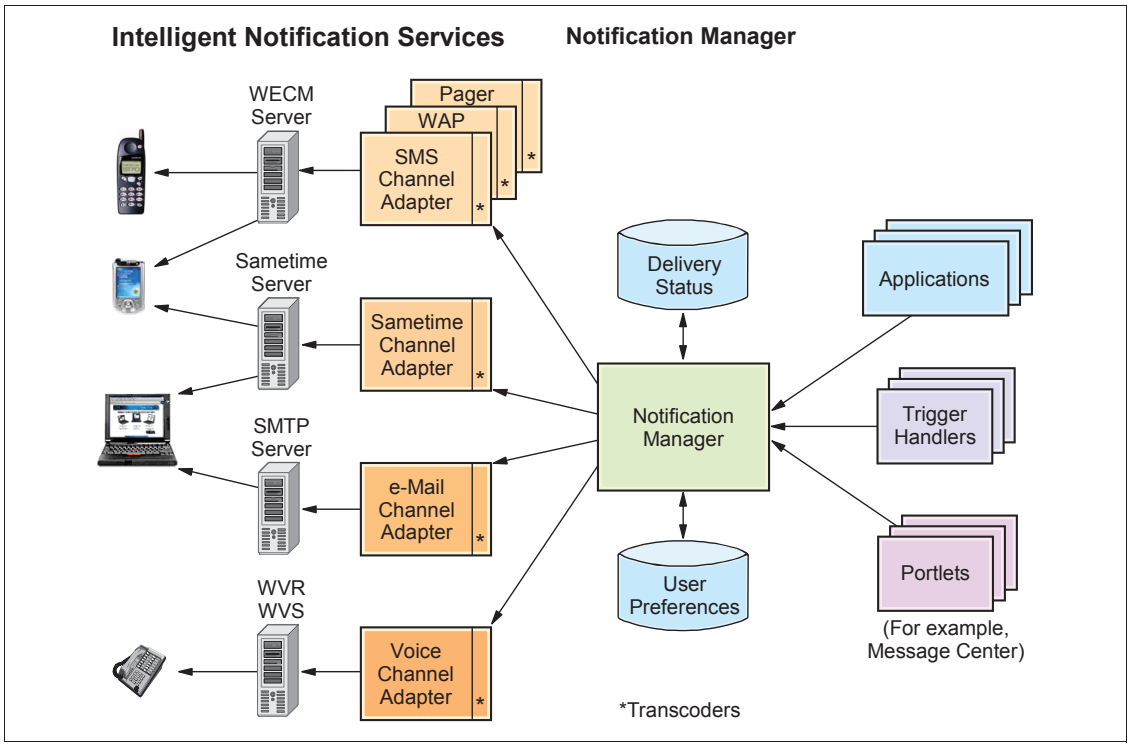

Figure 1-4 Components of the Notification Manager

The Notification Manager receives requests to send notifications from the following sources. For any source, the Notification Manager dispatches notifications based on subscriber delivery preferences. Delivery preferences are stored in a database by the Preferences Manager.

- Simple notifications from other users (via Message Center or other developed portlets)

  In this case, the users are able to overwrite the channel preferences and decide which delivery channels will be used.

- Simple notifications from applications

  Simple notifications from the Message Center Portlet can be sent only to other users and groups via the Message Center.

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- Subscription notifications from the Subscription Manager (via trigger handlers)

When the Notification Manager receives a message, it receives the destination user (or group) and the message. It queries Member Services to see if the destination is a group and retrieves all the necessary user IDs. When the Notification Manager knows the users, it queries one by one all the suitable delivery channels in which it has to send out the notifications and preferences associated to that channel or the list of channels. If any information relative to delayed notification is available in the message it receives, the Notification Manager works accordingly to queue that message.

After it has decided which channel or channels it must use, the Notification Manager sends the notification to the channel adapter using a WebSphere Application Server embedded messaging queue system. Then, messages are delivered to the appropriate channel adapter.

The Notification Manager keeps track of all the delivery status messages that are sent by the channel adapters. Applications can use that delivery status to check whether a message was delivery successfully or if it failed.

1.2.6 Trigger handler

When a content match occurs, the trigger handler notifies the appropriate user via the Notification Manager. The trigger handler also participates in adding, modifying, and querying subscriptions. In some cases, the trigger handler could be used for other tasks. such as login, reformatting the data that is received by the Subscription Manager, and so on.

Intelligent Notification Services provide sample trigger handlers with the sample subscription portlets. You can modify a sample trigger handler or use it as model to develop a trigger handler that satisfies your business needs. For more information about trigger handlers, see 3.4, “Trigger handler” on page 96.

1.2.7 Channel adapters

The Notification Manager sends notifications to many types of delivery channels by interfacing with those delivery channels through channel adapters (see Figure 1-4 on page 7). Channel adapters receive notification messages from the Notification Manager and transcode those messages into the proper formats for the designated delivery channels. Channel adapters use transcoders to format messages to device specifications. A separate channel adapter is provided for each different delivery channel.

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Inside the channel adapter, the message can be modified using specific transcoders. *Transcoders* modify the message depending on the preferences. For example, for the SMS channel adapter, if the message is too long, the channel adapter only uses the first 160 bytes. Transcoding adapters must be included to transform the message into the proper format.

After the message is transcoded (if needed), it is sent to the appropriate delivery channel. Also if the message which comes from the subscription manager is unmodified, it arrives in XML format. So, it should be modified for sending just the specific information and not the XML tags or content that is not useful. When a message has been treated by the transcoder of a specific channel adapter, it is sent to the delivery channel which then sends the message to the device. Each channel adapter has specific information about one delivery channel.

The following are the out-of-the-box channel adapters that are provided with Intelligent Notification Services inside WebSphere Everyplace Access:

- Message Center

  Using the Message Center, the recipient has a single place to look at all recent notifications. For example, if a traffic notification is sent to the recipient's cell phone while a news notification is sent to an e-mail account at work, both notifications can also be sent to the Message Center, where the recipient can view them using the Message Center portlet.

- Lotus Sametime instant messaging

  The Sametime channel adapter sends notifications to a user who is logged in to Sametime. A Sametime user ID identifies the recipient and is required by the Sametime channel adapter to log in and send the message.

- Pager (WCTP)

  The Pager channel adapter sends notifications to a WCTP pager using the WebSphere Everyplace Connection Manager.

- Simple Mail Transfer Protocol (SMTP) e-mail

  The SMTP e-mail channel adapter sends e-mail notifications to a user through an SMTP server. An e-mail address identifies the recipient of the message. A message can be sent to any device that is e-mail addressable.

- Short Message Service (SMS)

  The SMS channel adapter sends notifications to an SMS-enabled phone or emulator using the WebSphere Everyplace Connection Manager. A phone number or an IP address identifies the recipient.

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- Wireless Application Protocol (WAP)

  The WAP channel adapter sends notifications to a WAP-enabled phone or emulator using the WebSphere Everyplace Connection Manager. A phone number or an IP address identifies the recipient.

  Note: WebSphere Everyplace Connection Manager is a prerequisite for enabling the use of SMS, WAP, and Pager channel adapters.

- Voice

  The Voice channel adapter sends notifications to a telephone. It communicates with the Intelligent Notification Services voice gateway, which runs on the WebSphere Voice Response and WebSphere Voice Server computer. The Voice channel adapter sends the notification message to the Intelligent Notification Services voice gateway, which processes the notification and uses WebSphere Voice Response to deliver the notification to the user by making an outbound call. A phone number identifies the recipient. WebSphere Voice Server synthesizes the text of the notification into speech and, optionally, for enabling a speech dialog with the user. For more information about Voice Notification Server, WebSphere Voice Response, and WebSphere Voice Server, refer to the WebSphere Voice Response documentation.

- Server Initiated Actions

  The Server Initiated Actions channel adapter provides a delivery channel that sends commands to a WebSphere Everyplace Access client and trigger, for example, an e-mail sync.

- AOL instant messaging

  The AOL channel adapter sends notifications to a user who is logged in to AOL Instant Messenger. An AOL user ID identifies the recipient of the message. An AOL user ID is required for use by the AOL channel adapter to log in and send the message.

- BlackBerry

  The BlackBerry channel adapter sends notifications to a BlackBerry device. An e-mail address or BlackBerry personal identification number (PIN) is used to identify the recipient of the message. A BlackBerry Enterprise Server is required to deliver the notification. The notification is sent to the BlackBerry device using a message push and appears on the Messages screen.

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Note: There are dependencies when using some channel adapters. For details on dependencies, read the product documentation.

In addition, you must configure each channel adapter in the system before running Intelligent Notification Services by changing the notificationManagerConfig.xml file (see 1.3.1, “Channel adapter” on page 12).

Also, after updating notificationManagerConfig.xml, you need to restart Intelligent Notification Services.

1.3 Configuration

To configure Intelligent Notification Services, the following configuration files are available:

- insBaseConfig.xml
- notificationManagerConfig.xml
- subscriptionManagerConfig.xml
- mailCalenderServicesConfig.xml

These files are located in *ins_home*\config\xml directory, where *ins_home* is in the installation directory, C:\Program Files\WebSphere\INS.

The insBaseConfig.xml file contains configuration parameters for global, properties such as logging and messaging, and general naming and URL definitions. These properties should already contain the correct information.

Note: The logging properties that are specified in all configuration files are only for running Intelligent Notification Services in a development environment such as WebSphere Studio Application Developer. To use the logging properties with WebSphere Everyplace Access, you must enable tracing using the WebSphere Application Server Administrative Console.

The logging and messaging properties that are set in the insBaseConfig.xml file override the logging and messaging properties that are set in the notificationManagerConfig.xml and subscriptionManagerConfig.xml files.

The subscriptionManagerConfig.xml file contains configuration parameters that control the logging and that specify message queue names. It should be already configured.

The mailCalendarServicesConfig.xml file contains configuration parameters that control logging, specifying message queue names, and specifying parameters

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that control mail file access. This file is discussed in 1.3.2, “Mail and Calendar Service” on page 14.

In the notifictationManagerConfig.xml file, you can configure the channel adapters. This file contains configuration parameters that control logging, specifying message queue names, and specifying parameters that control how the channel adapters function. These parameters define each channel adapter that is used by Intelligent Notification Services. There is one channel adapter for each delivery channel. The configuration of additional channels is described in 1.3.1, “Channel adapter” on page 12.

1.3.1 Channel adapter

After installing Intelligent Notification Service, you should initially configure it to use the Message Center and Server Initiated Actions as channel adapter. All of the Intelligent Notification Services channel adapters are available after installation but are not configured at installation. If you want to customize your configuration of the Message Center or Server Initiated Actions channel adapters or if you want to use any of the other channel adapters, you must do those configurations separately.

The Notification Manager provides the following channel adapters:

- Message Center portlet channel adapter
- Lotus Sametime instant messaging channel adapter
- Pager (WCTP) channel adapter
- Simple Mail Transfer Protocol (SMTP) e-mail channel adapter
- Short Message Service (SMS) channel adapter
- Wireless Application Protocol (WAP) channel adapter
- Voice channel adapter
- Server Initiated Actions channel adapter
- BlackBerry (RIM) channel adapter
- AOL Instant Messaging channel adapter

All adapters are configured in the notificationManagerConfig.xml file, which is located in *ins_home*\config\xml directory, where *ins_home* is in the installation directory, C:\Program Files\WebSphere\INS.

Note: Only 12 channel adapters can be running at the same time. Therefore, if you need to add content channel adapters, you can use one of the already defined adapters that you are not using.

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Sametime

To enable Sametime as a channel adapter, uncomment the Sametime section in the notificationManagerConfig.xml file and customize the values so that they fit your environment. Example 1-1 highlights the properties that you need to customize.

Example 1-1 Customizing the notificationManagerConfig.xml file for Sametime

```
<channelAdapter
            name="SameTime"
            mdBean="NmChannelAdapter09"
            jmsQueueName="jms/NmChannelQueue09"
            adapterClassName="com.ibm.pvc.ins.nm.server.adapter.Sametime"
            channelSelector="IM#SAMETIME"
            serverAddress="wea5e.itso.ral.ibm.com"
            retryCount="3"
            retryPeriod="180"
            retryPeriodBackOffDelayPercent= "0"
            failServiceStartOnFault= "none"
            pauseWorkFlowOnFault= "true"
            pauseWorkFlowDelaySeconds= "0"
            adapterRestartPeriodSeconds= "15"
            activePoolSize= "1"
            activePoolSingleUse= "false" >
            <transcoder>
                <transcoderClassName
value="com.ibm.pvc.ins.nm.server.adapter.SametimeTC" />
            </transcoder>
            <extendedProperties>
                <property name="Userid" value="insadmin"/>
                <property name="Password" value="dpinsadm"/>
            </extendedProperties>
</channelAdapter>
```

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SMTP

To enable SMTP as a channel adapter, uncomment the mail section in the notificationManagerConfig.xml file and customize the values so that they fit your environment. The important property to customize is `serverAddress`, which should match your mail server's host name (see Example 1-2).

Example 1-2 Customizing the notificationManagerConfig.xml file for SMTP

```
<channelAdapter
            name="Mail"
            mdBean="NmChannelAdapter04"
            jmsQueueName="jms/NmChannelQueue04"
            adapterClassName="com.ibm.pvc.ins.nm.server.adapter.Mail"
            channelSelector="MAIL#SMTP"
            serverAddress="wea5e.itso.ral.ibm.com"
            ...
```

BlackBerry

To enable BlackBerry as a channel adapter, uncomment the BlackBerry section in the notificationManagerConfig.xml file and customize the values so that they fit your environment. The important property to customize is `serverAddress`, which should match your BlackBerry Enterprise Server (BES) host name, including the port number (see Example 1-3. If you run BES on a Domino server the default port number is 8080. If you are using the BlackBerry Emulator, the port number is 8080 as well. On an Exchange Server the default port is 8300.

Example 1-3 Customizing the notificationManagerConfig.xml file for BlackBerry

```
<channelAdapter
            name="BlackBerry"
            mdBean="NmChannelAdapter11"
            jmsQueueName="jms/NmChannelQueue11"
            adapterClassName="com.ibm.pvc.ins.nm.server.adapter.BlackBerry"
            channelSelector="RIM#PUSH"
            serverAddress="wea5e.itso.ral.ibm.com:8080"
            ...
```

1.3.2 Mail and Calendar Service

The Mail and Calendar Service should be already configured after installation. However, you might need to change some parameters if you customize Intelligent Notification Services.

You can specify the time interval after which the mail files should checked to see if they contain new mails with the emailRunTimeInterval property. The time is

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measured in minutes. The default is 15 minutes, as shown in the following example:

```
<emailRunTimeInterval          value="15" />
```

Another parameter is the miningTimeout parameter. It specifies the minutes to wait if a problems occurs while Mail and Calender Services is checking the mail file of the user. The default is 60 minutes, as shown in the following example:

```
<miningTimeout                 value="60" />
```

1.3.3 Managing users

To use the Intelligent Notification Service, a WebSphere Everyplace Access user has to be in an Intelligent Notification Services user group. This group is created during the installation. If you do not know the name of the Intelligent Notification Services user group, look in the *ins_home*\config\INSinstallIconfig.properties file and search for the `instINSUser` property. In the sample installation, the Intelligent Notification Services user group is `insusers`.

To add a user to the Intelligent Notification Services user group:

1. Log on to the Portal as an administrator (such as `weaadmin` in the sample installation).
2. Go to **Administration**.
3. Click **Access** → **User and Groups.**
4. Select **all portal user groups.**
5. Choose your Intelligent Notification Services user group**.**
6. Click **Add member.**
7. Choose the user who you want to add and click **OK**.

For Mail and Calendar Services to mine Lotus Domino® Servers, additional configuration is required. To read all the Lotus Domino mail files that will be mined through Intelligent Notification Services, the Intelligent Notification Services Lotus Notes® ID must have read access to all Lotus Domino mail files. In the sample installation, this user is called `insadmin`.

The Mail and Calendar Services INSAdmin ID must have read access to the Public Name and Address Book (names.nsf) on the Lotus Domino Server that was specified during installation. That Address Book must include a short name, user name, mail file, mail server, and Internet password for every user who is using Intelligent Notification Services.

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Each user's mail file that will be mined must grant reader access to the INSAdmin ID. To grant this access:

1. Log in to the Domino Administrator client.
2. Go to the mail file directory and select the user's mail of which you want to check the ACL.
3. Right click and select **Access Control** → **Manage.**
4. Click **Add**.
5. Specify the INSAdmin ID.
6. Select **Person** from the User Type menu.
7. Select **Reader** from the Access menu.

1.3.4 Starting and stopping the Intelligent Notification Services server

After you configure Intelligent Notification Services, you can start the Intelligent Notification Services server. If you changed parameters in the configuration files while running Intelligent Notification Services, you must restart it. When you restart the servers, the changes you made in the configuration files are applied.

Intelligent Notification Services includes the following servers, which you should start in the order that is listed here:

- Notification Manager
- Subscription Manager
- Mail and Calendar Services

WebSphere Application Server environment

In a WebSphere Application Server environment, all three servers are started when the Intelligent Notification Services server is started. You can start the Intelligent Notification Services server from the command line. From the *was_home*\bin directory, use the following command to start or stop the server:

- On Windows®:

```
startServer INSServer -user was_admin -password password
stopServer INSServer -user was_admin -password password
```

- On AIX:

```
./startServer.sh INSServer -user was_admin -password password
./stopServer.sh INSServer -user was_admin -password password
```

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In these commands, *was_admin* is the user that you specified to administer the WebSphere Application Server. In the sample installation, it is `wpsadmin` and the password is `wpsadmin`.

> **Note:** The Intelligent Notification Services server is called `INSServer` by default. You can, however, change the server name. Look in the *ins_home*\config\INSinstallIconfig.properties file, and search for the `instServer` property.

WebSphere Network Deployment environment

In a WebSphere Network Deployment environment, you can stop and start the Mail and Calendar Services, Subscription Manager, and Notification Manager servers through the WebSphere Application Server Administrative Console by following these steps:

1. Open the WebSphere Application Server Administrative Console, and log in.
2. In the left pane, select **Applications** → **Enterprise Applications**. A list of applications appears.
3. In the list, select either **Mail and Calendar Services**, **Notification Manager**, or **Subscription Manager**. The status of each server application appears next to the server name.
4. To start a stopped server, select the server name and click **Start**.
5. To stop a started server, select the server name and click **Stop**.

Microsoft® Exchange

If you are using Microsoft Exchange 5.5 with Mail and Calendar Services, you must start the RMI server, which is only available on a Windows machine. To start the RMI server:

1. Set the environment variable `INS_HOME=<INS Install Dir>`.
2. From *install_home*\java\jre\bin, run `rmiregistry`.
3. Start WebSphere Application Server, and make sure that the Subscription Manager is running.
4. From *install_home*\bin, run `startX55MAILRMI`.

1.3.5 Message logging

Intelligent Notification Services message logging and tracing uses the WebSphere Application Server application logging and tracing system. There are three basic types of trace messages that are produced: error, warning, and information. All trace messages are recorded in the trace file that is associated

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with the WebSphere Application Server that is running the Intelligent Notification Services application instance. To turn on tracing:

1. Go to the WebSphere Application Server Administrative Console and log in.
2. Go to **Troubleshooting** → **Logs and Trace**.
3. Select the Intelligent Notification Services Server. In the example, it is **INSServer**.
4. Click **Diagnostic Trace**.
5. Make sure that **Enable Trace** is checked.
6. In the Trace Specification field, specify the component or components that you want to trace.

   Table 1-1 lists the components with the corresponding trace specification package.

Table 1-1 Intelligent Notification Services and packages

Component	Package
all components	com.ibm.pvc.ins.*=all=enabled
Notification Manager Services	com.ibm.pvc.ins.logger.NMLog=all=enabled
Subscription Manager Services	com.ibm.pvc.ins.logger.SMLog=all=enabled
Mail and Calender Services	com.ibm.pvc.ins.logger.MCSLog=all=enabled
Preference Manager Service	com.ibm.pvc.ins.logger.PMLog=all=enabled*
Member Service	com.ibm.pvc.ins.logger.MSLog=all=enabled.*
Utility Service	com.ibm.pvc.ins.logger.UTILLog=all=enabled

   If you want to turn on trace for multiple components, specify each component's trace specification, separated with a semicolon (;).

7. Click **OK.**
8. Click **Save**.
9. Click **Save** again.
10. Click **Logout**.

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Note: Error and warning type messages are always logged to the corresponding WebSphere Application Server trace file. These messages indicate that a problem occurred and are shown as error messages. Operating conditions that are not errors but need to be recorded are shown as warning messages. Both of these message types are always captured in the WebSphere Application Server trace file and cannot be disabled.

1.4 User portlets configuration

You can select the way that you want to be notified and when you want to be notified. In addition, you can define subscriptions about the information that you want to receive. There are several portlets that you can use. These portlets are located under Intelligent **Notification** → **Setup**, as shown in Figure 1-5.

Figure 1-5 Intelligent Notification Services user portlets

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1.4.1 My Delivery channels

One of the first things a user wants is to receive notification of events, messages, and so forth. In order to do so, you have to select the mechanism which the system uses for notification. Several portlets are provided:

- Intelligent Notification Sametime delivery channel

  You use the Sametime delivery channel when you want notification through Lotus Sametime (even Mobile Sametime).

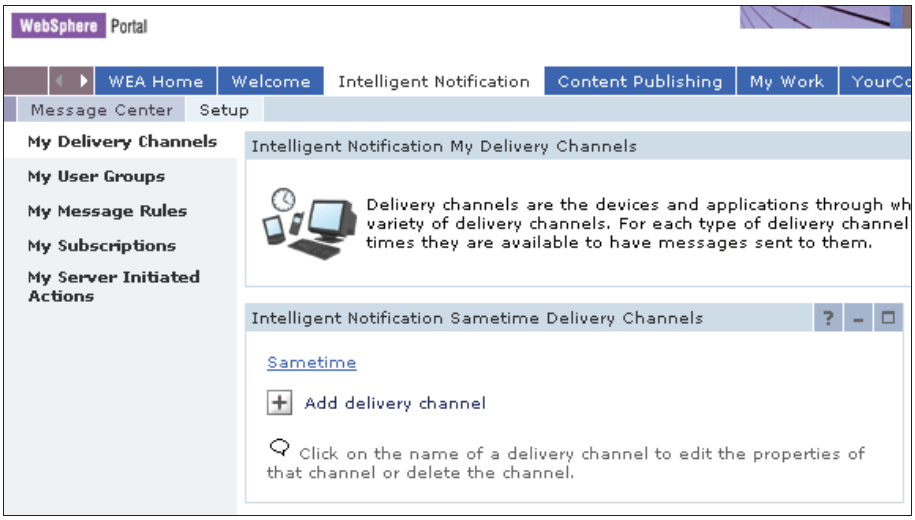

Figure 1-6 Sametime delivery channel

To create a delivery channel, select **Add delivery Channel**, as shown in Figure 1-6. The screen in Figure 1-7 on page 21 appears.

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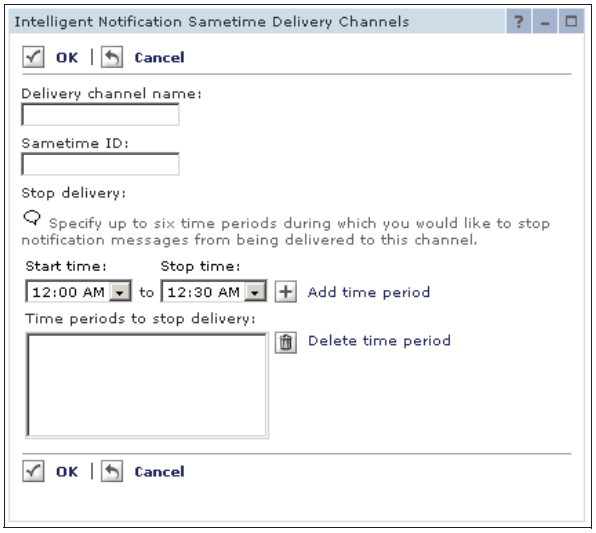

Figure 1-7 Creating a new Sametime delivery channel

You supply the following data:

- Delivery channel name, which refers to the name that you see when performing other options.
- Sametime ID, which is the identification already created on the Sametime Server.
- Stop delivery, which is optional. If you do not want notification using this channel, even if you are connected, set the start and end time here. You can select several time slots. If you receive a message during any other time, you are notified.

► Intelligent Notification Message Center delivery channel

One mechanism for communicating notifications is the Message Center. The Message Center allows you to route all the events, alerts, messages, and so forth to a portlet where you can see all the messages. You can find this portlet on the Setup page, as shown in Figure 1-8 on page 22.

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Created from multco on 2024-05-24 16:22:09.

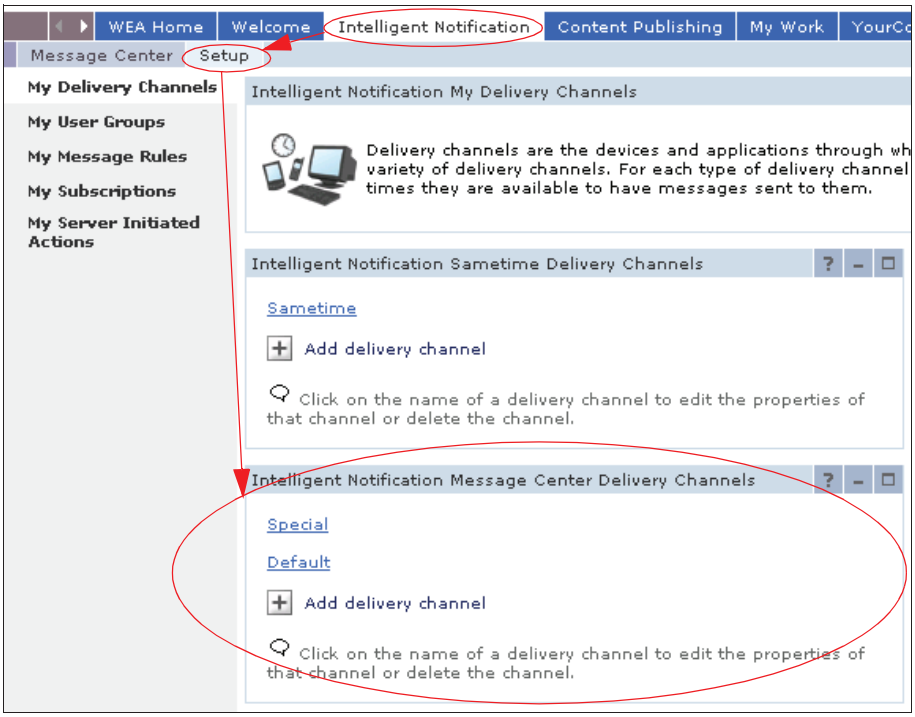

Figure 1-8 Message Center delivery channel

In the figure, you can see that two different delivery channels have been defined for the Message Center delivery channel. If you select **Add Delivery Channel,** you have to provide the name of the delivery channel, and optionally, the stop delivery times.

- Intelligent Notification SMTP e-mail delivery channel

  You can receive notification via the e-mail delivery channel. Select the Intelligent Notification Mail delivery channel portlet, and click **Add Delivery channel**.

  In this portlet you have to select the destination e-mail address where the notification must be sent. Optionally, you can select the Stop delivery feature.

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- Intelligent Notification WAP delivery channel

  If you have a WAP-enabled telephone, you can have messages forwarded to that telephone. You can set up this option using the screen shown in Figure 1-9.

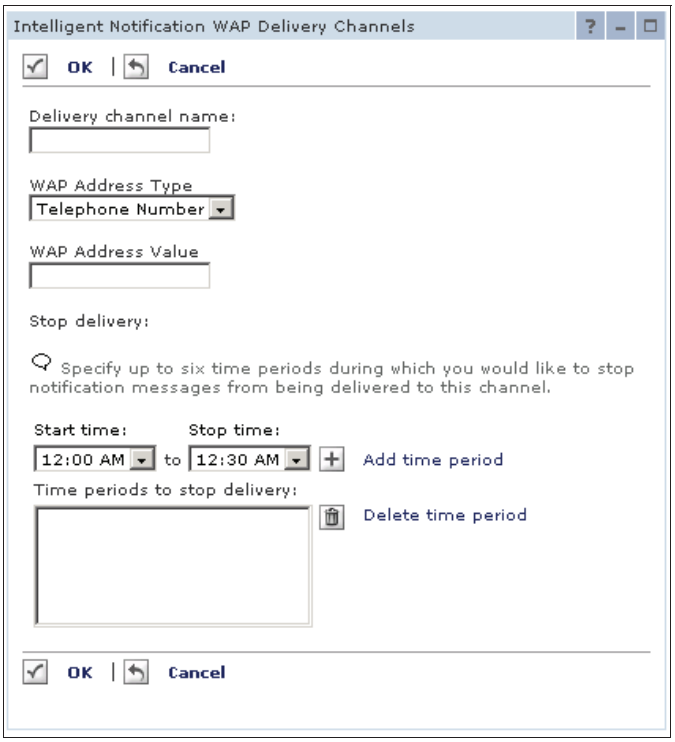

Figure 1-9 Creating a new WAP delivery channel

The fields included in this screen are:

- Delivery channel name, which is the external name for the delivery channel.
- WAP Address Type, which is either Telephone Number or IP Address.
- WAP Address Value, which is the value for Telephone Number or IP address, depending on your selection in the previous field. The portlet does not validate these values.
- Stop delivery, which is optional. If you do not want notification using this channel, even if you are connected, set the start and end time here. You can select several time slots. If you receive a message during any other time, you are notified.

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> **Note:** This option is only available when WebSphere Everyplace Connection Manager has been set up to work with WebSphere Everyplace Access.

- Intelligent Notification SMS delivery channel

  You use this channel to receive notification using SMS to a phone. The same fields that are defined in the Intelligent Notification WAP delivery channel apply to this delivery channel.

> **Note:** This option is only available when WebSphere Everyplace Connection Manager has been set up to work with WebSphere Everyplace Access.

- Intelligent Notification AOL delivery channel

  WebSphere Everyplace Access incorporates a portlet for communicating with AOL users.

Other predefined portlets for delivery channels include:

- Intelligent Notification Pager delivery channel
- Intelligent Notification Voice delivery channel
- Intelligent Notification BlackBerry delivery channel

For each delivery channel, more than one personalized delivery channel can be added. For example, if you have two telephone numbers, a business number and a personal number, you could configure the delivery channel such that you receive notifications on your business number during working hours and notifications to you personal number at other times.

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Intelligent Notification delivery channel configuration

When you have defined all the delivery configurations that you need, you need to define the order of the delivery channels in order to receive notifications, as shown in Figure 1-10.

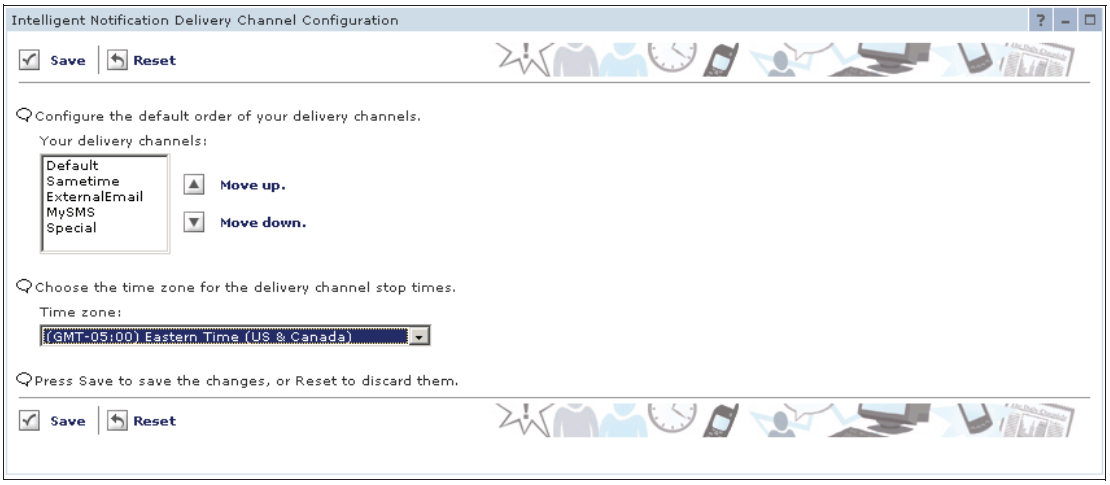

Figure 1-10 Intelligent Notification delivery channel configuration

In this example, there are five possible delivery channels in the following order:

- Default (Message Center)
- Sametime
- ExternalEmail
- MySMS
- Special (Message Center)

After a message arrives to the Intelligent Notification Services, it is forwarded by default to the selected delivery channel. Because you can send a message to more than one delivery channel or you can send a message to the first available delivery channel, this portlet shows you which delivery channel (if selected) will be chosen first. As discussed later, each subscription can choose which delivery channels to use, but the order cannot be changed.

On these administrative portlets, you can set up the time zone for the delivery channel stop times. This set up could be quite useful when you are in a different time zone and you do not want to change the stop time hours for all your delivery channels.

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1.4.2 My User Groups portlet

You can set up and manage user groups for receiving and delivering notifications (as a group) in order to classify different groups. For example, you can manage how you receive messages from the members of user groups. Examples of user groups include your team, department, friends, or family. You can create and populate groups with members, or you can delete groups that you do not need.

From the My User Groups portlet, you can create and delete groups as well as add and remove users to a group. To create a new group:

1. Select **Add User Group** inside Intelligent Notification User Groups, as shown in Figure 1-11.

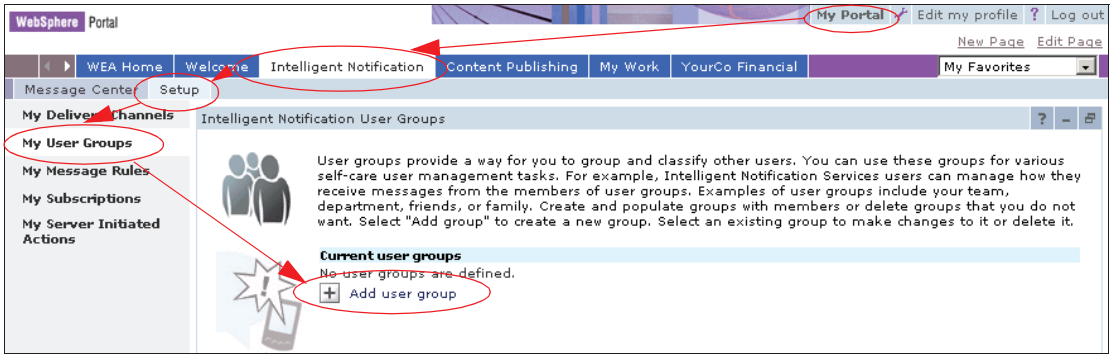

Figure 1-11 My User Groups portlet

2. In the screen that appears (Figure 1-12 on page 27), enter the name of the user group, and select **Add member**.

> **Note:** The users that you select must be active users for WebSphere Everyplace Access and must have Intelligent Notification Services capabilities.

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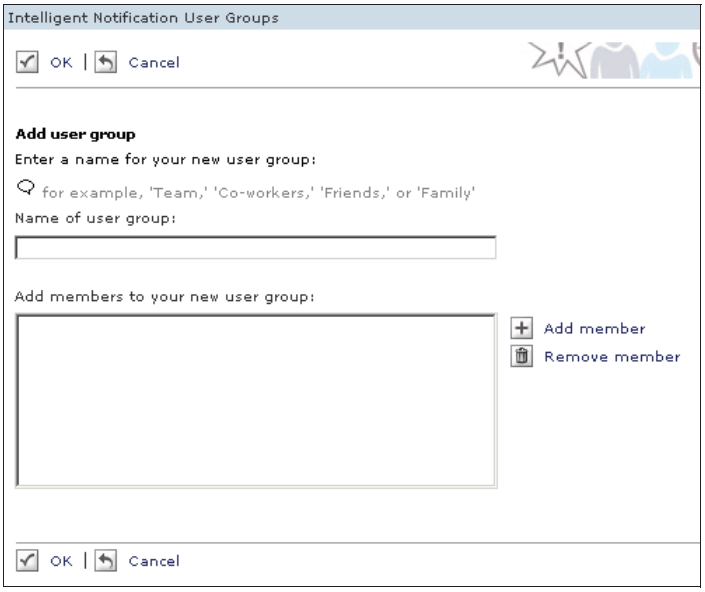

Figure 1-12 Creating a group from the Intelligent Notification User Groups portlet

When you select **Add member**, the window shown in Figure 1-13 on page 28 appears.

Before adding users in the group, you must look for the users, taking into account the following:

- You can use short names in your search.
- You can use long names in your search.
- You can combine any of the above with the predefined wildcard (*).
- If you are not sure about the name you are looking for, just enter (*).
- After the field is entered with your needs, click **Go**. Do not press Enter.
- Each group must contain at least one member.
- Groups cannot be added to a group.

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Created from multco on 2024-05-24 16:22:09.

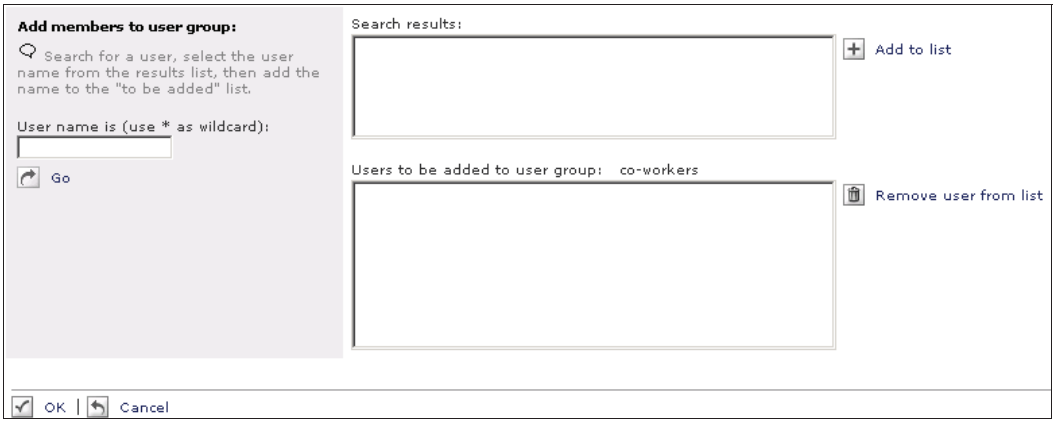

Figure 1-13 Adding/Removing users from a Group

3. After you have selected all the users, select **OK** in this window, and then **OK** again in the previous window. The name of the group is displayed.

Note: You can test the functionality of users groups by sending messages from the Message Center portlet.

Note: Applications can send messages directly to the Notification Manager (see 1.1, “Introduction to Intelligent Notification Services” on page 2). In that case, the application can send messages to the a User Defined group. When the Notification Manager gets that notification, it sends a request to the Preferences Manager to determine which users are assigned to the group that is marked by the application, and it forks as many notifications as there are users are in that group.

You can deleted groups from the My Users Group by selecting the name of the group that the user has defined and then selecting the trash icon beside **Delete this group**.

You can add or remove users from groups by selecting the group and then selecting **Add member** or **Remove member**.

By default, WebSphere Everyplace Access creates a default users group that is called **All Users Group**. That group contains all the users who are authorized for Intelligent Notification Services. You cannot delete the default group from the system.

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1.4.3 My Message Rules

When you have defined all the delivery channels, you also define which delivery channels order must be used, depending on the priority of the message.

There are three basic priorities for notifications: urgent, normal, and for your information (FYI), as shown in Figure 1-14.

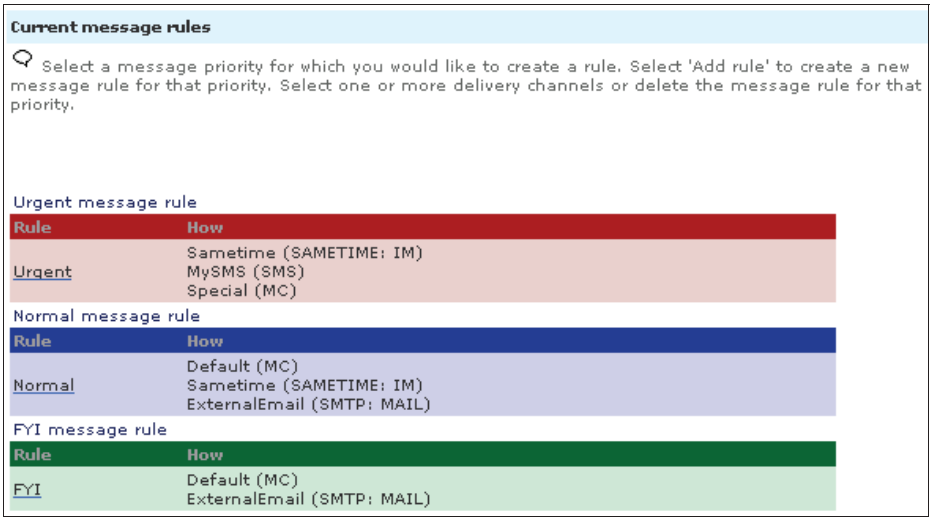

Figure 1-14 My Message Rules portlet

For each rule, you can:

- Select the delivery channels that you want to use (Figure 1-15 on page 30 shows Sametime, MySMS and Special selected).
- Edit the order of your delivery channels. When you receive a notification, you can select the order of your delivery channels. If you select the Edit button, you can modify the order, which affects all notifications.
- Apply the same rule to other rules. In Figure 1-15 on page 30, these are the delivery channels that are assigned to urgent messages. Without editing other rules, you can apply the same configuration to the normal and FYI messages. If you are editing other message rules (such as normal or FYI), you will see the other rules to which you can apply the changes.
- Delete this rule. You can remove all the configuration information related to this rule.

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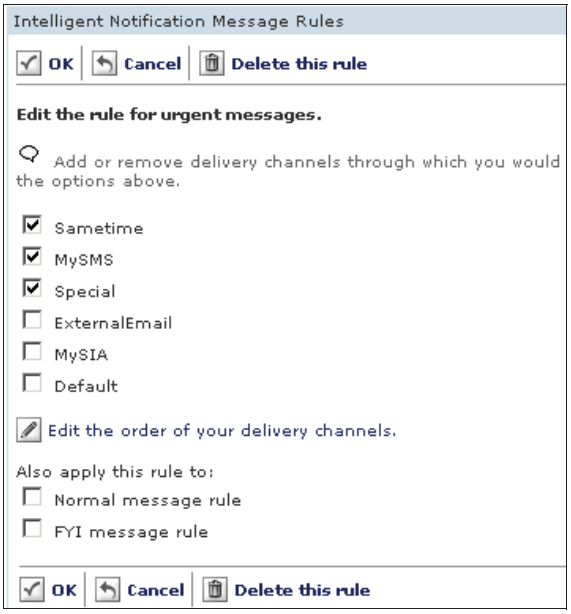

Figure 1-15 Modifying a rule

1.4.4 My Subscriptions

In the My Subscriptions portlet, you can define what kind of information you want to receive based on subscriptions. The out-of-the-box content adapters are:

- Lotus Notes e-mail subscriptions
- Weather subscriptions
- Stock subscriptions
- News subscriptions
- Microsoft Exchange 2000 subscriptions
- Microsoft Exchange 5.5 subscriptions

Lotus Notes e-mail subscriptions

Intelligent Notification Services provides notifications when you receive an e-mail on your mail account.

> **Note:** This service is different from the one that is provided in Intelligent Notification Services Everyplace Synchronization Server. In Everyplace Synchronization Server, the e-mail is replicated from a mailbox to a PDA.

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For this subscription, a user (INSAdmin) must have privilege to the account in the Domino server. Therefore, each user who wants to have notifications from the Domino server must have this user activated in the Access Control List.

To begin, select **Edit account settings**, as shown in Figure 1-16.

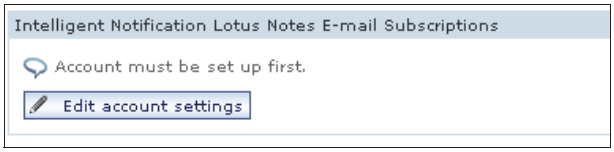

Figure 1-16 Edit account settings

To set up of this subscription:

1. Define the name and the password of the user in Domino, and click **OK**, as shown in Figure 1-17.

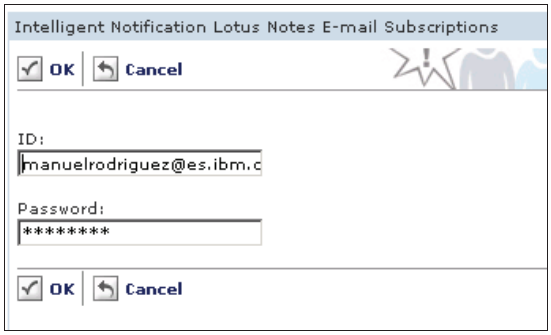

Figure 1-17 Defining the name and password of the user in Domino

2. Create the subscription by clicking **New**, as shown in Figure 1-18.

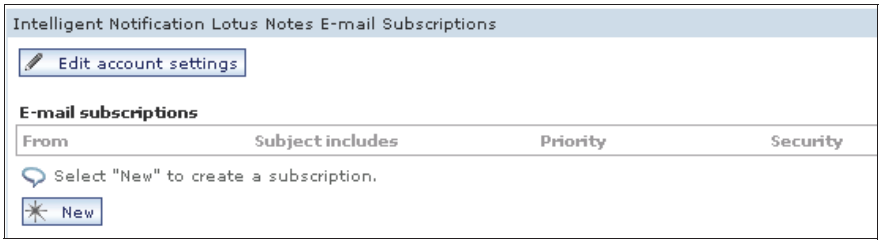

Figure 1-18 Creating a Lotus e-mail subscription

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When you create the subscription, you can include the following information about the subscription:

- From

  If you want notification when the e-mail arrives based on who sends the e-mail, put the name of the sender in this field.

- Subject includes

  If you want notification when the subject includes special strings, enter those strings here. Otherwise, it takes all the possible subjects.

- Priority

  Based on the priority of the message, you can filter what you want to receive as a notification. Possible options are urgent, normal, FYI. If you do not want to filter notifications based on the priority, select **Any Priority** in this field.

- Notification

  Two options are available for this field: Once or Always. To receive just one notification the first time that a match occurs, select **Once**. To receive notification every time a match occurs, select **Always**.

- Delivery channels options

  To receive notification just once by trying all different channels that are activated in the list, choose **Each selected delivery channel in order, until delivery is successful**.

  If you want to deliver to all the channels that are selected in the list, choose **All of the selected delivery channels**.

Figure 1-19 on page 33 shows an example of this subscription information.

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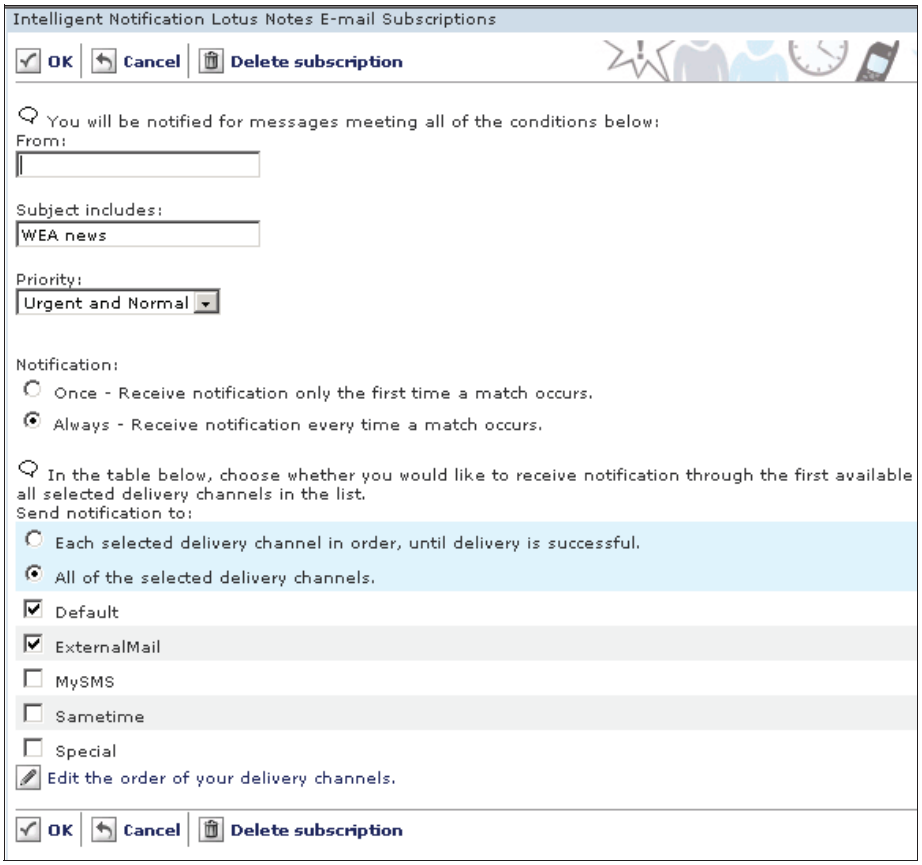

Figure 1-19 Defining information about a Lotus e-mail subscription

Weather subscription

Weather subscription is provided by WebSphere Everyplace Access as an example of what Intelligent Notification Services can do for you. In this sample scenario, the Intelligent Notification Weather subscription portlet is provided and obtain all the preferences of different users, validates data, and publishes that data to the Subscription Manager through the Preferences Manager.

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This portlet requires the following data:

- City
- State
- Weather report, current conditions or forecast
- Notification, Once or Always
- Delivery channels, all the delivery channels or just the first one available
- Suitable delivery channels

Figure 1-20 shows an example of this information for the Intelligent Notification Weather subscription.

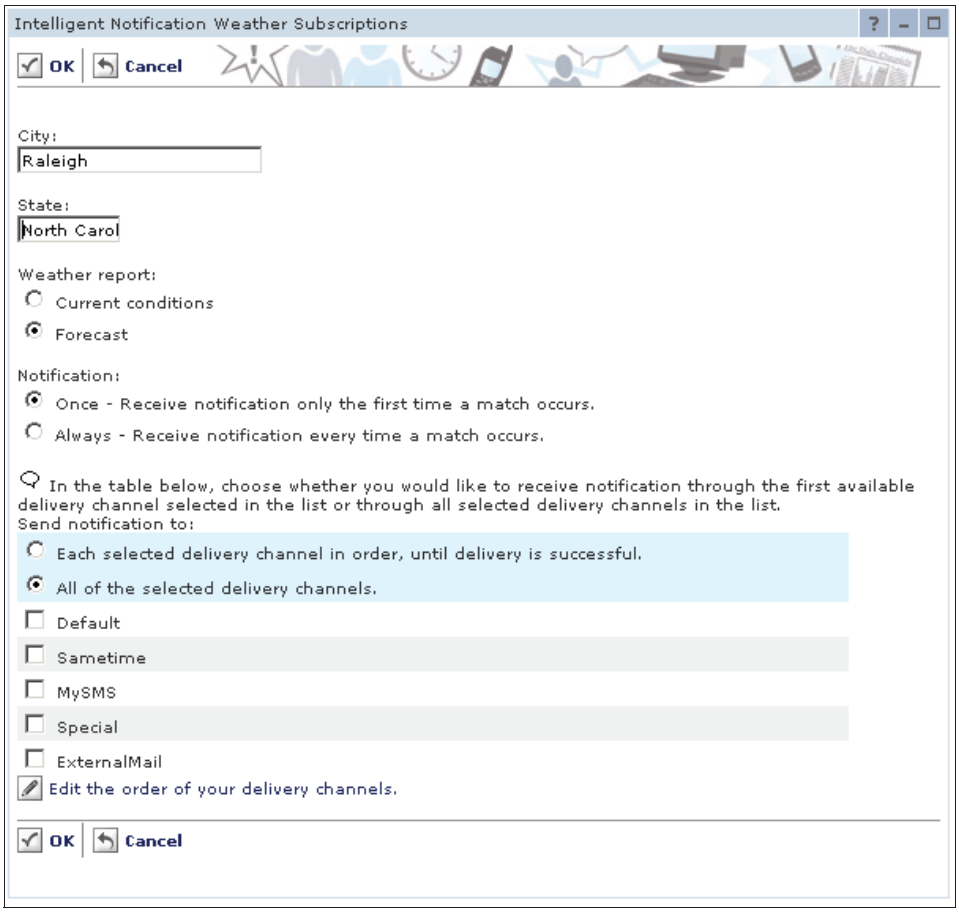

Figure 1-20 Intelligent Notification Weather portlet

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Content adapter for Weather

The Subscription Manager can only receive XML files. The contentfeed.bat utility, a J2EE application, reads XML files and sends these XML files to the Subscription Manager in a proper format.

Server Initiated Action notifications

Server Initiated Action notifications are special notification messages that are not seen by users. Rather, they are intercepted by client software, which interprets the messages and initiates actions on client devices. These messages can be used to initiate an e-mail sync on a device when new e-mail arrives at its server.

To enable this type of notification:

1. On the My Delivery Channels page, create a delivery channel for the device on which you wish to receive Server Initiated Action notifications, or verify that you already have one of the correct types defined.
2. Use the portlet (as shown in Figure 1-21) to create the Server Initiated Action delivery channel based on the channel that you created in the previous step. This delivery channel will only be available for e-mail subscriptions.
3. On the My Subscriptions page, create an e-mail subscription using the My Lotus Notes subscriptions portlet or one of the My Microsoft Exchange portlets. Customize the subscription to send messages, using the conditions on which you would like to have an e-mail sync initiated. Specify that the subscription use the Server Initiated Action delivery channel that is created by the portlet on this page.

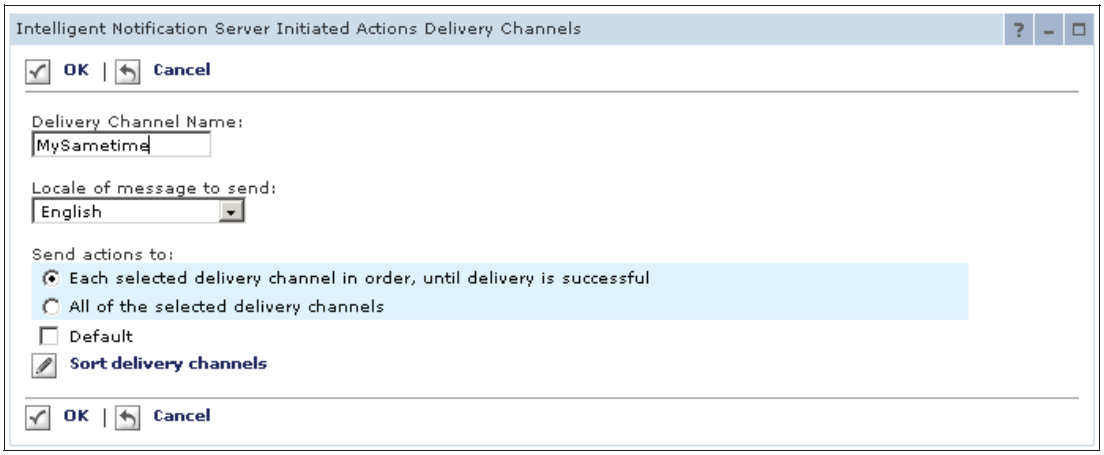

Figure 1-21 Creating a delivery channel for Server Initiated Action notifications

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1.5 Administration portlets configuration

To manage the Intelligent Notification Services, the administrator can use a set of administrative portlets. With these porlets, you can:

- Remove user preferences
- Configure the administrator information for e-mail subscriptions
- Send server initiated actions to one or more users or a group of users

These portlets are available in the Administration tab (using **WebSphere Everyplace** → **Intelligent Notification Services**) after you log in as an administrator.

1.5.1 Removing user preferences

After deleting a user in WebSphere Everyplace Access or in the directory, the preferences and subscriptions for that user in Intelligent Notification Services still remain. You must remove these preferences and subscriptions using the Remove User Preferences portlet.

To remove the subscriptions and preferences of a user:

1. Log on to WebSphere Everyplace Access as an administrator.
2. Select **Administration**, then **WebSphere Everyplace** → **Intelligent Notification Services** → **Remove User Preferences**.
3. In the single field which appears, enter the user ID of the user that you want to delete.
4. Click **OK**.
5. If a confirmation appears asking you if really want to delete this user, click **OK**.

Note: When you remove the preferences and subscriptions of a user who is not deleted in WebSphere Everyplace Access, that user is still an Intelligent Notification Services user who can reconfigure settings.

Figure 1-22 on page 37 shows an example of this action.

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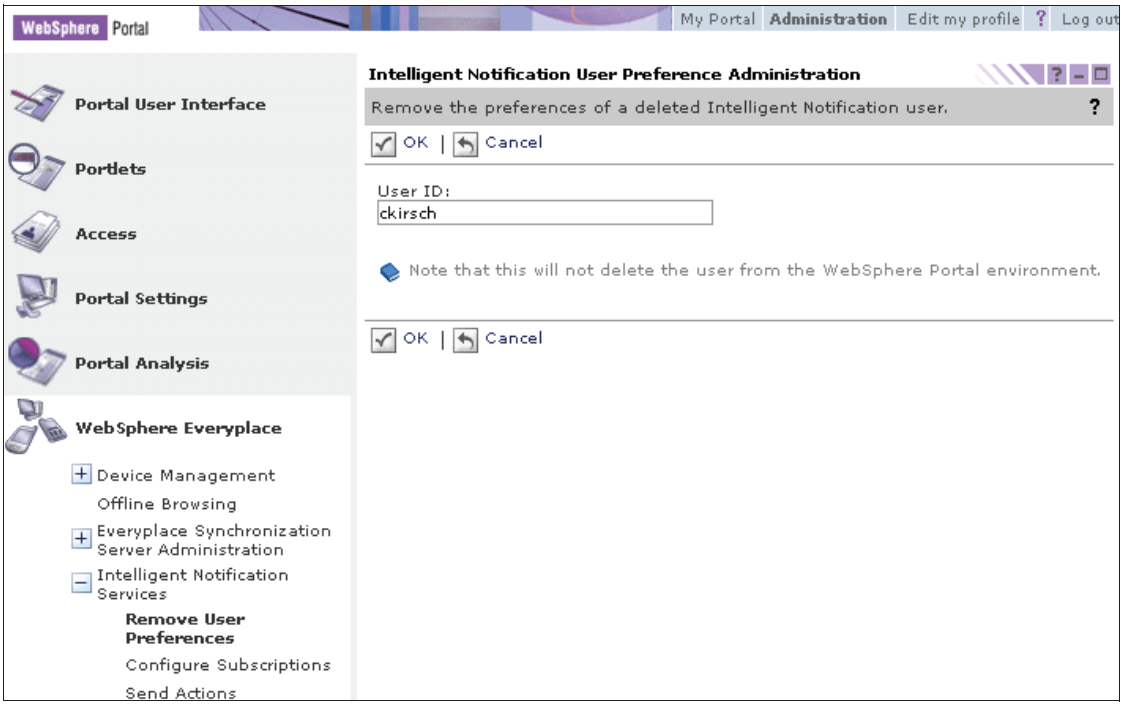

Figure 1-22 Remove User Preferences portlet

1.5.2 Configuring administrator information for e-mail subscriptions

Intelligent Notification Services can notify a user when new e-mail messages have arrived in a mailbox. Intelligent Notification Services uses the Mail and Calendar services to poll the e-mail server to determine whether it is Lotus Notes, Microsoft Exchange 2000, or Microsoft Exchange 5.5. To configure the server's mail, you have to specify the host name of the mail server and a user name with a password to connect to the host. The user ID is used to access the mail files on the mail servers. Therefore, this user is must have access to all the required mail files.

To configure the administrator information for e-mail subscriptions:

1. Log on to WebSphere Everyplace Access as an administrator.
2. Select **Administration**, then **WebSphere Everyplace** → **Intelligent Notification Services** → **Configure Subscriptions**. A page with user name and password fields for Microsoft Exchange 2000, Microsoft Exchange 5.5, and Lotus Notes appears.

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3. Specify the administrative user name and password for the supported e-mail system. The user name and password are the user name and password that Intelligent Notification Services uses to access mail files. In Figure 1-23, the user name is **INSAdmin**.

   For Lotus Notes, specify the internet address of the Domino server.

   For Microsoft Exchange 5.5, specify RMI Server mapping and be sure you have already started the RMI server.

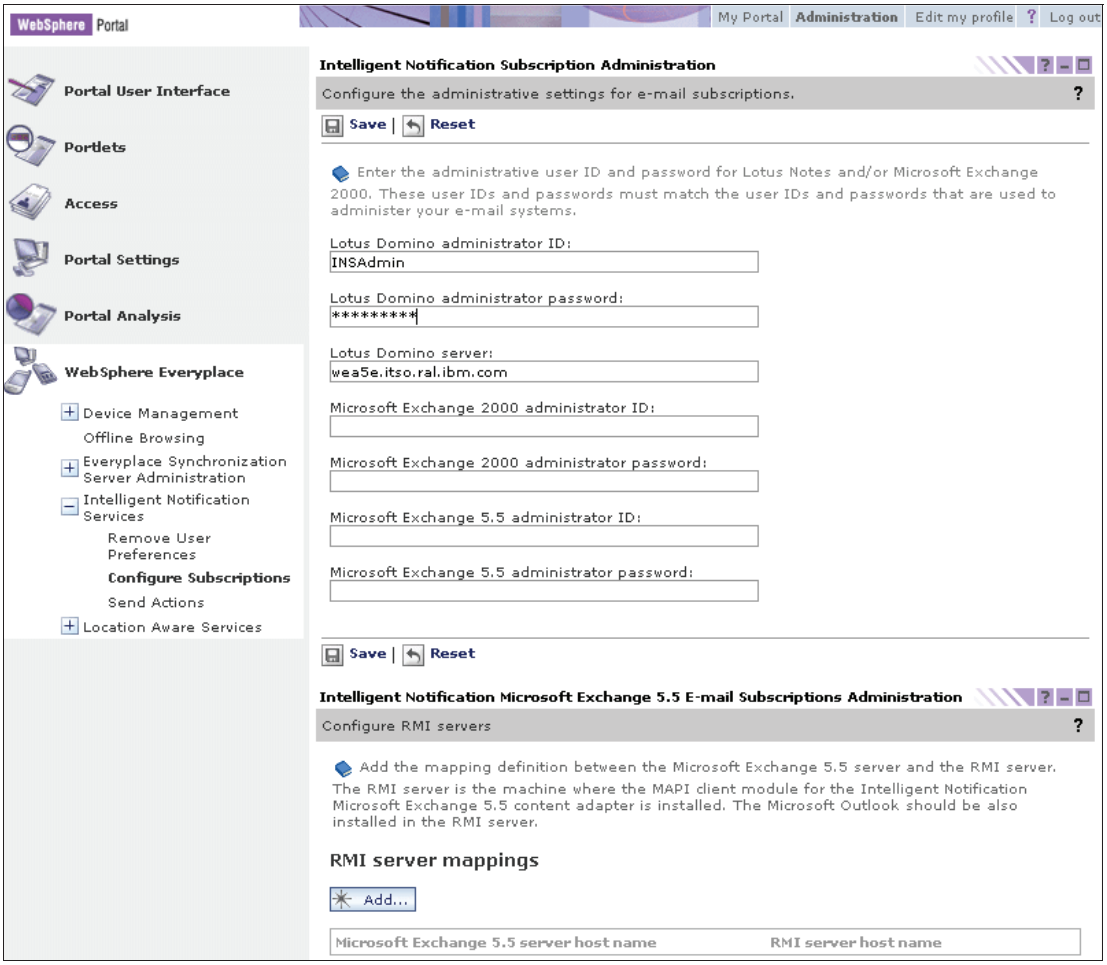

Figure 1-23 Configure subscriptions portlet

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4. Click **Save** to save these settings.
5. For Microsoft Exchange 5.5, click **Add...** to create an RMI server mapping. Then, specify the Microsoft Exchange 5.5 server name and the RMI server name.

   The MAPI client module of the Microsoft Exchange 5.5 content adapter and Microsoft Outlook must be installed on the RMI server.
6. Click **OK** to save these settings.

1.5.3 Sending actions

The Send Action portlet lets you quickly send commands to a client, which will then executed on the client. For example, you can select a command to synchronize e-mail and then select the users or groups of users to which the e-mail is sent. The portlet uses Server Initiated Actions to send the commands to the client.

To send commands:

1. Log on to WebSphere Everyplace Access as an administrator.
2. Select **Administration**, then **WebSphere Everyplace** → **Intelligent Notification Services** → **Send Actions**.
3. Click **Get users**. The screen in Figure 1-24 appears.

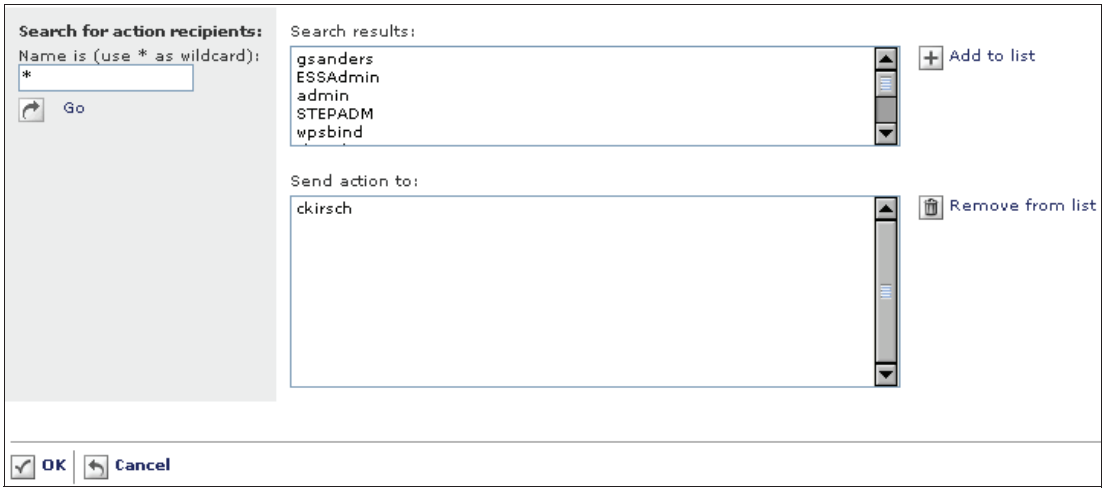

Figure 1-24 Get users

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4. Enter a string to search for users or enter a wildcard (*) to see all users, and click **Go**.
5. Select a user from the search results and click **Add to list**.
6. Repeat these steps for each user who you want to add. To remove a user, select the user, and click **Remove from list**.
7. Click **OK**.
8. Specify an action to send (Figure 1-25). This is the action that you would like the recipient delivery channels to performed.

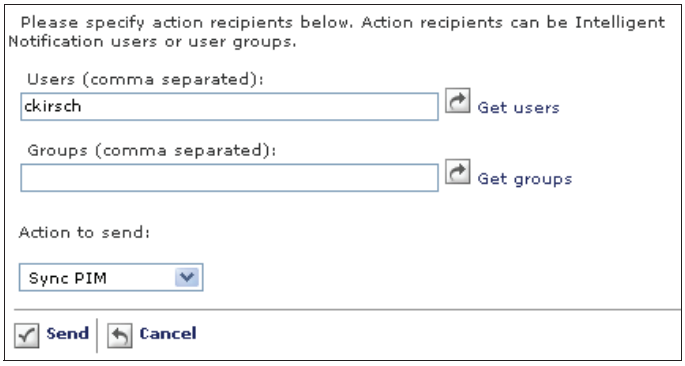

Figure 1-25 Sending an action

9. Click **Send** to send the action.

1.6 Scenarios

The scenarios that are described in this section show two ways to use Intelligent Notification Services. The first example describes how notification about a stock price can be sent to a user. The second example demonstrates sending e-mail notifications from a Lotus Domino Mail server to a user.

To use these scenarios, all delivery channels should be configured. Furthermore, the user should be part of the Intelligent Notification Services group. You define this group during the installation. In the sample installation, it is called `insusers`. If the user is not member of this group, you will not see the Intelligent Notification Services tab in the portal. To add a user to the Intelligent Notification Services user group, see to 1.3.3, “Managing users” on page 15.

To make sure all delivery channels are configured, open the notificationManagerConfig.xml file, which is located in the *ins_home*\config\xml directory, where *ins_home* is in the installation directory, C:\Program

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Files\WebSphere\INS. Sametime and SMTP should be available as delivery channels. If you see lines that have been commented out in this file, you will need to configure these channels as described in 1.3.1, “Channel adapter” on page 12.

1.6.1 Stock example

This scenario sends notifications to a user named `Christian` about stocks when those stocks have reached a specific limit. The user has specified three delivery channels: e-mail, BlackBerry, and the Message Center.

The stock price is simulated by the sample stock feed application, which is part of the Intelligent Notification Services. The stock price information is stored in an XML file. The application reads this file and sends the data to the Subscription Manager.

If the stock price is less than $50, a notification message is sent to the Message Center. If the stock price is higher than $100, a notification message is sent to all three delivery channels.

First, we configure the delivery channels as necessary (for example, supplying which e-mail address or BlackBerry PIN should be used). After that, we configure the stock subscription by specifying which stock should be monitored and at which price the user should be informed. Finally, we configure the sample stock feed application to send the stock information to the Subscription Manager.

Configuring delivery channels

1. Log in to the WebSphere Everyplace Access portal as user `Christian`.
2. Select **Intelligent Notification** → **Setup** → **My Delivery Channels**. The screen shown in Figure 1-26 appears.

Figure 1-26 Add a new e-mail delivery channel

3. Click **Add delivery channel**. The window shown in Figure 1-27 on page 42 appears.
4. Enter the name of this channel. This name is used later to specify which notification should be sent to which delivery channel. We use `e-mail` in this scenario.

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5. Specify an e-mail address to where the notification should sent.

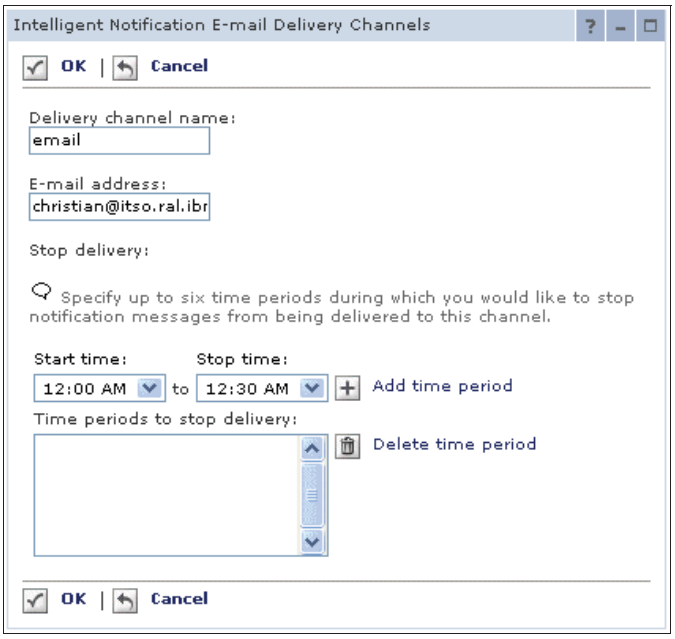

Figure 1-27 Configure e-mail delivery channel

6. Click **OK.**

After the e-mail delivery channel is configured, we configure the BlackBerry delivery channel.

1. Select **Intelligent Notification** → **Setup** → **My Delivery Channels**. The screen shown in Figure 1-28 appears.

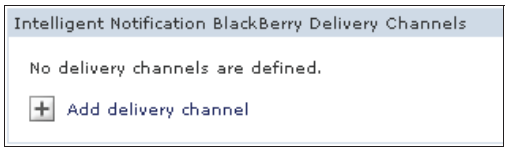

Figure 1-28 Add a new BlackBerry delivery channel

2. Click **Add delivery channel**. The window shown in Figure 1-29 on page 43 appears.
3. Enter the name of this channel. This name is used later to specify which notification should be send to which delivery channel. We use `BlackBerry` in this scenario.

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4. Specify the PIN of your device.

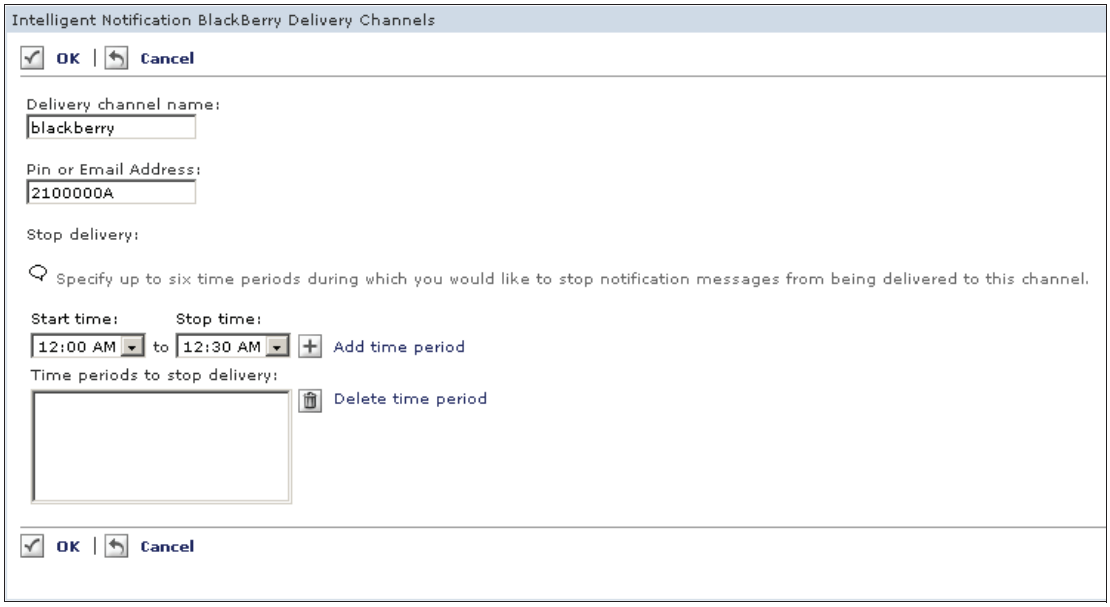

Figure 1-29 Configure BlackBerry delivery channel

Configuring the subscriptions

To configure the subscriptions for this scenario:

1. Logged in as Christian in the WebSphere Everyplace Access portal, go to **Intelligent Notification** → **Setup** → **My Subscriptions**. The screen shown in Figure 1-30 appears.

Figure 1-30 Add a new stock subscription

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2. Click **New**. The window in Figure 1-31 appears.
3. Enter the following information:
   - Enter `CK` as the stock symbol.
   - Select **Less than** and enter `50` in the stock price (points).
   - Select **Always** to receive a notification every time the stock price is less than 50.
   - Select **All of the selected delivery channels** and **Default** as delivery channel.

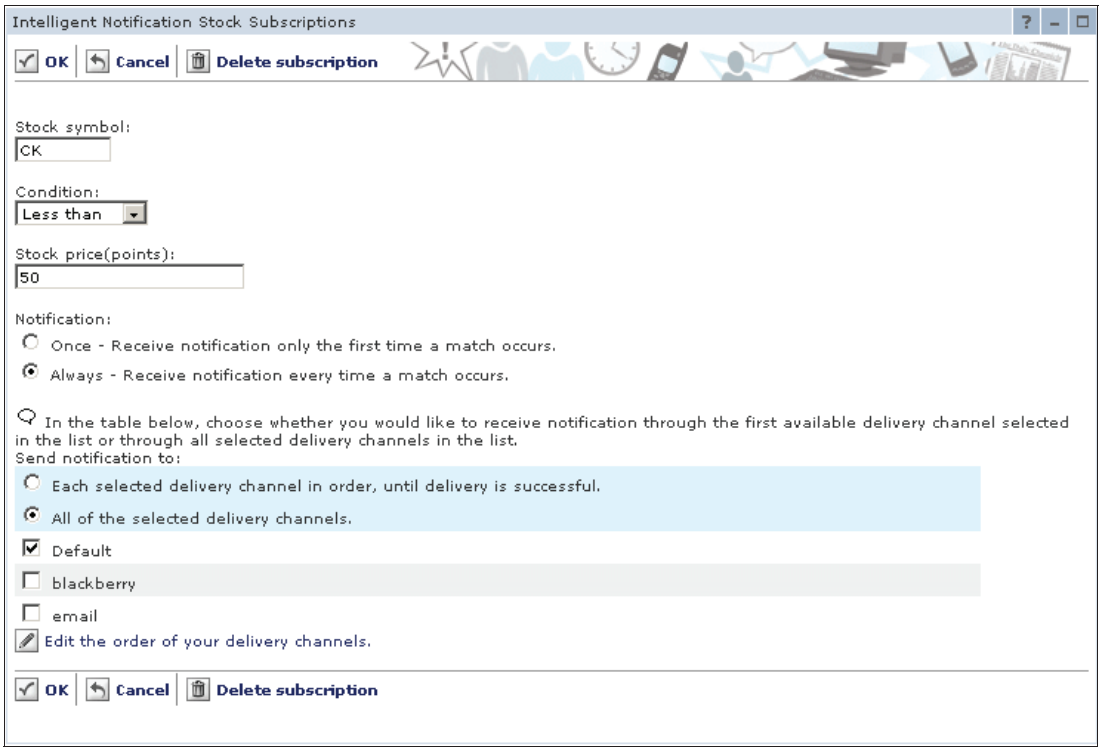

Figure 1-31 Configure the stock subscription

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4. Click **OK.**
5. Click **New**. The window in Figure 1-32 appears.
6. Enter the following information:
   - Enter `CK` as stock symbol.
   - Select **Higher than** and enter `100` in the stock price (points).
   - Select **Always** to receive a notification every time the stock price is higher than 100.
   - Select **All of the selected delivery channels** and **default**, **e-mail**, and **BlackBerry** as delivery channels.

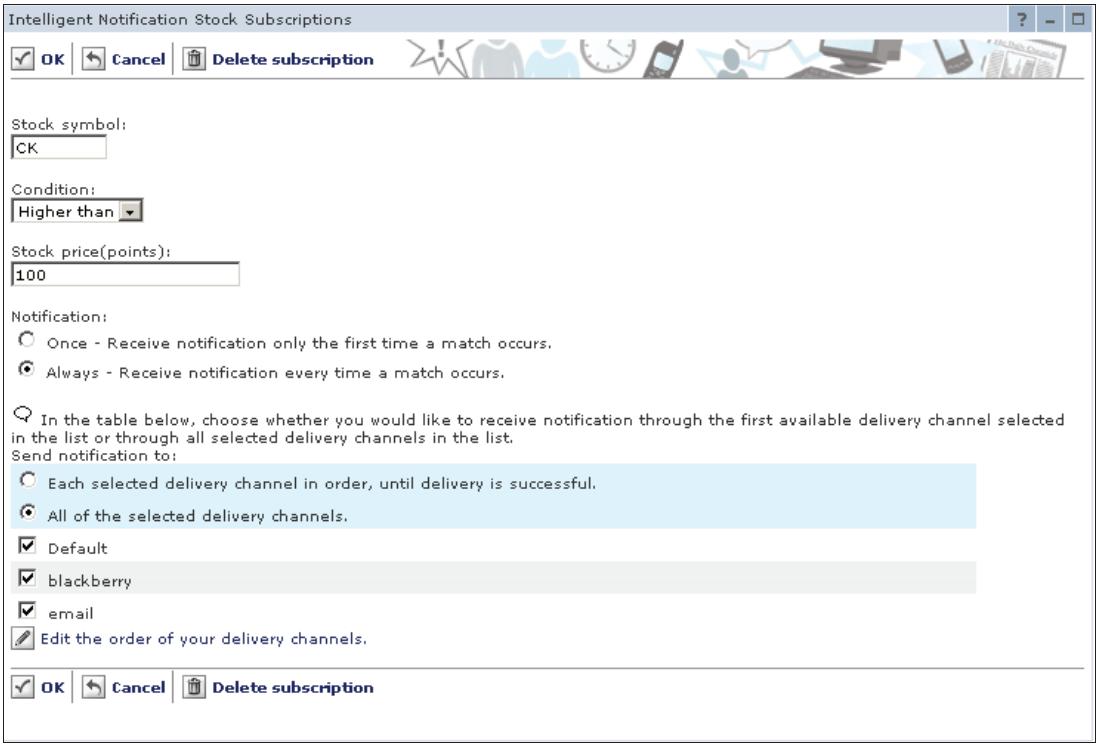

Figure 1-32 Configure the subscription

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7. Click **OK**. You should see two cases for a notification (Figure 1-33).

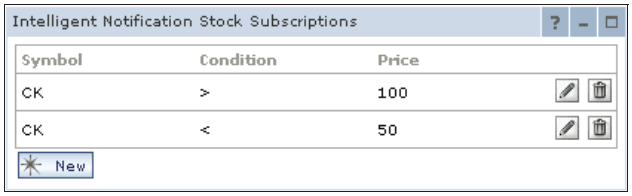

Figure 1-33 Cases for Stock Notification

Configuring the stock content adapter

To configure the stock content adapter:

1. Open the stock1.xml file, which contains the stock information. This file is located in *ins_home*\samples\sm\stock, where *ins_home* is your Intelligent Notification Services installation directory. In the sample installation, it is the C:\Program Files\WebSphere\INS directory.
2. Look for the `<nameval name="timestamp">` element and change the value to ten minutes before the current time that is used on that server.

   ```
   <nameval name="timestamp" type="string">2004-10-11 10:20:03</nameval>
   ```

3. Look for the `<nameval name="last">` element, which contains the last stock price. You should set it to a value less than 50, because that is the condition that was set in the stock subscription.

   ```
   <nameval name="last" type="double">44</nameval>
   ```

4. Save and close the stock1.xml file.

Before we can simulate a stock feed using the content feed application, we have to configure it by performing the following steps:

1. Open the contentfeed.bat file, which is located in the *ins_home*\bin directory, where *ins_home* is your Intelligent Notification Services installation directory. In the sample installation, it is the C:\Program Files\WebSphere\INS directory.
2. In the Environment Setup section of this file, enter the appropriate *ins_home* and *was_home* settings as shown in the following example:

   ```
   rem ----------------------------------------------------------------
   rem Environment setup
   rem ----------------------------------------------------------------

   set INS_HOME=C:\Program Files\WebSphere\INS
   set WAS_HOME=C:\Program Files\WebSphere\AppServer
   ```

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3. Look for the line starting with `"%WAS_HOME%\bin\launchclient"`. Add the property `-CCBootstrapPort=port_number` to the line.

   The modified line should look like the following:

   ```
   "%INS_HOME%\samples\sm\XMLContentPublisher.ear" -CCBootstrapPort=9814
   -CCclasspath="%INS_HOME%\bin;%INS_HOME%\lib\insSmClient.jar" %1
   "%INS_HOME%\samples\sm\%2"
   ```

   The *port_number* is the bootstrap address of the Intelligent Notification Services application server. To determine the port number:

   a. Open the WebSphere Application Server Administrative Console by clicking **Start** → **Program** → **IBM WebSphere** → **Application Server V5.0** → **Administrative Console**.

   b. Expand **Application Servers** → **INSServer** → **End Points** → **Bootstrap Address**.

   c. The port is the value in the **Port** field.

Running the stock application

To run the stock application:

1. In a command prompt, change the directory to *ins_home*\bin and simulate the stock feed by executing the following command:

   ```
   contentfeed stocks stock
   ```

2. Because of the security that was enabled during the installation, you should see the window shown in Figure 1-34.

Figure 1-34 Enter security information

3. Enter your WebSphere Application Server administrative user ID and its password. In the sample installation the user ID and password is `wpsbind`.

4. Log in to the WebSphere Everyplace Access Portal as `Christian` and go to **Intelligent Notification** → **Message Center**.

5. You should see a new message from the STOCK application as shown in Figure 1-35 on page 48.

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Figure 1-35 Stock notification received

6. You can select the new message to see the details (as shown in Figure 1-36).

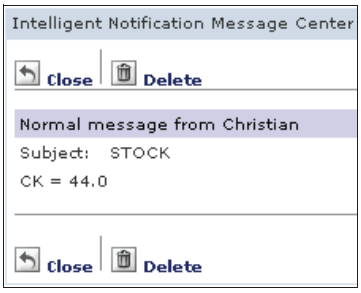

Figure 1-36 Stock notification details

7. Open the stock1.xml file to change the stock price.
8. Change the value to higher than 100, as shown in the following example:

```
<nameval name="last" type="double">120</nameval>
```

9. Change the time to the actual server time, as shown in the following example:

```
<nameval name="timestamp" type="string">2004-10-11 11:20:03</nameval>
```

10. Save and close the file.
11. Run the content feed application again, using this command:

```
contentfeed stocks stock
```

12. Enter your WebSphere Application Server administrative user ID and its password in the security window.

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13. Log in to the WebSphere Everyplace Access Portal as `Christian` and go to **Intelligent Notification** → **Message Center**.

14. You should see a new message from the STOCK application as shown in Figure 1-37.

15. If you open your e-mail client, you should see a stock message also.

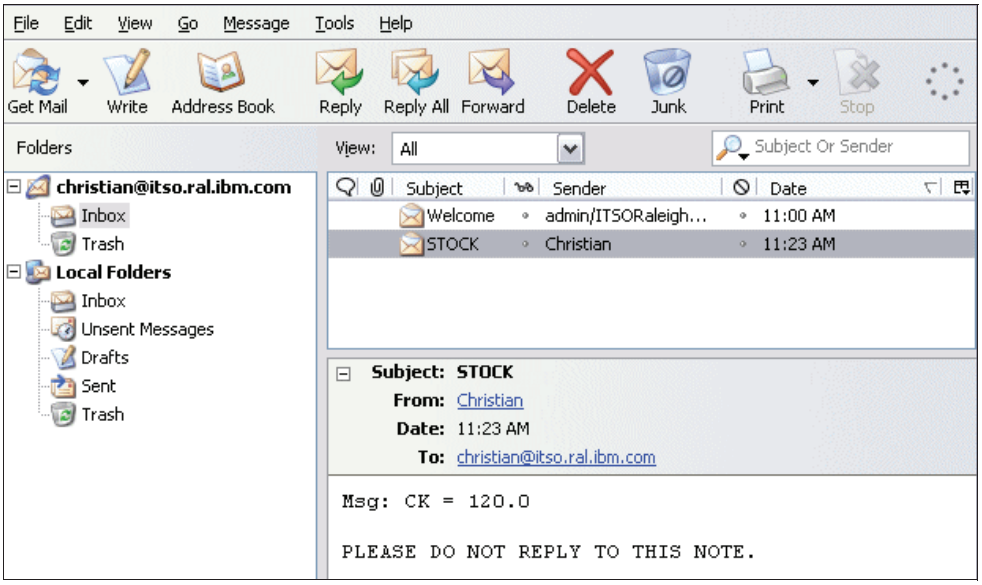

Figure 1-37 Stock notification to e-mail account

16. If click the Messages Icon on your BlackBerry, you should see the message (as shown in Figure 1-38 on page 50).

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Figure 1-38 Stock notification in the BlackBerry emulator

1.6.2 Mail and Calender services

This scenario sends notification to user `Manuel` when new mails arrived in his inbox. The user has defined two delivery channels for this notification: Sametime and the Message Center.

Verifying the requirements

To use the Mail and Calender Services, the Intelligent Notification Services user ID needs access to the mail file that it should monitor. To verify that the mail file of Manuel has the correct permissions:

1. Open Lotus Notes and log in as `manuel`.
2. Open the mail file for manuel.
3. Go to **File** → **Database** → **Access Control...** and give the Intelligent Notification Services administrative user reader access as shown in Figure 1-39 on page 51.
4. Click **OK** and close Lotus Notes.

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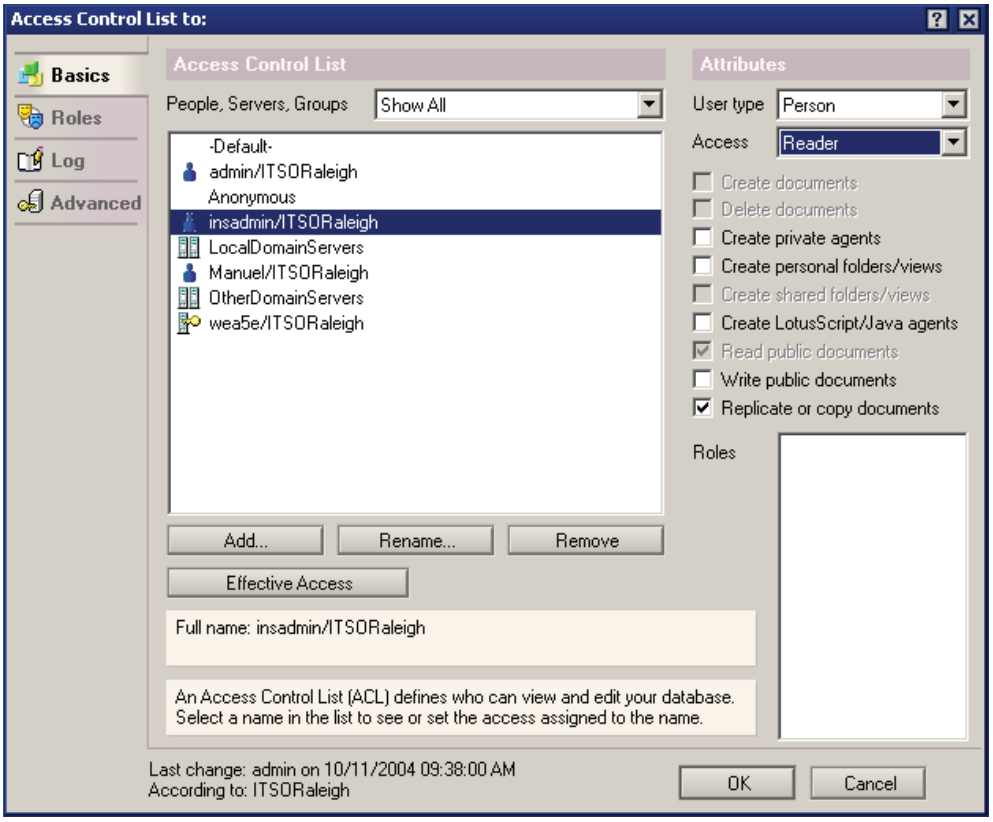

Figure 1-39 Giving permission to the Intelligent Notification Services administrative user

Configuring delivery channels

To configure delivery channels:

1. Log in to the WebSphere Everyplace Access portal as user `Manuel`.
2. Select **Intelligent Notification** → **Setup** → **My Delivery Channels**.

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3. Click **Add delivery channel** in the Intelligent Notification Sametime Delivery Channels portlet as shown in Figure 1-40. The window shown in Figure 1-41 on page 52 appears.

Figure 1-40 Add a new Sametime Delivery Channel

4. Enter the name of this channel. This name is used later to specify which notification should be sent to which delivery channel. This scenario uses `sametime`.
5. Specify the Sametime ID to where the notification should sent.
6. Click **OK**.

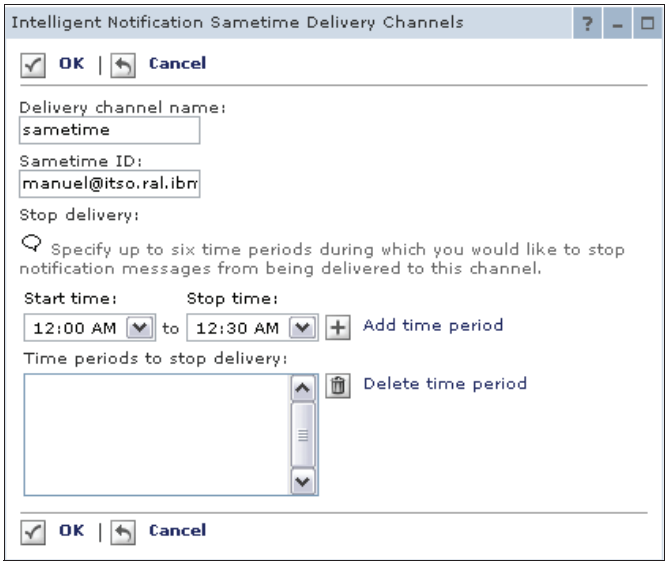

Figure 1-41 Configure Sametime Delivery Channel

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Configuring the subscriptions

To configure the subscriptions:

1. Logged in to the WebSphere Everyplace Access portal as Manuel, go to **Intelligent Notification** → **Setup** → **My Subscriptions**. The screen in Figure 1-42 appears.

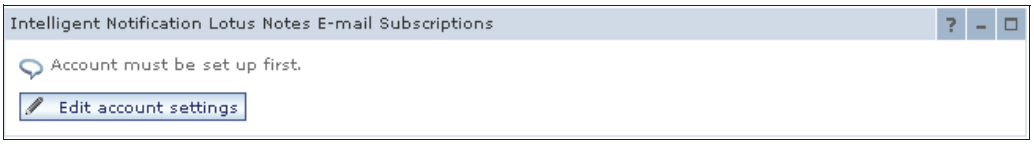

Figure 1-42 Editing account settings

2. Click **Edit account settings** in the Intelligent Notification Lotus Notes e-mail subscriptions portlet. The window in Figure 1-43 appears.

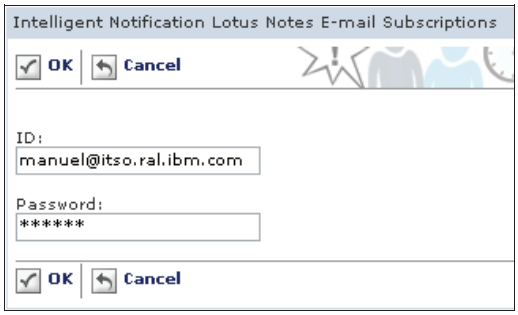

Figure 1-43 Configure Lotus Notes e-mail account settings

3. Enter the e-mail address and the password for the user and click **OK**.
4. Click **New** to create a new mail subscription. The window in Figure 1-44 on page 54 appears.
5. Enter the following information:
   - Leave the From and Subject Fields empty. That means e-mail message with any subject result in a notification.
   - Select **Always** to receive a notification every time a new e-mail arrives.
   - Select **All of the selected delivery channels** and **Default** and **Sametime** as delivery channels.
6. Click **OK.**

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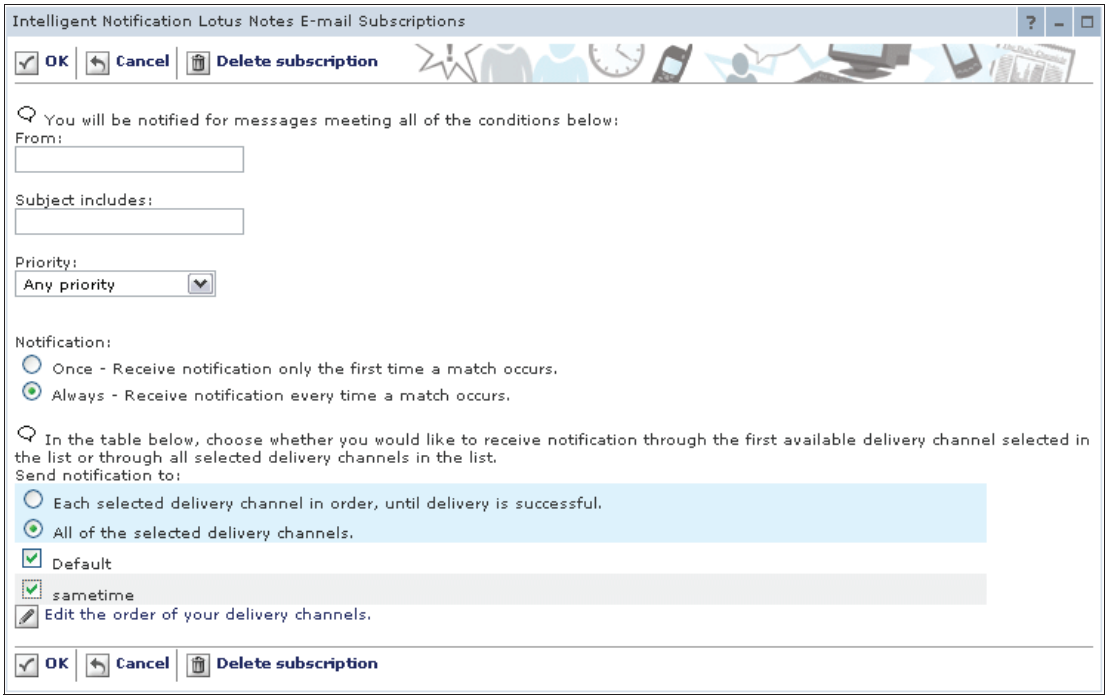

Figure 1-44 Configuring the subscription

Receiving e-mail notification

To receive e-mail notifications with Sametime:

1. Log in to Sametime.
2. Send an e-mail to user Manuel as shown in Figure 1-45 on page 55.

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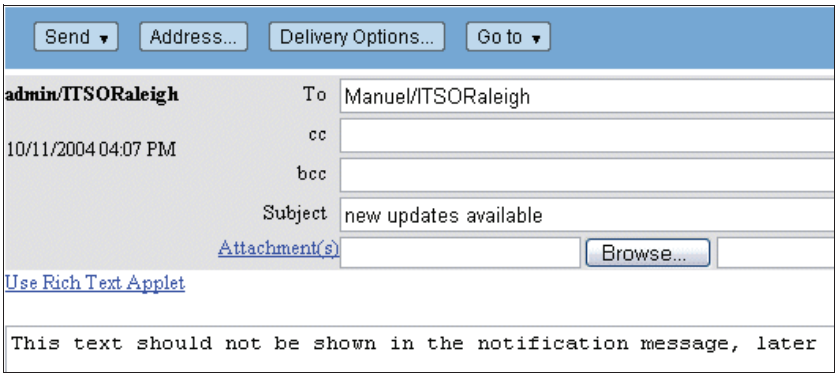

Figure 1-45 Composing an e-mail

3. After some minutes, you will see a notification in the Message Center and on Sametime as shown in Figure 1-46.

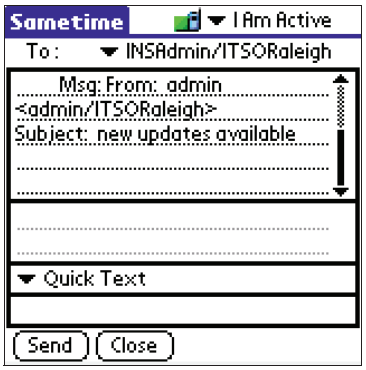

Figure 1-46 Lotus Notes e-mail notification

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2

Simple notifications

This chapter provides instructions on how to develop custom applications to send simple notifications using the application programming interface (API) that is provided by Intelligent Notification Services in WebSphere Everyplace Access.

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2.1 Overview of simple notifications

Simple notifications are messages that originate from other users or applications. The Message Center portlet provides Intelligent Notification users with a place to send and receive simple notifications. In addition to that, Intelligent Notification Services includes an API that lets developers build simple notification functionality into any kind of application.

This section describes simple notifications that are implemented in the Intelligent Notification Services component of WebSphere Everyplace Access. Figure 2-1 illustrates the basic architecture of this function where messages are sent from other applications to users with one or more channel delivery options.

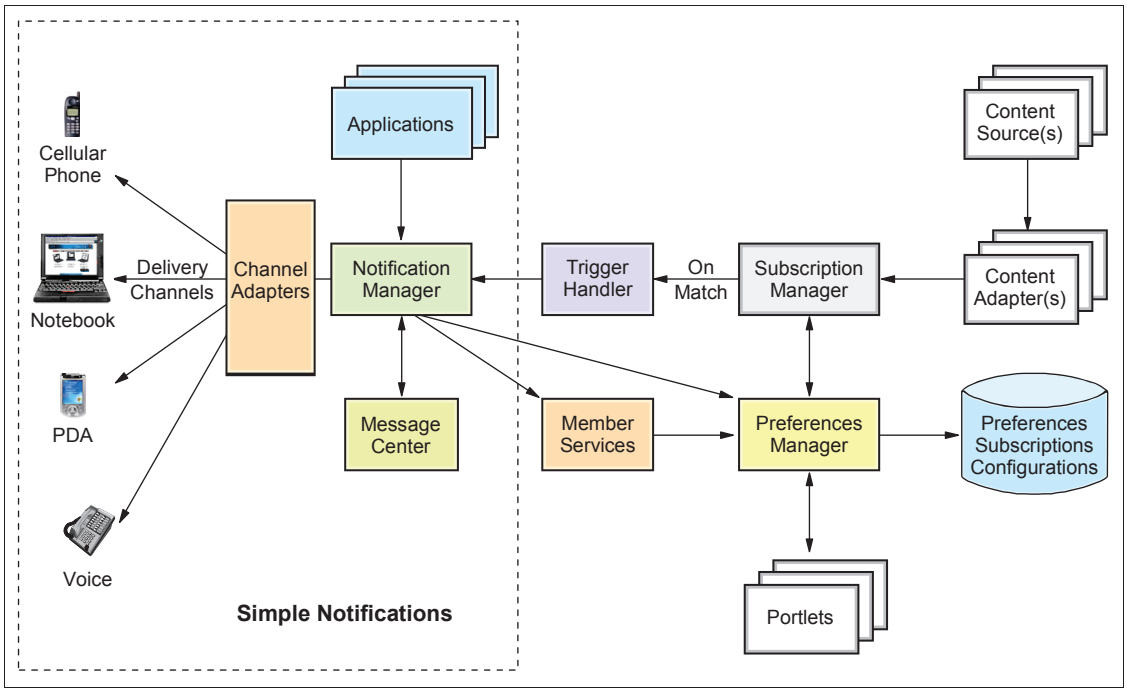

Figure 2-1 Simple notifications in Intelligent Notification Services

Simple notification applications build messages with information about the sender, recipient, message content, and delivery preferences. These messages are sent to the Notification Manager using CORBA/IIOP. The Notification Manager queries the recipient's preferences, or uses the preferences that specified by the application, and sends out a notification that is based on those preferences. The notification is delivered via the appropriate channel adapter to the specified delivery channel.

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The steps to implement a simple notification functionality in an application are:

1. Include in the Java classpath the Intelligent Notification Services JAR files insUtil.jar and insNmClient.jar. These JAR files are located in the directory *ins_home*\lib, where *ins_home* is in the installation directory, C:\Program Files\WebSphere\INS.
2. Import the following packages:
   - javax.naming.Context
   - java.util.*
   - com.ibm.pvc.ins.nm.client.*
   - com.ibm.pvc.ins.nm.server.Request
   - com.ibm.pvc.ins.nm.server.NotificationService

   Note: The imported Intelligent Notification Services packages are part of the *ins_home*\lib\insNmClient.jar file, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

3. Create a Notification Manager client instance.

   The NmClientFactory class allows you to create a local Enterprise JavaBean (EJB) or a remote EJB for the Notification Manager client instance. You must specify a context provider URL to create this instance. By default, it is corbaloc:iiop:localhost:2809. However, it is possible to specify an alternate context provider URL.

   The context provider URL is specified in the XML file insBaseConfig.xml that is located in *ins_home*\config\xml, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

   The available methods to create a Notification Manager client instance are:

   - createLocalNmClient(): creates a local instance using default initial context provider URL of corbaloc:iiop:localhost:2809
   - createLocalNmClient(java.util.Hashtable): creates a local instance using context provider URL specified.
   - createRemoteNmClient(): creates a remote instance using default initial context provider URL of corbaloc:iiop:localhost:2809
   - createRemoteNmClient(java.util.Hashtable): creates a remote instance using context provider URL specified.
4. Create a notification object, which is necessary to build the message.

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5. Set up the sender, recipient, message contents, and delivery preferences into the notification object.

   Some of the most important and available methods are:

   – addDeliveryChannel (Delivery Channel): adds the specified delivery channel to the list of channels notification through which messages are delivered.
   – addDeliveryChannel(java.lang.String): adds the specified delivery channel to the list of channels notification through which messages are delivered. The parameter specifies either the delivery channel name (“dcname#name”) or protocol type (“type”).
   – setBinaryMsgType(): sets the message content type to binary.
   – setMultiDevices(boolean): specifies whether the message is delivered to all of the recipients through available delivery channels or if the message is delivered to each of the recipients delivery channels in order, until delivery is successful.
   – setTextMsgType(): sets the message content type to text.
   – setFromUserID(java.lang.String): sets the user ID of the message sender.
   – setMsgPriority(int): sets the priority of the message.
   – setMsgText(java.lang.String): sets the text of the message.
   – setSubjectText(java.lang.String): sets the subject of the message.
   – setToGroupID(java.lang.String): sets the group ID of the message recipients.
   – setToUserID(java.lang.String): sets the user ID of the message recipient.

6. Pass the message to the Notification Manager.

   The sendMessage(Notification) method delivers a notification to the Notification Manager. This method belongs to the NotificationService interface and the NotificationServiceLocal interface, depending the kind of Notification Manager client instance created (local or remote).

Note: For more information about Intelligent Notification Services classes and methods, refer to the Javadoc documentation in *ins_home*\javadoc\insjavadoc.jar, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

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2.1.1 Delivery preferences in simple notifications

Simple notification applications set up delivery preferences in the message notifications, overriding the recipient's preferences. You should consider the following points when designing and implementing a simple notification application:

- In the general case, preferences are set by the simple notification applications, and these preferences are considered instead of the associated recipient's preferences.
- You need to consider the following issues when the simple notification application specifies the delivery channels:
  - Messages are delivered only to delivery channels that are specified by the application and configured by the recipient. Delivery channels that are specified by the application but not configured by the recipient are discarded.
  - If the simple notification application specifies setMultiDevices(false), messages are delivered to each of the delivery channels that are specified by the application until message delivery is successful.
  - The My Message Rules and Stop delivery options in the delivery channel configuration are not considered.
- When a simple notification application does not specify delivery channels, the recipient's delivery channels and preferences are considered.
- If the recipient in a simple notification application is a user group, the specified sender must have this group added to the My User Groups option in the Intelligent Notification Services module.

2.2 Sample scenario

The sample scenario included in this chapter shows how to develop and deploy a simple notification portlet using WebSphere Studio Site Developer and using the Java APIs that are provided by Intelligent Notification Services. The provided sample portlet allows you to send simple notifications to any Intelligent Notification Services user or group in a WebSphere Everyplace Access server.

Note: The sample scenario included in this chapter uses a portlet application distributed as a WAR file. However, you can also send simple notifications from Web applications and other stand-alone applications.

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2.2.1 Description

The following is a detailed description of the sample scenario:

- The portlet has a form that allows you to enter the following information:
  - Sender ID
  - Recipient (user ID or user group)
  - Message priority
  - Subject
  - Message content

  The form includes a Send Message button to submit the simple notification.
- Notifications are built and delivered to the Notification Manager component of Intelligent Notification Services when the Send Message button is selected.
- A message appears in the form when a notification has been sent.
- The following values are set directly by the portlet:
  - Delivery channels: Message Center, e-mail, and Sametime.
  - Messages are delivered to all of the selected delivery channels.
  - Message content type is text.
- The portlet can be accessed from desktop Web browsers and Pocket PCs (optional)

Note: If you want to show and display the preferences of a selected recipient in your simple notification portlet, these preferences must be stored in a custom database. The portlet queries the recipient's preferences in this database to show them in the form.

The following resources are needed for this scenario:

- Development
  - WebSphere Studio Site Developer (WSSD) or WebSphere Studio Application Developer (WSAD).
  - Everyplace Toolkit 5.0.1 for WebSphere Studio.
- Deployment
  - WebSphere Everyplace Access V5.0 server with Intelligent Notification Service installed and working properly.
  - An Intelligent Notification Services user configured in WebSphere Everyplace Access server with Message Center, e-mail, and Sametime delivery channels configured. This user must have at least one Intelligent

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Notification Services user group created. The following values are used in this scenario:

- Intelligent Notification Services user ID: GRB
- Intelligent Notification Services user group name: Friends
- Users belonging to the Friends group: ANG and MRR. These users must be Intelligent Notification Services users.

Refer to Chapter 1, “Intelligent Notification Services” on page 1 for details on how to create and configure Intelligent Notification Services users and groups.

– WebSphere Portal server or WebSphere Everyplace Access server where you install and run the simple notification sample portlet.

> **Note:** You can also install the sample portlet in the same WebSphere Everyplace Access server that is running Intelligent Notification Services.

– A Pocket PC device or Pocket PC emulator is needed to access the sample portlet (optional).

2.2.2 Sample application development

This section explains how to develop a simple notification portlet using WebSphere Studio Site Developer.

1. Create a Portlet Application Project:
   a. Start IBM WebSphere Studio Site Developer and select **File** → **New** → **Project**.
   b. Select **Portlet Development** from the left panel and **Portlet Application Project** from the right panel. Click **Next**.
   c. Enter a project name. In this example it is `SimpleNotification`. Select the options **Create basic portlet** and **Configure advanced options**. Click **Next**.
   d. Set the Enterprise Application project settings, context root, and J2EE level. Take the default values for this example. Click **Next**.
   e. Define the general settings of the basic portlet. Take the default values for this example. Click **Next**.
   f. Define the event handling options of the portlet. Take the default values for this example. Click **Next**.

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g. Define the single sign-on options of the portlet. Take the default values for this example. Click **Next**.

h. Select miscellaneous options of the portlet. For this example select the **Add pda markup support** option. Click **Finish** to create the project.

2. Include in the Java classpath the Intelligent Notification Services JAR files insUtil.jar and insNmClient.jar that are located in the *ins_home*\lib directory, where *ins_home* is in the installation directory, C:\Program Files\WebSphere\INS.

   a. Right click **Project Name** → **Properties** → **Java Build Path** → **Libraries**.

   b. Click **Add External JARs...** and browse the JAR files.

   c. Click **OK**. The portlet structure in the Project Navigator panel of the WebSphere Studio Site Developer should be similar to the structure that is shown in Figure 2-2 on page 65.

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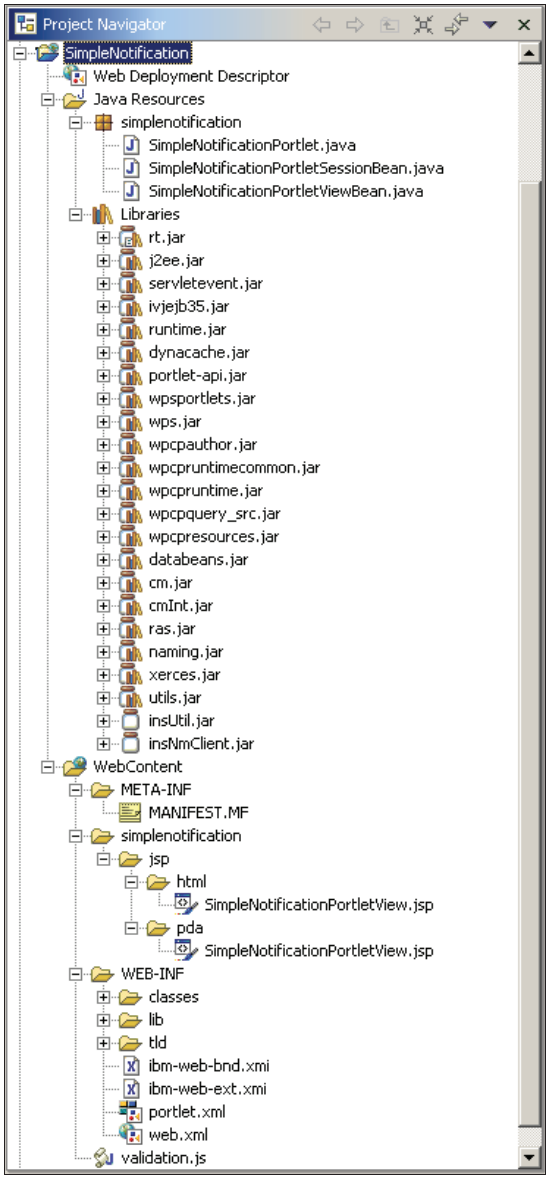

Figure 2-2 Simple notification portlet structure in WebSphere Studio

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3. Open and modify the portlet Java file. In our example is SimpleNotificationPortlet.java file.

   a. Include a constant for each field in the form, as shown in Example 2-1.

Example 2-1 Public constants

```
public class SimpleNotificationPortlet extends PortletAdapter implements
ActionListener {
   public static final String FROMUID          =
"simplenotification.SimpleNotificationPortletFromUID";
   public static final String TO =
"simplenotification.SimpleNotificationPortletTo";
   public static final String TOUID            =
"simplenotification.SimpleNotificationPortletToUID";
   public static final String TEXT             =
"simplenotification.SimpleNotificationPortletText";
   public static final String SUBJECT          =
"simplenotification.SimpleNotificationPortletSubject";
   public static final String PRIORITY=
"simplenotification.SimpleNotificationPortletPriority";
```

   b. In the actionPerformed method, set all the fields of the form in the session bean, as shown in Example 2-2.

Example 2-2 Set fields in session bean

```
public void actionPerformed(ActionEvent event) throws PortletException {
   if( getPortletLog().isDebugEnabled() )
      getPortletLog().debug("ActionListener - actionPerformed called");
   String actionString = event.getActionString();
   PortletRequest request = event.getRequest();
   SimpleNotificationPortletSessionBean sessionBean = getSessionBean(request);
   if( FORM_ACTION.equals(actionString) ) {
      sessionBean.setFormFromUID(request.getParameter(FROMUID));
      sessionBean.setFormTo(request.getParameter(TO));
      sessionBean.setFormToUID(request.getParameter(TOUID));
      sessionBean.setFormText(request.getParameter(TEXT));
      sessionBean.setFormSubject(request.getParameter(SUBJECT));
      sessionBean.setFormPriority (request.getParameter(PRIORITY));
      sessionBean.setFlag(true);
   }
}
```

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4. Open and modify the portlet session bean Java file. In our example it is the SimpleNotificationPortletSessionBean.java file.

   a. Import required packages, as shown in Example 2-3.

Example 2-3 Import packages

```
import javax.naming.Context;
import java.util.*;

import com.ibm.pvc.ins.nm.client.*;
import com.ibm.pvc.ins.nm.server.NotificationServiceLocal;
import com.ibm.pvc.ins.nm.server.Request;
import com.ibm.pvc.ins.nm.server.NotificationService;
```

   b. Declare variables and define set and get methods for all the fields in the form, as shown in Example 2-4.

Example 2-4 Variables and methods for the fields

```
public class SimpleNotificationPortletSessionBean {
   private String formText = "";
   private String formSubject = "";
   private String formTo = "";
   private String formToUID = "";
   private String formFromUID = "";
   private String formPriority = "";
   private boolean flag = false;

   public void setFormText(String formText) {
      this.formText = formText;
   }

   public void setFormSubject(String formSubject) {
      this.formSubject = formSubject;
   }

   public void setFormTo(String formTo) {
      this.formTo = formTo;
   }

   public void setFormToUID(String formToUID) {
      this.formToUID = formToUID;
   }

   public void setFormFromUID(String formFromUID) {
      this.formFromUID = formFromUID;
   }

   public void setFormPriority(String formPriority) {
      this.formPriority = formPriority;
```

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```
}

public void setFlag(boolean flag){
   this.flag = flag;
}

public String getFormText() {
   return this.formText;
}

public String getFormSubject() {
   return this.formSubject;
}

public String getFormTo() {
   return this.formTo;
}

public String getFormToUID() {
   return this.formToUID;
}

public String getFormFromUID() {
   return this.formFromUID;
}

public String getFormPriority() {
   return this.formPriority;
}

public boolean getFlag() {
   return this.flag;
}
```

c. Define a method that sets up message information and delivery preferences, and send this message to the Notification Manager. In the example, this method is named getResults.

d. Declare some auxiliary variables for the message ID, WebSphere Everyplace Access server name and the associated communication port (Example 2-5 on page 69). The last two variables are used to build the provider URL that is required for the communication between the portlet and the Notification Manager component in the WebSphere Everyplace Access server.

   The context provider URL is specified in the XML file insBaseConfig.xml that is located in *ins_home*\config\xml, where *ins_home* is the Intelligent Notification Services home installation directory (for example, C:\Program Files\WebSphere\INS).

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Example 2-5 getResults method and auxiliary variables

```
public String getResults() {
   String msgID = null;
   int ipriority =0;
   String hostName = "wea5d.itso.ral.ibm.com";
   String port = "9814";
   String providerUrl = "corbaloc:iiop:" + hostName + ":" + port;
```

e. Create a remote Notification Manager client instance, as shown in Example 2-6.

Example 2-6 Notification Manager client instance

```
   NotificationService nmClient = null;
   try {
      Hashtable env = new Hashtable();
      env.put (Context.PROVIDER_URL, providerUrl);
      nmClient = NmClientFactory.createRemoteNmClient(env);
```

f. Create a Notification object and set up the message information and delivery preferences, as shown in Example 2-7.

Example 2-7 Notification object

```
      Notification notf = new Notification();
      notf.addDeliveryChannel (new MessageCenterDeliveryChannel() );
      notf.addDeliveryChannel (new SametimeDeliveryChannel() );
      notf.addDeliveryChannel (new EmailDeliveryChannel() );
      if (formPriority.equals("MSG_PRIORITY_DEFAULT"))
            ipriority = Request.MSG_PRIORITY_DEFAULT;
      if (formPriority.equals("MSG_PRIORITY_FYI"))
            ipriority = Request.MSG_PRIORITY_FYI;
      if (formPriority.equals("MSG_PRIORITY_NORMAL"))
            ipriority = Request.MSG_PRIORITY_NORMAL;
      if (formPriority.equals("MSG_PRIORITY_URGENT"))
            ipriority = Request.MSG_PRIORITY_URGENT;
      notf.setMsgPriority(ipriority);
      notf.setMultiDevices(true);
      notf.setTextMsgType();
      if (formTo.equals("UserID"))
         notf.setToUserID(formToUID);
      if (formTo.equals("UserGroup"))
         notf.setToGroupID(formToUID);
      notf.setFromUserID(formFromUID);
      notf.setSubjectText(formSubject);
      notf.setMsgText(formText);
```

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g. Send the message to Notification Manager, as shown in Example 2-8.

Example 2-8 Send message to Notification Manager

```
msgID = nmClient.sendMessage(notf);
return "The message has been sent";
```

h. Finally, catch the exceptions, as shown in Example 2-9.

Example 2-9 Exceptions

```
      catch (NmClientFactoryException cfe)
      {
         return "NmClientFactoryException encountered" + " " +
cfe.getMessage();
      }
      catch (Exception e) {
         return "Exception ocurred" + " " + e.getMessage();
      }
```

5. Open and modify the JSP file that is located in the html subfolder (Figure 2-3 on page 71). In this example, it is the SimpleNotificationPortletView.jsp file. In that file:

   a. Define a form and include the required fields to obtain information about the message and delivery preferences.

   b. Invoke the method that you created earlier to send the message to the Notification Manager.

   Optionally, you can create a JSP file to use with Pocket PC. The JSP file for Pocket PC is located in the pda subdirectory, as shown in Figure 2-3 on page 71.

6. Save the project.

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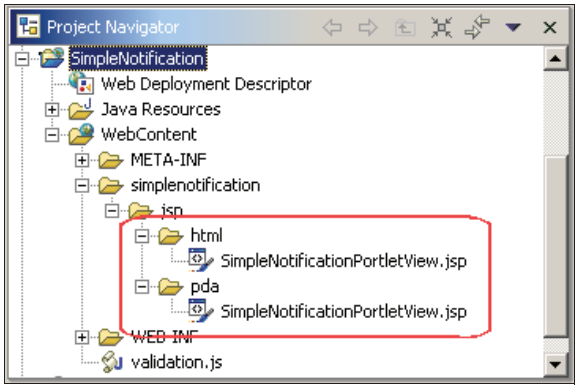

Figure 2-3 Location of JSP files

2.2.3 Running the sample scenario

To deploy and run the simple notification portlet:

1. From WebSphere Studio, export the project into an external WAR file.
2. Log in to the Portal server as Administrator, where the sample portlet runs and installs the portlet using the WAR file that you created earlier.
3. Add the portlet to a page as illustrated in Figure 2-4 on page 72 (from a Web browser) and Figure 2-5 on page 72 (from a PDA browser).

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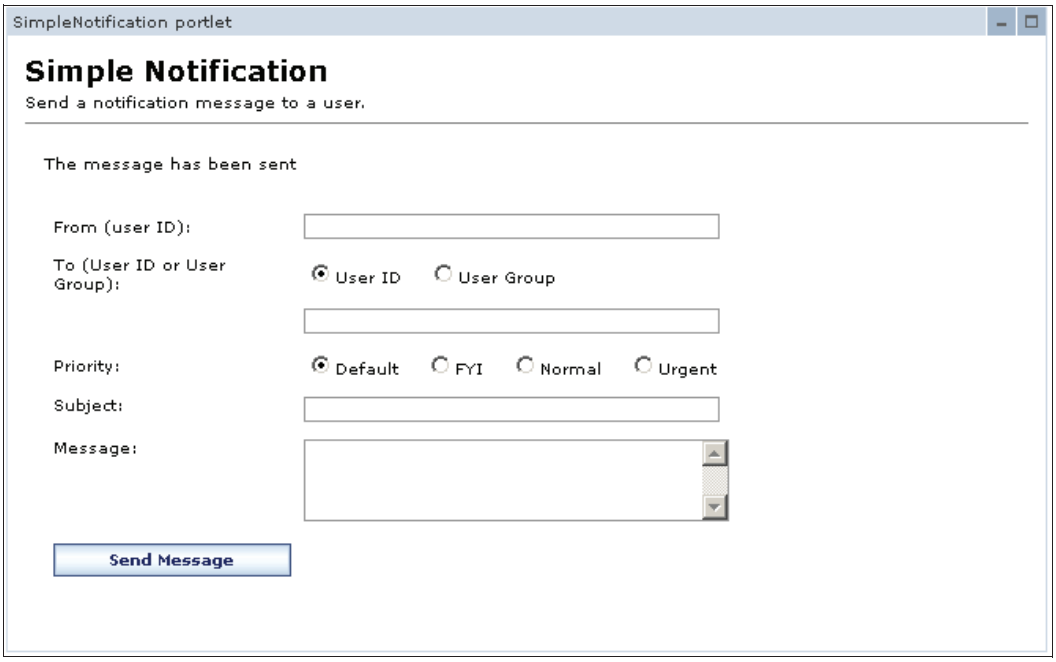

Figure 2-4 Simple notification portlet (from a Web browser)

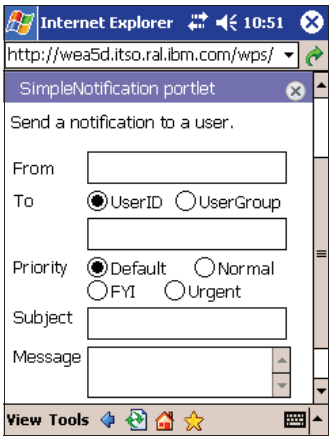

Figure 2-5 Simple notification portlet (from a PDA browser)

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Note: For more information about portlet installation procedures, refer to *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume I: Installation and Administration*, SG24-6462.

Sending a simple notification to a user

Once the sample portlet has been deployed, execute the following steps to send simple notifications:

1. Login to the Portal server where simple notification portlet has been installed.
2. Go to the page where portlet is located.
3. Fill out the simple notification form.
   - The sender can be any identification string. In this example it is called the tester user.
   - Select the user ID option
   - The recipient must be an Intelligent Notification Services user in the WebSphere Everyplace Access server. In this example the user ID is GRB.
   - Write a subject and a message content.
4. Send the message (Figure 2-6 on page 74)

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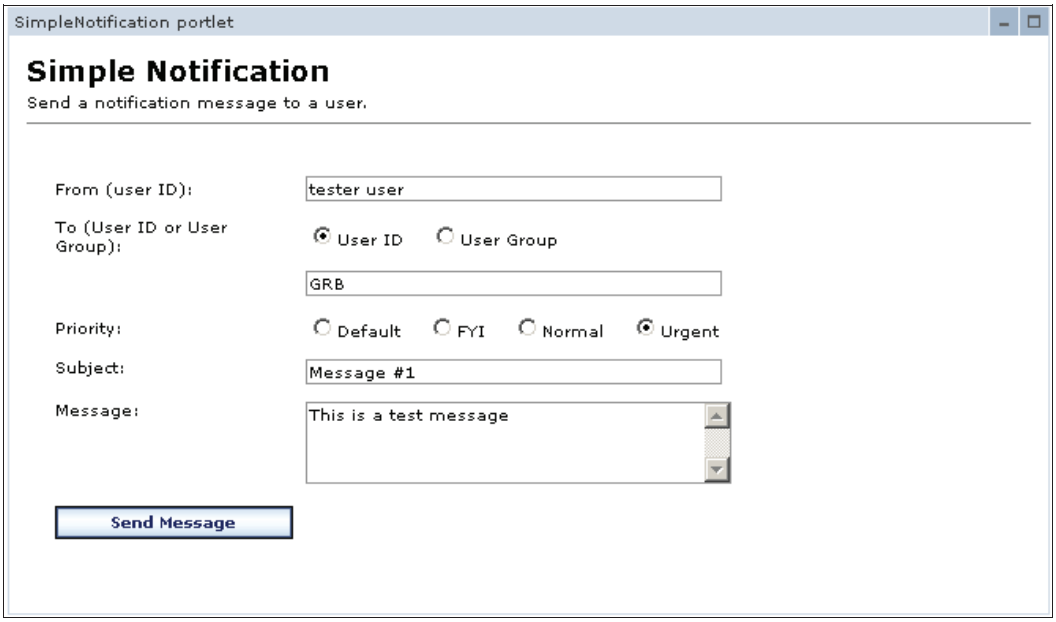

Figure 2-6 Sending a simple notification to an Intelligent Notification Services user

5. Log in to the WebSphere Everyplace Access server as the message recipient user (in this example GRB) and review the Message Center, e-mail and Sametime delivery channels.
6. The message appears in the selected delivery channels. Figure 2-7 illustrates the notification in the Message Center delivery channel.

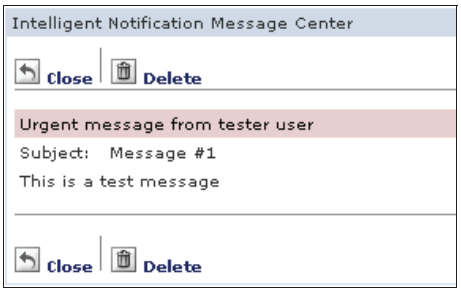

Figure 2-7 Message Center delivery channel

7. Figure 2-8 on page 75 illustrates the notification in the E-mail delivery channel.

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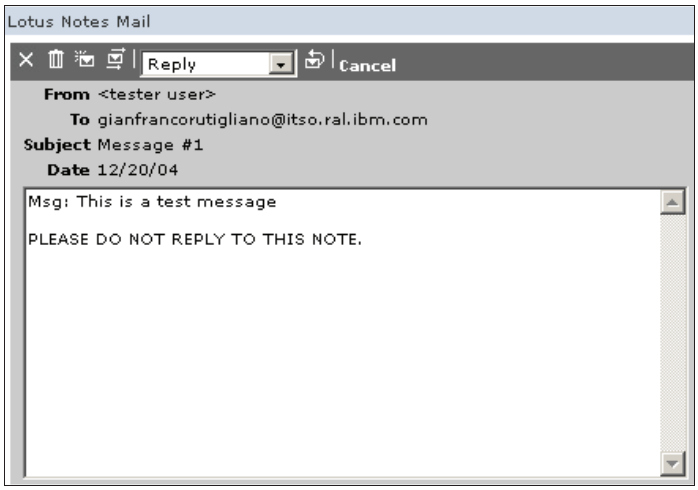

Figure 2-8 E-mail delivery channel

8. Figure 2-9 illustrates the notification in the Sametime delivery channel.

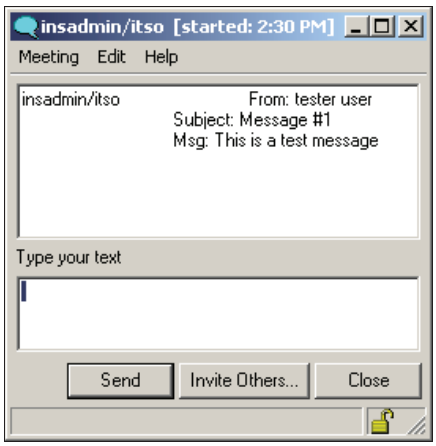

Figure 2-9 Sametime delivery channel

Sending a simple notification to a user group

To send a simple notification to a user group, follow these steps:

1. Log in to the Portal where simple notification portlet has been installed.
2. Go to the page where the portlet is located.

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3. Fill out the simple notification form.
   - The sender must be an Intelligent Notification Services user of the WebSphere Everyplace Access Server with a User group configured. In this example it is GRB
   - Select the User Group option
   - The recipient must be an Intelligent Notification Services user group. In this example the user group is called Friends
   - Write a subject and a message content
4. Send the message (Figure 2-10). The message will be delivered to the delivery channels configured for the users belonging to the recipient group.

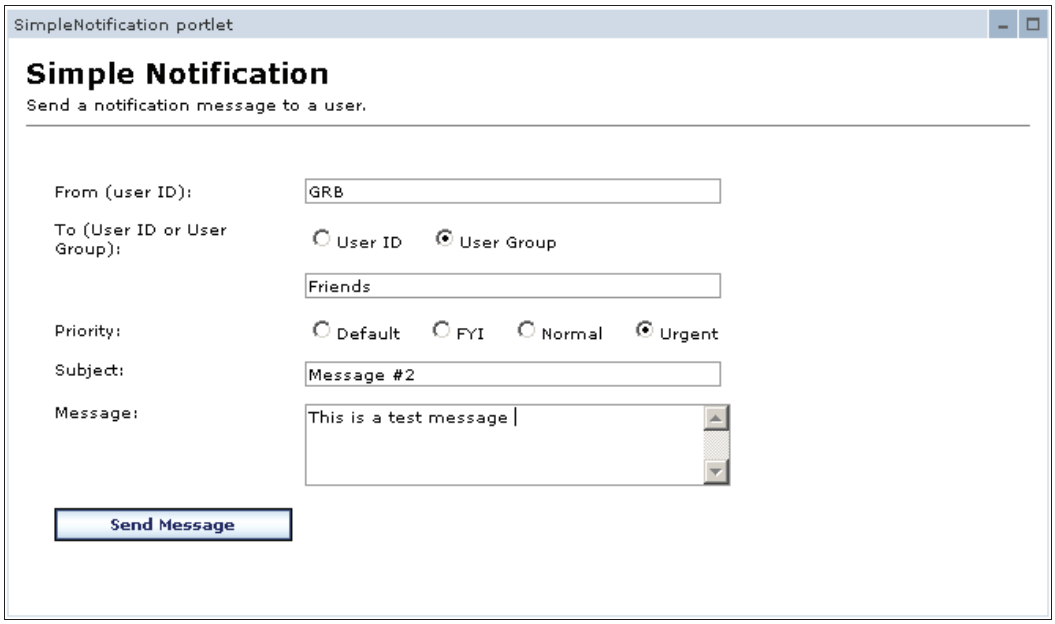

Figure 2-10 Sending a simple notification to a Intelligent Notification Services User group

5. Log in to the WebSphere Everyplace Access server as a user belonging to the recipient group and review the delivery channels configured by this user. In this example the user IDs are ANG and MRR and the delivery channels configured are Message Center, e-mail and Sametime (Figure 2-11 on page 77, Figure 2-12 on page 77 and Figure 2-13 on page 78).

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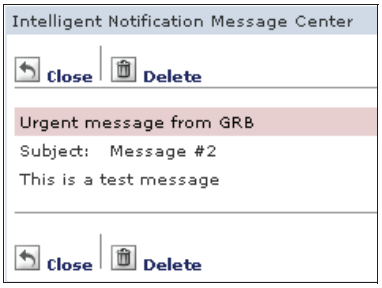

Figure 2-11 Message Center delivery channel

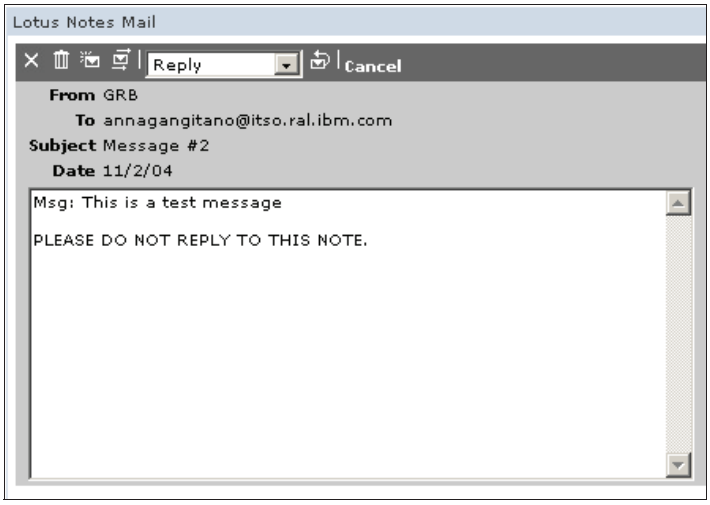

Figure 2-12 The e-mail delivery channel

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Figure 2-13 Sametime delivery channel

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3

Subscription-based notifications

This chapter explains how to develop and deploy custom subscription portlets using the Application Programming Interface (API) that is provided by Intelligent Notification Services. Subscription portlets allow Intelligent Notification Services users to subscribe to content source notifications. This chapter also includes a sample scenario that illustrates the development of a common application that implements intelligent notifications.

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3.1 Overview of subscription-based notifications

Subscription-based notifications are messages that are triggered by events to which the user subscribes. Subscriptions allow users to specify filters in order to be notified when certain events occur or information becomes available. Examples of subscription-based notifications include an alert when a certain stock goes above a certain value or information about the latest forecast for a particular city.

Intelligent Notification Services users can add, edit, and delete subscriptions. One subscription can define:

- The content matching criteria
- Whether notification should be sent once or always
- The selected delivery channels
- Whether all or first successful delivery channel are notified

Subscription-based notifications functionality is the core of the Intelligent Notification Services component of WebSphere Everyplace Access. Figure 3-1 illustrates the basic architecture of this function.

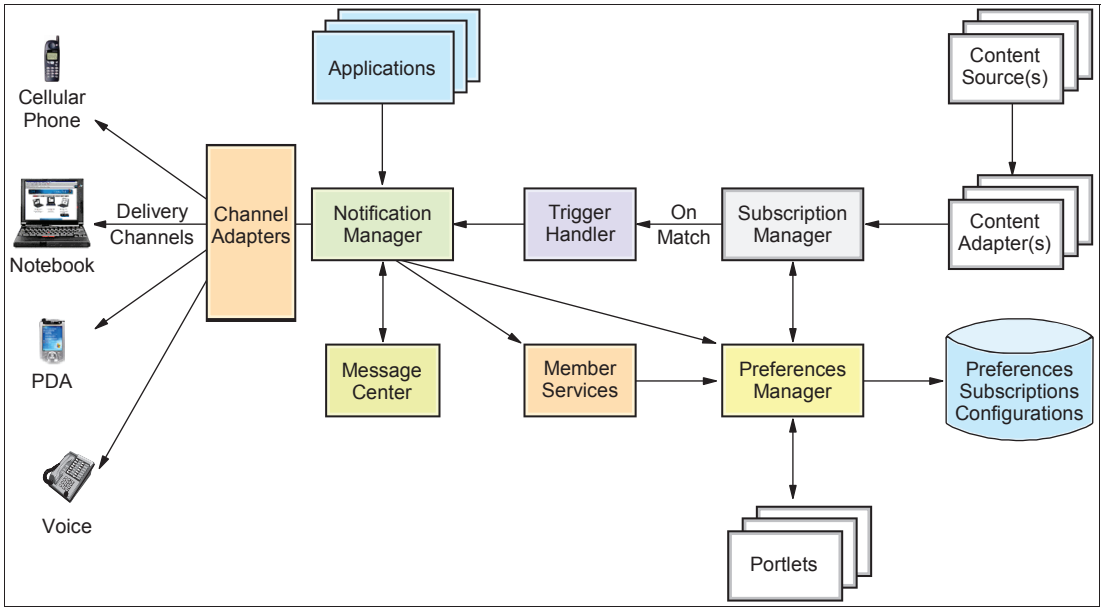

Figure 3-1 Subscription-based notifications in Intelligent Notification Services

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In general, the flow for subscription-based notifications is as follows:

1. The Subscription Manager gets information from new subscriptions and stores it in a database.
2. Periodically, content adapters send data from content sources to the Subscription Manager.
3. The Subscription Manager matches the stored subscriptions against the content data.
4. If a match occurs, an action is taken by the trigger handler. Most of the time, a notification is sent to the Notification Manager.
5. The Notification Manager sends out a notification that is based on the recipient's preferences through the delivery channels that are specified.

To develop a new Intelligent Notification Services subscription application, you should consider these components:

- The content adapter, which collects data from an information source and converts it into the appropriate format to be read for the Subscription Manager. A content source is required for content application as input data. Content sources can be data feeds, databases or information generated by an application.
- The subscription portlet, which allows users to subscribe to content source notifications. It allows subscribers to add, edit, and delete subscriptions.
- The trigger handler, which composes a notification when a content match occurs and passes it to the Notification Manager. Trigger handlers are involved in adding, modifying, and deleting subscriptions. Each subscription has a trigger handler which is associated with it.

Note: For more information about Intelligent Notification Services components, see Chapter 1, "Intelligent Notification Services" on page 1.

3.2 Sample scenario

The following scenario shows how to develop and deploy a subscription portlet to generate subscription-based notifications using WebSphere Studio. This sample scenario consists of a Monitoring Server subscription that allows users to be notified periodically of the HTTP service status on determined servers.

The possibilities for server status are:

- All servers are up.
- At least one server is down.
- All servers are down.

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The components of this scenario are:

- A content adapter

  The content adapter periodically receives a string that contains the status of a determined group of servers. There is a content source program which monitors the HTTP service status of the servers every five minutes and sends this information to the content adapter. The content adapter transforms the server status string into an appropriately formatted XML document and publishes it to the Subscription Manager.

  The content adapter runs periodically waiting for data from the content source program and is deployed as a WebSphere Application Server J2EE client application.

  The URL addresses of the servers to be monitored are specified in a properties file which is read by the content source program.

- A subscription portlet

  The subscription portlet allows users to create Monitoring Server subscriptions, which defines the status of which they want to be notified and the delivery options. Also, users can edit or delete existing server status subscriptions using this portlet.

- A trigger handler

  The trigger handler builds a notification message when the Subscription Manager component detects a match between the server status that is published by the content adapter and the server status subscription that is created by the users.

  The notification message is a string that contains the server status and is passed to the Notification Manager component.

The following is needed for this scenario:

- Development
  - WebSphere Studio Site Developer WebSphere Studio Application Developer.
  - Everyplace Toolkit 5.0.1 for WebSphere Studio.
- Deployment
  - WebSphere Everyplace Access V5.0 server with Intelligent Notification Service installed and working properly.
  - An Intelligent Notification Services user that is configured in WebSphere Everyplace Access server. In this example, the Intelligent Notification Services user ID is `GRB`.

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Refer to Chapter 1, “Intelligent Notification Services” on page 1 for details about how to create and configure Intelligent Notification Services users.

The following sections explain how to develop and deploy each component of this sample scenario using IBM WebSphere Studio.

3.3 Content adapter

Before you develop a content adapter, you must understand how you will obtain data from the information source. For purposes of this example, this section contains four parts:

- Developing a sample content source program that feeds the content adapter.
- Deploying that sample content source program.
- Developing a sample content adapter.
- Deploying that sample content adapter.

3.3.1 Developing a content source program

The characteristics of this sample content source program are:

- The program monitors the HTTP service status of the determined servers every five minutes.
- There is a properties file that contains the URL addresses of the servers to be monitored. This file is read by the content source program.
- A server status string is generated by this program after each server is monitored. The possible values for this string are:
  - All servers are up.
  - At least one server is down.
  - All servers are down.
- Communication between the content source and the content adapter is through sockets. A properties file contains the information that is needed to establish this connection.

The steps to develop this sample program are:

1. Create a Java Project:
   a. Open the IBM WebSphere Studio Site Developer and select **File** → **New** → **Project**.
   b. Select **Java** from the left panel and **Java Project** from the right panel. Click **Next**.

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c. Enter a project name. In this example it is `MonitoringContentFeed`. Click **Next**.

d. Define the Java build settings and click **Finish**.

2. Create a new package. In this example the package is `com.ibm.pvc.ins.sm.apps`.
3. In the new package, create a new Java file for the content source. In this example, the name of the Java file is `MonitoringContentFeeder.java`.
4. Import the required packages as shown in Example 3-1.

Example 3-1 Required packages for MonitoringContentFeeder class

```
import java.io.InputStream;
import java.io.IOException;
import java.io.OutputStreamWriter;
import java.util.PropertyResourceBundle;
import java.net.*;
```

5. Create a new class. Declare auxiliary variables for sockets communication, properties file (fully qualified class name), and server status messages as shown in Example 3-2.

Example 3-2 Auxiliary variables for MonitoringContentFeeder class

```
public class MonitoringContentFeeder {
   public static String host;
   public static int port;
   private final static String propertiesFile = "MonitoringFeederProperties";
   private final static String allUp = "All Servers are Up";
   private final static String allDown = "All Servers are Down";
   private final static String atLeastOneDown = "At least one server is Down";
```

6. Create a function that establishes a stream socket connection to the host where the content adapter resides, and send the server status information

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through this connection as shown in Example 3-3. Information about socket connection is read from a properties file.

Example 3-3 feedToContentAdapter method implementation

```
   private static boolean feedToContentAdapter(String sfeeded) {
      try {
         PropertyResourceBundle pr =
(PropertyResourceBundle)PropertyResourceBundle.getBundle(propertiesFile);
         host = pr.getString("MonitoringContentAdapter.host");
         port =
Integer.parseInt(pr.getString("MonitoringContentAdapter.port"));
         Socket socket = new Socket(host, port);
         OutputStreamWriter out = new
OutputStreamWriter(socket.getOutputStream());
         out.write(sfeeded,0,sfeeded.length()-1);
         out.flush();
         out.close();
      } catch (UnknownHostException e) {
         return false;
      } catch (IOException e) {
         return false;
      }
      return true;
   }
```

7. In the main method, define an infinite loop with the following attributes:
   a. Wait and sleep for five minutes so that the server is checked every five minutes for a status change.
   b. Read the properties file to obtain the URL addresses and the quantity of servers that are monitored.
   c. For each monitored server, try to establish an HTTP connection.
   d. Depending on the HTTP connection results, set the server status message. (One message status is generated for the whole group of servers.) Send the server status message to the content adapter using the function defined earlier. (In this example, it is `feedToContentAdapter`.)

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Example 3-4 Main method of class MonitoringContentFeeder

```
public static void main(String[] args)
{
   String monitoringServerURL;
   InputStream connection;
   System.out.println("Starting Monitoring Content Feeder....");
    do {
      String mssg = "ServerStatus: ";
      int srvQuantity = 0;
      int count = 0;
      try {
         Thread.sleep(300000);
         PropertyResourceBundle pr =
(PropertyResourceBundle)PropertyResourceBundle.getBundle(propertiesFile);
         srvQuantity = Integer.parseInt(pr.getString("ServersQty"));
         for (int i=1;i<=srvQuantity;i++) {
            monitoringServerURL = pr.getString("MonitoringServerURL"+i);
            try {
               connection = new URL(monitoringServerURL).openStream();
               if (connection != null)
                  count++;
            } catch (Exception e){
            }
         }

         if (count == srvQuantity) {
            mssg = mssg + allUp;
         } else
         if (count == 0) {
            mssg = mssg + allDown;
         } else {
            mssg = mssg + atLeastOneDown;
         }
         mssg = mssg + System.getProperty("line.separator");
         if (!feedToContentAdapter(mssg)) {
            System.err.println("Content feed error.");
            return;
         }
         System.out.println("Message: "+mssg);
      } catch (Exception e) {
         System.out.println(e.getMessage());
      }
   } while(true);
}
```

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8. Save the project.

The content source program requires a properties file to obtain information about the socket connection and the URL addresses of servers to be monitored. In this example, the name of this file is MonitoringFeederProperties.properties (Example 3-5).

The structure of the properties files is:

- MonitoringContentAdapter.host

  The host name needed to establish connection through sockets (the host name where the content adapter resides).

- MonitoringContentAdapter.port

  The port number for socket connection.

- ServersQty

  The number of monitored servers.

- MonitoringServerURLn

  The URL address of the server. The letter *n* represents the server sequence number in the file (from one to the ServersQty value).

Example 3-5 MonitoringFeederProperties file

```
MonitoringContentAdapter.host = wea5d
MonitoringContentAdapter.port = 55021
ServersQty = 2
MonitoringServerURL1 = http://wea5d.itso.ral.ibm.com
MonitoringServerURL2 = http://www.ibm.com
```

3.3.2 Deploying a content source program

The sample content source program runs as a Java stand-alone application in a computer that must have communication with both the content adapter application (through sockets) and monitored servers (through HTTP).

The steps to deploy the sample content source program are:

1. In WebSphere Studio, export the content source class file. In this example, the fully qualified class name is com.ibm.pvc.ins.sm.apps.MonitoringContentFeed.
2. Place the MonitoringContentFeed.class file in the directory C:\samples\MonitoringContentFeed\com\ibm\pvc\ins\sm\apps.
3. Place the MonitoringFeederProperties.property file in the directory C:\samples\MonitoringContentFeed.

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4. In a command line window, execute the instruction all on one line as shown in Figure 3-2:

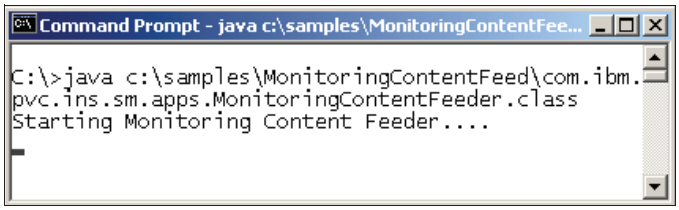

Figure 3-2 Running the content source program

Note: The MonitoringContentFeed program requires the sample content adapter application that is running to work appropriately. Refer to 3.3.4, "Deploying a content adapter" on page 94 for instructions how to deploy a content adapter application.

3.3.3 Developing a content adapter application

This sample content adapter is deployed as a WebSphere Application Server J2EE client application. To develop this content adapter:

1. Create an Application Client Project
   a. Open the IBM WebSphere Studio Site Developer and select **File** → **New** → **Project**.
   b. Select **J2EE** from the left panel and **Application Client Project** from the right panel. Click **Next**.
   c. Select **Create J2EE 1.3 Application Client project**. Click **Next**.
   d. Enter a project name. In this example, it is `MonitoringContentAdapter`. Select a EAR project. In this example, it is `MonitoringContentAdapterEAR`. Click **Next** and click **Finish**.
2. Include in the Java classpath the Intelligent Notification Service JAR files ins.jar and insSmClient.jar that are located in the directory *ins_home*\lib, where *ins_home* is in the installation directory C:\Program Files\WebSphere\INS.
   a. Right click **Project Name** → **Properties** → **Java Build Path** → **Libraries**.
   b. Click **Add External JARs...** and browse the JAR files.
   c. Click **OK**.

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3. Create a new package. In this example, the package is `com.ibm.pvc.ins.sm.apps`.
4. Create into the new package a new Java file. In this example, the name of this file is MonitoringContentAdapter.java.
5. Import the required packages as shown in Example 3-6.

Example 3-6 Required packages for MonitoringContentAdapter class

```
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.util.PropertyResourceBundle;
import java.net.Socket;
import com.ibm.pvc.ins.sm.client.ConfigurationException;
import com.ibm.pvc.ins.sm.client.IQueueException;
import com.ibm.pvc.ins.sm.client.SmClientFactory;
import com.ibm.pvc.ins.sm.server.SubscriptionService;
import com.ibm.pvc.we.ins.context.util.SocketListener;
```

6. Create a new class that extends the SocketListener class. The SocketListener class listens for an incoming connection request through sockets. Declare auxiliary variables for the properties file (the fully qualified class name) and the Subscription Manager client instance as shown in Example 3-7.

Example 3-7 Auxiliary variables for MonitoringContentAdapter class

```
public class MonitoringContentAdapter extends SocketListener
{
  private final static String propertiesFile = "MonitoringContentAdapter";
  private SubscriptionService smClient;
```

7. Define the constructor method for this class, call the parent constructor to listen for incoming connection on the specified port, and create a Subscription Manager client remote instance (which is necessary to publish the content source into the Subscription Manager).

   The method createRemoteSmClient belongs to SmClientFactory class and allows you to create a remote Subscription Manager client. If a parameter is not specified, this method uses the default context provider URL corbaloc:iiop:localhost:2809.

   The context provider URL is specified in the XML file insBaseConfig.xml located in *ins_home*\config\xml, where *ins_home* is the Intelligent Notification

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Services home installation directory (for example C:\Program Files\WebSphere\INS).

Example 3-8 Extension of MonitoringContentAdapter constructor

```
   public MonitoringContentAdapter(int port, int threads) throws IOException,
IQueueException, ConfigurationException
   {
      super(port, threads);
      smClient = SmClientFactory.createRemoteSmClient();
      System.out.println("Connected to SM");
   }
```

8. Define the SocketListener abstract method named `processSocket`. This method processes input data that it receives by a socket connection.

   The following is an explanation of how this method works:

   a. The processSocket method receives as a parameter a socket object and obtains its input stream. Auxiliary variables are declared to obtain information of this input stream. In this example, it gets the server status information.

Example 3-9 processSocket method implementation

```
   public void processSocket(Socket socket)
   {
      try {
      BufferedReader in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
      String sServerStatus = "ServerStatus: ";
      String sServerStatusValue = "";
      String st = "";
```

   b. Review the entire input stream in search of the server status value.

Example 3-10 processSocket method implementation

```
      do {
         st = in.readLine();
         if (st != null) {
            if (st.startsWith(sServerStatus)) {
               sServerStatusValue =
st.substring(sServerStatus.length()).trim();
               System.out.println("Server Status = " + sServerStatusValue);
            }
         }
      } while (st != null);
```

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c. Build the XML message using the server status value that obtained earlier. The XML format of the message must conform to the predefined Subscription Manager DTD.

Example 3-11 processSocket method implementation

```
      String xml = "<?xml version=\"1.0\" encoding=\"UTF-8\"?>" +
                 "<ContentMessage>" +
                 "<ContentTopic>" +
                 "<topic>monitoring</topic>" +
                 "</ContentTopic>" +
                 "<ContentProperties>" +
                 "<nameval name=\"ServerStatus\" type=\"string\">" +
sServerStatusValue + "</nameval>" +
                 "</ContentProperties>" +
                 "</ContentMessage>";
```

Notice the tag <topic> in Example 3-11. This tag specifies the name (or topic) that identifies each content source. All subscriptions need a content source in order to obtain the information that they match against filters which subscribers create. When a user creates a subscription (filter) to a content source, this subscription is stored with the topic of the content source from which information is retrieved. Then, when a content adapter publishes information from a particular content source, it only is considered by subscriptions that contain this topic.

In this example, the content topic is `monitoring`.

d. Publish the server status information into the Subscription Manager and finish the method.

The publish method transmits an XML representation of the content message to the Subscription Manager and publishes it under the specified topic. This method belongs to the SubscriptionService class.

Example 3-12 processSocket method implementation

```
      smClient.publish("monitoring",xml);

      System.out.println("XML: " + xml);
      in.close();
      socket.close();

   } catch (IOException e) {
      e.printStackTrace();
      return;
   } catch (IQueueException iqe) {
      System.out.println(iqe.getMessage());
   }
}
```

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9. Define the main method to start port listening. Information about the port number which is required to start port listening is read from a property file that is specified in the (###) variable propertiesFile.

Example 3-13 main method implementation

```
   public static void main(String[] args)
   {
      MonitoringContentAdapter mca;
      try {
         PropertyResourceBundle pr =
(PropertyResourceBundle)PropertyResourceBundle.getBundle(propertiesFile);
         int port =
Integer.parseInt(pr.getString("MonitoringContentAdapter.port"));

         try {
            mca = new MonitoringContentAdapter(port, 2);
         } catch (Exception e){
            System.out.println(e.getMessage());
            return;
         }
         System.out.println("Waiting for conenction from ContentFeeder...");
         synchronized (mca) {
            while(true){
               mca.wait();
            }
         }
      } catch (Exception e) {
         System.out.println(e);
      }
      return;
   }
}
```

10. Save the project.

Note: You can find the sample code for the custom content adapter in the directory *ins_home*\samples\sm\ in WebSphere Everyplace Access V5 server, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS). The samples are the XML content adapter sample, located in the XMLContentPublisher.ear file and the News content adapter sample, located in the NewsContentPublisher.ear file.

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Note: For more information about Intelligent Notification Services classes and methods, refer to the Javadoc documentation in *ins_home*\javadoc\insjavadoc.jar, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

The content adapter that is developed requires a properties file to obtain information about socket connection port. In these examples the name of this file is MonitoringContentAdapter.properties and is included into the content adapter project (as shown in Figure 3-3).

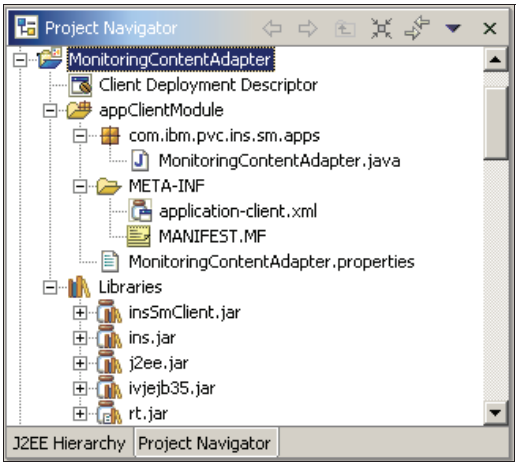

Figure 3-3 MonitoringContentAdapter project

Example 3-14 shows the property file for this sample.

Example 3-14 MonitoringContentAdapter properties file

```
MonitoringContentAdapter.port = 55021
```

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3.3.4 Deploying a content adapter

The sample content adapter that is developed must run on the same computer as the Subscription Manager and must have connection (through sockets) with the sample content source program. To deploy this content adapter application:

1. In WebSphere Studio, export the content adapter project into an EAR file:
   a. Go to the content adapter project. Right-click the content adapter project name (in this example, MonitoringContentAdapter) and select **Export** → **EAR file**. Click **Next**.
   b. Select the Enterprise Application project name and the directory destination and click **Finish**.
2. Place the content adapter EAR file in a directory in the same computer where the Subscription Manager runs.
3. Open the startMonitorContentAdapter.bat file. This file is similar to the *ins_home*\bin\contentfeed.bat file that is used to run the XML content adapter. (For more information about this file, see Chapter 1, “Intelligent Notification Services” on page 1.)

   Modify the following lines in the startMonitorContentAdapter.bat file:

   a. In the Environment Setup section, enter the appropriate *ins_home* and *was_home* settings (Example 3-15).
      - Set *ins_home* to specify the directory where Intelligent Notification Services is located.
      - Set *was_home* to specify the directory where WebSphere Application Server is installed.

Example 3-15 Environment setup in the startMonitorContentAdapter.bat file

```
rem ----------------------------------------------------------------
rem Environment setup
rem ----------------------------------------------------------------

set INS_HOME=C:\Program Files\WebSphere\INS
set WAS_HOME=C:\Program Files\WebSphere\AppServer
```

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b. Look for the line that begins with `%WAS_HOME%\bin\launchclient` (Example 3-16). Specify on this line the location of the content adapter EAR file and bootstrap port number.

Example 3-16 EAR location and bootstrap port in the startMonitorContentAdapter.bat file

```
"%WAS_HOME%\bin\launchclient"
"%INS_HOME%\samples\MonitoringContentAdapterEAR.ear"
-CCclasspath="%INS_HOME%\lib\ins.jar;%INS_HOME%\lib\insSmClient.jar"
-CCBootstrapPort="9814"
```

For information about how to determine the bootstrap port number, see Chapter 1, “Intelligent Notification Services” on page 1.

4. Place this file in a directory in the same computer where the Subscription Manager is running.
5. Run the startMonitorContentAdapter.bat file using the following command from a command prompt window as shown in Figure 3-4.

```
C:\Program Files\WebSphere\INS\samples\startMonitorContentAdapter
```

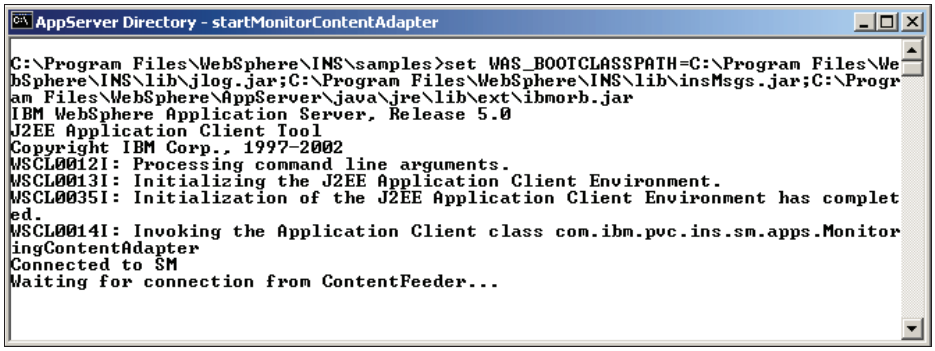

Figure 3-4 Running the content adapter program

Note: The startMonitorContentAdapter.bat file requires WebSphere Application Server client application environment. The WebSphere Application Server Administrator user ID and password is required if security is enabled.

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3.4 Trigger handler

This section discusses how to develop and deploy a trigger handler.

3.4.1 Developing a trigger handler

To develop a trigger handler program:

1. Create a Java project:
   a. Open the IBM WebSphere Studio Site Developer and select **File** → **New** → **Project**.
   b. Select **Java** from the left panel and **Java Project** from the right panel. Click **Next**.
   c. Enter a project name. In this example, it is `MonitoringHandler`. Click **Next**.
   d. Define the Java build settings and click **Finish**.
2. Include in the Java classpath the j2ee.jar file and the Intelligent Notification Services JAR files.

   The Intelligent Notification Services JAR files are located in the directory *ins_home*\lib, where *ins_home* is in the installation directory C:\Program Files\WebSphere\INS.

   a. Right click **Project Name** → **Properties** → **Java Build Path**.
   b. Click **Add External JARs...** and browse the JAR files.
   c. Click **OK**.
3. Create a new package. In this example the package is `com.ibm.pvc.ins.sm.handler`.
4. Create into the new package a new Java file. In this example, the name of this file is MonitoringHandler.java.

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5. Import the required packages as shown in Example 3-17.

Example 3-17 Import packages for MonitoringHandler class

```
package com.ibm.pvc.ins.sm.apps;

import java.util.*;
import com.ibm.pvc.ins.logger.INSLogger;
import com.ibm.pvc.ins.logger.THLog;
import com.ibm.pvc.ins.nm.server.NotificationService;
import com.ibm.pvc.ins.sm.client.*;
import com.ibm.pvc.ins.sm.server.ContentMessage;
import com.ibm.pvc.ins.nm.client.*;
import com.ibm.pvc.ins.sm.handler.*;
import javax.naming.Context;
```

6. Create a class that extends TriggerHandler and define variables for delivery options and subscription matching parameters as shown in Example 3-18.

Example 3-18 Auxiliary variables for MonitoringHandler class

```
public class MonitoringHandler extends TriggerHandler {
   private static INSLogger log = null;
   private static ResourceBundle messages = null;
   private String NotificationOption;
   private String fromUserid;
   private String toUserid;
   private String ServerStatus;
   private String notificationURL;
   private String DeviceNames;
   private int priority;
   private String multidevice;
   private String topic;
   private String selector;
   private String reqParm;
   private int sid;
```

Notice the variable named `topic`. This variable contains the topic of the content source that is associated with this subscription. It must be the same as the topic specified in the content adapter (see page Example 3-11 on page 91).

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7. Implement the constructor of this class (Example 3-19). Initialize some variables (for example, topic).

Example 3-19 Constructor method for MonitoringHandler

```
public MonitoringHandler()
{
   NotificationOption = "once";
   priority = 5;
   multidevice = "ALL";
   topic = "monitoring";
   messages = ResourceBundle.getBundle("trigletMsg",Locale.getDefault());
   log = THLog.getLogger();
}
```

8. Implement the doGet method. This method retrieves information from the requested parameter and puts it into the TriggerResponse object. The types of information that are retrieved are subscription matching parameters, delivery options, and delivery channel names. To implement this method:

   a. Get subscription matching parameters from the TriggerRequest object and put them into the TriggerResponse object. In this example, the subscription matching parameter is `ServerStatus` (Example 3-20).

Example 3-20 Get matching parameters

```
   public void doGet(TriggerRequest req, TriggerResponse resp) throws
TriggerException
   {
      for (Iterator reqKeys = req.keys(); reqKeys.hasNext();)
      {
         reqParm = (String)reqKeys.next();
         if (reqParm.equals("ServerStatus"))
            resp.put(reqParm, ServerStatus);
```

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b. Get delivery options and channel information from the TriggerRequest object and put them into the TriggerResponse object (Example 3-21).

Example 3-21 Get delivery option and channel information

```
      else
      if (reqParm.equals("NotificationOption"))
         resp.put(reqParm, NotificationOption);
      else
      if (reqParm.equals("DeviceNames"))
         resp.put(reqParm, DeviceNames);
      else
      if (reqParm.equals("ChannelOrderOption"))
         resp.put(reqParm, multidevice);
   }
}
```

9. Implement the doPut method. This method retrieves information from the requested parameter and creates a new subscription to the Subscription Manager.

   a. Get subscription matching parameters, delivery options, and delivery channels from the TriggerRequest object as shown in Example 3-22.

Example 3-22 Get matching parameters, delivery options, and delivery channels

```
public void doPut(TriggerRequest req) throws TriggerException
{
   reqParm = req.get("userid");
   if ((reqParm == null) || (reqParm.trim().equals("")))
      throw new TriggerException("The user ID parameter is not valid.");
   toUserid = reqParm;
   fromUserid = reqParm;
   reqParm = req.get("ServerStatus");
   if ((reqParm == null) || (reqParm.trim().equals("")))
      throw new TriggerException("Server status is a required field for a
monitoring subscription");
   ServerStatus = reqParm;
   reqParm = req.get("NotificationOption");
   if ((reqParm != null) && !(reqParm.trim().equals("")))
      NotificationOption = reqParm;
   reqParm = req.get("DeviceNames");
   if ((reqParm == null) || (reqParm.trim().equals("")))
      throw new TriggerException("At least one device must be specified when
creating a subscription");
   DeviceNames = reqParm;
   reqParm = req.get("ChannelOrderOption");
   if ((reqParm != null) && !(reqParm.trim().equals("")))
      multidevice = reqParm;
```

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b. Create the selector statement and the searchable entities as shown in Example 3-23.

The selector statement is a filter string that contains the values for all the subscription matching parameters of the subscription to be added (in this example the subscription matching parameter is ServerStatus).

The searchable entities are items that identify the subscription for maintenance purposes, such as searching for and removing old subscriptions from the system.

Example 3-23 Create the selector statement and searchable entities

```
      selector = "(ServerStatus = '" + ServerStatus + "')";
      TriggerRequest treq = new TriggerRequest();
      treq.put("ServerStatus", ServerStatus);
      treq.put("DeviceNames", DeviceNames);
}
```

c. Create the new subscription with information from the subscription topic, the selector statement, and the searchable entities. Then, activate this subscription to begin to accept publish content messages (from the content adapter) that satisfy the subscription.

The subscribe method creates a content subscription based on the topic, the selector string, and the searchable entities. The activate method initiates the pending content subscriptions for this trigger. Both methods belongs to the TriggerHandler class.

Example 3-24 Create and activate the new subscription

```
   try
   {
      sid = subscribe(topic, selector, treq);
      activate();
   }
   catch (IQueueException iqe)
   {
      throw new TriggerException("An eror ocurred while creating a
subscription, " + iqe.getMessage());
   }
}
```

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10. Implement the doPost method. This method updates information for an existing subscription based on information from the TriggerRequest object. To implement this method:

    a. Get subscription matching parameters, delivery options, and delivery channels from the TriggerRequest object as shown in Example 3-25.

Example 3-25 Get matching parameters, delivery options, and delivery channels

```
   public void doPost(TriggerRequest req, TriggerResponse resp) throws
TriggerException
   {
      for (Iterator reqKeys = req.keys(); reqKeys.hasNext();)
      {
         reqParm = (String)reqKeys.next();
         if (reqParm.equals("ServerStatus"))
            ServerStatus = req.get(reqParm);
         else
         if (reqParm.equals("NotificationOption"))
            NotificationOption = req.get(reqParm);
         else
         if (reqParm.equals("DeviceNames"))
            DeviceNames = req.get(reqParm);
         else
         if (reqParm.equals("ChannelOrderOption"))
            multidevice = req.get(reqParm);
      }
```

    b. Build the selector statement, create the searchable entities, and update the subscription using the update method of the TriggerHandler class.

Example 3-26 doPost method implementation

```
   selector = "(ServerStatus = '" + ServerStatus + "')";
   TriggerRequest treq = new TriggerRequest();
   treq.put("ServerStatus", ServerStatus);
   treq.put("DeviceNames", DeviceNames);

   try
   {
      update(sid, topic, selector, treq);
   }
   catch (IQueueException iqe)
   {
      throw new TriggerException("An eror ocurred while creating a
subscription, " + iqe.getMessage());
   }
}
```

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11. Implement the doDelete method to add the processing that is required before the subscription is removed. In this example, no additional functionality is required.

Example 3-27 doDelete method implementation

```
public void doDelete(TriggerRequest req) throws TriggerException
   {
   }
```

12. Implement the handleMatch method. This method is called when a subscription match occurs. It composes the message notification and sends it to the Notification Manager. To implement this method:

    a. Create the notification message string that is sent to users as shown in Example 3-28.

Example 3-28 Create the notification message string

```
public void handleMatch(ContentMessage cmsg)
{
   String notificationString;
   try
   {
      notificationString = cmsg.getString("ServerStatus");
   }
   catch (IQueueException iqe)
   {
      log.error("ERR_CONT_RETRIEVAL",toUserid,iqe);
      notificationString = iqe.toString();
   }
```

    b. Remove the subscription if the notification option is set to receive notification only the first time a match occurs (the value is `once` as shown in Example 3-29 on page 103).

       The remove method of TriggerHandler class deletes the trigger and unsubscribes all outstanding subscriptions.

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Example 3-29 Notification option is set to “once”

```
      if (NotificationOption.equals("once"))
      {
         try
         {
            remove();
         }
         catch (IQueueException iqe)
         {
            if (log.isTracing())
            log.exception("An exception occurred removing the subscription, "
+ selector + ", for user, " + toUserid + ".", iqe);
         }
      }
```

c. Retrieve a Notification Manager client instance and create a notification object to build the message as shown in Example 3-30.

   The method getNotificationService belongs to the TriggerHandler class and returns a remote Notification Service client if one exists or a new one that is based on the provider URL parameter if one does not exist. The provider URL parameter is defined in the XML file, insBaseConfig.xml, that is located in *ins_home*\config\xml, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

Example 3-30 Retrieve Notification Manager client instance, create notification object

```
   NotificationService ns = null;
   boolean retry = true;
   try
   {
      ns = getNotificationService();
      Notification notf = new Notification();
```

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d. Set the notification object with information about delivery channels, delivery options, sender and recipient users ID, and subject and message content as shown in Example 3-31.

Example 3-31 Set notification object information

```
String token;
for(StringTokenizer tokens = new StringTokenizer(DeviceNames, "+");
tokens.hasMoreTokens(); notf.addDeliveryChannel(token))
   token = tokens.nextToken().trim();
if (multidevice.equalsIgnoreCase("ALL"))
   notf.setMultiDevices(true);
else
   notf.setMultiDevices(false);
   notf.setMsgPriority(priority);
   notf.setToUserID(toUserid);
   notf.setFromUserID(fromUserid);
   notf.setSubjectText("MONITORING");
   notf.setMsgText(notificationString);
   notf.setTextMsgType();
```

e. Send out the notification to the Notification Manager using the method sendMessage of the NotificationService class as shown in Example 3-32 on page 105.

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Example 3-32 Send notification

```
if (log.isDebugEnabled())
   log.debug("Calling sendMessage() with message " + notificationString );
for (int r=1; r<3 && retry; r++)
{
   try
   {
      String msgID = ns.sendMessage(notf);
      if (log.isDebugEnabled())
         log.debug("Message sent, message ID is " + msgID);
      retry = false;
   }
   catch (java.rmi.RemoteException re)
   {
      if (log.isDebugEnabled())
         log.debug("An exception occurred on the sendMessage call to
Notification Manager. " + re.getMessage());
      if (r==1)            // Only attempt this once
         ns = initNotificationService();
      else
         log.error("SENDMSG_EXC",toUserid,re);
   }
}
   catch (IQueueException iqe)
   {
      log.error("NMINIT_ERR",iqe);
   }
}
```

13. Save the project.

Note: You can find the sample code for trigger handler in the directory *ins_home*\samples\sm\ in WebSphere Everyplace Access V5 server, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS). The samples are the weather trigger handler code, which is located in the WeatherHandler.java file and the stock trigger handler code, which is located in the StockHandler.java file.

Note: For more information about Intelligent Notification Services classes and methods, refer to the Javadoc documentation in *ins_home*\javadoc\insjavadoc.jar, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

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3.4.2 Deploying a trigger handler

To deploy a trigger handler:

1. Go to Intelligent Notification Services applications directory and create a new directory or choose an existing directory in which to place the new trigger handler. The Intelligent Notification Services applications directory is located in *ins_home*\insapps, where *ins_home* is the example directory (C:\Program Files\WebSphere\INS).

   This example uses the existing directory samples in C:\Program Files\WebSphere\INS\insapps\samples.

2. Create the ./classes subdirectory, and place the class file for the new trigger handler in this subdirectory as shown in Figure 3-5. Be sure you include the appropriate directory structure according to the package of this class.

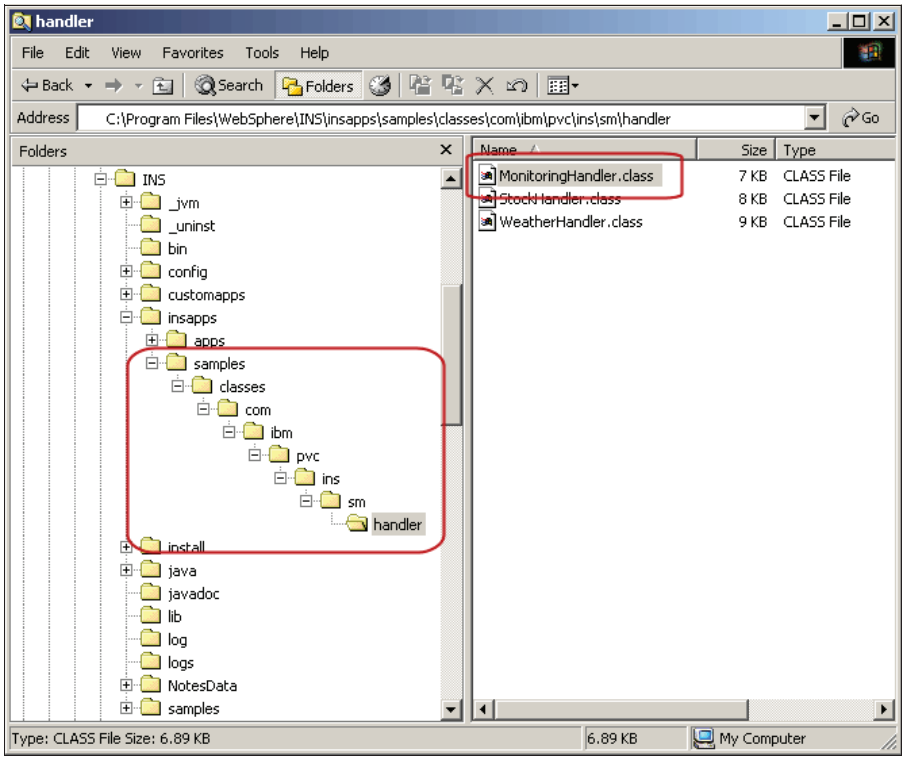

Figure 3-5 Location of Monitoringandler.class file

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3. Define information about trigger handlers, such as name, description, class file, URL pattern, and other parameters, in an XML file named triglets.xml. The URL pattern allows the subscription portlet to reference a trigger handler inside the triglets.xml file.

   Depending where the trigger handler is located, you must compose a new triglets.xml file or modify the existing file. (A single triglets.xml file can reference multiple trigger handlers.) All trigger handlers must be specified in a triglets.xml file.

   The triglets.xml file is located in each directory that contains a trigger handler and requires a triglets.dtd file. Open the triglets.dtd file located in *ins_home*\insapps\samples for more information (Figure 3-6).

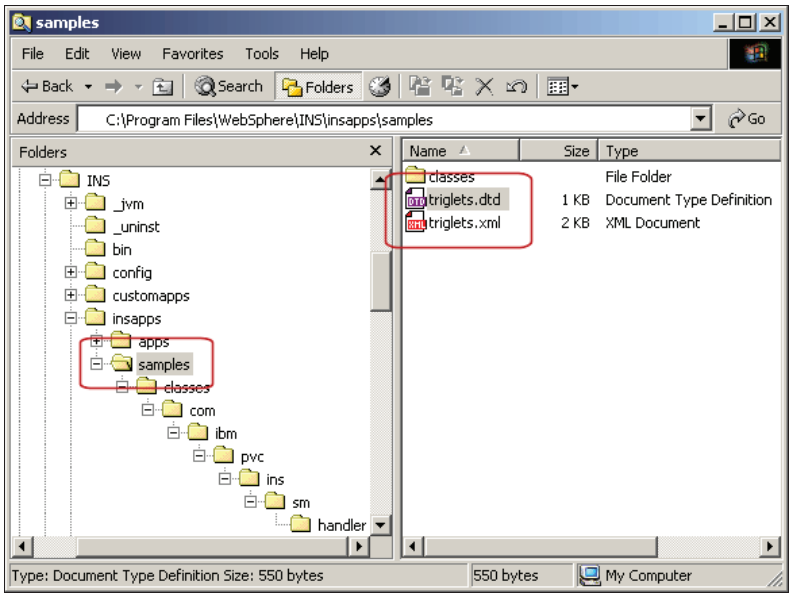

Figure 3-6 Location of file.triglets.dtd and triglets.xml files

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This example modifies the triglets.xml file that is located in the sample directory to include information of the MonitoringHandler trigger. The properties of this new trigger handler are highlighted in Example 3-33.

Example 3-33 Properties of the new trigger handler

```
<?xml version='1.0'?>
<!DOCTYPE triglet-app SYSTEM "./triglets.dtd">
<triglet-app>
<triglet>
   <triglet-name>StockHandler Sample for WAS</triglet-name>
   <description>Sample handler for a stock subscription</description>
   <triglet-class>com.ibm.pvc.ins.sm.handler.StockHandler</triglet-class>
   <init-param>
      <param-name>SubscriptionsPerTriglet</param-name>
      <param-value>2</param-value>
   </init-param>
   <init-param>
      <param-name>TrigletTimeToLiveMillis</param-name>
      <param-value>1209600000</param-value>
   </init-param>
</triglet>

<triglet>
   <triglet-name>WeatherHandler Sample for WAS</triglet-name>
   <description>Sample handler for a weather subscription</description>
   <triglet-class>com.ibm.pvc.ins.sm.handler.WeatherHandler</triglet-class>
   <init-param>
      <param-name>SubscriptionsPerTriglet</param-name>
      <param-value>1</param-value>
   </init-param>
   <init-param>
      <param-name>TrigletTimeToLiveMillis</param-name>
      <param-value>1209600000</param-value>
   </init-param>
</triglet>

<triglet>
   <triglet-name>MonitoringHandler Sample for WAS</triglet-name>
   <description>Sample handler for a monitoring subscription</description>
   <triglet-class>com.ibm.pvc.ins.sm.handler.MonitoringHandler
</triglet-class>
   <init-param>
      <param-name>SubscriptionsPerTriglet</param-name>
      <param-value>1</param-value>
   </init-param>
   <init-param>
      <param-name>TrigletTimeToLiveMillis</param-name>
      <param-value>1209600000</param-value>
   </init-param>
</triglet>
```

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```
<triglet-mapping>
   <triglet-name>StockHandler Sample for WAS</triglet-name>
    <url-pattern>/StockHandler</url-pattern>
</triglet-mapping>

<triglet-mapping>
   <triglet-name>WeatherHandler Sample for WAS</triglet-name>
   <url-pattern>/WeatherHandler</url-pattern>
</triglet-mapping>

<triglet-mapping>
   <triglet-name>MonitoringHandler Sample for WAS</triglet-name>
   <url-pattern>/MonitoringHandler</url-pattern>
</triglet-mapping>

</triglet-app>
```

Notice that the `<triglet-name>` parameters for the `<triglet>` and `<triglet-mapping>` tags must match.

4. Restart the Intelligent Notification Service server.

3.5 Subscription portlet

Subscription portlets are used for Intelligent Notification Services users to subscribe to content source notifications. The subscribers can add, edit, or delete subscriptions using these portlets.

This section explains how to develop and deploy a subscription portlet.

3.5.1 Developing a subscription portlet

The following base classes are needed to create subscription portlets:

- Subscription base controller (SubscriptionBaseController.java), which contains basic logic common to all subscription portlets.
- Subscription bean (SubscriptionBean.java), which stores data for the subscription.
- Subscription manager (SubscriptionManager.java), the utility class for managing subscriptions which the subscription manager implementation class implements.
- Subscription manager factory (SubscriptionManagerFactory.java), which creates subscription manager instances.

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- Subscription manager implementation (SubscriptionManagerImpl.java), the utility class for managing subscriptions which implements the subscription manager interface.

In general, to develop a new subscription portlet, you must create the following files:

- A class named <My_subscription>SubscriptionBaseController.class that extends the subscription base controller class.
- A class named <My_subscription>SubscriptionBean.class that extends of subscription bean class.
- A JavaServer Pages (JSP) file named <My_subscription>SubscriptionConfig.jsp that is used to add or to modify a subscription.
- A JSP file named <My_subscription>SubscriptionView.jsp that is used to list current subscriptions.
- A JPS file named DeliveryChannelOrdering.jsp that is used to change the delivery channels order of the subscription.
- XML files for registering the subscription portlet:
  - web.xml, for registering the portlet as a Web application with WebSphere Application Server.
  - portlet.xml, for registering the portlet as portlet with the WebSphere Portal Server.

Note: The prefix <My_subscription> is the name that identifies the subscription, for example Stocks, Weather, and so forth.

Note: The easiest way to develop a new subscription portlet is to base it in an existing subscription portlet. We use the MonitoringNotify portlet that is provided in this book to explain how subscription portlets work. This subscription portlet is ready to work for the sample scenario that is defined in this chapter. In addition, we include notes to indicate the changes you need to make if you use the MonitoringNotify portlet as a base to develop your own subscription portlets.

To use the MonitoringNotify subscription portlet as a base to create a subscription portlet project, follow these steps:

1. Create a Portlet Application Project.
   a. Open the IBM WebSphere Studio Site Developer and select **File** → **New** → **Project**.

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b. Select **Portlet Development** from the left panel and **Portlet Application Project** from the right panel. Click **Next**.

c. Enter a project name. In this example, it is MonitoringNotify. Select **Create a basic portlet** as your portlet type. Click **Next**.

d. Set the EAR project, context root, and J2EE. Click **Finish**.

2. Import the MonitoringNotify.war file that is provided in this book by following these steps:

   – Right-click the project that you created in the previous step.

   – Select **Import** → **WAR file**. Click **Next**.

   – Select the WAR file location and the **Overwrite existing resources without warning** option.

   – Click **Finish**.

3. Into the project, go to the JavaResources directory and delete the default package directory by right-clicking this package and selecting **Delete** as shown in Figure 3-7.

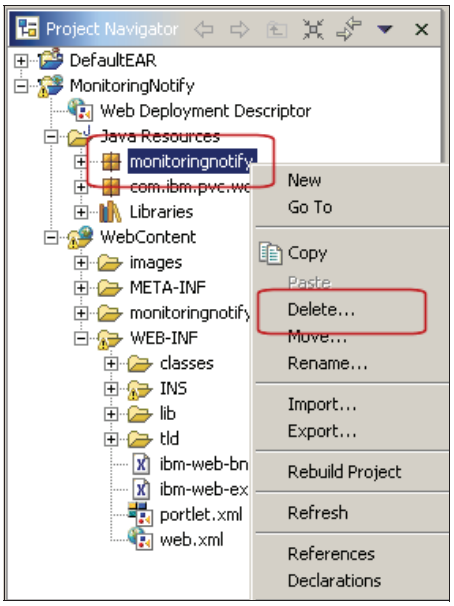

Figure 3-7 Delete the default package directory

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4. In the WebContent directory, delete the default JSP directory by right-clicking this directory and selecting **Delete** as shown in Figure 3-8.

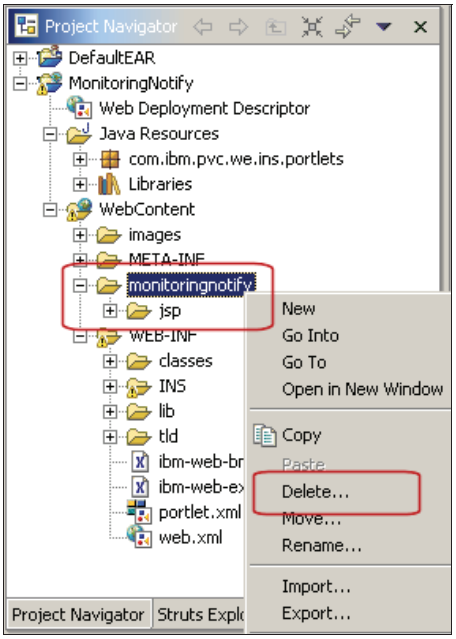

Figure 3-8 Delete the default JSP directory

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Figure 3-9 shows the subscription portlet project structure in WebSphere Studio.

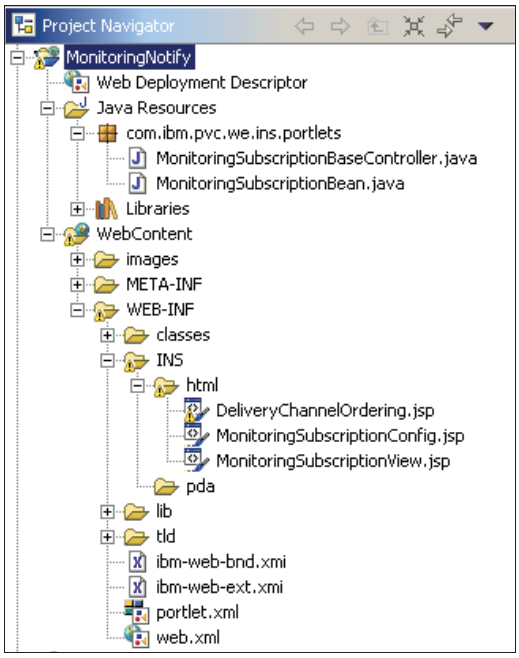

Figure 3-9 Subscription portlet project structure

Subscription base controller Java class

This class controls the subscription portlet itself. In this example, this class is named MonitoringSubscriptionBaseController and extends the SubscriptionBaseController class.

> **Note:** The subscription base controller class must reside in the package com.ibm.pvc.we.ins.portlets.

To develop this class:

1. Import the required packages as shown in Example 3-34.

Example 3-34 Required packages for subscription base controller

```
import org.apache.jetspeed.portlets.*;
import org.apache.jetspeed.portlet.*;
import org.apache.jetspeed.portlet.event.*;
import com.ibm.wps.portlets.*;
```

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2. Create a class that extends SubscriptionBaseController. In this example, this class is MonitoringSubscriptionBaseController.
3. Create an initialization method (init) as shown in Example 3-35. This method is called by the portlet container when the portlet is first loaded.

   The init method of the subscription base controller calls its superclass and initializes all the instance variables. These variables are:

   – contentSource

     The topic of the content source that is associated with this subscription. It identifies this content source from others and must be the same as the topic that is specified in the content adapter.

   – triggerHandlerURN

     Specifies where the trigger handler that is associated with this subscription is located and its URL pattern. In this example, the trigger handler is located in the directory samples in the insapps directory and the URL pattern that is specified in the triglets.xml file is MonitoringHandler.

   – subKeys

     Contains the key names of the delivery options, delivery channels, and subscription matching parameters.

Example 3-35 init method implementation

```
public void init(PortletConfig portletConfig) throws UnavailableException {
   super.init( portletConfig );
   INSDataAccess.init(log);
   contentSource = "monitoring";
   triggerHandlerURN = "/samples/MonitoringHandler";
   subKeys = new String[]{SubscriptionBean.KEY_NOTIFICATION_OPTION,
      SubscriptionBean.KEY_CONTENT_STORAGE,
      SubscriptionBean.KEY_DEVICE_NAMES,
      SubscriptionBean.KEY_CHANNEL_ORDER_OPTION,
      MonitoringSubscriptionBean.MONITORING_SERVER_STATUS
   };

   config_jsp = jspBaseDir + "/MonitoringSubscriptionConfig.jsp";
   help_jsp = jspBaseDir + "/MonitoringSubscriptionHelp.jsp";
   view_jsp = jspBaseDir + "/MonitoringSubscriptionView.jsp";

   if (log.isDebugEnabled()) {
      log.debug("MonitoringSubscriptionBaseController(init):
triggerHandlerURN= " + triggerHandlerURN);
      for (int i=0;i<subKeys.length; i++) {
         log.debug("MonitoringSubscriptionBaseController(init); subKeys = " +
i + " " + subKeys[i]);
      }
   }
}
```

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Note: Rename `Java class` as `MySubscriptionSubscriptionBaseController`, and replace all the occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive). Be careful to specify the correct contentSource (topic), trigger handler URN, and sub keys variables.

4. Implement the method createSubscriptionBeanFromRequestData that is defined in the SubscriptionBaseController class. This method creates a subscription bean using the user input data that is sent in by the action request.

   a. Get the delivery options, delivery channels, and subscription matching parameters from the request as shown in Example 3-36.

Example 3-36 createSubscriptionBeanFromRequestData method implementation

```
public void createSubscriptionBeanFromRequestData(PortletRequest
request,SubscriptionBean newSub) throws PortletException{
   if (log.isDebugEnabled()) {
      log.debug(contentSource + "SubscriptionBaseController(entering
createSubscriptionBeanFromRequestData method");
   }
   String notificationOption = "once";  //by default is "once"
   notificationOption = request.getParameter("notificationOption");
   String channelOrderOption = request.getParameter("channelOrderOption");
   String contentStorageOption = "don't save"; //deprecated - always don't
save
   String ServerStatus = request.getParameter("ServerStatus");

   String selectedDCNames = "";
   selectedDCNames = getSelectedDCNamesFromRequest(request);
```

   b. Set the subscription bean with the information that is obtained from the request.

Example 3-37 createSubscriptionBeanFromRequestData method implementation

```
if (notificationOption != null && contentStorageOption != null
   && ServerStatus != null && selectedDCNames != null && channelOrderOption !=
null) {
   newSub.setNotificationOption(notificationOption);
   newSub.setContentStorage(contentStorageOption);
   newSub.setDeviceNames(selectedDCNames);
   newSub.putProperty(SubscriptionBean.KEY_CHANNEL_ORDER_OPTION,
      channelOrderOption);
   newSub.putProperty(MonitoringSubscriptionBean.MONITORING_SERVER_STATUS,
      ServerStatus);
      }
   }
}
```

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The method createSubscriptionBeanFromRequestData is called by doAddSubscriptionAction and doModifySubscriptionAction methods of SubscriptionBaseController class to create and modify subscriptions respectively.

Customization: Replace all the occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive). Be careful to use all the subscription matching parameters that your subscription needs.

For this example, the methods listed in Table 3-1 are not changed from the SubscriptionBaseController generic Java class.

Table 3-1 Methods that are unchanged

Method	Description
includeJSP	
doView	Called when the portlet is in view mode.
setSubIndexBeansToSession	Called by doView for the default view mode to instantiate the bean.
filterChannels	Filters out server-initiated action channels for normal subscriptions.
doAdd	Called by doView when adding a subscription to get the delivery channels and call the subscription configuration JSP.
doModify	Called by doView when modifying a subscription to retrieve the subscription, get the delivery channels, and call the subscription configuration JSP.
doChannelOrdering	Called by doView when modifying the order of the delivery channels to get the delivery channels and call the channel ordering JSP.
doHelp	Called when the portlet is in help mode.
actionPerformed	Called when an action is performed on the portlet to call doChannelOrderAction, doMoveUpChannelAction, or doMoveDownChannelAction accordingly. You may want to override this method when implementing more actions than the default ones.

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Method	Description
doChannelOrderAction	Called by actionPerformed when ordering of the channels was requested.
doMoveUpChannelAction	Called by actionPerformed when channel has to move up.
doMoveDownChannelAction	Called by actionPerformed when channel has to move down.
doAddSubscriptionAction	Called by the actionPerformed method when an add action is performed to instantiate a bean and create a subscription.
doModifySubscriptionAction	Called by the actionPerformed method when a modify action is performed to instantiate a bean and modify the subscription.
doDeleteSubscriptionAction	Called by the actionPerformed method when a modify action is performed to instantiate a bean and delete the subscription.
getSelectedDCNamesFromRequest	Called by createSubscriptionBeanFromRequestData to get the delivery channels associated to the subscription.
addToDCBufferIfNeeded	Called by getSelectedDCNamesFromRequest to add more channels.
shouldSwitchToOrderingMode	Called by doAdd and doModify to decide whether channels should be re-ordered.
saveTemporateDataInBean	Called by shouldSwitchToOrderingMode to buffer user input data.
printBeanPropertiesForDebugging	Debug purpose method.

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Subscription bean Java class

This class contains the variables, getters, and setters of the following core subscription properties:

- Notification option
- Content storage option
- Channel order option
- Preferred delivery channels
- Subscription name
- Content source

In this example, the MonitoringSubscriptionBean class extends the SubscriptionBean class, adding a subscription property key for Server Status and some constants, as shown in Example 3-38.

Example 3-38 MonitoringSubscriptionBean class implementation

```
package com.ibm.pvc.we.ins.portlets;

import java.io.Serializable;

public class MonitoringSubscriptionBean extends SubscriptionBean implements
Serializable {
     // The general subscription properties keys
   public static final String MONITORING_SERVER_STATUS = "ServerStatus";

   public static final String SERVER_STATUS_ALL_DOWN = "All Servers are Down";
   public static final String SERVER_STATUS_SOME_DOWN = "At least one server
is Down";
   public static final String SERVER_STATUS_ALL_UP = "All Servers are Up";
   }
```

Customization: Replace all the occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive). Be sure to add the subscription property keys and constants that you need.

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Subscription view JSP

This JSP allows the user to view existing subscriptions. In this example, the subscription view JSP file is named MonitoringSubscriptionView.jsp. You must create a JSP file for each device that you want to give access to this portlet (for example, PDA devices) and save this file in its corresponding directory.

The instructions of this JSP file are:

1. Import the required libraries and beans (Example 3-39).

Example 3-39 Required libraries and beans for subscription view JSP

```
<%@ page import="com.ibm.pvc.we.ins.portlets.*" %>
<%@ page import="org.apache.jetspeed.portlet.*" %>
<%@ page import="java.util.*" %>
<%@ page import="java.text.*" %>
<%@ taglib uri="/WEB-INF/tld/portlet.tld" prefix="portletAPI" %>
<%@ taglib uri="/WEB-INF/tld/admin.tld" prefix="admin" %>
<portletAPI:init />
```

2. Get the current subscriptions from portlet session (Example 3-40).

Example 3-40 Get current subscriptions

```
<%
SubscriptionIndexBean[] indexObjects =
(SubscriptionIndexBean[])portletRequest.getPortletSession().getAttribute(Subscr
iptionBaseController.SUB_INDEX_BEANS);
%>
```

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3. Prompt the user to add a subscription if none exists (Example 3-41).

Example 3-41 Prompt the user to add a subscription

```
<table class="wpsTable" cellspacing="0" cellpadding="4" width="100%">
<!--if there is no exising subscription  -->
<%  if (indexObjects == null || indexObjects.length <= 0) { %>
   <tr bgcolor="#DEF2FD">
      <td>
         <span class="wpsPortletHead">No subscriptions</span>
      </td>
   </tr>
   <tr>
      <td>
         <span class="wpsPortletText">Select <b>Add subscription</b> to create
a subscription.</span>
      </td>
   </tr>
```

4. If there are subscriptions, for each existing subscription bean, display its name as a modify link, which changes the portlet into MODIFY_MODE when selected (Example 3-42).

Example 3-42 Display existing subscriptions

```
<!--if there are already subscriptions    -->
<%  } else if (indexObjects != null && indexObjects.length>0 ) { %>
   <tr bgcolor="#DEF2FD">
      <th class="wpsTableHeadStart" width="70%">
            Server Status
      </th>
      <th class="wpsTableHeadMiddle" width="15%">
      </th>
      <th class="wpsTableHeadEnd"  width="15%">
      </th>
   </tr>

   <%  boolean toggle = true;
       for (int i = 0; i < indexObjects.length; i++, toggle = !toggle) {
         SubscriptionIndexBean indexBean =
(SubscriptionIndexBean)indexObjects[i];
         SubscriptionBean subBean =
(SubscriptionBean)indexBean.getSubscriptionBean();
         PortletURI modifyURI = portletResponse.createURI();
         modifyURI.addParameter(SubscriptionBaseController.MODIFY_MODE,
"true");
```

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```
         modifyURI.addParameter(SubscriptionBaseController.SUB_BEAN_INDEX,
String.valueOf(indexBean.getIndex()));
         PortletURI deleteURI = portletResponse.createURI();
         deleteURI.addAction(SubscriptionBaseController.ACTION_DELETE);
         deleteURI.addParameter(SubscriptionBaseController.SUB_BEAN_TO_DELETE,
subBean.getName());
   %>
   <tr>
      <td class="wpsTableDataStart">

<%=(String)subBean.getProperty(MonitoringSubscriptionBean.MONITORING_SERVER_STA
TUS)%>
      </td>
      <td class="wpsTableDataMiddle">
         <a href="<%= modifyURI%>">
            <span class="wpsTaskIconText">Edit</span>
         </a>
      </td>
      <td class="wpsTableDataEnd">
         <a href="<%= deleteURI%>">
            <span class="wpsTaskIconText">Delete</span>
         </a>
      </td>
   </tr>
   <%  } %>
<%  } %>
</table>
```

5. Create an add link that switches the portlet in the ADD_MODE when selected (Example 3-43).

Example 3-43 Add link

```
<%
   PortletURI addURI = portletResponse.createURI();
   addURI.addParameter(SubscriptionBaseController.ADD_MODE, "true");
%>

<table border="0" cellspacing="0" cellpadding="2" >
   <tr>
      <td>
         <A style="text-decoration: none;" href="<%= addURI%>">
            <SPAN class="wpsTaskIconText">Add subscription</SPAN>
         </A>
      </td>
   </tr>
</table>
```

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Note: Customization: Replace all the occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive). Be careful to use all the subscription matching parameters that your subscription needs.

Subscription configuration JSP

This JSP allows the user to add or edit subscription parameters. In this example, the subscription configuration JSP file is named MonitoringSubscriptionConfig.jsp. You must create a JSP file for each device that you want to give access to this portlet (for example, PDA devices) and save this file in its corresponding directory.

The instructions of this JSP file are:

1. Import necessary libraries and beans (Example 3-44).

Example 3-44 Required libraries and beans for subscription configuration JSP

```
<%@ page import="com.ibm.pvc.we.ins.portlets.*" %>
<%@ page import="org.apache.jetspeed.portlet.*" %>
<%@ page import="java.util.*" %>
<%@ taglib uri="/WEB-INF/tld/portlet.tld" prefix="portletAPI" %>
<portletAPI:init />
```

2. Declare variables for delivery options, subscription matching parameters, the list of existing delivery channels, and others (Example 3-45).

Example 3-45 processSocket method implementation

```
<%  String notificationOption = "";
   String notifyOnce  = "checked";
   String notifyAlways  = " ";

   String channelOrderOption = "";
   String orderChannel ="";
   String notOrderChannel = "checked";

   String contentStorageOption = "";
   String saveContent = " ";
   String notSaveContent = "checked";

   String srvStatus = "";
   String allDown = "checked";
   String atLeastOneDown = " ";
   String allUp = " ";
```

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```
   String addFailed = (String)portletRequest.getAttribute("add_failed");
   String modifyFailed = (String)portletRequest.getAttribute("modify_failed");
   String deleteFailed = (String)portletRequest.getAttribute("delete_failed");
   String inputError= (String)portletRequest.getAttribute("input_error");
   String serverError = (String)portletRequest.getAttribute("server_error");

   DeliveryChannelBean[] dcBeans =
(DeliveryChannelBean[])portletRequest.getPortletSession().getAttribute("allDCBe
ans");
   if
(portletRequest.getPortletSession().getAttribute("savedOrderedAllDCBeans") !=
null) {
      dcBeans =
(DeliveryChannelBean[])portletRequest.getPortletSession().getAttribute("savedOr
deredAllDCBeans");
   }
   String selectedDCNames = "";
   Vector temp = new Vector();
```

3. Get subscription bean from request and create a Cancel, Delete, and Save URI (Example 3-46).

Example 3-46 Get subscription bean and create a Cancel, Delete, and Save URI

```
   String subBeanIndex =
(String)portletRequest.getAttribute(SubscriptionBaseController.SUB_BEAN_INDEX);
   SubscriptionBean subBean
=(SubscriptionBean)portletRequest.getAttribute("selectedSubBean");

   PortletURI cancelURI = portletResponse.createURI();
   PortletURI deleteURI = portletResponse.createURI();
   DefaultPortletAction deleteAction = new
DefaultPortletAction(SubscriptionBaseController.ACTION_DELETE);
   deleteURI.addAction(deleteAction);
   PortletURI saveURI = (PortletURI)portletRequest.getAttribute("saveURI");

   if (subBeanIndex != null) {
      saveURI.addParameter(SubscriptionBaseController.SUB_BEAN_INDEX,
subBeanIndex);
      deleteURI.addParameter(SubscriptionBaseController.SUB_BEAN_TO_DELETE,
subBean.getName());
   }
```

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4. Get subscription information from the subscription bean and store it in its corresponding variables (Example 3-47). If subscription bean is not null, then the subscription exists, and the JSP file retrieves the existing subscription data.

Example 3-47 Get subscription information from subscription bean

```
if (subBean != null) {
   notificationOption = subBean.getNotificationOption();
   contentStorageOption  = subBean.getContentStorage();
   channelOrderOption =
(String)subBean.getProperty(SubscriptionBean.KEY_CHANNEL_ORDER_OPTION);
   if
(subBean.getProperty(MonitoringSubscriptionBean.MONITORING_SERVER_STATUS) !=
null) {
      srvStatus =
(String)subBean.getProperty(MonitoringSubscriptionBean.MONITORING_SERVER_STATUS
);
   }
   if (subBean.getDeviceNames() != null) {
      selectedDCNames  = subBean.getDeviceNames();
   }
}
SubscriptionBean tempUserInputSub
=(SubscriptionBean)portletRequest.getAttribute("tempUserInputSub");
if (tempUserInputSub != null) {
   notificationOption = tempUserInputSub.getNotificationOption();
   contentStorageOption  = tempUserInputSub.getContentStorage();
   channelOrderOption =
(String)tempUserInputSub.getProperty(SubscriptionBean.KEY_CHANNEL_ORDER_OPTION)
;
   if
(tempUserInputSub.getProperty(MonitoringSubscriptionBean.MONITORING_SERVER_STAT
US) != null) {
      srvStatus =
(String)tempUserInputSub.getProperty(MonitoringSubscriptionBean.MONITORING_SERV
ER_STATUS);
   }
   if (tempUserInputSub.getDeviceNames() != null) {
      selectedDCNames  = tempUserInputSub.getDeviceNames();
   }
}
```

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5. If the subscription exists, obtain the vector with the selected delivery channels and their order for this subscription (Example 3-48).

Example 3-48 Get delivery channels information

```
Vector reorderedBeansTemp = new Vector();
Vector unselectedBeansTemp = new Vector();
if (selectedDCNames != null) {
   StringTokenizer st = new StringTokenizer(selectedDCNames);
   while (st.hasMoreTokens()) {
      String token = st.nextToken("+");
      String displayDC = token;
      if (token.startsWith(DeliveryChannelBean.DC_LABEL)) {
         displayDC = token.substring(DeliveryChannelBean.DC_LABEL_LEN);
      }
      temp.add(displayDC);
      if (dcBeans != null && dcBeans.length > 0){
         for (int i = 0; i < dcBeans.length;i++){
            String deviceName = dcBeans[i].getName();
            if (deviceName.equals(displayDC) &&
!reorderedBeansTemp.contains(dcBeans[i])){
               reorderedBeansTemp.add(dcBeans[i]);
            }
         }
      }
   }
}

boolean  isOrderChanged = false;
if (portletRequest.getAttribute("dcOrderSaved") != null){
   isOrderChanged = true;
}
if (!isOrderChanged) {
   if (dcBeans != null && dcBeans.length > 0){
      for (int i = 0; i < dcBeans.length;i++){
         if( !unselectedBeansTemp.contains(dcBeans[i]) &&
!reorderedBeansTemp.contains(dcBeans[i])){
            unselectedBeansTemp.add(dcBeans[i]);
         }
      }
   }
   reorderedBeansTemp.addAll(unselectedBeansTemp);
   if (reorderedBeansTemp.size() > 0) {
      dcBeans = new DeliveryChannelBean[reorderedBeansTemp.size()];
      dcBeans = (DeliveryChannelBean[])reorderedBeansTemp.toArray(new
DeliveryChannelBean[reorderedBeansTemp.size()]);
   }
}
portletRequest.getPortletSession().setAttribute("savedOrderedAllDCBeans",dcBean
s);
```

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6. Set auxiliary variables for radio buttons and check options with the subscription information (Example 3-49).

Example 3-49 Set auxiliary variables

```
   if (channelOrderOption != null && channelOrderOption.equals("any")) {
      orderChannel = "checked";
      notOrderChannel = "";
   }
   if (channelOrderOption != null && channelOrderOption.equals("all")) {
      notOrderChannel = "checked";
      orderChannel = "";
   }
   if (notificationOption != null && notificationOption.equals("once")) {
      notifyOnce = "checked";
      notifyAlways = "";
   }
   if (notificationOption != null && notificationOption.equals("always")){
      notifyAlways = "checked";
      notifyOnce = "";
   }
   if (contentStorageOption != null && contentStorageOption.equals("save")){
      saveContent = "checked";
      notSaveContent = "";
   }
   if (contentStorageOption != null && contentStorageOption.equals("nosave")){
      notSaveContent = "checked";
      saveContent = "";
   }
   if (srvStatus != null &&
srvStatus.equals(MonitoringSubscriptionBean.SERVER_STATUS_ALL_DOWN)){
      allDown = "checked";
      atLeastOneDown = "";
      allUp = "";
   }
   if (srvStatus != null &&
srvStatus.equals(MonitoringSubscriptionBean.SERVER_STATUS_SOME_DOWN)){
      allDown = "";
      atLeastOneDown = "checked";
      allUp = "";
   }
   if (srvStatus != null &&
srvStatus.equals(MonitoringSubscriptionBean.SERVER_STATUS_ALL_UP)){
      allDown = "";
      atLeastOneDown = "";
      allUp = "checked";
   }
```

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7. Create the form, display the OK and Cancel buttons, and the Delete button, if necessary (Example 3-50). Display the corresponding error messages if there is some exception during the execution of the program.

Example 3-50 Required libraries and beans for subscription configuration JSP

```
<form name="<portletAPI:encodeNamespace value="MonitoringSubscriptionConfig"/>"
action="<%=saveURI %>" method="POST">
   <table width="100%" border="0" cellspacing="0" cellpadding="0">
      <tr>
         <td align="left" nowrap>
            <a style="text-decoration: none;"
href="javascript:document.forms.<portletAPI:encodeNamespace
value='MonitoringSubscriptionConfig'/>.submit()">
               <span class="wpsTaskIconText">OK</span>
            </a>  
            <a style="text-decoration: none;" href="<%= cancelURI %>">
               <span class="wpsTaskIconText">Cancel</span>
            </a>
<%  if (subBeanIndex != null) { %>
             
            <a style="text-decoration: none;" href="<%= deleteURI %>">
               <span class="wpsTaskIconText">Delete subscription</span>
            </a>
<%  } %>
         </td>
      </tr>
      <tr>
         <td colspan="2" height="1" class="wpsAdminHeadSeparator"></td>
      </tr>
   </table>

   <table width="100%" border="0" cellspacing="0" cellpadding="0" >
<%  if (addFailed != null) { %>
      <tr>
         <td>
            <span class="wpsFieldWarningText">Adding subscription
failed.</span>
         </td>
      </tr>
<%  } %>
<%  if (modifyFailed != null) { %>
      <tr>
         <td>
            <span class="wpsFieldWarningText">Modifying subscription
failed.</span>
         </td>
      </tr>
<%  } %>
```

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```
<%  if (deleteFailed != null) { %>
      <tr>
         <td>
            <span class="wpsFieldWarningText">Deleting subscription
failed.</span>
         </td>
      </tr>
<%  } %>
<%  if (serverError != null) { %>
      <tr>
         <td>
            <span class="wpsFieldWarningText">Sorry we cannot connect to
Intelligent Notification Services currently.</span>
         </td>
      </tr>
<%  }%>
<%  if (inputError != null) { %>
      <tr>
         <td>
            <span class="wpsFieldWarningText">Please check to make sure all
the data you input are valid.</span>
         </td>
      </tr>
<%  } %>
      <tr>
         <td>
            <br>
         </td>
      </tr>
```

8. Display the subscription parameter options for this subscription (Example 3-51). In this example, this parameter is the server status.

Example 3-51 Required libraries and beans for subscription configuration JSP

```
      <tr>
         <td>
            <span class="wpsPortletText">Select an option:</span>
         </td>
      </tr>
      <tr>
         <td>
            <input type="radio"
value="<%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_DOWN%>"
id="<%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_DOWN%>"
name="<portletAPI:encodeNamespace
```

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```
value="<%=MonitoringSubscriptionBean.MONITORING_SERVER_STATUS%>"/>"
<%=allDown%>>
            <label
for="<%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_DOWN%>">
            <span
class="wpsPortletText"><%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_DOWN%>.<
/span>
            </label>
         </td>
      </tr>
      <tr>
         <td>
            <input type="radio"
value="<%=MonitoringSubscriptionBean.SERVER_STATUS_SOME_DOWN%>"
id="<%=MonitoringSubscriptionBean.SERVER_STATUS_SOME_DOWN%>"
name="<portletAPI:encodeNamespace
value="<%=MonitoringSubscriptionBean.MONITORING_SERVER_STATUS%>"/>"
<%=atLeastOneDown%>>
            <label
for="<%=MonitoringSubscriptionBean.SERVER_STATUS_SOME_DOWN%>">
            <span
class="wpsPortletText"><%=MonitoringSubscriptionBean.SERVER_STATUS_SOME_DOWN%>.
</span>
            </label>
         </td>
      </tr>
      <tr>
         <td>
            <input type="radio"
value="<%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_UP%>"
id="<%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_UP%>"
name="<portletAPI:encodeNamespace
value="<%=MonitoringSubscriptionBean.MONITORING_SERVER_STATUS%>"/>" <%=allUp%>>
            <label for="<%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_UP%>">
            <span
class="wpsPortletText"><%=MonitoringSubscriptionBean.SERVER_STATUS_ALL_UP%>.</s
pan>
            </label>
         </td>
      </tr>
      <tr>
         <td><br>
         </td>
      </tr>
```

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9. Display the delivery preferences and the list of available delivery channels (Example 3-52).

Example 3-52 Display delivery preferences and available delivery channels

```
      <tr>
         <td>
            <span class="wpsPortletText">Notification:</span>
         </td>
      </tr>
      <tr>
         <td>
            <input type="radio" value="once" id="notify_option_once"
name="<portletAPI:encodeNamespace value="notificationOption"/>"
<%=notifyOnce%>>
            <label for="notify_option_once">
            <span class="wpsPortletText">Once - Receive notification only the
first time a match occurs.</span>
            </label>
         </td>
      </tr>
      <tr>
         <td>
            <input type="radio" value="always" id="notify_option_always"
name="<portletAPI:encodeNamespace value="notificationOption"/>"
<%=notifyAlways%>>
            <label for="notify_option_always">
            <span class="wpsPortletText">Always - Receive notification every
time a match occurs.</span>
            </label>
         </td>
      </tr>
      <tr>
         <td><br>
         </td>
      </tr>
      <tr><td>
            <img
src='<%=portletResponse.encodeURL("/images/INS/information.gif")%>' border="0"
alt="" />
            <span class="wpsPortletText">
            <portletAPI:text key="Sub_channelOrderOptionHelp"
bundle="nls.INS.PortletMessages" />
            </span>
         </td></tr>
      <tr>
         <td>
            <span class="wpsPortletText">
```

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```
            <portletAPI:text key="Sub_deliveryChannel_prompt"
bundle="nls.INS.PortletMessages" />
            </span>
         </td>
      </tr>
      <tr><td>
            <table border="0" cellspacing="0" align="left" width="90%">
            <tr bgcolor="#DEF2FD">
               <td>
                  <input type="radio" value="any" id="orderChannel"
name="<portletAPI:encodeNamespace value="channelOrderOption"/>"
                  <%=orderChannel%>> <label for="orderChannel">
                  <span class="wpsPortletText">
                  <portletAPI:text key="Sub_channelWithOrder"
bundle="nls.INS.PortletMessages" />
                  </span>
                  </label></td>
            </tr>
            <tr bgcolor="#DEF2FD">
               <td>
                  <input type="radio" value="all" id="notOrderChannel"
name="<portletAPI:encodeNamespace value="channelOrderOption"/>"
                  <%=notOrderChannel%>> <label for="notOrderChannel">
                  <span class="wpsPortletText">
                  <portletAPI:text key="Sub_channelWithoutOrder"
bundle="nls.INS.PortletMessages" />
                  </span>
                  </label></td>
            </tr>
<%  if (dcBeans != null && dcBeans.length > 0){
      String bgColorStr = "#ffffff";
      for (int i = 0; i < dcBeans.length;i++){
         String deviceName = dcBeans[i].getName();
         String deviceNameLocalized =
dcBeans[i].getNameLocalized(portletRequest.getLocale());
         String selected = " ";
         if (temp != null && temp.contains(deviceName)){
            selected =  "checked";
         }
         if ( (i & 0x1) == 0x1 ) {
             bgColorStr = "#efefef";
         }
         else {
            bgColorStr = "#ffffff";
         }
%>
            <tr bgcolor="<%= bgColorStr %>">
               <td>
```

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```
                  <input type="checkbox" value="<%=deviceName%>"
id='<portletAPI:encodeNamespace value="<%=deviceName%>"/>'
NAME='<portletAPI:encodeNamespace value="<%=deviceName%>"/>' <%=selected%>>
                  <label for="<portletAPI:encodeNamespace
value="<%=deviceName%>"/>">
                  <span class="wpsPortletText">
                  <%=deviceNameLlocalized%>
                  </span>
                  </label>
               </td>
            </tr>
<%} %>
            </table>
         </td></tr>
            <input type="hidden" value="" name="action"/>
<%  if (dcBeans != null && dcBeans.length > 1){ %>
      <tr><td>
            <a href="javascript:document.forms.<portletAPI:encodeNamespace
value='MonitoringSubscriptionConfig'/>.action.value='switchToChannelOrdering';d
ocument.forms.<portletAPI:encodeNamespace
value='MonitoringSubscriptionConfig'/>.submit();" STYLE="text-decoration:none">
            <img name="<portletAPI:encodeNamespace
value='switchToChannelOrdering'/>" src=
"<%=portletResponse.encodeURL("/images/INS/edit.gif")%>" align="middle"
alt="<portletAPI:text key="Sub_channelOrderPrompt"
bundle="nls.INS.PortletMessages" />" border="0"/>
            <span class="wpsDialogIconText">
            <portletAPI:text key="Sub_channelOrderPrompt"
bundle="nls.INS.PortletMessages" />
            </span></a>
         </td></tr>
<% } %>
<%  }else{%>
      <tr>
         <td>
            <span class="wpsPortletText">
            <portletAPI:text key="dcBase.no_dcs_defined"
bundle="nls.INS.PortletMessages" />
            </span>
         </td>
      </tr>
<%}%>
      <tr>
         <td><br>
         </td>
      </tr>
   </table>
```

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10. Display the OK and Cancel button, and the Delete button, if necessary (Example 3-53).

Example 3-53 Display buttons

```
   <table cellspacing="0" cellpadding="0" border="0" width="100%">
      <tr>
         <td colspan="2" height="1" class="wpsAdminHeadSeparator"></td>
      </tr>
       <tr>
         <td align="left" nowrap>
             <a style="text-decoration: none;"
href="javascript:document.forms.<portletAPI:encodeNamespace
value='MonitoringSubscriptionConfig'/>.submit()">
            <span class="wpsTaskIconText">OK</span>
            </a>  
            <a style="text-decoration: none;" href="<%= cancelURI %>">
            <span class="wpsTaskIconText">Cancel</span>
            </a>
<%  if (subBeanIndex != null) { %>
             
            <a style="text-decoration: none;" href="<%= deleteURI %>">
            <span class="wpsTaskIconText">Delete subscription</span>
            </a>
<%  }%>
         </td>
      </tr>
   </table>
</form>
```

Customization: Replace all the occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive). Be careful to use all the subscription matching parameters that your subscription needs.

Delivery channel ordering JSP

This JSP file allows users to change the order in which their delivery channels are prompted for notification. This is a WebSphere Everyplace Access core JSP file and does not need customization.

The file is located in INSPortlet.war files in *ins_home*\config\templates\wps directory, where *ins_home* is in the installation directory C:\Program Files\WebSphere\INS.

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The web.xml file

This is an XML file for registering the portlet as a Web application with WebSphere Application Server. Example 3-54 shows the web.xml file for the monitoring subscription sample.

Note: You can find sample code for the subscription portlets in the *ins_home*\samples\portlets\ directory in the WebSphere Everyplace Access V5 server, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

Example 3-54 The web.xml file

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE web-app PUBLIC "-//Sun Microsystems, Inc.//DTD Web Application
2.3//EN" "http://java.sun.com/dtd/web-app_2_3.dtd">
<web-app id="WebApp_IBM_INS_MonitoringSubscriptions_Portlets">
   <display-name>Monitoring Notification</display-name>
   <!-- First do all of the servlet definitions -->
   <servlet id="MonitoringNotification">
      <servlet-name>Monitoring Notification</servlet-name>
      <display-name>Monitoring Notification</display-name>

<servlet-class>com.ibm.pvc.we.ins.portlets.MonitoringSubscriptionBaseController
</servlet-class>
      <load-on-startup>0</load-on-startup>
   </servlet>
   <servlet-mapping>
      <servlet-name>Monitoring Notification</servlet-name>
      <url-pattern>/MonitoringNotification/*</url-pattern>
   </servlet-mapping>
</web-app>
```

Customization: Replace all the occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive).

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The portlet.xml file

This is an XML file for registering the portlet as a portlet with the WebSphere Portal Server. Example 3-55 shows the portlet.xml file for the monitoring subscription sample.

Note: You can find sample code for the subscription portlets in the *ins_home*\samples\portlets\ directory in the WebSphere Everyplace Access V5 server, where *ins_home* is the Intelligent Notification Services home installation directory (for example C:\Program Files\WebSphere\INS).

Example 3-55 The portlet.xml file

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE portlet-app-def PUBLIC "-//IBM//DTD Portlet Application 1.1//EN"
"portlet_1.1.dtd">
<portlet-app-def>
   <portlet-app uid="MonitoringNotification_application" major-version="1"
minor-version="0">
      <portlet-app-name>MonitoringNotification application</portlet-app-name>
      <portlet id="MonitoringNotification_portlet"
href="WEB-INF/web.xml#MonitoringNotification" major-version="1"
minor-version="0">
         <portlet-name>MonitoringNotification portlet</portlet-name>
         <cache>
            <expires>0</expires>
            <shared>NO</shared>
         </cache>
         <allows>
            <maximized />
            <minimized />
         </allows>
         <supports>
            <markup name="html">
               <view output="fragment" />
            </markup>
            <markup name="wml">
               <view output="fragment" />
            </markup>
            <markup name="pda">
               <view output="fragment" />
            </markup>
         </supports>
      </portlet>
   </portlet-app>
   <concrete-portlet-app uid="MonitoringNotification_application_concrete">
      <portlet-app-name>MonitoringNotification application</portlet-app-name>
```

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```
      <concrete-portlet id="MonitoringNotification_portlet"
href="#MonitoringNotification_portlet">
         <portlet-name>MonitoringNotification portlet</portlet-name>
         <default-locale>en</default-locale>
         <language locale="en">
            <title>MonitoringNotification portlet</title>
            <title-short></title-short>
            <description></description>
            <keywords></keywords>
         </language>
         <config-param>
            <param-name>pda-icon</param-name>
            <param-value>/images/pda/subscriptions.gif</param-value>
         </config-param>

      </concrete-portlet>
   </concrete-portlet-app>
</portlet-app-def>
```

Customization: Replace all occurrences of the word `Monitoring` with the word `MySubscription` (case sensitive).

Note: For more information about Intelligent Notification Services classes and methods, refer to the Javadoc documentation in *ins_home*\javadoc\insjavadoc.jar, where *ins_home* is the Intelligent Notification Services home installation directory (for example, C:\Program Files\WebSphere\INS).

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3.5.2 Deploying a subscription portlet

To deploy the subscription portlet:

1. From WebSphere Studio, export the subscription portlet project as a WAR file:
   a. Go to the subscription portlet project. In this example it is MonitoringNotify. Right-click the project and select **Export** → **WAR file**. Click **Next**.
   b. Select the directory destination and click **Finish**.
2. Install the portlet in the WebSphere Everyplace Access V5 server.
3. Give Intelligent Notification Services users access to this portlet.
4. Add this portlet to the My Subscription page in Intelligent Notification Services module.

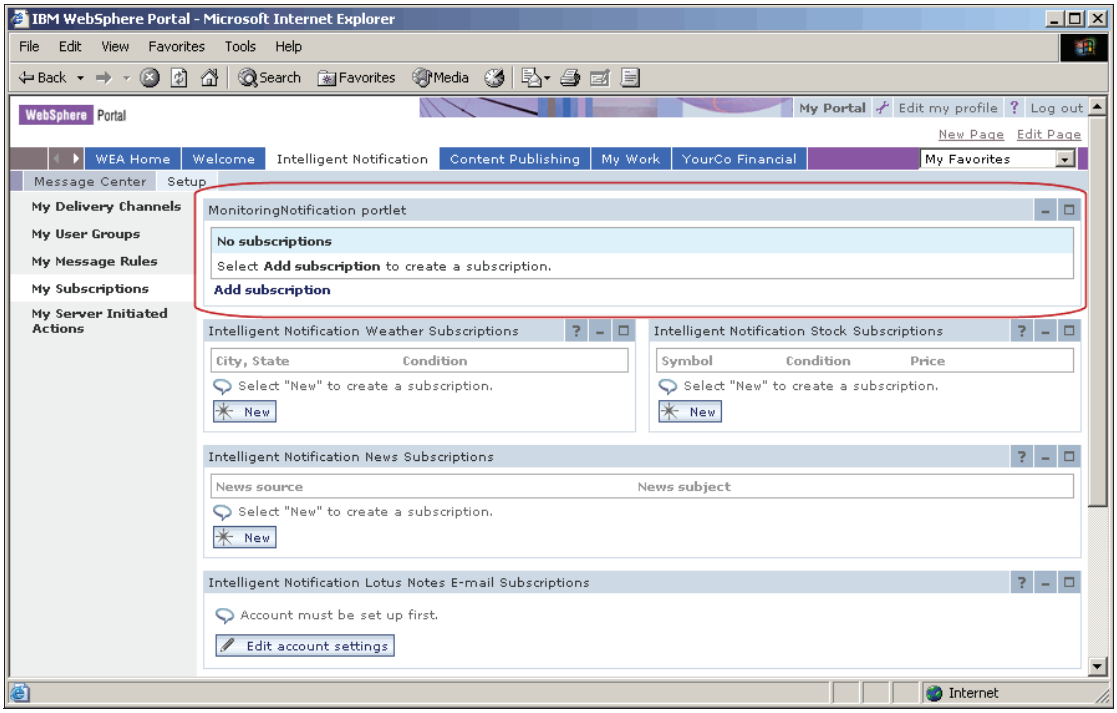

Figure 3-10 Monitoring notification portlet

Note: For more information about portlet installation and user permissions, refer to *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume I: Installation and Administration*, SG24-6462.

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3.6 Running the sample scenario

The following is a sample situation to show how the sample subscription portlet works to generate subscription-based notifications:

- User ID (subscriber): GRB. It must be an Intelligent Notification Services user.
- Subscription: Monitoring Notification.
- Subscription filter: The user wants to be informed if at least one server has the HTTP service down.
- Servers to be monitored:
  - An existing server, for example: www.ibm.com®
  - A nonexistent server, for example: www.mysampledomain.com
- Delivery options:
  - Notification: Always.
  - All of the selected delivery channels.
  - Delivery channels: Message Center.
- WebSphere Everyplace Access server name: wea5d.
- Socket port: 55021.

To run this scenario:

1. Start the monitoring content adapter application, including the correct socket port number in the property file. This procedure is described in 3.3.4, “Deploying a content adapter” on page 94.
2. Start the monitoring content source program, including the server names that are specified and the correct WebSphere Everyplace Access server and socket port to establish communication with the content adapter. This procedure is described in 3.3.2, “Deploying a content source program” on page 87.

   In this example, because one of the monitored servers does not exist, the content source sends the message “At least one server is Down” to the content adapter, as shown in Figure 3-11 on page 139.

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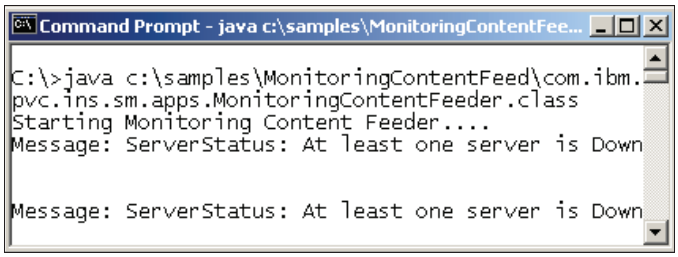

Figure 3-11 Monitoring content source program

3. Log on in WebSphere Everyplace Access server as GRB. Go to **Intelligent Notification Section** → **My Subscriptions**.
4. Add a new subscription, a shown in Figure 3-12, by following these steps:
   a. Select **At least one server is Down**.
   b. Select Notification **Always**.
   c. Check the option **All of the selected delivery channels** and select the delivery channels that you want to receive notification.
   d. Click **OK**.

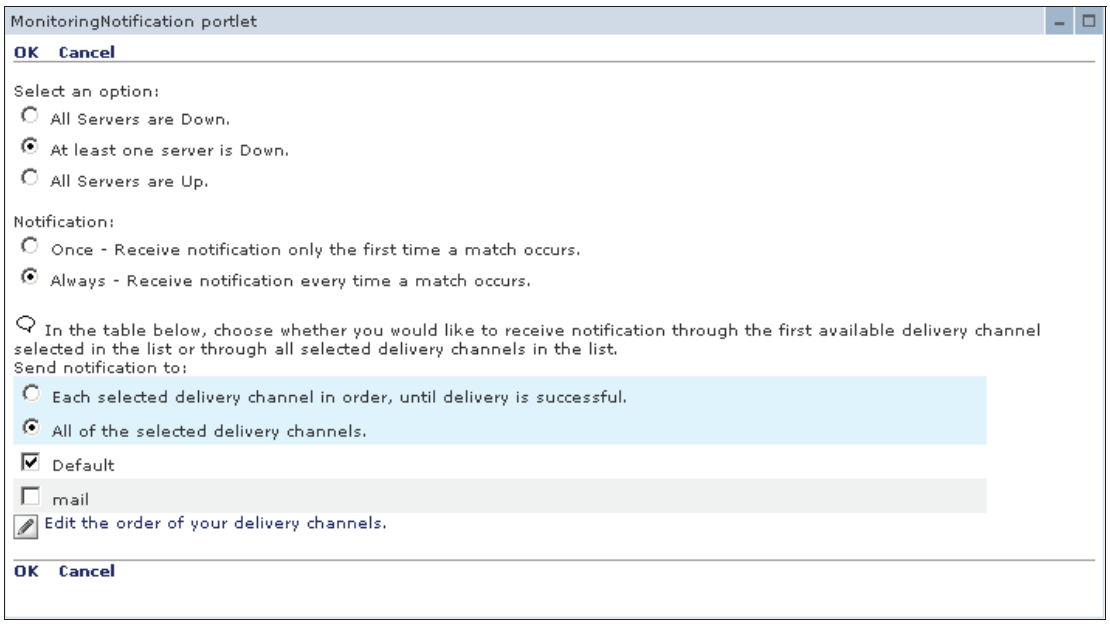

Figure 3-12 Monitoring notification subscription

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The notification will arrive at the delivery channels that are selected, as shown in Figure 3-13, Figure 3-14, and Figure 3-15 on page 141.

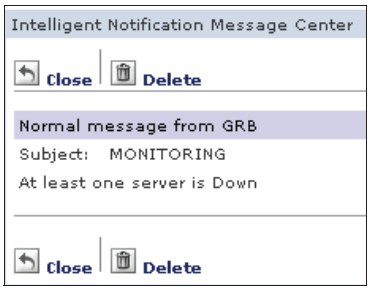

Figure 3-13 Monitoring notification in Message Center delivery channel

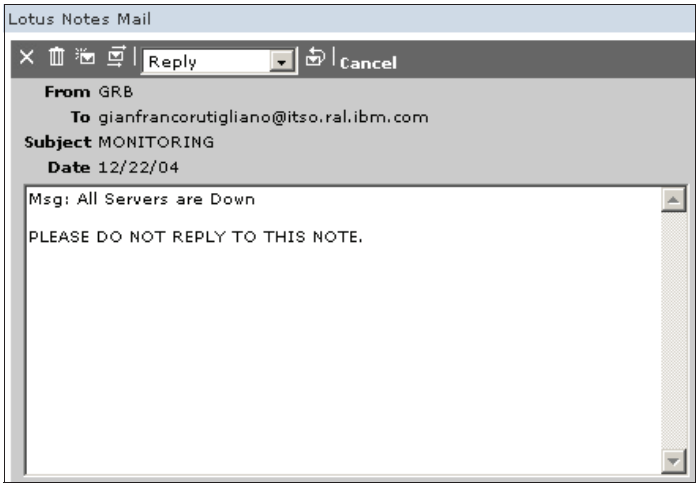

Figure 3-14 Monitoring notification in e-mail delivery channel

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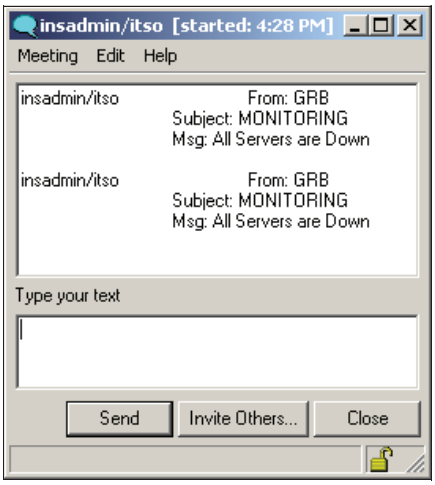

Figure 3-15 Monitoring notification in Sametime delivery channel

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4

Server-initiated actions

This chapter describes the server-initiated actions (SIA) function in WebSphere Everyplace Access. This feature uses the notification mechanisms in Intelligent Notification Services to send notifications to the user devices through preferred server-initiated actions delivery channels so that the device performs the actions that were requested by the server in the notification.

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4.1 Overview of server-initiated actions

There are two ways of using the server-initiated actions (SIA) feature:

- Users want to synchronize their devices automatically when a particular mail is received (for example, when they receive an urgent mail from their manager). In such cases, only e-mail synchronization is requested.
- The administrator wants a given user, or group of users, to have their devices synchronized (for example, the administrator wants a Device Manager Services (DMS) job to run on their devices. The solicited synchronizations are:
  - DMS synchronization
  - DB2e synchronization
  - Offline synchronization
  - PIM synchronization
  - e-mail synchronization
  - All synchronizations

Note: The SIA function does not ensure delivery of the notification. If the notification is not delivered, it is discarded and not retried.

4.1.1 Description of server-initiated actions

Server-initiated actions work on top of Intelligent Notification Services and consist of the following:

- An SIA delivery channel. This special delivery channel receives notifications from Intelligent Notification Services as a regular delivery channel. It then feeds transformed SIA notifications back into Intelligent Notification Services. This delivery channel has the following components:
  - The SIA channel adapter receives regular Intelligent Notification Services notification messages and translates them into the proper SIA format to be sent to the device. This channel adapter is used as a normal channel adapter in WebSphere Everyplace Access.
  - The SIA user delivery channel portlet allows the user to configure the SIA notification channels.
- An administrative portlet. This portlet allows an administrator to send SIA notifications to users or group of users.

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SIA delivery channels

SIA sends Short Message Service (SMS) or Sametime notifications and relies on the following companion products: WebSphere Everyplace Connection Manager (to transport the SMS notifications) and Sametime Server (to transport Sametime notifications). SIA supports Pocket PC devices for Sametime notifications and SMS notifications using WebSphere Everyplace Connection Manager. Figure 4-1 illustrates the functional overview of SIA.

Note: A future release of WebSphere Everyplace Access is expected to include Palm support.

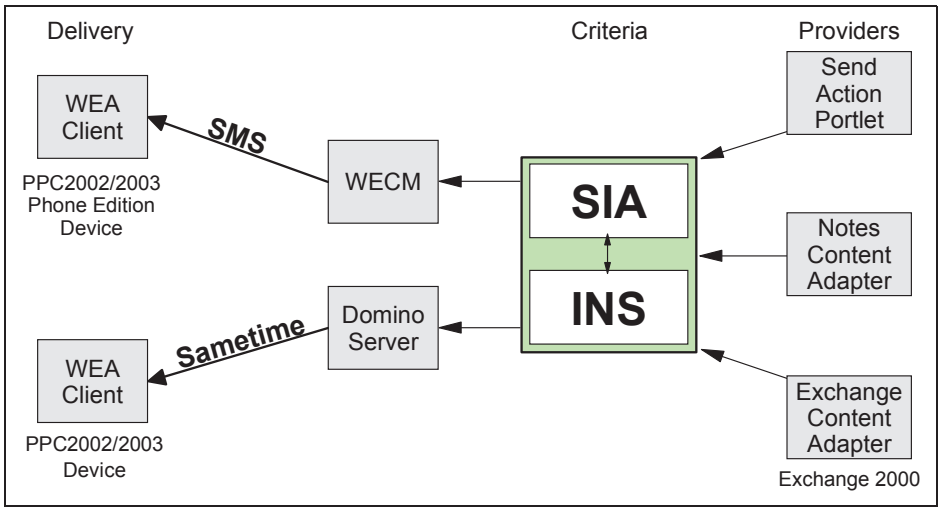

Figure 4-1 SIA functional overview

Note: It is possible to use an e-mail delivery channel for SMS server-initiated actions notification, provided that the SMS addressing is given by an e-mail address.

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SIA data flow

Figure 4-2 illustrates the different data flows occurring during an SIA notification.

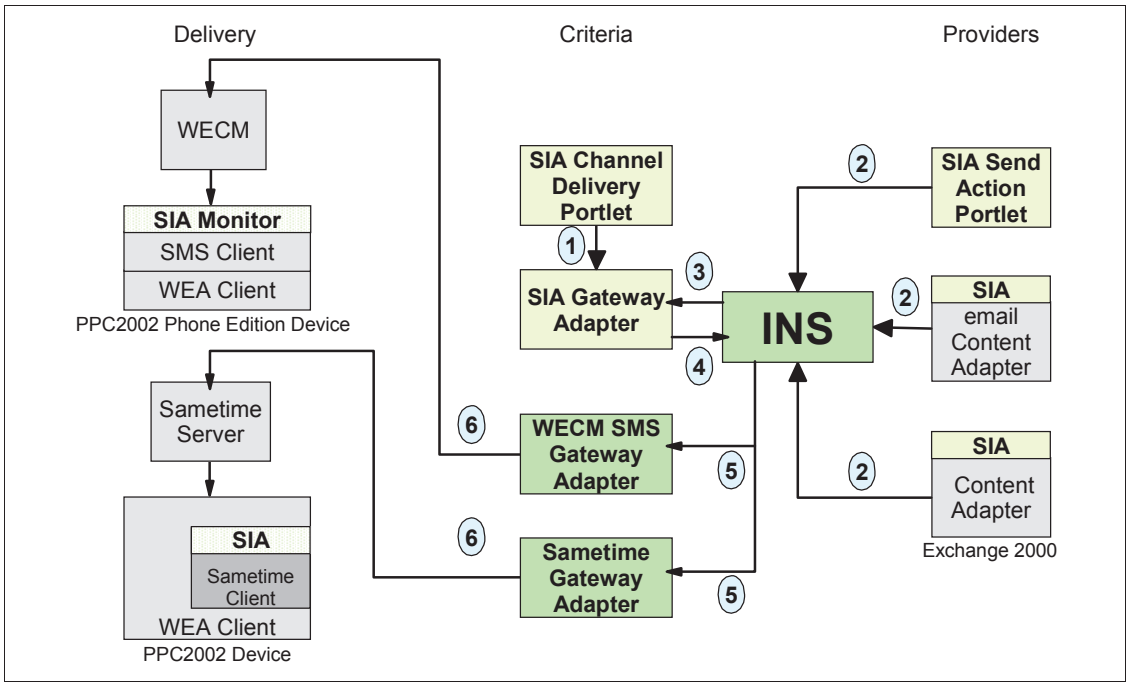

Figure 4-2 SIA data flows

The steps in this data flow are as follows:

1. The Intelligent Notification Services user configures the SIA channel adapter using the SIA channel delivery portlet, which allows the setting of the SMS or Sametime delivery channels that are used by SIA.

> **Note:** The SIA does not need a subscription portlet to be configured (unlike a regular subscription). All the information that SIA needs for a given user is set inside the SIA channel delivery portlet. Thus, this portlet appears to be a combination of the regular subscription portlet with a regular channel delivery portlet.

2. The SIA notification is triggered in the following ways:
   – The WebSphere Everyplace Access administrator uses the SIA send action portlet to trigger a solicited synchronization of the device.

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– The Intelligent Notification Services user has configured an e-mail subscription with one SIA delivery channel to trigger a synchronization action on the device.

  When content arrives, the corresponding content adapter runs a specific SIA process to generate the notification to Intelligent Notification Services.

3. The notification is sent by the Intelligent Notification Services to the SIA channel adapter, which re-formats the synchronization request according to the target delivery channel, SMS, or Sametime.
4. The re-formatted synchronization request goes back to Intelligent Notification Services for delivery.
5. The appropriate delivery channel is triggered by Intelligent Notification Services to deliver the notification.
6. Intelligent Notification Services relies on the WebSphere Everyplace Connection Manager to deliver SMS to the device and on the Sametime Server to deliver the Sametime message to the device.

Client processing

For client processing, the following occurs:

- When the SIA synchronization request arrives on a device where the WebSphere Everyplace Access client is not running, the request is discarded and, therefore, lost. If you are using Sametime as a channel adapter for SIA and it is not running, the message is discarded.
- When the SIA synchronization request is an SMS:
  – The device relies on a component called the SIA monitor, which is installed at the time that WebSphere Everyplace Access client is installed.

    Note: The SIA monitor is an application that registers towards the phone regular SMS client to receive the SMS. Because only one application is allowed to do such, an error message is displayed. In this case, the other application that is already registered towards the SMS client must be stopped, and the device must be reset to make the change effective.

  – The SIA monitor intercepts the SIA synchronization requests and forwards them to the WebSphere Everyplace Access client for processing.
  – All the regular SMS notifications are forwarded to the SMS inbox.

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- When the SIA synchronization request is a Sametime instant message:
  - When the Sametime client is not running, the request is discarded and, therefore, lost.
  - The Sametime client intercepts the SIA synchronization requests and forwards them to the WebSphere Everyplace Access client for processing.
  - All the regular Sametime instant messages are forwarded to the Sametime connect client.

4.2 Sample scenario with server-initiated actions

This scenario sends commands to a user's device when new e-mail messages arrive in an inbox. After receiving this messages, the device connects to WebSphere Everyplace Access and synchronizes the new e-mail messages.

The user in this example is *Manuel*. The example configures two delivery channels for Manuel. The first delivery channel is Sametime, which is used by the second delivery channel, SIA, to send the commands to the device.

4.2.1 Requirements for this scenario

To use this scenario, the delivery channel for Lotus Sametime must be configured. Furthermore, the user should be part of the Intelligent Notification Service group.

To make sure the Sametime delivery channel is configured, open the notificationManagerConfig.xml file, which is located in *ins_home*\config\xml directory, where *ins_home* is in the installation directory C:\Program Files\WebSphere\INS. Sametime should be available as a delivery channel.

To be able to use Intelligent Notification Services, the user has to be a member of the Intelligent Notification Services user group. This group is defined during the installation. In the sample installation, it is called *insusers*. If the user is not a member of this group, the user will not see the Intelligent Notification Services tab in the portal.

To use the Mail and Calender Services, the Intelligent Notification Services user ID needs access to all mail files that it should monitor. To ensure this access:

1. Open Lotus Notes and log in as *manuel*.
2. Open the mail file for *manuel*.

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3. Go to **File** → **Database** → **Access Control...** and give the Intelligent Notification Services administrative user *Reader* access, as shown in Figure 4-3.
4. Click **OK** and close Lotus Notes.

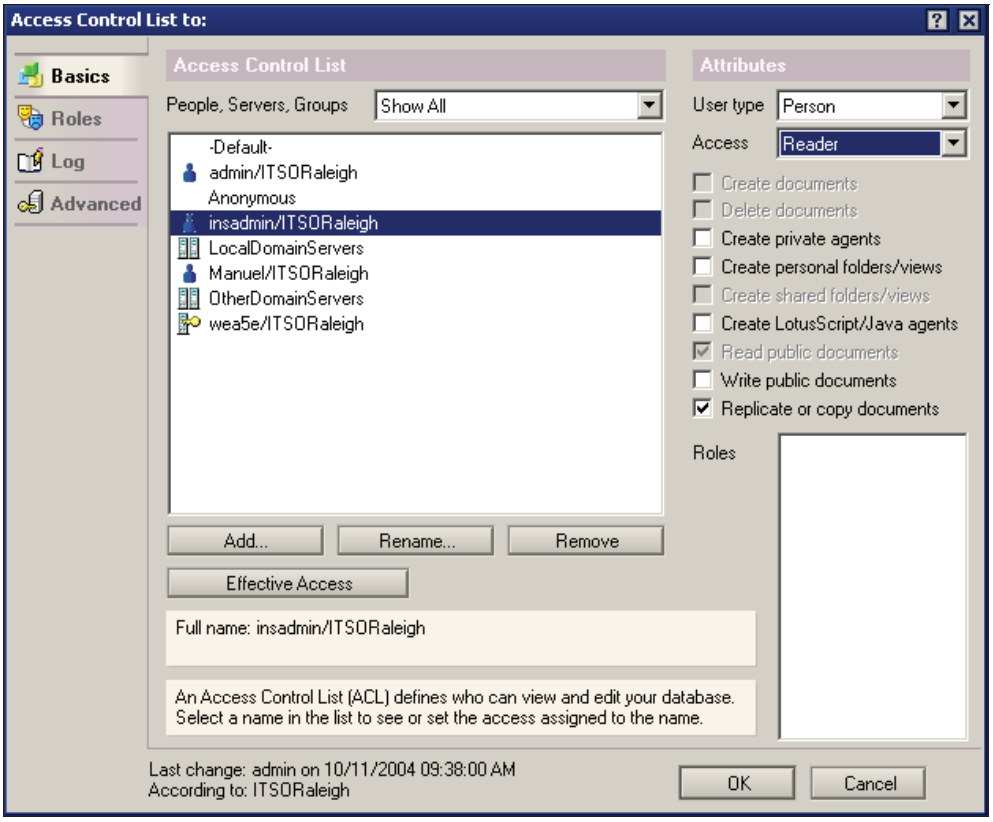

Figure 4-3 Access Control List to give permission to the administrative user

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Configuring delivery channels

To configure delivery channels:

1. Log in to the WebSphere Everyplace Access Portal as user Manuel.
2. Select **Intelligent Notification** → **Setup** → **My Delivery Channels**.
3. Click **Add delivery channel** in the Intelligent Notification Sametime Delivery Channels portlet (Figure 4-4).

Figure 4-4 Add a new Sametime delivery channel

4. Enter the name of this channel. This name is used later to specify which notification should be sent to which delivery channel. You can choose any name you want. This scenario uses the name `sametime`.
5. Specify the Sametime ID to where the notification should sent, as shown in Figure 4-5.
6. Click **OK**.

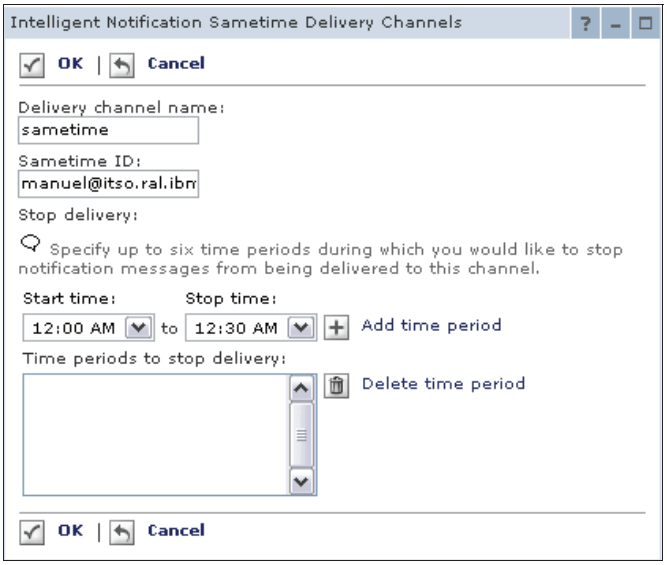

Figure 4-5 Configure Sametime delivery channel

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Follow these steps to create a server-initiated action delivery channel:

1. Assuming user Manuel is still logged in to the WebSphere Everyplace Access Portal, go to **Intelligent Notification** → **Setup** → **My Server Initiated Actions**.
2. Click **Add delivery channel** in the Intelligent Notification Serve Initiated Actions Delivery Channels portlet.

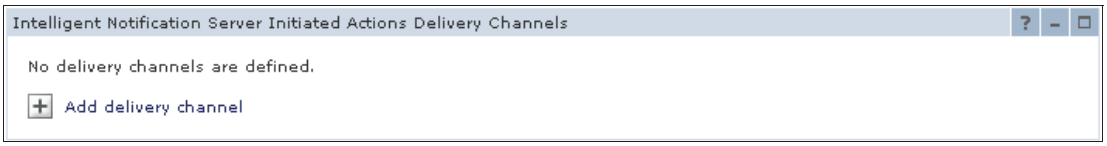

Figure 4-6 Add a new delivery channel

3. Enter the name of this channel. This name is used later to specify which notification should be sent to which delivery channel. You can choose any name you want. This scenario uses `sia` as the name of the delivery channel.
4. Select **sametime** as the delivery channel.
5. Click **OK**.

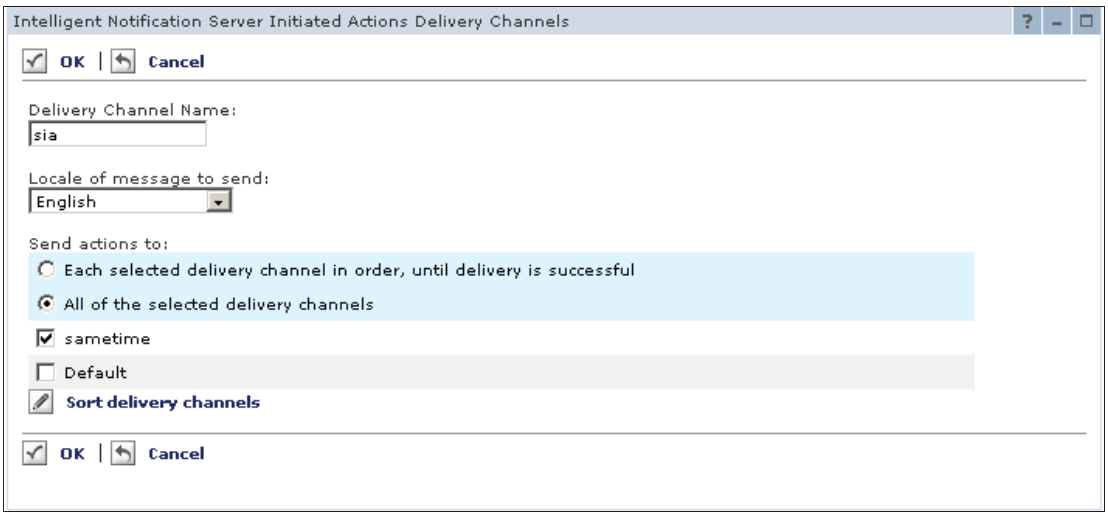

Figure 4-7 Configure SIA delivery channel

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Configuring the subscriptions

Follow these steps to configure subscriptions:

1. Assuming that user Manuel is still logged in to the WebSphere Everyplace Access Portal, go to **Intelligent Notification** → **Setup** → **My Subscriptions.**
2. Click **Edit account settings** in the Intelligent Notification Lotus Notes E-mail Subscriptions portlet (Figure 4-8).

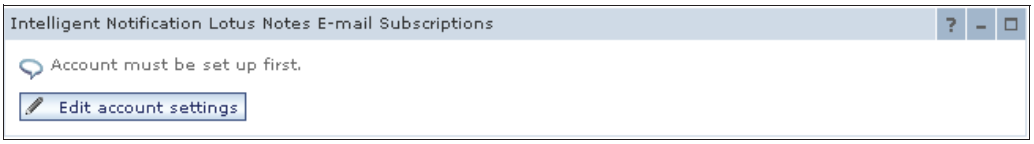

Figure 4-8 Add a new subscription

3. Enter the e-mail address and the password for the user and click **OK** (Figure 4-9).

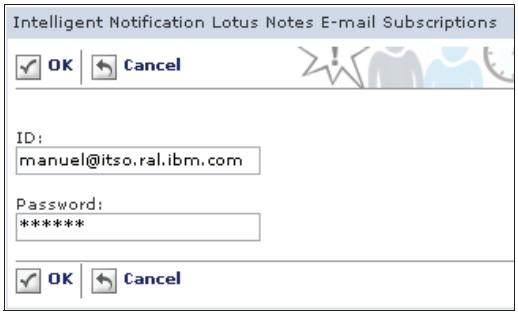

Figure 4-9 Configure Lotus Notes e-mail account settings

4. Click **New** to create a new mail subscription.
5. Leave the From and Subject Fields empty so that all e-mail messages with any subject result in a notification. Select **Always** to receive a notification every time a new e-mail arrives. Select **All of the selected delivery channels** and **sia** as delivery channels, as shown in Figure 4-10 on page 153.
6. Click **OK.**

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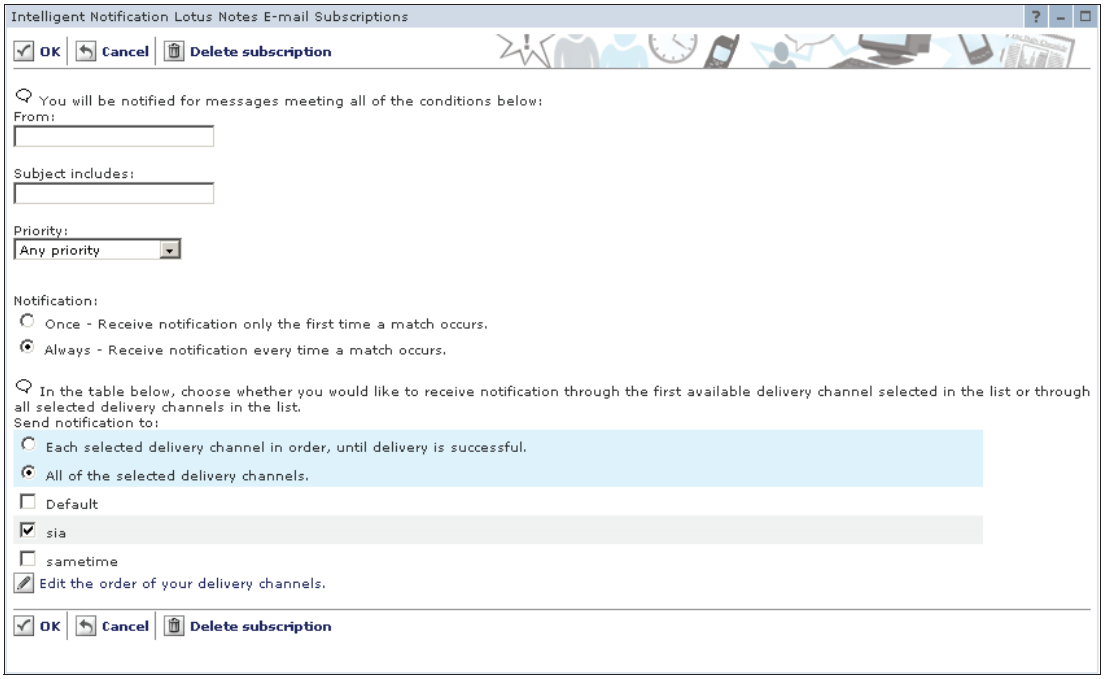

Figure 4-10 Configure Lotus Notes e-mail subscription

Receiving an e-mail notification

1. To receive the notifications with Sametime, log in to Sametime on your device.
2. Send an e-mail to user Manuel (Figure 4-11).

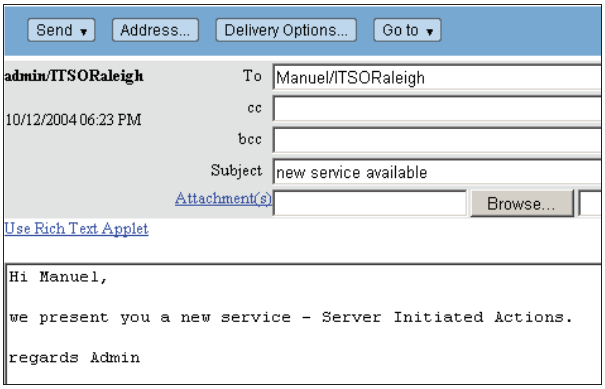

Figure 4-11 Composing an e-mail

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3. After a few minutes, you will see a new message in your inbox, as shown in Figure 4-12.

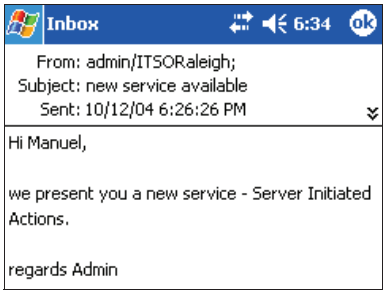

Figure 4-12 Synchronized e-mail

Note: The command that is sent via Sametime does not appear on the Sametime client. It is processed. You will only recognize that the WebSphere Everyplace Access client synchronizes the inbox.

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5

Location Aware Services

This chapter describes the Location Aware Services that are provided in WebSphere Everyplace Access. Location Aware Services provide application developers an easy-to-use, yet powerful, application programming interface (API) for creating location aware applications. Being able to discover the position (latitude and longitude) of the cellular device, providing mapping and directions based on position or address, can significantly enhance mobile applications.

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5.1 Introduction to Location Aware Services

The increasing use of pervasive devices provides tremendous opportunity for providing value-added solutions to users. Location Aware Services provide an opportunity for enhancing existing applications that are extended to mobile devices (for example, enter the users location automatically in a mapping or directions application) or for creating totally new applications (for example, find the closest gas station).

Location Aware Services is middleware that WebSphere Everyplace Access provides to applications that access the location-based services provided by many cellular service providers. These location-based services provide the latitude and longitude of the cellular device to the application. The use of Location Aware Services can improve the adoption rate of some applications dramatically by catering to specific needs of the mobile user.

Without Location Aware Services, enabling location awareness in applications can be complex and time consuming because this involves collaborating with several vendors and aggregating technologies from various sources. Location Aware Services in WebSphere Everyplace Access enables rapid development and deployment of applications that are location aware.

WebSphere Everyplace Access provides a single standards-based API for the Location Aware Services so that developers can program to services and not to individual providers. Programming to services avoids being tied to a single provider and shields the developer from changes in the provider's location services implementation.

Location Aware Services provide:

- Provider transparency
  - Ability to program to a single API for location services. Location Aware Services provide developers of location-aware applications with a single API for common location services. The API defines call interfaces, the types of objects passed in the calls, and error codes. Behind the Location Aware Services API, a set of service adapters translates the Location Aware Services API to the API of a particular service provider. As a result, the application is now independent of the actual provider of a location service.
  - Transparent authentication of the application or user to the service provider. In general, service providers require an application to authenticate before invoking a service. Authentication mechanisms differ from provider to provider, and credentials must be obtained, stored, and periodically renewed. Location Aware Services and the service adapters

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cooperate to manage the authentication process transparently to the application programmers.

  - Local and remote transparency. Location service providers often make their services available both over the Internet and as software to be installed at the application provider's site. If installed locally, there will be no need to authenticate, and a different invocation mechanism can be used. Location Aware Services makes these differences transparent to the application. It is not aware whether or not the service is implemented locally or remotely.

- Provider differentiation

  Service adapters implementing a common API mask differences between providers at the API level, but services from different providers will differ in other ways. For example, one provider's location-based directory service might offer a wider coverage region than another provider's, or one provider's mapping service might offer color images for WAP phones while another does not. Two services can differ in their quality of service, for example, accuracy of position or level of detail in maps. Location Aware Services offer an application a high-level way to differentiate between implementations on the basis of the capabilities that concern it. The application then can select the service implementation that offers the desired capabilities.

  Location Aware Services also allow applications flexibility in their requests for services. For example, an application that supplies maps to WAP phones might be able to use images in either WBMP or BMP format, but would prefer WBMP. Location Aware Services enable applications to express not only requirements but preferences as well.

- Dynamic service binding

  Third-party location services often are offered as network services, such as all network services, but can become unavailable occasionally, whether due to network outage or a failure at the provider's site. Provider transparency enables Location Aware Services to bind another service dynamically to the application, allowing the application to continue without interruption. Location Aware Services select a replacement service based on the requirements that the application supplied in its original request for service.

  Dynamic service binding also is used in a function sometimes referred to as location roaming. By nature, a location-based service is associated with a certain geographical area. Certain location-based services can be highly localized, that is, apply to a limited geographic area. As examples, a traffic-congestion reporting service might offer information for certain metropolitan areas, or a directory service might be specialized for a particular city. Therefore, a location-based service that is valid for one location might not be valid for another. If a user of a location-based service moves to another area, that service might eventually become invalid.

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5.2 Architecture of Location Aware Services

Figure 5-1 illustrates the architecture of the Location Aware Services function that is provided by WebSphere Everyplace Access.

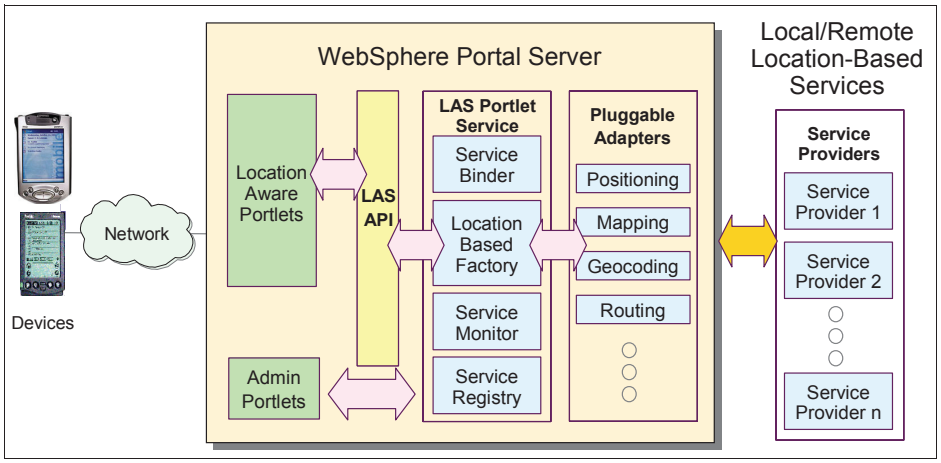

Figure 5-1 Location Aware Services architecture

Location Aware Services provide a single API for location services. In addition to defining service interfaces, the API defines classes for representing locations, parameters for requesting maps, route information, and so on.

Location Aware Services currently support the following services:

- **Geocoding**, which provides the geographical coordinates for a provided address.
- **Reverse-geocoding**, which provides the nearest address to provided geographical coordinates.
- **Mapping**, which provides a map of a given location.
- **Routing**, which provides path from one provided point to another.
- **Directory**, which provides points of interest near a given location.
- **Device - Position**, which provides the position of a specific subscriber's device.

5.2.1 Service adapters

Applications use the different services through service adapters. Location Aware Services mask the service adapters from the application developer and provide a single interface to program.

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The role of a service adapter includes:

- Interface translation

  The service adapter translates the interface that is provided by the service provider to a Location Aware Services interface.

- Service invocation and error handling

  Adapters invoke services depending on the service provider. It could, for example, be through TCP/IP sockets, HTTP requests, and so on. Adapters also act like RPC stubs that serialize and deserialize objects that are used by location services. Adapters insulate the application developer from the service protocols.

- Authentication with service providers

  Adapters have to handle the authentication mechanism as required by the service provider.

In order to enable services through WebSphere Everyplace Access, service providers have to write their own adapters. Adapters must implement specific interfaces that are provided by Location Aware Services.

Adapters for the following service providers are already provided with WebSphere Everyplace Access:

- Webraska
- MapInfo
- Go2Map
- LIF

5.2.2 Location Aware Services portlet service

The core functionality of the Location Aware Services is handled by the portlet service, which comprises several components and is the core component in the Location Aware Services architecture.

A portlet service is a discoverable extension to the Portal functionality. Location Aware Services are implemented as a portlet service because the life cycle is managed by the Portal and does not have container restrictions placed on portlets. Application portlets can query the container for Location Aware Services and use the service without knowing the implementation or concern themselves with its life cycle management.

To understand more about portlet services, see *IBM WebSphere Portal V5: A Guide for Portlet Application Development*, SG24-6076.

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The Location Aware Services portlet:

- Provides appropriate service to the application based on the preferences that are given by the application through the properties file. This functionality is taken care by the Location Service Factory.
- Determines service failures based on service failover policies and takes appropriate action. This functionality is handled by the Service Binder object.
- Determines the ordering of service providers who are offering the same service. If Location Aware Services cannot determine which service provider to use, then it uses the order set by the administrator for the services.

Location Service Factory

As the name implies, Location Service Factory creates instances of Location Aware Services adapters when requested. The request for adapters can come from two sources: applications, via the service binder objects, and internally via service monitor object when it decides that the particular service adapter is needed.

The Location Service Factory makes use of the parameters that are supplied to determine which service provider adapter must be instantiated. For example, for map services, the parameters might include the coverage region, the format of the maps, and so on. The Location Service Factory that is based on these parameters provides the best-fit service provider. If there is a conflict because several providers provide the requested features, then the order set by the administrator is taken.

Service Binder objects

Service Binder objects provide the point at which Location Aware Services mediates access to location services. To the application, these objects offer the interfaces of specific location services. Internally, they make use of Location Service Factory functions to instantiate adapters. Service Binder objects also handle service failure based on failover policies and replace services.

Service Monitor

This monitors the status of all the current services and notifies the Service Binder if any of the service fails so that the failed service can be replaced by other service providers.

Service Registry

The Service Registry is a repository of service descriptions and other service data, including authentication credentials. Service descriptions contain information that Location Aware Services require to manage the service, including a unique name (within the Location Aware Services installation) and

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the name of the Java class that is implementing the service adapter, as well as information that describes the capabilities of the service.

5.3 Installing and configuring Location Aware Services

This section provides information about installation, configuration, and verification of Location Aware Services.

5.3.1 Installation overview

Location Aware Services include the following components:

- Portlets (WebSphere Portal)
- Location Aware Services Application Server (LasAppServer)
- Database

You can install these components on one machine or different machines to suit your business needs. This section discusses how to install on a single machine. However, installation on multiple machines is very similar. On each machine in the configuration (up to three), follow these steps:

1. Run the installer to lay down the Location Aware Services files.
2. Edit the configuration properties file.
3. Run the configurator script with options that are appropriate to the function of the particular machine.

The InfoCenter documentation states that Location Aware Services require a component installation of Everyplace Serve. However, adding Location Aware Services after a basic install also works and is much easier for single machine installations. A basic single machine installation is especially useful to pilot Location Aware Services applications.

5.3.2 Installing Location Aware Services

After completing the base installation of Everyplace Server (basic or component), you should verify that the base functions are working. After you have verified that the base functions are operational, you can log on to create new accounts, and you are ready to install Location Aware Services.

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Run Location Aware Services setup

To run the setup program:

1. Run the graphical install from the las directory on CD5. For windows this file is lassetupwin.exe. There is no need to stop any of the services. The InstallShield Wizard begins (Figure 5-2)

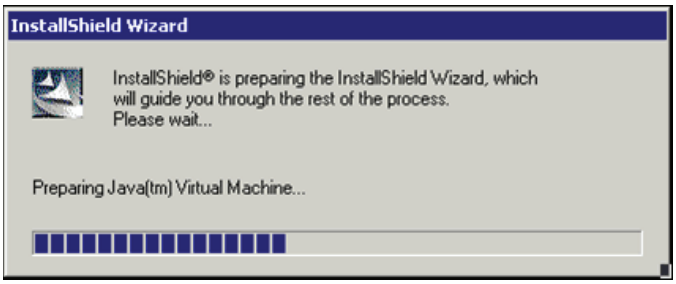

Figure 5-2 Location Aware Services installation

2. Select your language as shown in Figure 5-3.

Figure 5-3 Language selection

The screen shown in Figure 5-4 on page 163 appears.

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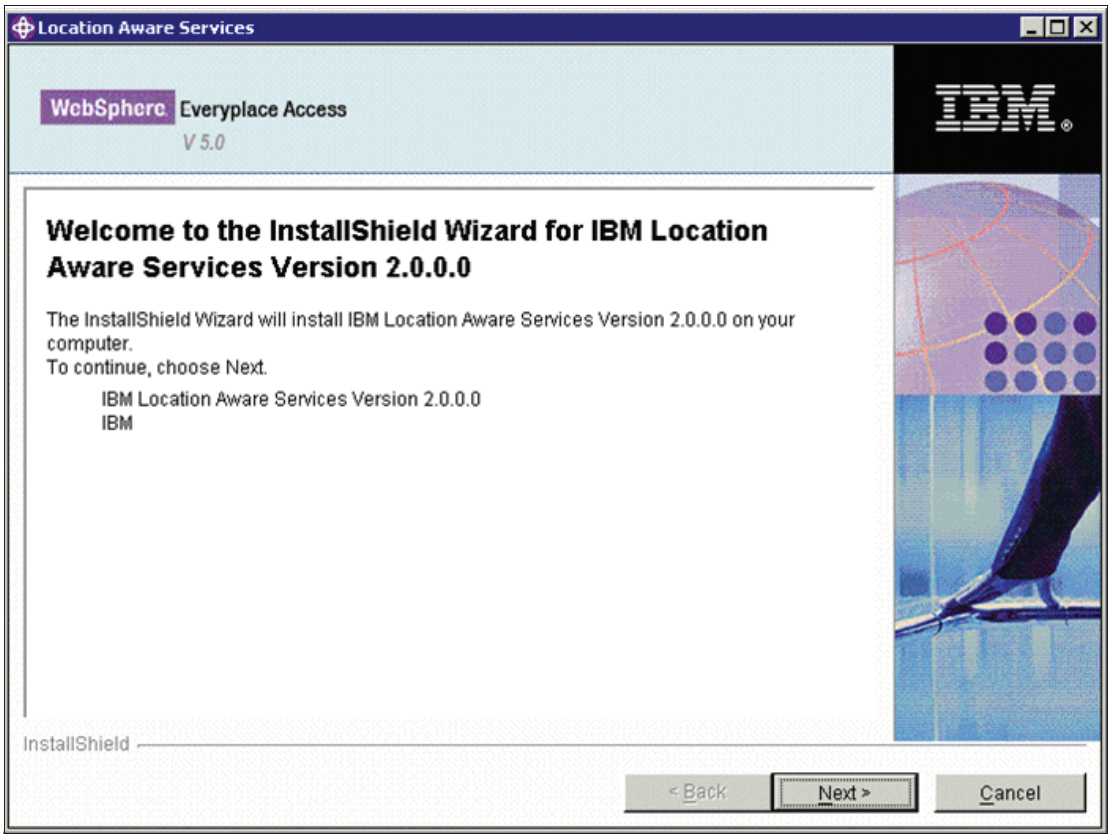

Figure 5-4 Location Aware Services V2.0 install

3. Select **Next**.

   The screen shown in Figure 5-5 on page 164 appears.

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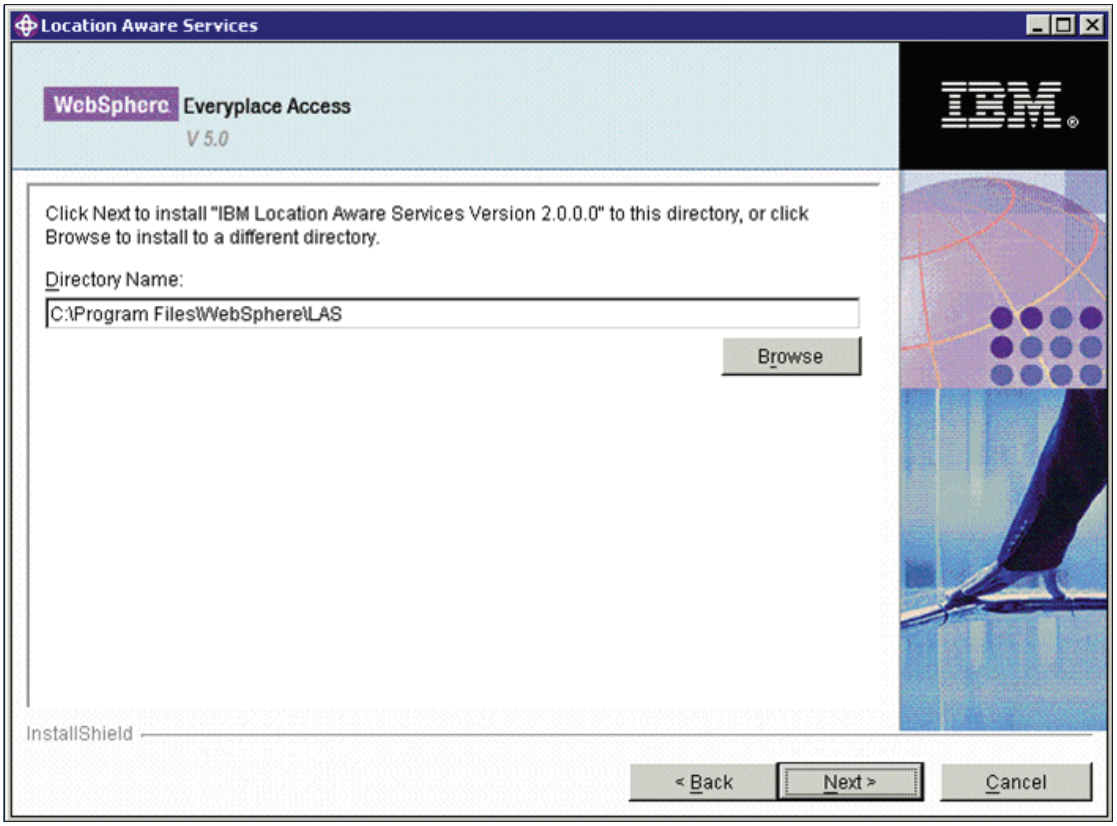

Figure 5-5 Directory name

4. Enter the directory to install the Location Aware Services files and press **Next**.

> **Tip:** Using the default directory is easiest.

The screen shown in Figure 5-6 on page 165 appears.

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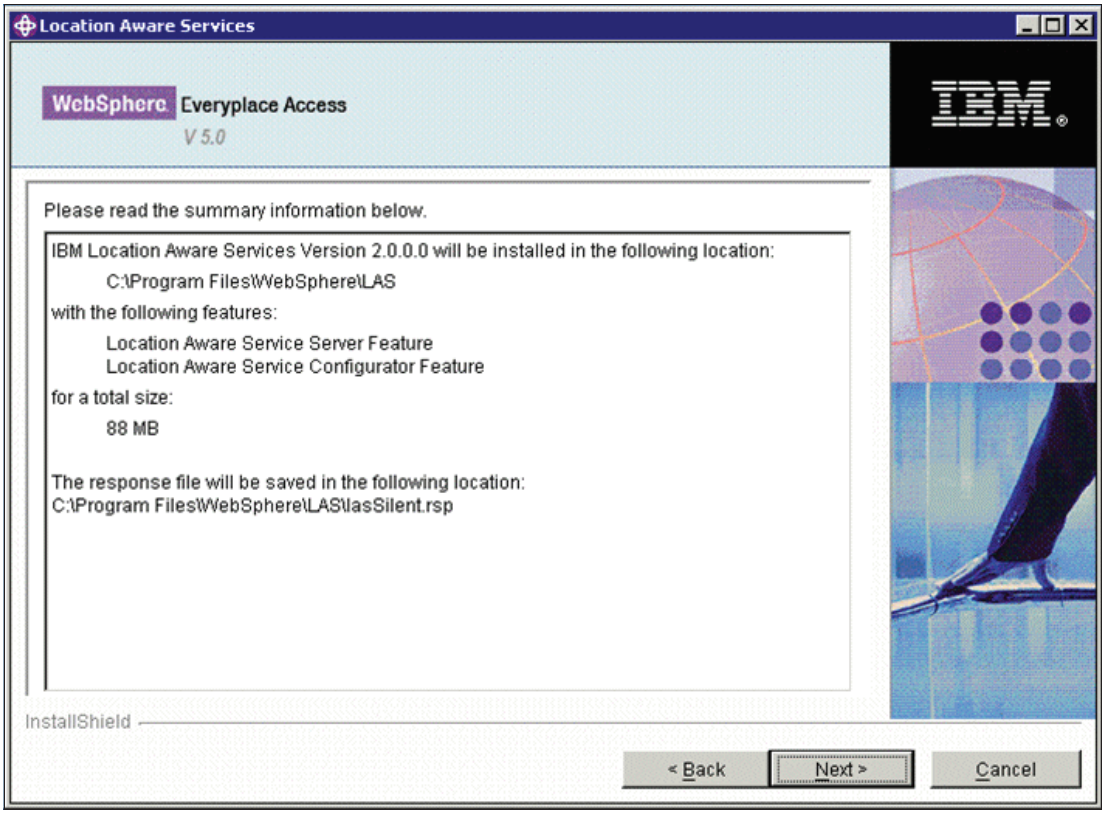

Figure 5-6 Summary information

5. Check the summary information and select **Next** to install the files.

   When installation is complete, you see the screen shown in Figure 5-7 on page 166.

6. Click **Finish** to exit the install program.

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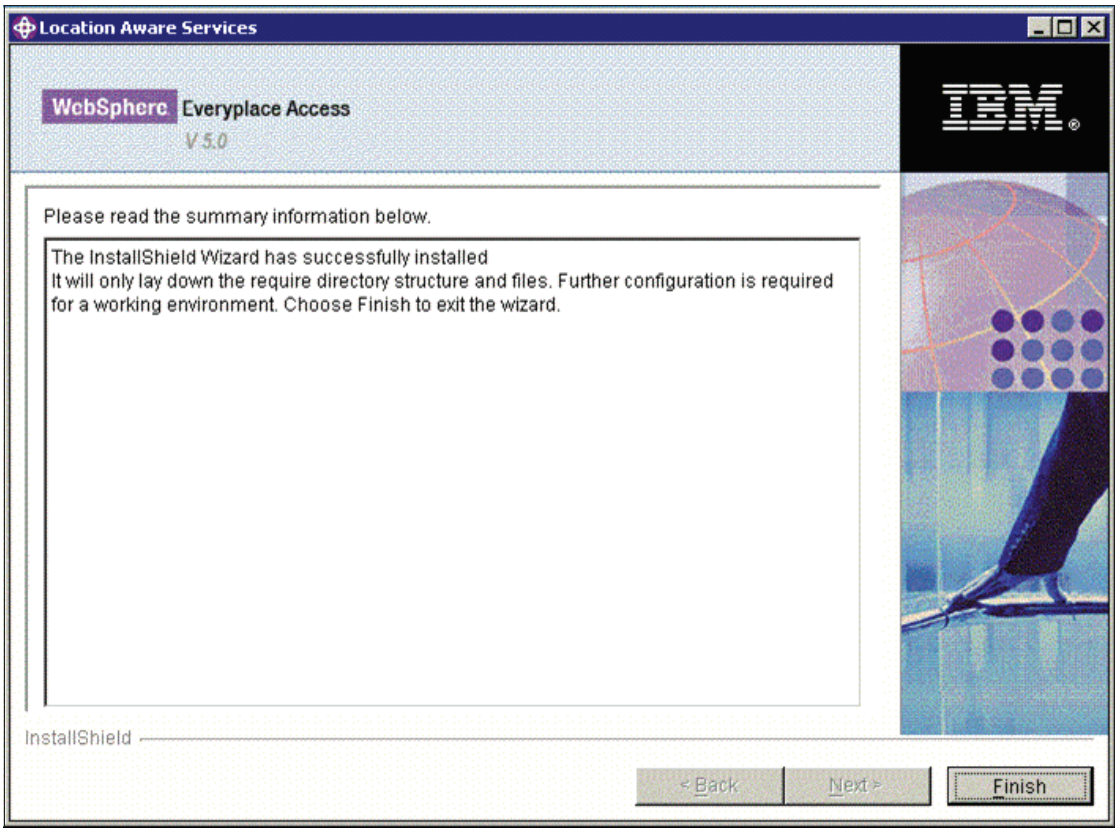

Figure 5-7 Successful installation

Editing the properties configuration file

After you install the Location Aware Services files, you need to configure the system(s) to use Location Aware Services. There are Database tables used by the Location Aware Services server (for configuration, service provider information, and so forth), portlets for managing Location Aware Services, and the Location Aware Services server itself.

You configure each function by updating the corresponding section of the Location Aware Services configuration properties file and then running the Location Aware Services configurator. The configurator is a self-contained program that runs the ANT processes which configure Location Aware Services or remove the Location Aware Services configuration. (You would need to remove the configuration if you wanted to modify the Location Aware Services configuration, such as moving the Databases to another database server.)

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In this example, the Location Aware Services components are on the same server. Thus, you only need a single copy of the configuration file. The name of the configuration file is LASinstallconfig.properties, and you can find the file in the <LAS_HOME>/config/ directory.

Note: Many entries in the Location Aware Services configuration properties file require fully qualified path names, the ANT configuration process expects the use of forward slash (/) regardless of the operating system. Using backslash, as typically used on Windows systems, causes errors.

Note: The Location Aware Services configuration properties file uses the directory C:/Program Files/IBM/SQLLIB as the default DB2® installation directory. However, an Everyplace Server quick install uses the directory C:/Program Files/WebSphere/SQLLIB. If you used the quick install, you will need to find all the entries that need the DB2 install path (or have a fully qualified name that contains this path) and update them with the correct path.

Updating the sample configuration properties file

A single server install using DB2 as the database program, such as the one that is created by the quick install program, requires updating the following entries in the Location Aware Services configuration properties file, <LAS>/config/LASinstallconfig.properties:

- LasHost=yourhost.yourco.com

  Replace with the system host name.
- WasHome=C:/Program Files/WebSphere/AppServer

  Replace with the WAS Root Directory.
- NodeName=wea

  Replace with your node name. (You node name will most likely be the system's host name. However, you can start the WebSphere Administrative Server console to verify the node name.)
- CellName=wea

  Replace with your cell name. In a stand-alone environment, CellName is the same as NodeName.
- WasUserid=wasid

  Replace with the WebSphere Administrative Server administrator ID.

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- WasPassword=waspw

  Replace with the WebSphere Administrative Server administrator ID password.

- LasDbInstPath=C:\Program Files\WebSphere\SQLLIB

  The directory where DB2 is installed.

- LasDbServerHost=ReplaceWithYourDbHostName

  Replace with your DB2 host name. (For a single system install, this is the same as the portal host name.

- LasDbUser=ReplaceWithYourDbUserID

  Replace with your DB2 administrator ID. (The quick install sets all administrator ID names to the same value.)

- LasDbPassword=ReplaceWithYourDbPassword

  Replace with your DB2 administrator ID password. (The quick install sets all administrator ID passwords to the same value.)

- LasDbJdbcPort=ReplaceWithYourDbListenPort

  This is the port number that is used to access the database. (Typical values are `6789` for DB2 and `1521` for Oracle.)

- LasDbLibrary=C:/Program Files/WebSphere/SQLLIB/java/db2java.zip

  This is your JDBC driver. Update the path as needed.

- LasDbLibraryDs=C:/Program Files/WebSphere/SQLLIB/java/db2java.zip; C:/Program Files/WebSphere/SQLLIB/java/db2jcc.jar

  This is your data source driver. Update the path as needed).

- WpsHome=C:/Program Files/WebSphere/PortalServer

  Replace with your WebSphere Portal Server install location.

- WpsHostName= yourhost.yourco.com

  Replace with the system host name.

- PortalAdminIdShort=wpsadmin

  Replace with your WebSphere Portal Server administrator ID. (The quick install sets all administrator ID passwords to the same value.)

- PortalAdminPassword = ReplaceWithYourWPSPassword

  Replace with your Location Aware Services administrator ID. (The quick install sets all administrator ID names to the same value.)

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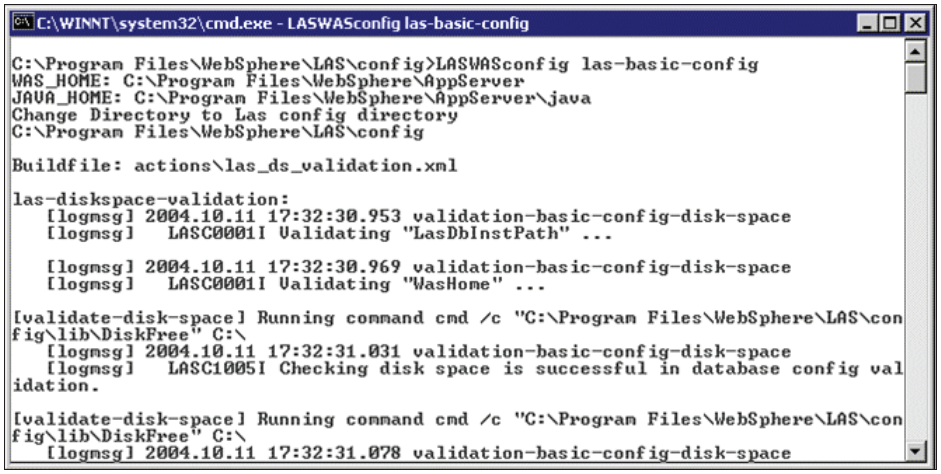
Running the ANT configuration script

The final step required to complete the Location Aware Services installation is to run the ANT script(s). For a basic installation on a single server, run the following command from the <LAS_HOME>/config/ directory:

```
LASWASconfig las-basic-config
```



```
C:\WINNT\system32\cmd.exe - LASWASconfig las-basic-config

C:\Program Files\WebSphere\LAS\config>LASWASconfig las-basic-config
WAS_HOME: C:\Program Files\WebSphere\AppServer
JAVA_HOME: C:\Program Files\WebSphere\AppServer\java
Change Directory to Las config directory
C:\Program Files\WebSphere\LAS\config

Buildfile: actions\las_ds_validation.xml

las-diskspace-validation:
   [logmsg] 2004.10.11 17:32:30.953 validation-basic-config-disk-space
   [logmsg]   LASC0001I Validating "LasDbInstPath" ...

   [logmsg] 2004.10.11 17:32:30.969 validation-basic-config-disk-space
   [logmsg]   LASC0001I Validating "WasHome" ...

[validate-disk-space] Running command cmd /c "C:\Program Files\WebSphere\LAS\con
fig\lib\DiskFree" C:\
   [logmsg] 2004.10.11 17:32:31.031 validation-basic-config-disk-space
   [logmsg]   LASC1005I Checking disk space is successful in database config val
idation.

[validate-disk-space] Running command cmd /c "C:\Program Files\WebSphere\LAS\con
fig\lib\DiskFree" C:\
   [logmsg] 2004.10.11 17:32:31.078 validation-basic-config-disk-space
```

Figure 5-8 Running the ANT scripts

Configuration can take some time to complete. If any errors are reported, there probably is an error in an entry in the Location Aware Services properties configuration file. The log files in the <LAS_HOME>/logs directory might help determine the problem. After the configuration properties file has been updated, run the ANT configuration script again.

To install individual components, run the following scripts:

- To configure the database, run `LASDBconfig(bat|sh) las-db-config`
- To configure the server, run `LASWASconfig(bat|sh) las-was-config`
- To configure the portlets, run `LASWASconfig(bat|sh) las-wps-config`

To make configuration changes, such as changing the server that has the Location Aware Services databases, follow these steps:

1. Remove the configuration using the ANT configuration script:
   a. To remove the configurations of all three sub-components at the same time, stop the database connection and run the following command:

      ```
      LASWASconfig(bat|sh) las-remove-all
      ```

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b. To remove the database configuration, stop the database connection and run the following command:

```
LASDBconfig(bat|sh) las-db-remove
```

c. To remove the server configuration, run the following command:

```
LASWASconfig(bat|sh) las-was-remove
```

d. To remove the portlets configuration, run the following command:

```
LASWASconfig(bat|sh) las-wps-remove
```

2. Update the configuration properties file.
3. Run the appropriate ANT configuration script.

5.4 Location Aware Services administration portlets

Location Aware Services include a number of administration portlets that are used to configure and mange Location Aware Services. To access the administration portlets, log on to the Everyplace Server Portal with a user ID in the administrators' group and select **administration** from the toolbar at the top of the screen. On the left-hand menu, look for Location Aware Services under WebSphere Everyplace.

Note: While configuring, if you navigate to a different page and come back, any changes that you have made are lost unless you saved them previously.

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5.4.1 The Manage Services portlet

The Manage Services portlet is used to add, activate, prioritize, and configure the services of the mapping information providers (Figure 5-9). Before configuring services, you need to subscribe to the service and set up an account.

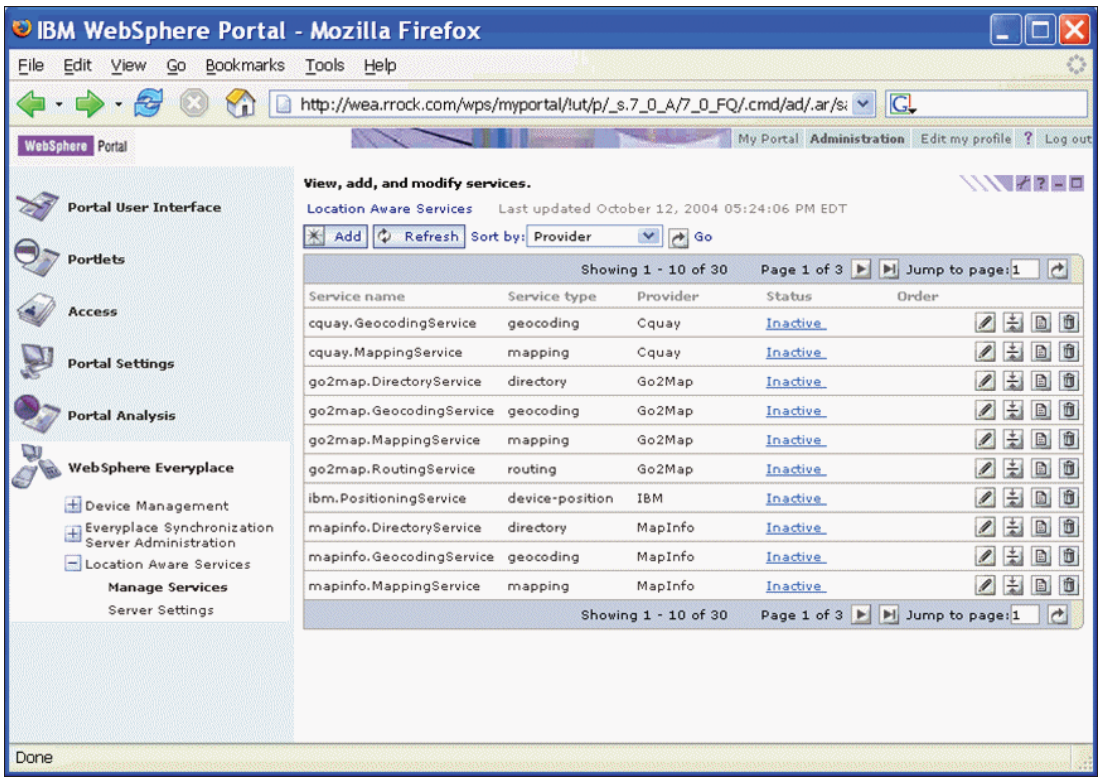

Figure 5-9 Manage Services portlet

Configuring a service

To configure a service, select the properties icon for the service that you want to configure. This action takes you to a configuration page where you can enter your account information (Figure 5-10 on page 172). The basic information you need is:

- clientName
- clientPassword
- URL

This information should have been supplied by the mapping information service provider at the time the account was opened. Additional information, such as

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coverage region, might also have been provided. However, in most cases, the three fields mentioned above are all that you need to get started.

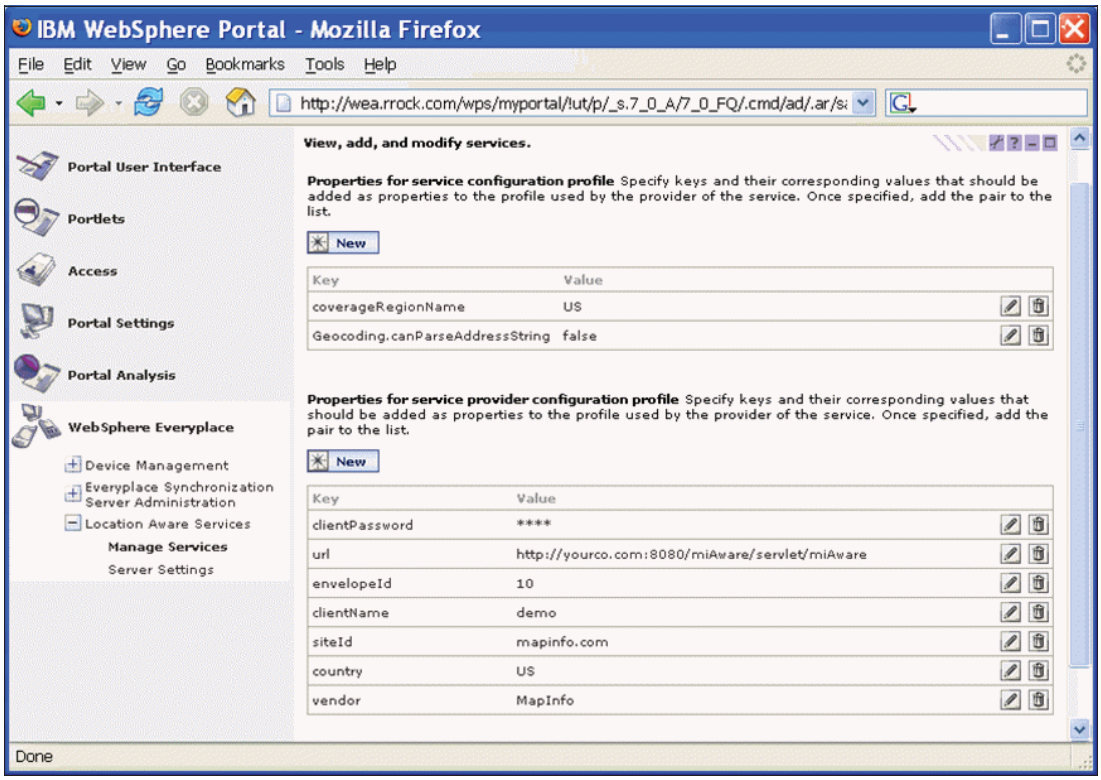

Figure 5-10 Configure a service

Adding a custom service provider

Adding a new service provider involves developing a new adapter for the service provider and then adding them into the Location Aware Services. For example, to add a new service in WebSphere Everyplace Access, follow these steps:

1. Navigate to the Manage Services page (Figure 5-9 on page 171).
2. Click **Add**. The window shown in Figure 5-11 on page 173 appears.

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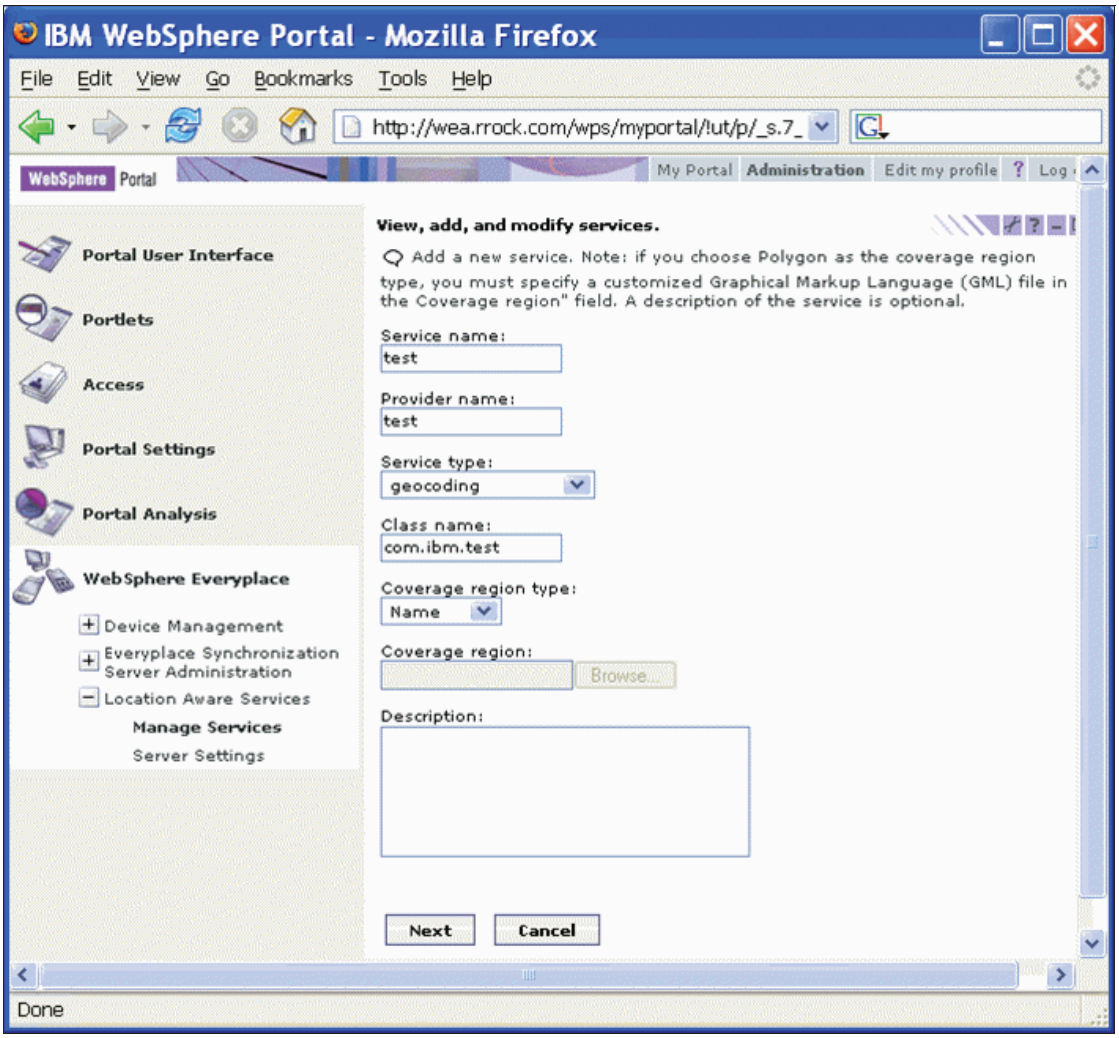

Figure 5-11 Adding a service

3. Enter the following details for this service:
   - Service Name.
   - Provider Name.
   - Service Type. The service type has to be one of the six service types that WebSphere Everyplace Access supports.
   - Coverage Region type. If a polygon is selected as the coverage region type, you need a customized Graphical Markup Language (GML) file.

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Note: For more information about GML, see the Open GIS Consortium Web site:

http://www.opengis.org

4. Click **Next**. The window shown in Figure 5-12 appears.

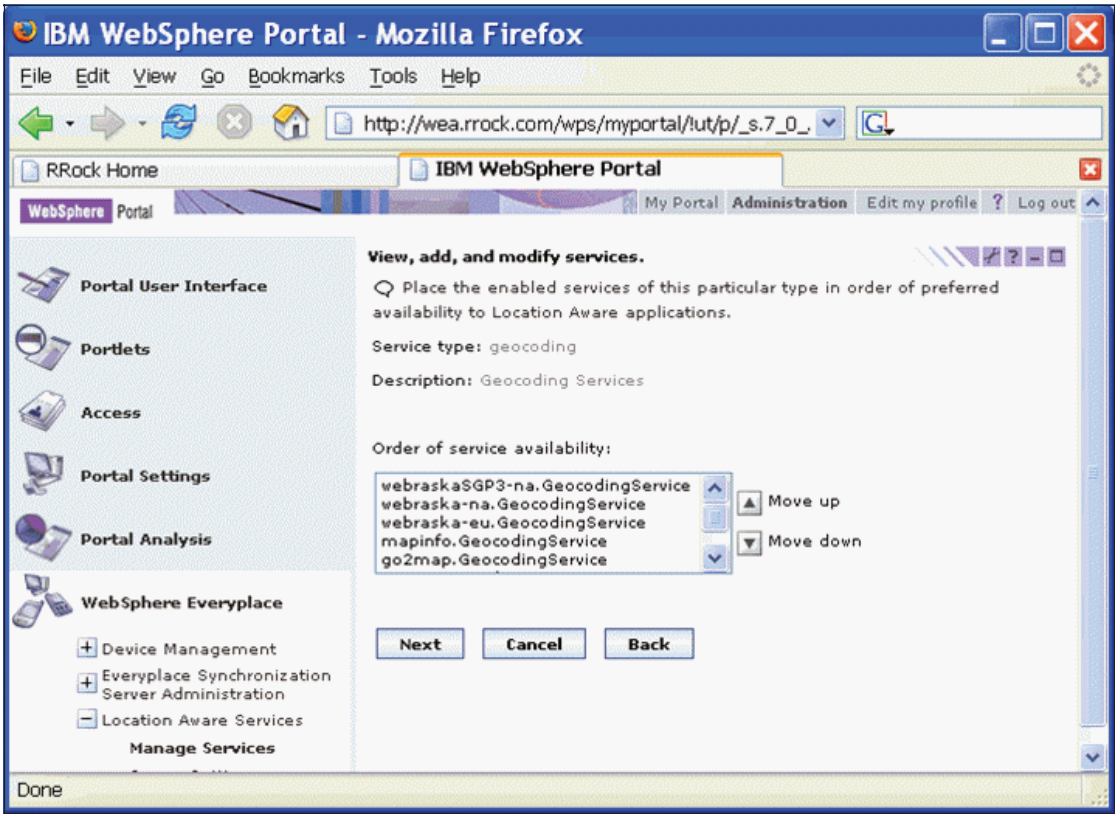

Figure 5-12 Order of service availability

5. Select the order of the availability. The Location Aware Services engine searches for the services based on this order. If you want your service to be searched first, move your service to the top of the list. Click **Next**. The window shown in Figure 5-13 on page 175 appears.

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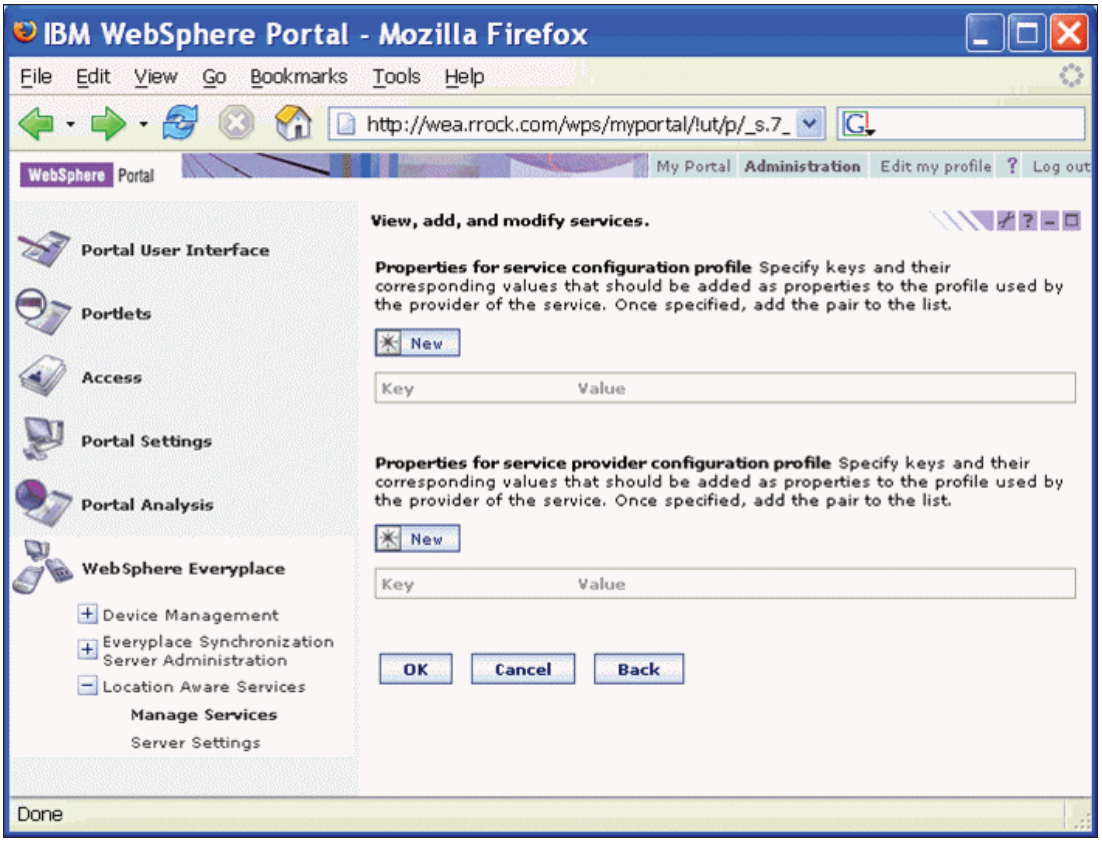

Figure 5-13 Adding properties

6. Add the properties for the service configuration profile. Service configuration profile properties are used to describe the characteristics of the service. The Location Aware application can use the profile to select the services that it uses. For example, coverageRegion, providerName, and serviceType are service parameters that you can enter here. The properties should be entered as key-value pairs. Enter the key and value and click **Add a key-value pai**r to add the properties. To modify the properties, the key-value pair has to be removed and added again.
7. Add the properties for the service provider configuration profile. These properties are used to initialize the adapter. For example, the URL of the service provider, clientName, clientPassword, and userLanguagePreference are service provider parameters. The properties are entered as key-value pairs. Click **OK**.

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Modifying the properties of a service and service provider

To modify the properties of a service provider, select Location Aware Services and open the Manage Services portlet and select the edit service icon ( ) that is next to the service that you want to edit.

You can modify the adapter class, coverage region, service provider configuration profile, or the service configuration profile.

5.4.2 Enabling and disabling the service

If the service is enabled, then this service can be used by other portlets. To enable or disable a service, select Location Aware Services and open the Manage Services portlet. Click **Active** or **Inactive** to toggle the state of a service.

5.4.3 Location Aware Services server settings

The Location Aware Services server has some settings at the server level (Figure 5-14 on page 177). These settings are accessed by selecting the Server Settings page (found in the menu on the left side). Here, settings for the message and trace logs are found. Performance is best with trace disabled (or low) and messages set to error. The more verbose settings are mainly used for problem determination. For more information, see 5.6, “Troubleshooting ” on page 187.

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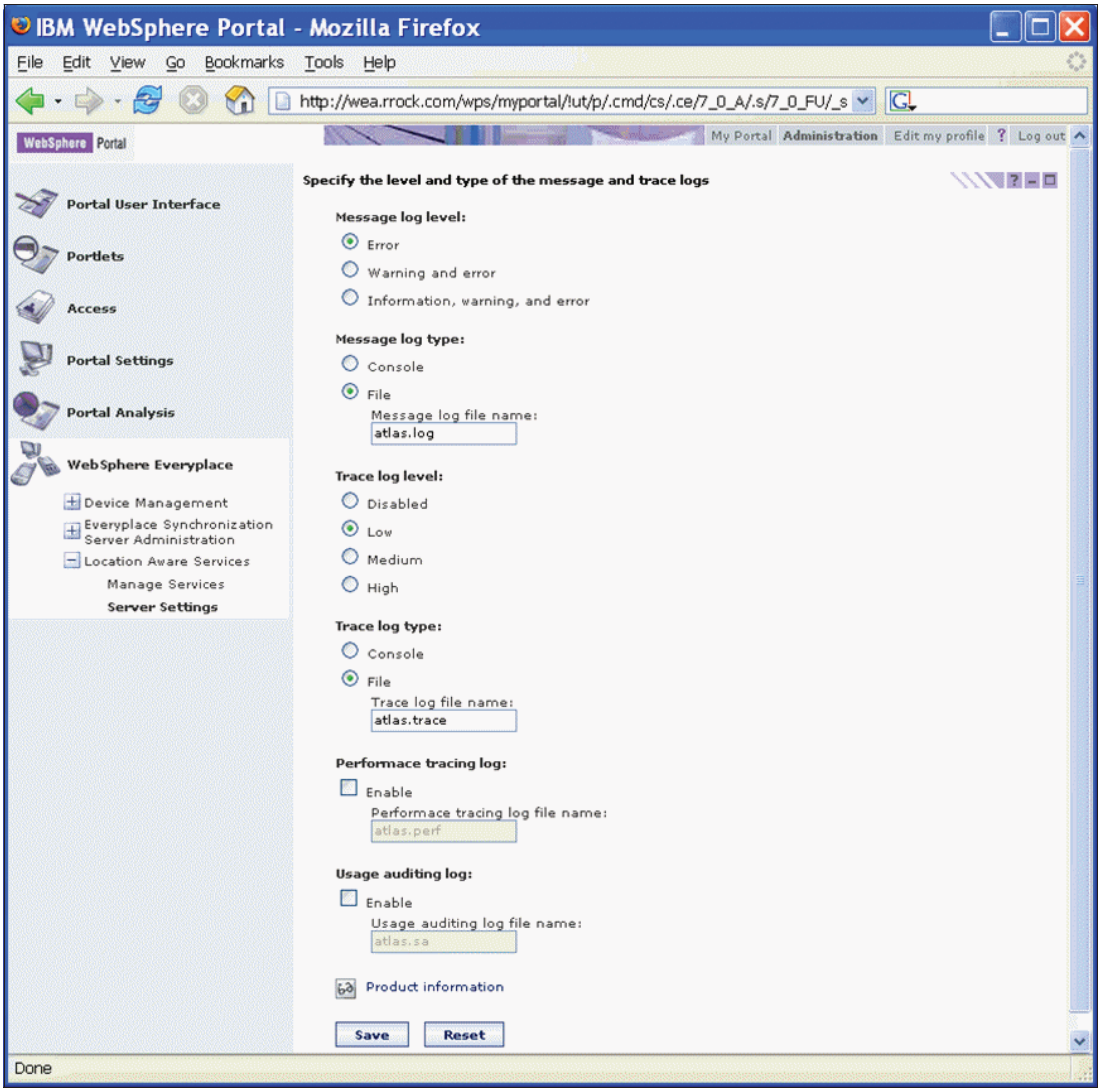

Figure 5-14 Location Aware Services server settings

Note: While configuring, if you navigate to a different page and come back, any changes that you have made are lost unless you saved them previously.

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5.5 Mapping and Directions sample portlet

A sample Location Aware Services portlet called Mapping and Directions is shipped along with WebSphere Everyplace Access. This portlet demonstrates all the available features of Location Aware Services. You must configure a Location Aware Services adapter before using the features of the sample portlet. The figures in this section were created using Webraska as the service provider.

Restriction: If you are in the middle of a task, such as retrieving a map, you will lose information you entered if you execute any of the following events:

- Navigate to another place or page before the task is completed.
- Click the maximize or minimize button on the title bar.
- Click **Edit** on the title bar.

5.5.1 Getting a map of a location

Select **My Portal** on the WebSphere Everyplace Access navigation bar to navigate to the non-administration portlets. The Mapping and Directions portlet is located on the WebSphere Everyplace Access Web page.

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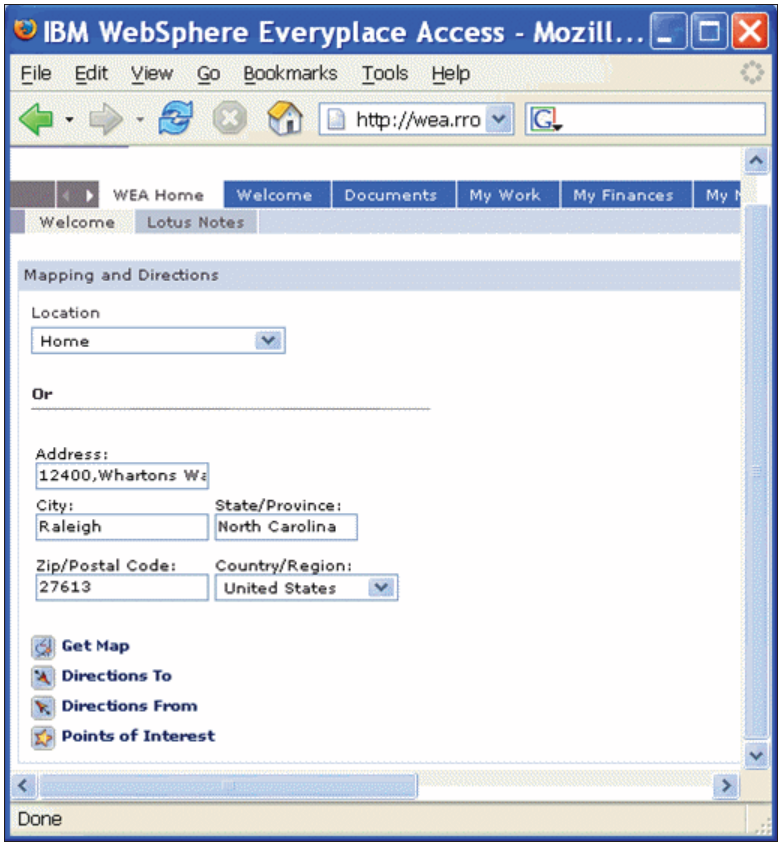

Figure 5-15 WebSphere Everyplace Access home page

To get a map of a location, enter the address of the location and click **Get Map**. You should see a map such as the example shown in Figure 5-16 on page 180.

After the map is visible, you should be able to zoom in and out, move, and re-center the map.

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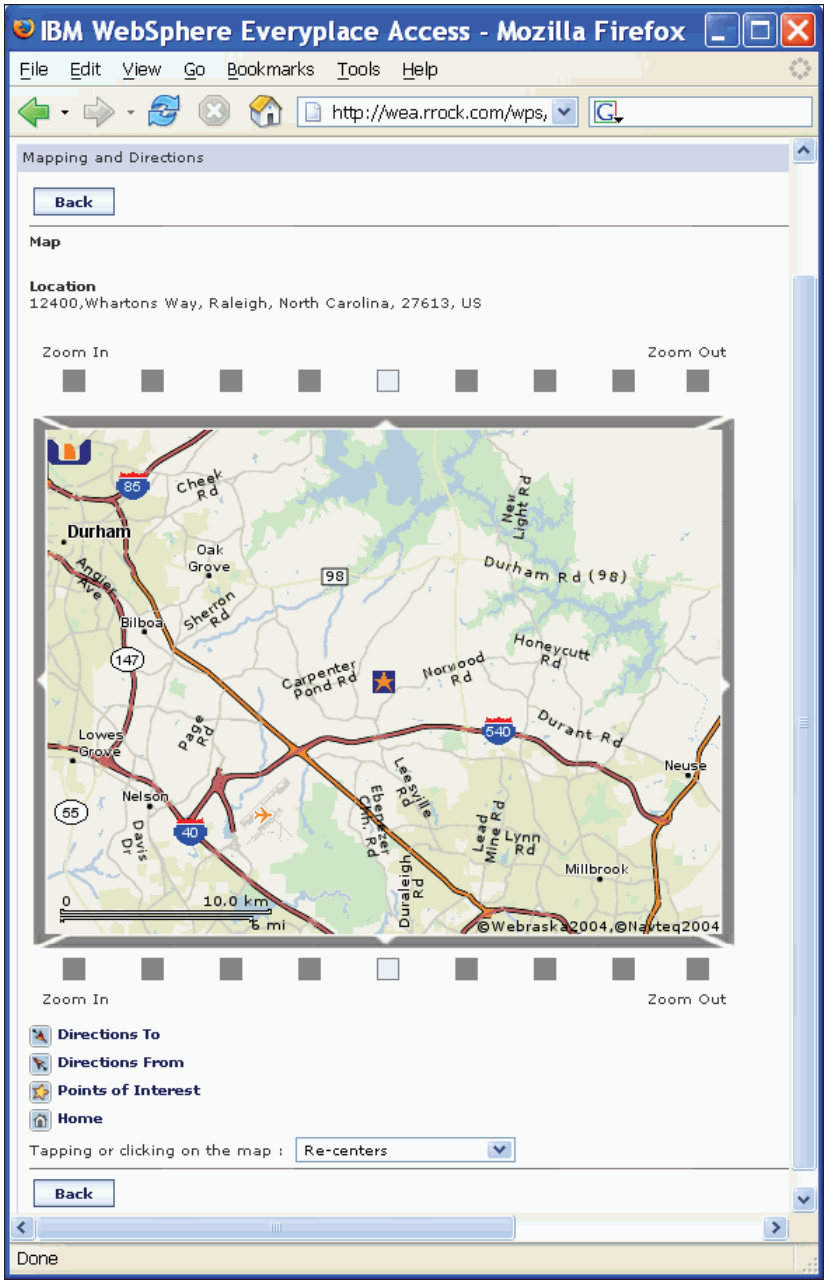

Figure 5-16 Mapping and directions portlet

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5.5.2 Adding locations for persistence

Frequently used locations can be added to the portlet so that they get persisted. To add locations, click the portlet's Edit button (). The window shown in Figure 5-17 appears.

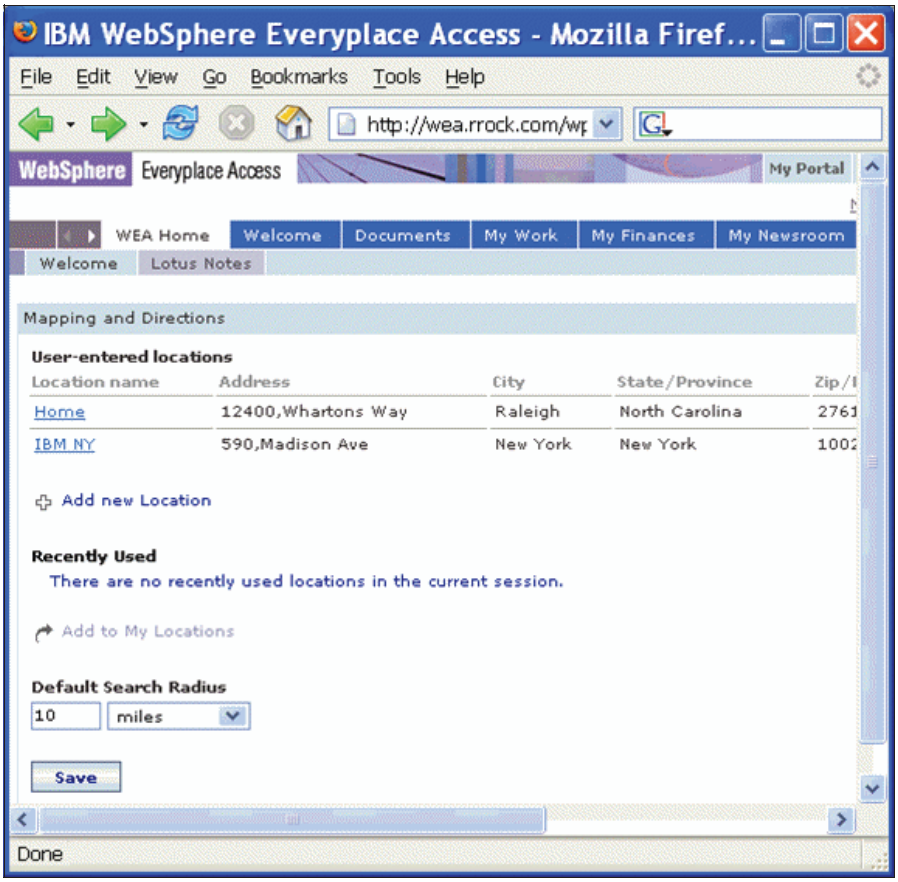

Figure 5-17 Adding locations for persistence

You can add a new location by clicking **Add new Location**, or you can add one of the recently used addresses. To edit or delete a saved location, select the location name to open the edit window.

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5.5.3 Getting directions

You can use the Location Aware Services sample portlet to get directions from one point of interest to another. Also, you can obtain reverse directions between the same locations as well as a map showing the directions.

Enter the address from where you want the direction in the Location Aware Services portlet and click **Directions To.** This should bring up the window shown in Figure 5-18.

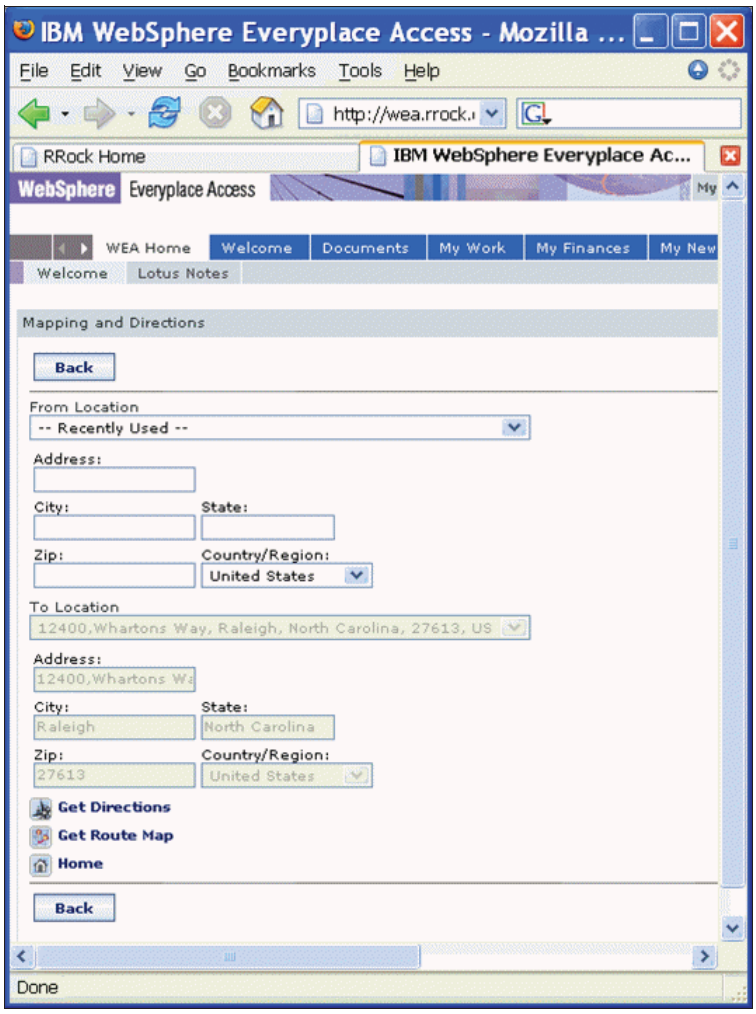

Figure 5-18 Directions to window

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Enter the address to where you want the directions and click **Get Directions**.

Figure 5-19 Driving directions

To get a map of the directions, click **Get Route Map**.

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5.5.4 Getting points of interest near location

To get the points of interest near a location, enter the location address and click **Points of Interest**.

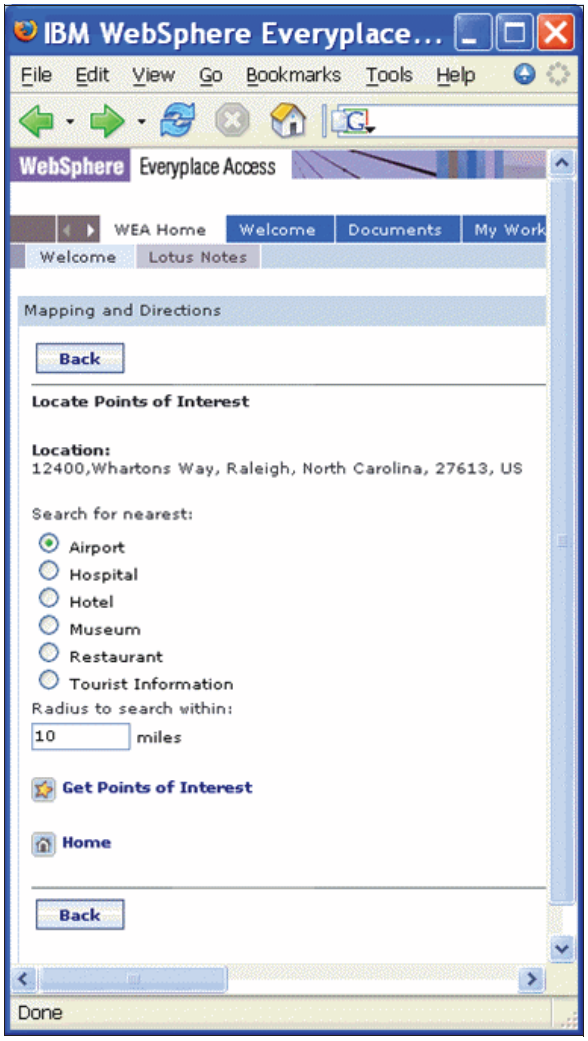

Figure 5-20 Points of interest

Select the type of your interest and click **Get points of Interest**.

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5.5.5 Location Aware Services on devices

This section shows the working of a Location Aware Services portlet on pervasive devices. As an example, it uses a Pocket PC device.

In the WebSphere Everyplace Access client:

1. Click the drop-down list and select **Location Aware Services**.
2. Select the **Locations** portlet.

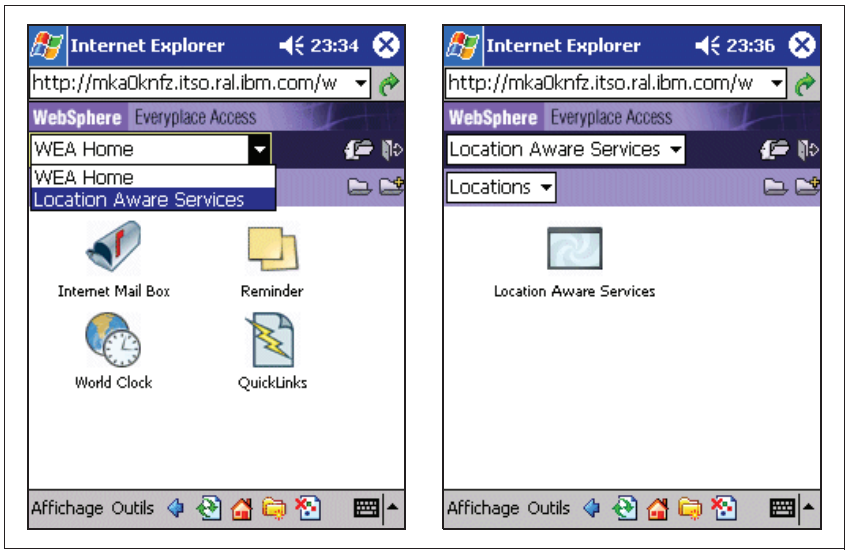

Figure 5-21 Location Aware Services on Pocket PC

3. Enter the location details and click **Get Map**.

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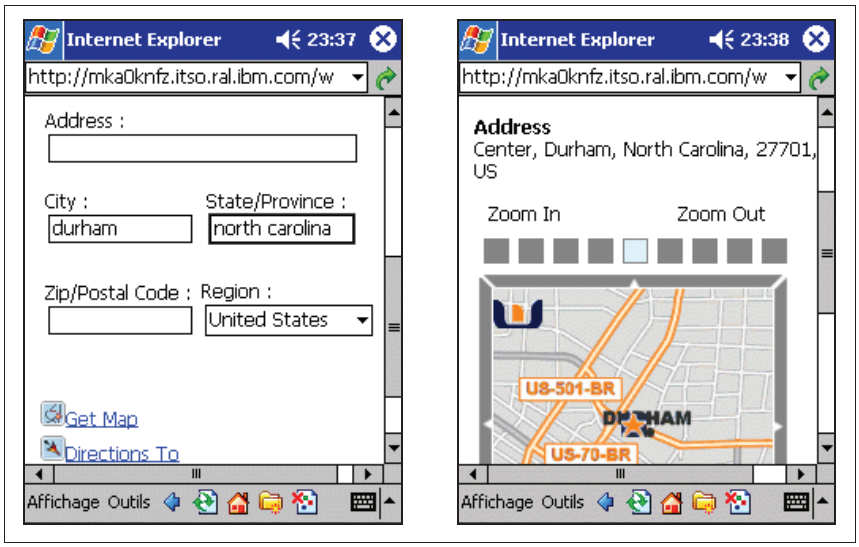

Figure 5-22 Requesting map

4. Scroll down and select **Points of Interest**. Figure 5-23 shows the restaurants near the location.

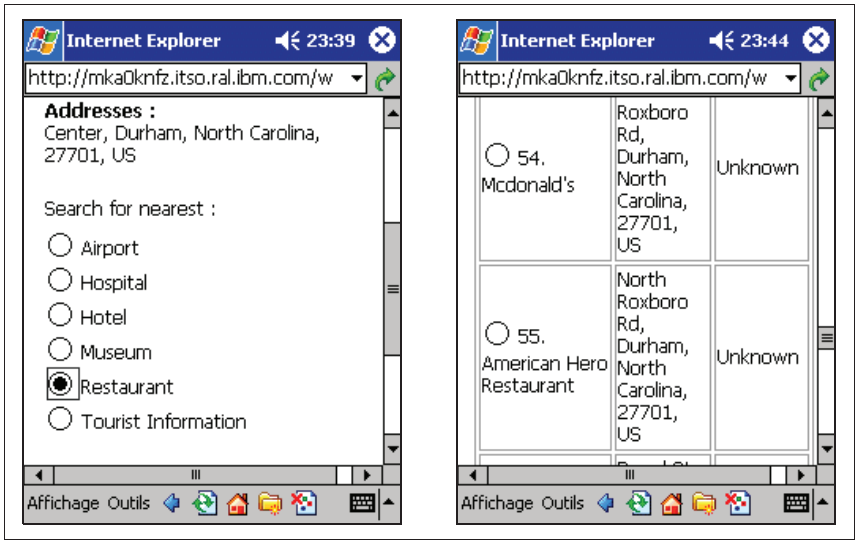

Figure 5-23 Points of interest

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5.6 Troubleshooting

You can use the Server Settings portlet to set the Message log and Trace log levels (see 5.4.3, “Location Aware Services server settings” on page 176). Messages can be written either to a separate file or console. If console is selected, messages are written to a Portal message log file that can be found in *wps_home*/log/appserver-out.log. If writing to a file is selected, the messages is written to a specified file found in *wps_home*/log.

There are three message level settings:

- Errors

  Logs errors that are critical but Location Aware Services are still operational.

- Warning and error

  Includes error messages along with minor problems.

- Information, warning, and error

  Includes basic information messages along with warnings and errors.

Tracing is a troubleshooting tool but decreases system performance. So, it should be enabled only when necessary. Tracing can either be disabled or levels set to low, medium, or high.

Trace information can either be logged to a file or console. When console is selected, the trace information is logged into the file *wps_home*/log/SystemOut.log. If writing to a file is selected, the trace information is logged into a specified file found in *wps_home*/log.

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6

Location Aware Services application development

This chapter describes the process and tools for developing Location Aware portlets and Java applications that you can run on the WebSphere Everyplace Access server. Everyplace Toolkit for WebSphere Studio provides wizards for developing Location Aware Services portlets, greatly simplifying developing Location Aware Services applications.

Note: This chapter assumes that WebSphere Studio Site Developer and the Everyplace Toolkit have been already installed.

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6.1 Developing a Location Aware Services portlet

After installing Everyplace Toolkit for WebSphere Studio, creating a new Location Aware Services project can be as simple as creating a project based on the Location Aware Services example. The new portlet immediately has basic mapping and directions functionality. Using this as a starting point, from which modifications and additions can be made, is an easy way to create a complete Location Aware Services portlet.

This section provides step-by-step instructions for creating a Location Aware Services portlet using Everyplace Toolkit for WebSphere Studio with the WebSphere Portal test environment.

Note: WebSphere Everyplace Access includes WebSphere Studio Site Developer for application development. Some enterprise applications (such as J2EE portlets) require WebSphere Studio Application Developer. Although not included with WebSphere Everyplace Access, installing the Everyplace Toolkit with WebSphere Studio Application Developer V5.1.1 is supported allowing the development of enterprise Location Aware Services applications.

Location Aware Services portlet development summary

Developing a Location Aware Services portlet involves the following steps:

1. Create a Location Aware portlet project using the Location Aware Services wizard.
2. Add the jar files containing the mapping services jar files.
3. Edit the atlas.properties and service configuration property files.
4. Run the new project in the WebSphere Portal test environment.
5. Deploy the new project to a WebSphere Everyplace Access server.

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6.1.1 Creating a Location Aware Services project

Using the Location Aware Services example as a starting point is the easiest way to create a Location Aware Services portlet application:

1. Select **File** → **New** → **Example**.

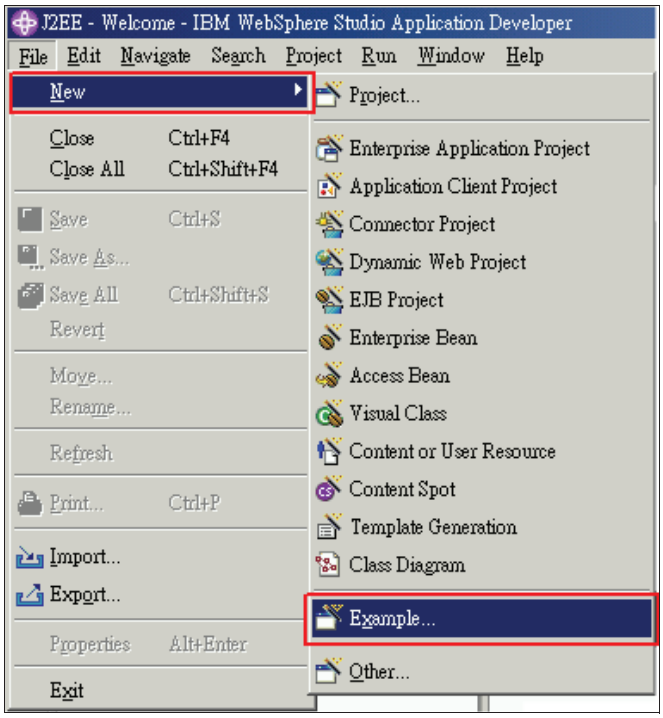

Figure 6-1 Creating a new project

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2. Select **Mobile** under Portlet Development on the left pane and **Location Aware Services Sample** on right, and then click **Next**.

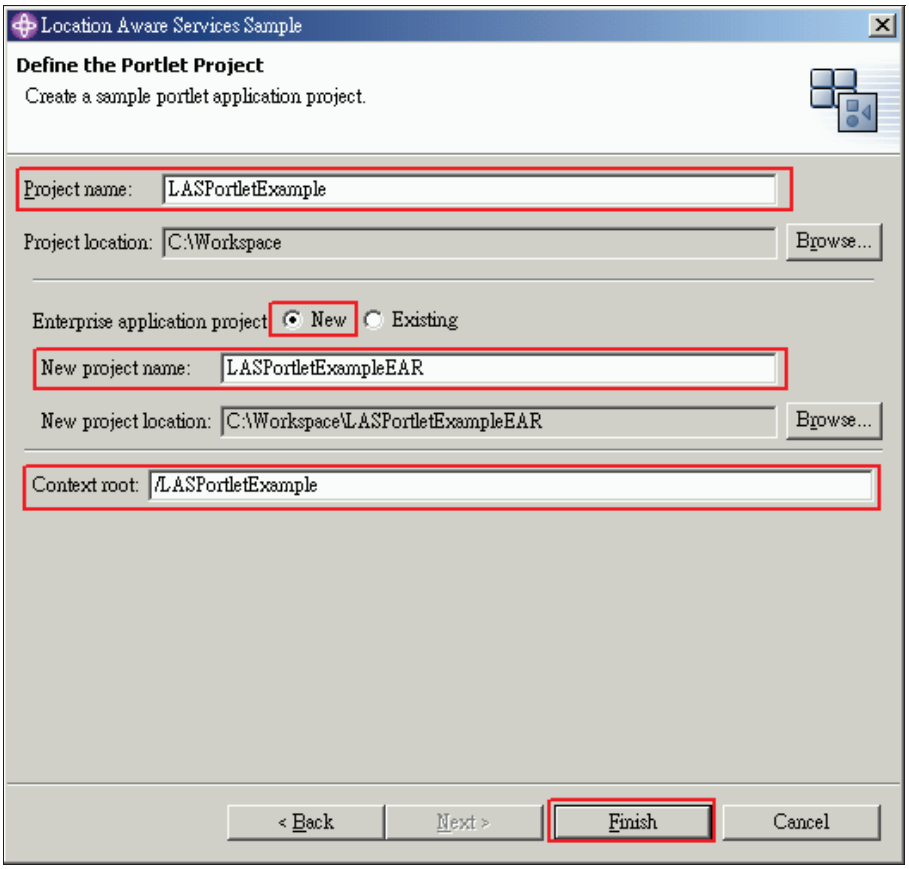

Figure 6-2 Location Aware Services sample application

3. Input the Project name `LASPortletExample`, the new Enterprise application project name `LASPortletExampleEAR`, and the Context root `/LASPortletExample`, and then click **Finish** to complete creating the Location Aware Services sample portlet application project.

   Now, you have a Location Aware Services sample portlet project LASPortletExample and a Enterprise application project LASPortletExampleEAR.

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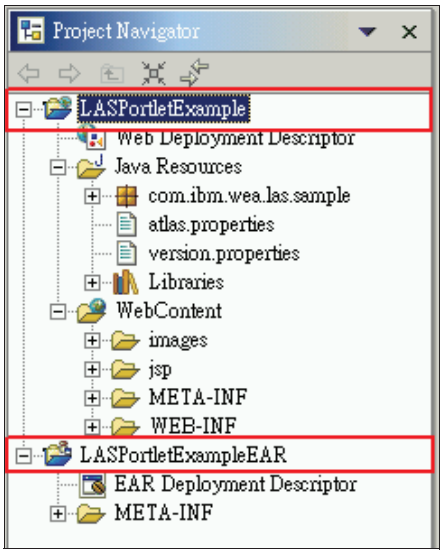

Figure 6-3 Location Aware Services projects

4. Modify the atlas.properties file in the Java source directory to match the current environment settings.

   Directory paths reference the LAS_CONTEXT_ROOT directory of the Web context in the Location Aware Services sample portlet project. In this example, LAS_CONTEXT_ROOT is C:/Workspace/LASPortletExample/WebContent.

   Note: Note the use of a forward slash (/) instead of backslash (\) character in the Windows platform.

   Modify the following keys with proper values:

   – logDirectory

     Modify logDirectory to correspond with the full path name of the directory where the log and trace files will be written. For example:

     ```
     logDirectory = <LAS_CONTEXT_ROOT>/WEB-INF/logs
     ```

   – servicePropertiesRoot

     Modify servicePropertiesRoot to correspond with the full path name of the directory containing the properties files for each of the services that are available. We provide the properties files for services in WEB-INF/service_properties directory, so set the value of

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servicePropertiesRoot to this directory with the full path name. For example:

```
servicePropertiesRoot = <LAS_CONTEXT_ROOT>/WEB-INF/service_properties
```

– HTTPProxy

  This property is the proxy server address to be used by service adaptors. If no proxy server is needed this may be left blank

```
HTTPProxy = http://proxy.yourcomp.com:80
```

5. Modify the service properties in the WEB-INF/service_properties directory. You need the GIS server URL, ID, and password for your mapping services account.

   For example, if you are using Webraska, modify the following properties in init.properties found in the WEB-INF/service_properties/webraska-eu directory:

   – server: the URL of the Webraska GIS server for Europe.
   – clientName: the user id used for the Webraska GIS server.
   – clientPassword: the password used for the Webraska GIS server.

   In the init.properties in the WEB-INF/service_properties/webraska-na directory, modify these properties:

   – server: the URL of the Webraska GIS server for North America.
   – clientName: the user id used for the Webraska GIS server.
   – clientPassword: the password used for the Webraska GIS server.

   In the init.properties in WEB-INF/service_properties/ webraskaSGP3-na directory, modify these properties:

   – server: the URL of the Webraska Smart Geospatial Platform 3.0 (SGP 3.0) GIS server for North America.

   – clientName: the user id used for the Webraska SGP 3.0 GIS server.

   – clientPassword: the password used for the Webraska SGP 3.0 GIS server.

   If you want to use Webraska SGP V3.0 adaptor, you need to get the client Java SDK from Webraska. For Webraska, copy the following JAR files into WEB-INF/lib directory:

   – dom4j.jar
   – jaxm-api.jar
   – jaxm-runtime.jar
   – saaj-api.jar
   – saaj-ri.jar
   – sgp-3.0-ext.jar
   – sgp-3.0-ols.jar

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6. The service ordering for each service is defined in WEB-INF/service_properties/service-order.properties. The first order for each service is webraskaSGP3-na, the second is webraska-na, and the third is webraska-eu. If you do not copy the client JAR files of Webraska SGP 3.0 SDK into WEB-INF/lib directory, it fails in using the webraskaSGP3-na services and uses the webraska-na services instead of webraskaSGP3-na for North America.

6.1.2 Testing the Location Aware Services portlet

You must deploy the Location Aware Services sample portlet application to a test environment. To do so:

1. Create a server and server configuration.
2. Select menu **File** → **New** → **Other…**.

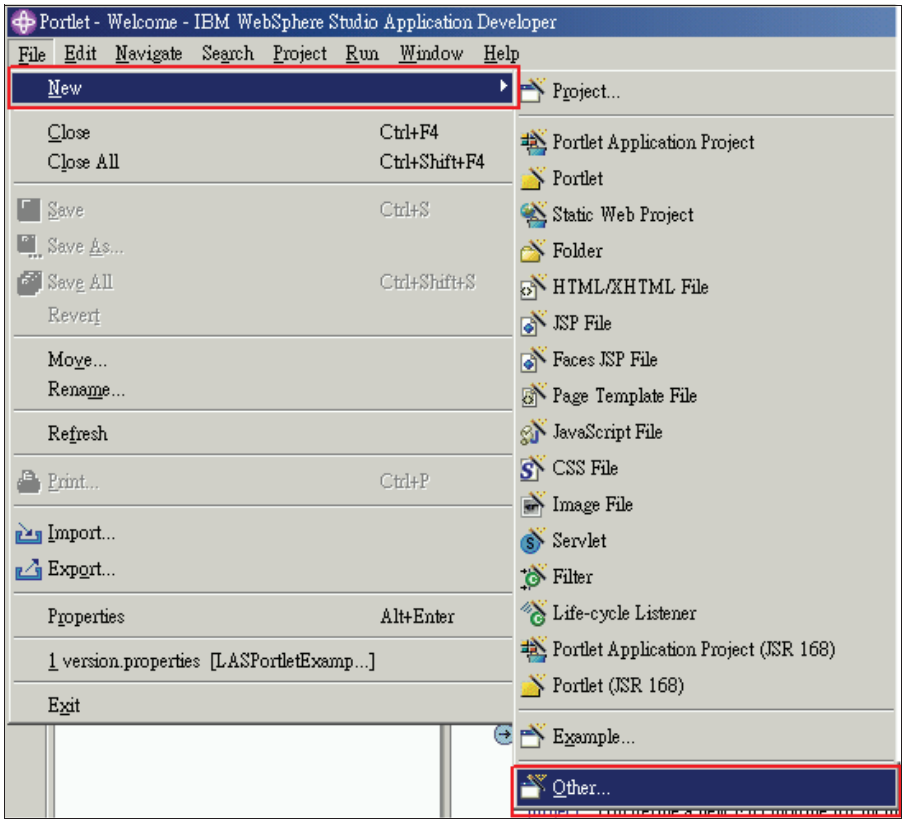

Figure 6-4 Select project

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3. Select **Server** on the left pane and **Server and Server Configuration** on the right and then click **Next**.

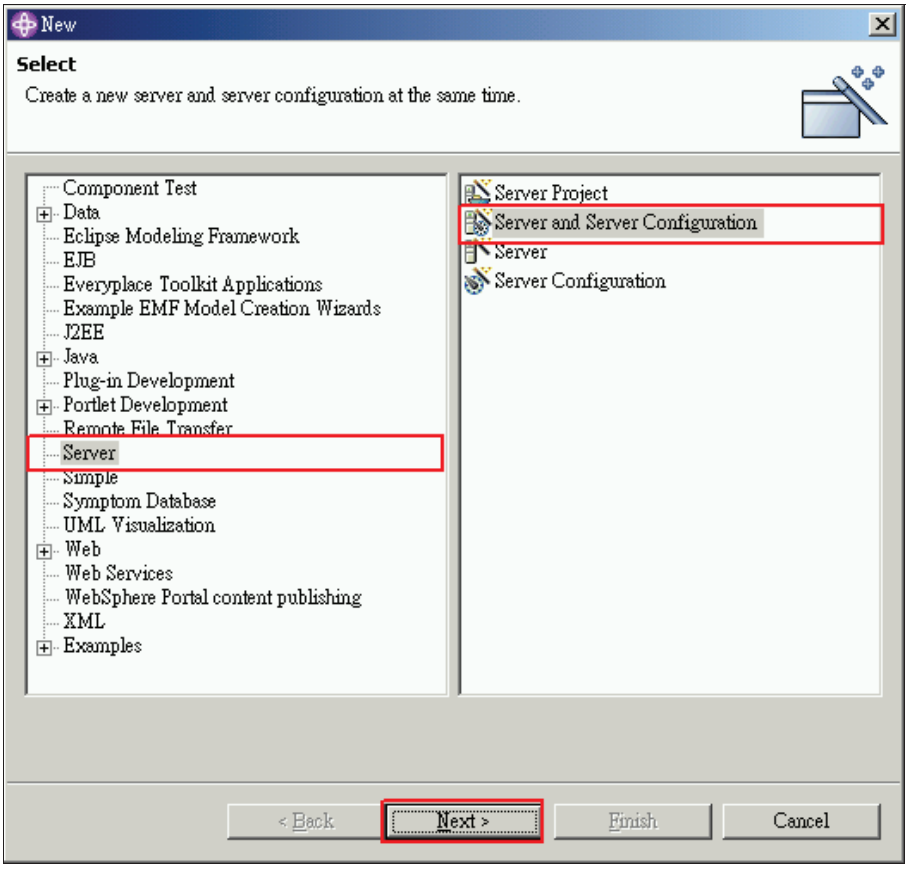

Figure 6-5 Create a new server and server configuration

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4. Input the Server name `LASPortalServer`, select **WebSphere Portal Version 5.0** → **Test Environment** as the Server type and then click **Next**.

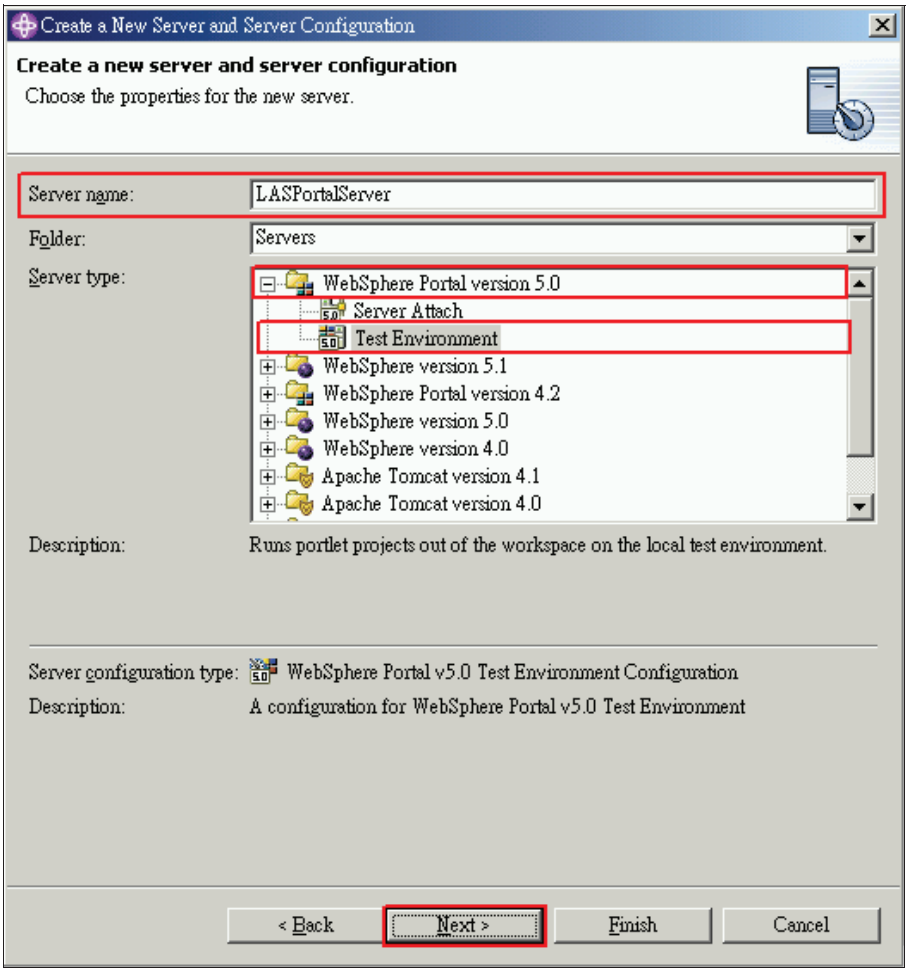

Figure 6-6 Selecting the Portal Test Environment

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5. Use the default HTTP port number 9081 and then click **Finish**.

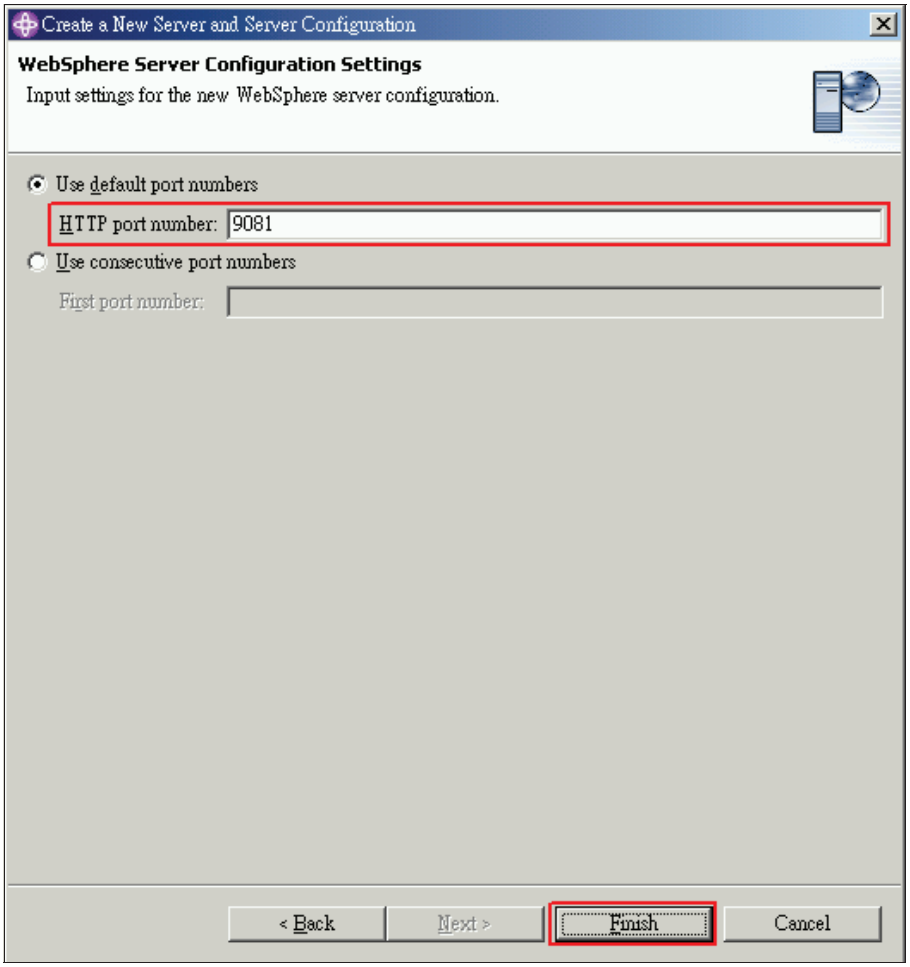

Figure 6-7 HTTP port number

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6. Double-click the LASPortalServer in the Server Configuration view to edit the settings.

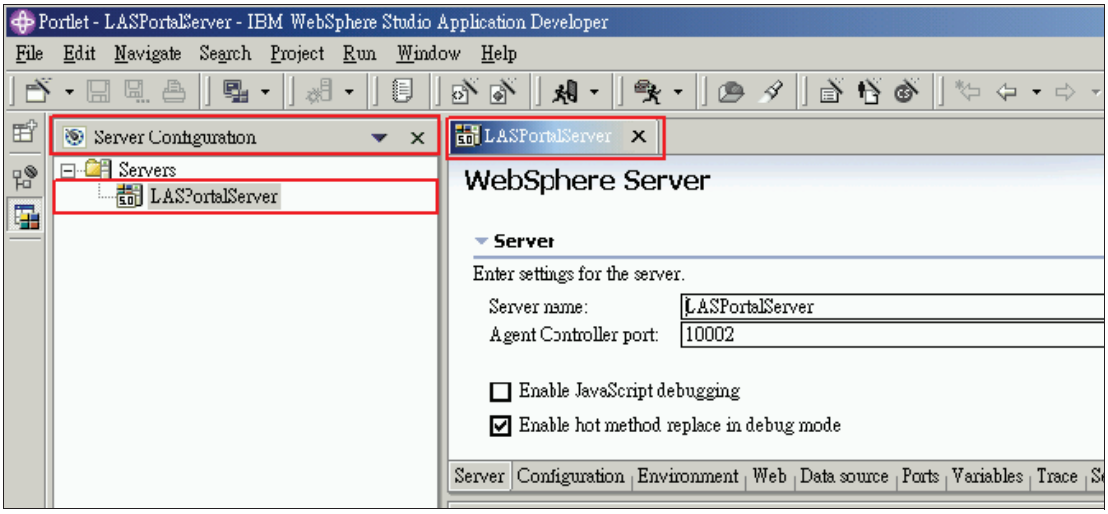

Figure 6-8 Server settings

7. Select the Portal tab to change the WebSphere Portal settings, select **Enable base portlets for portal administration and customization** and then save the settings.

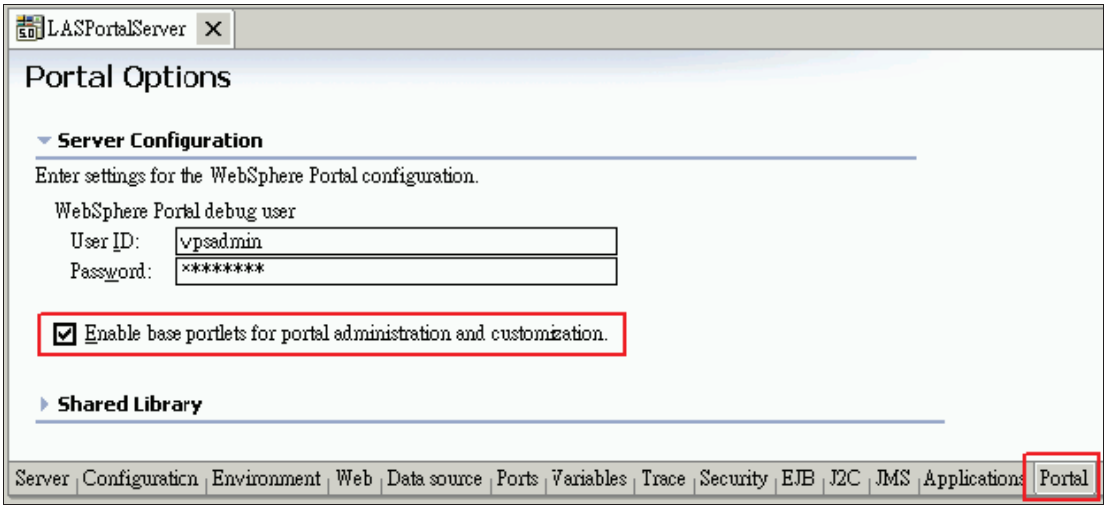

Figure 6-9 Portal options

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8. Add the project to the server.
9. Expand Servers in the Server Configuration view. Then, right-click the LASPortalServer server and select **Add and remove projects…** .

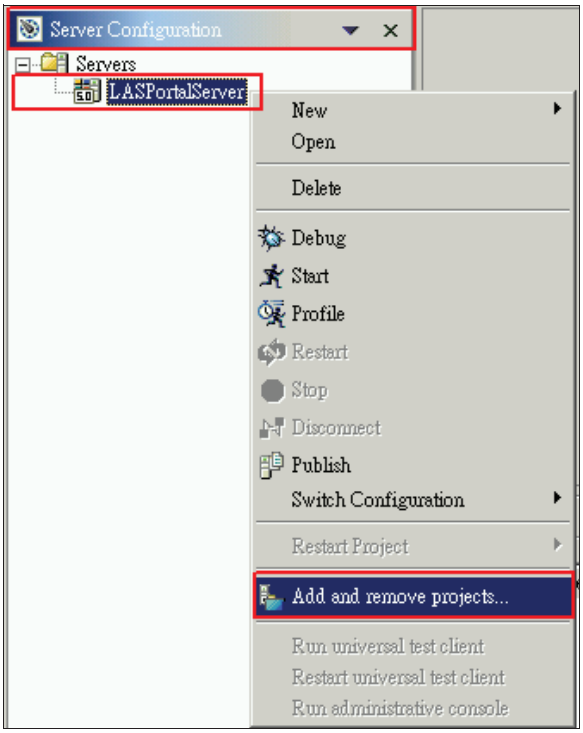

Figure 6-10 Server configuration

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10. Select the LASPortletExampleEAR project on the left pane and click **Add**.

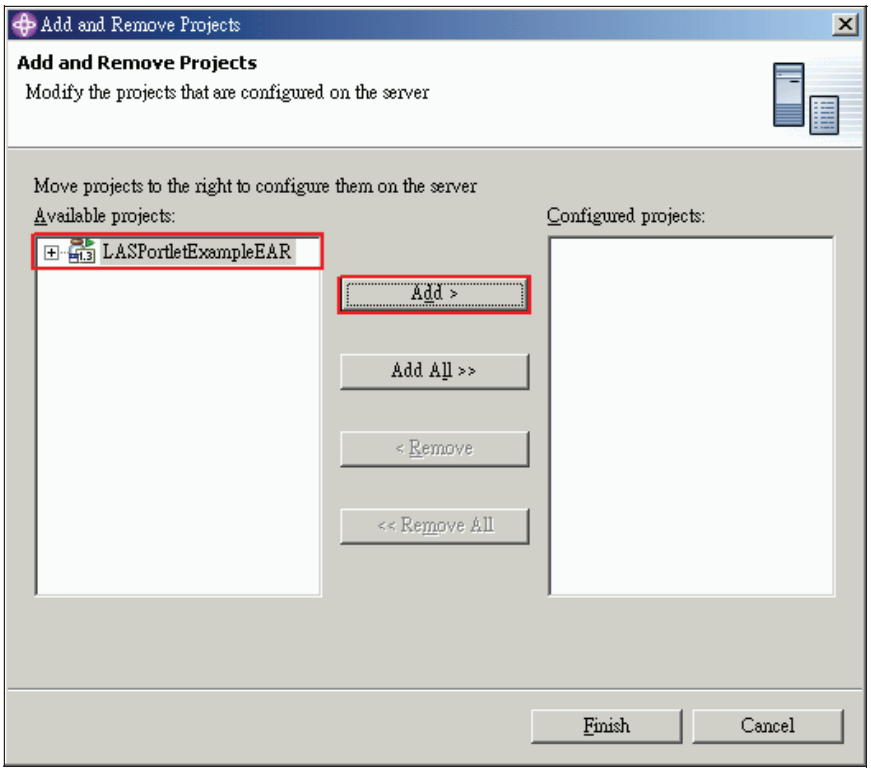

Figure 6-11 Add project

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11. Click **Finish** after the LASPortletExampleEAR project is added into right pane.

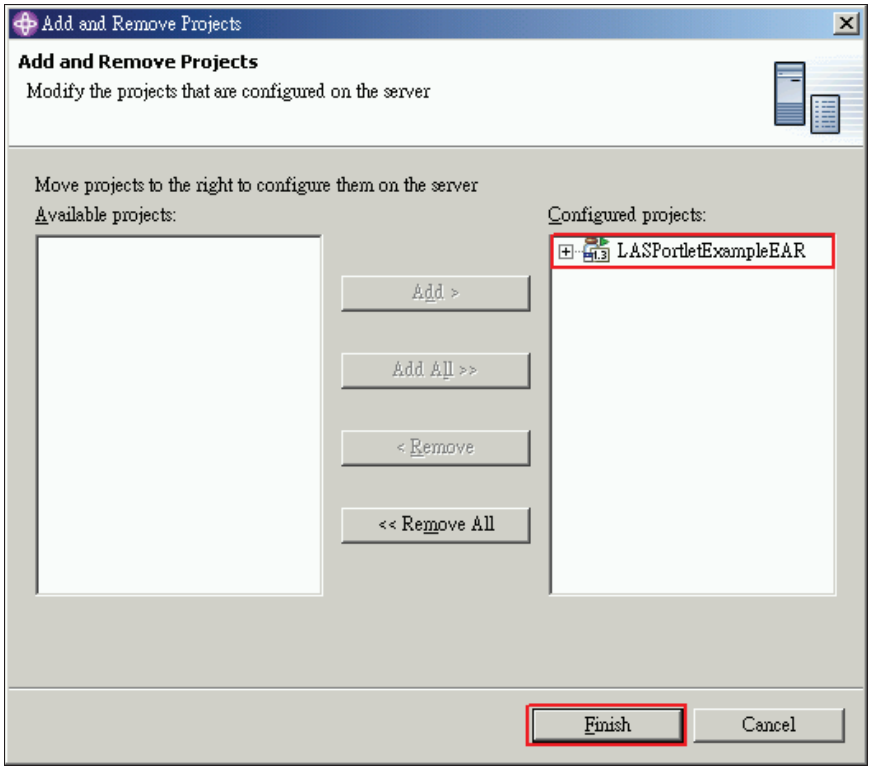

Figure 6-12 Add and remove projects

12. Expand the LASPortalServer and the LASPortletExampleEAR project is added to the server.

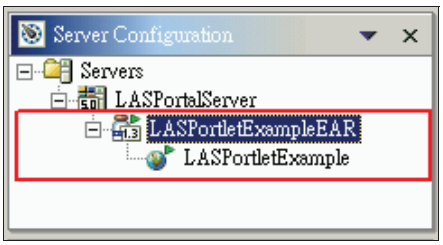

Figure 6-13 Project added to server

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13. Run the Location Aware Services sample portlet application on the test environment.

14. Rebuild the LASPortletExample project. Click the LASPortletExample project to locate the focus on the Project Navigator view and then select **Project** → **Rebuild Project** to rebuild the project.

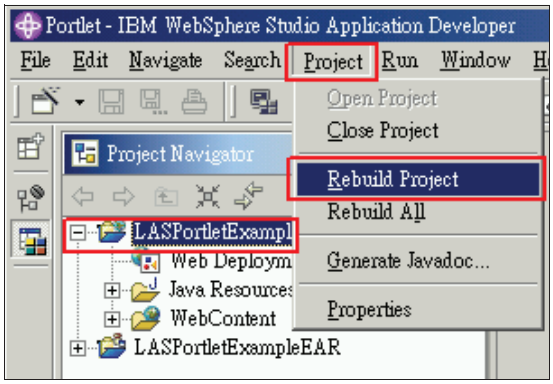

Figure 6-14 Rebuild project

15. Locate the LASPortletExample project in Project Navigator view.

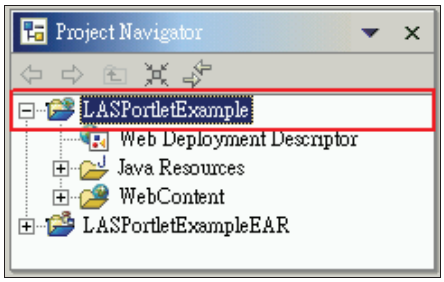

Figure 6-15 Project navigator

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16. Right-click the LASPortletExample project and select **Run on Server…** from the pop-up menu.

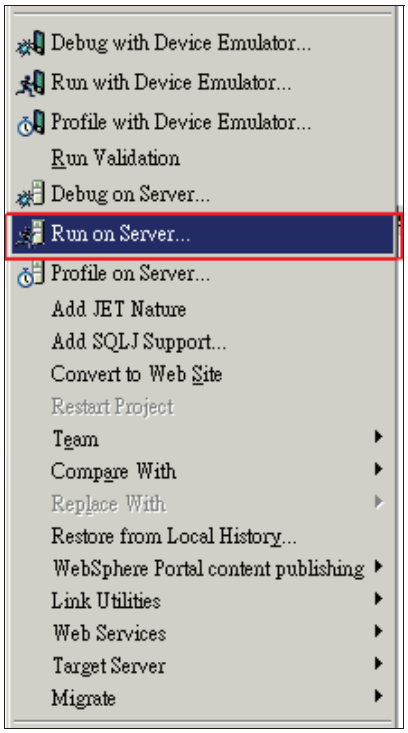

Figure 6-16 Run on Server option

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17. Use the existing server LASPortalServer, select the Set server as project default (do not prompt) and then click **Finish**.

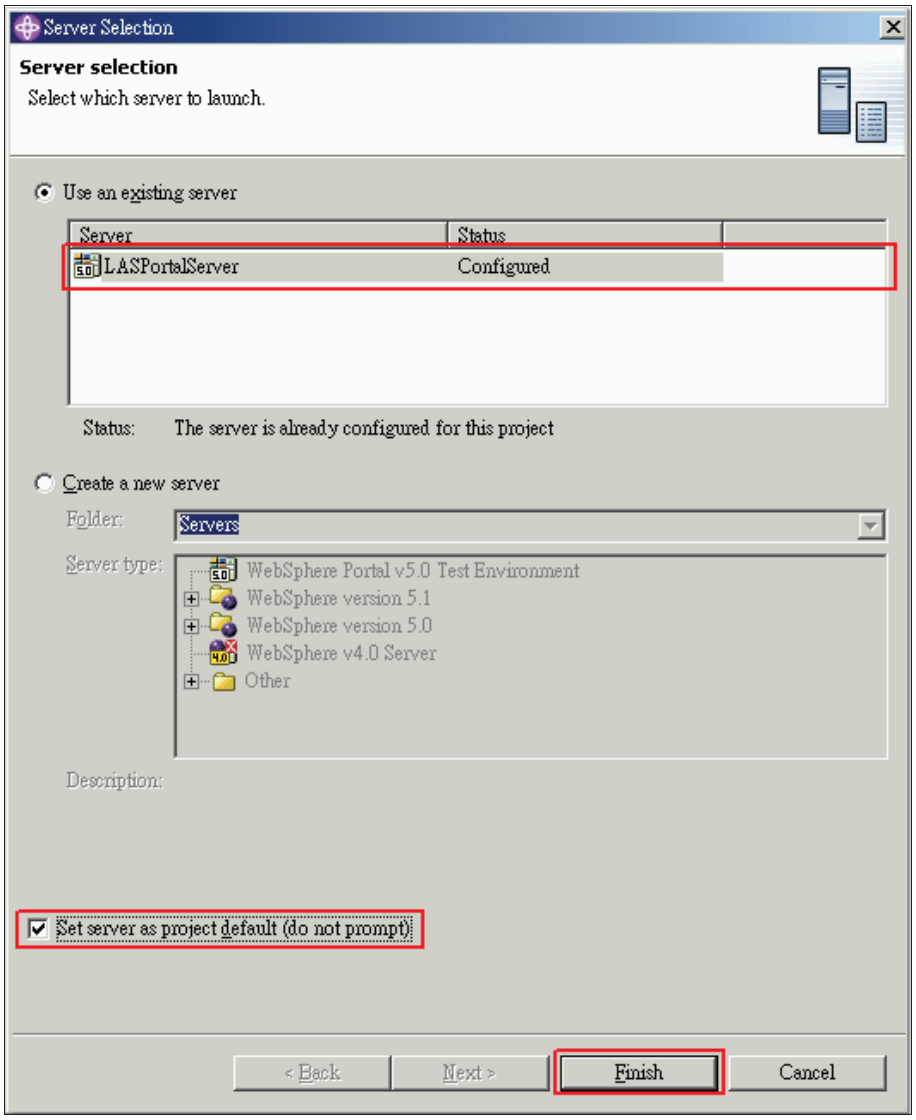

Figure 6-17 Select test environment server as default server

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18. Switch to use [LASPortalServer] LASPortalServer (WebSphere Portal v5.0) console in the Console view.

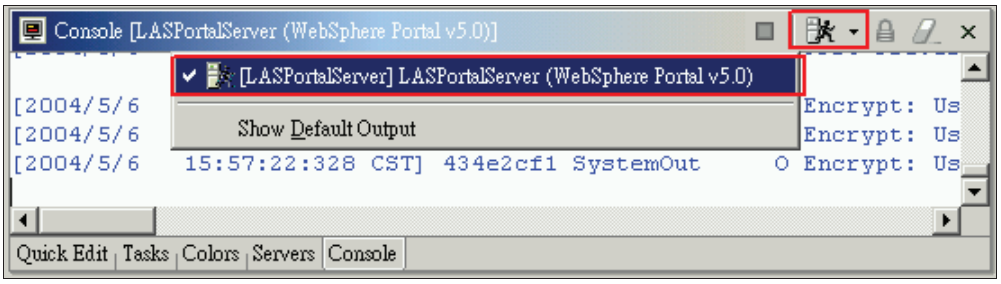

Figure 6-18 Console view

19. The browser is launched automatically with the following URL:

```
http://localhost:9081/wps/portal/!ut/p/.cmd/LoginUserNoAuth?userid=wpsadmin
&password=wpsadmin
```

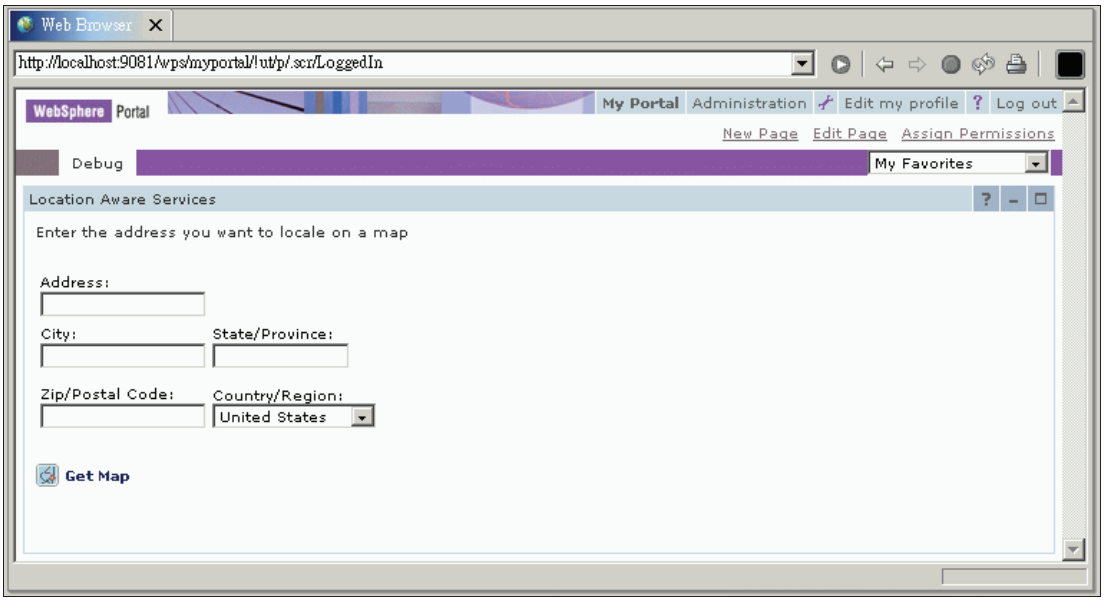

Figure 6-19 Accessing the portlet

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20. This sample portlet only uses geocoding and mapping services. The sample shows the map of the address that the user inputs.

21. Input the following information and select the **Get Map** icon.

```
City: london
Country: United Kingdom
```

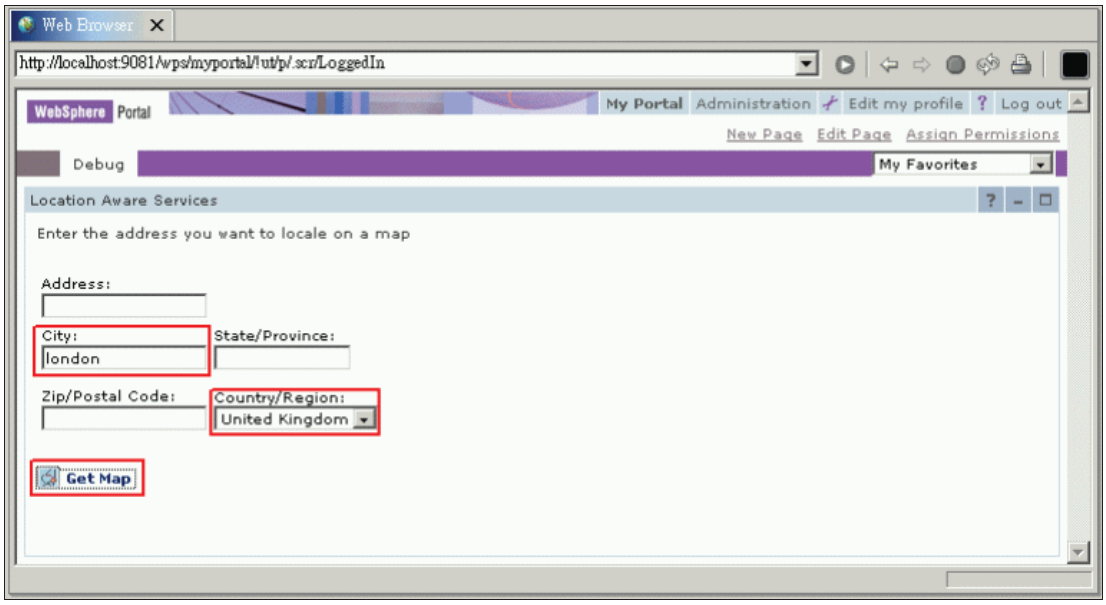

Figure 6-20 Entering data

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22. You should see the matched addresses for your inputs. Select the address that you want, and click **OK** to get the map of this address.

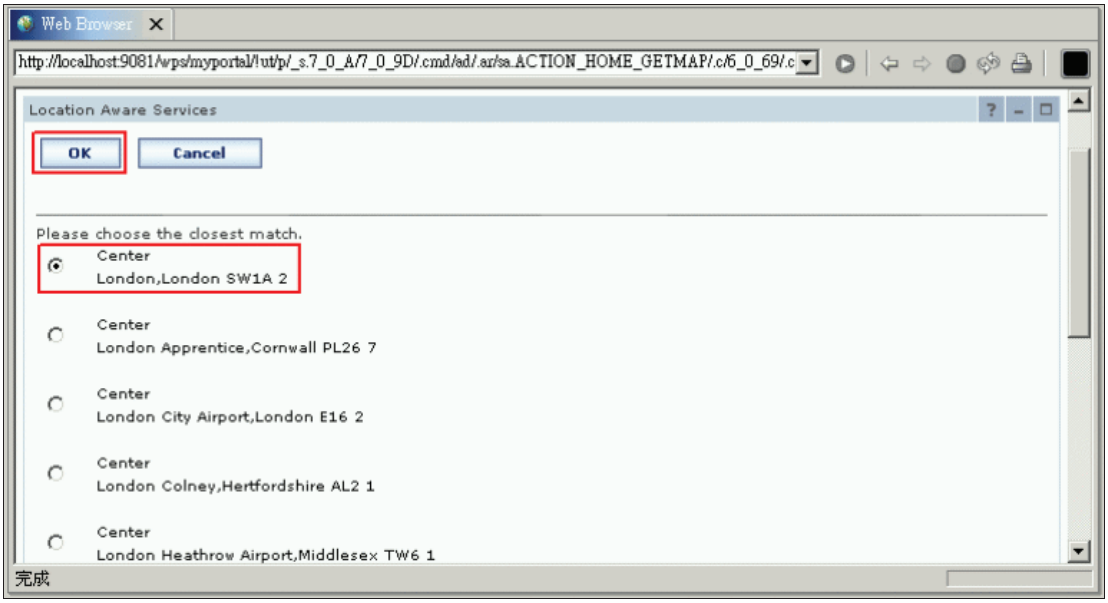

Figure 6-21 Selecting address

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23. The map shows as illustrated in Figure 6-22.

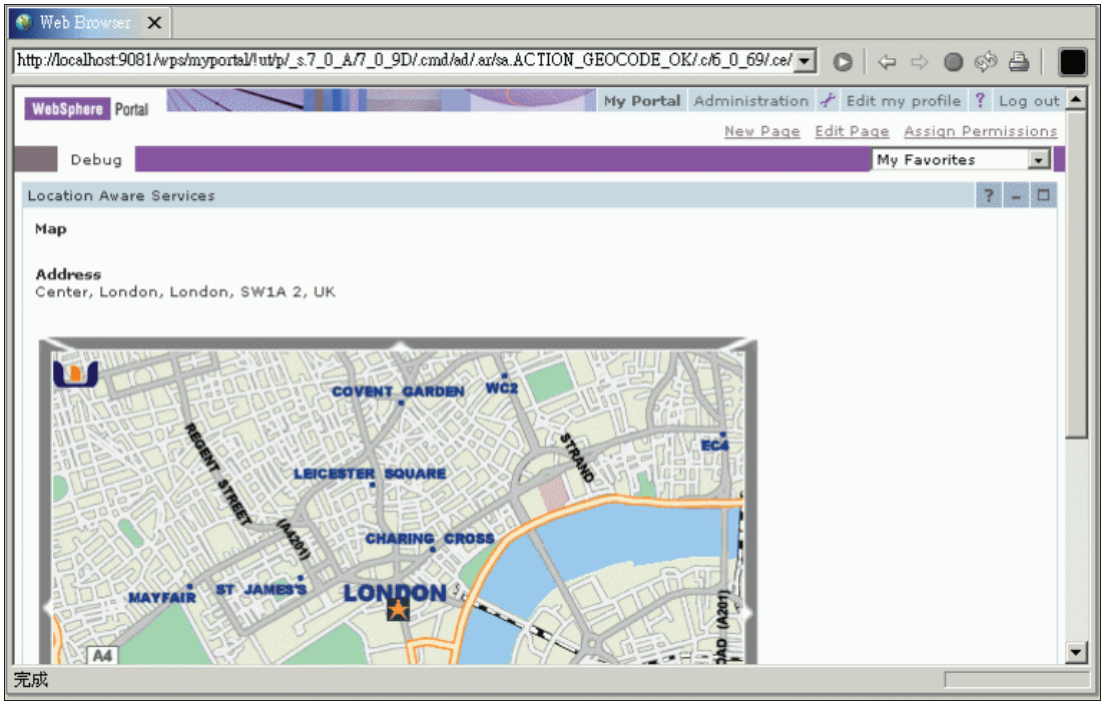

Figure 6-22 Resulting map

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24. Click the **Home** icon to get the map of another address.

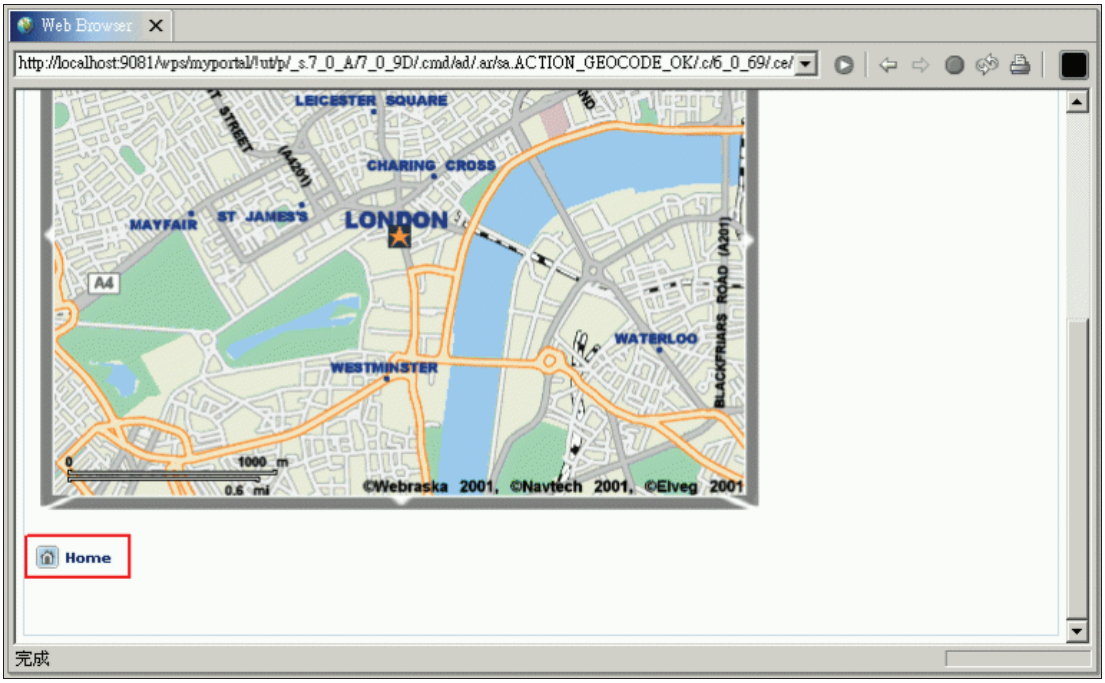

Figure 6-23 Another address map

In this section, you go through running the Location Aware Services sample portlet with WebSphere Studio Site Developer and WebSphere Studio Application Developer V5.1.1 via Everyplace Toolkit V5.01 with the WebSphere Portal V5.0.2.1 test environment. You could use this as a reference to write the Location Aware Services portlet application. For portlet programming with Location Aware Services APIs, refer to the Location Aware Services InfoCenter for more details.

http://www-306.ibm.com/software/pervasive/ws_everyplace_access/library/

6.1.3 Further enhancements

The Location Aware Services example provides a very basic Location Aware Services application that supports HTML markup. You can use the same techniques described in Chapter 5, “Location Aware Services” on page 155 to add support for other devices such as PDAs, smart phones, and even WAP phones.

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6.2 Deploying the Location Aware Services portlet

After completing the development and testing of the Location Aware Services portlet using WebSphere Studio Site Developer, and the Everyplace Toolkit and the test environment the portlet can be deployed to WebSphere Everyplace Access server.

6.2.1 Deploying to a server with Location Aware Services installed

To deploy to a server where Location Aware Services are installed, export your Location Aware Services portlet project from WebSphere Studio Site Developer to an external WAR file, for example lassample.war.

An WebSphere Everyplace Access server with Location Aware Services installed provides the mapping services adapters. Therefore, you need to remove the JAR files for the mapping service adapter that is added during the development and testing of the portlet. This can be done using JAR tools or a zipped file utility.

The following files need to be removed from the WAR file.

- WEB-INF/classes/atlas.properties
- WEB-INF/lib/atlas.jar
- WEB-INF/lib/dom4j.jar
- WEB-INF/lib/jaxm-api.jar
- WEB-INF/lib/jaxm-runtime.jar
- WEB-INF/lib/saaj-api.jar
- WEB-INF/lib/saaj-ri.jar
- WEB-INF/lib/sgp-3.0-ext.jar
- WEB-INF/lib/sgp-3.0-ols.jar

After removing the JAR files the Location Aware Services portlet:

1. Install the Location Aware Services portlet on the WebSphere Everyplace Access server.
2. Add the Location Aware Services sample portlet to a page.

After the Location Aware Services portlet has been installed and added to the page, you can use the portlet to enter an address and to display a map of the address.

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6.2.2 Deploying to a server without Location Aware Services

The Location Aware Services portlet can also be deployed on a WebSphere Everyplace Access server without Location Aware Services by retaining the JAR files that contain the mapping service adapters and by performing the following steps:

1. Export the Location Aware Services portlet project from WebSphere Studio Site Developer to an external WAR file, lassample.war.
2. Install the WAR file that contains the Location Aware Services portlet on the Everyplace server.
3. Add the Location Aware Services portlet to a page.
4. Modify the atlas.properties in *LAS_CONTEXT_ROOT*/WEB-INF/classes directory to match the current environment settings (for example, if *LAS_CONTEXT_ROOT* is C:/Program Files/WebSphere/PortalServer/installedApps/lassample_PA_1_0_IP.ear/lassample.war.

   Note: Note the use of a forward slash (/) instead of a backslash (\) for the Windows platform.

   a. Modify the value of logDirectory to correspond with the full path name of the directory where the log and trace files will be written. For example:

      ```
      logDirectory = <LAS_CONTEXT_ROOT>/WEB-INF/logs
      ```

   b. Modify the value of servicePropertiesRoot to correspond with the full path name of the directory containing the properties files for each of the services that are available. The properties files for services in the WEB-INF/service_properties directory is provide. So, set the value of servicePropertiesRoot to this directory with the full path name. For example:

      ```
      servicePropertiesRoot = <LAS_CONTEXT_ROOT>/WEB-INF/service_properties
      ```

   c. Set the HTTPProxy property for service adaptors, if needed. If no proxy is required, you can leave it blank.

      ```
      HTTPProxy = http://proxy.yourserver.com:80
      ```

   After you modify the atlas.properties files to match the environment setting, the Location Aware Services portlet can be used to display a map of an address entered.

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6.3 Location Aware Services Java application development

Location Aware Services is not limited to portlet development Everyplace Toolkit for WebSphere Studio can also be used to develop Java applications that use the Location Aware Services API.

6.3.1 Summary of Java application development

Developing a Java Location Aware Services application involves these steps:

1. Add all the JAR files in <WebSphere>LAS/las/lib into your project.
2. Find the atlas.properties file and add it to your project.
3. Modify the atlas.properties file (Example 6-1 on page 214). This is a global file for the Atlas Location Aware Services middleware. By default, Atlas loads this file from com.ibm.atlas.properties file, but may be pointed to directly by the system property ATLAS_PROPERTIES.
4. Modify the servicePropertiesRoot to point to the folder where the Location Aware Services adapter properties files are located. Location Aware Services adapter properties files are located in the directory <WebSphere>/LAS/las/service_properties.
5. Modify the trace and log level accordingly. Setting trace on and to high will slow down the system performances.
6. Set useConsoleLog or useConsoleTrace to true causes the log and trace messages to be written to the Portal server log and trace file, or the messages will be written in the file specified by logFileName and traceFileName properties.
7. ClientName and Password are clear text values used to gain access to services when no corresponding properties are provided in individual service properties file.
8. Atlas gives a default service failover policy file. But you could write your own service failover policy class, which implements the ServiceFailoverPolicy interface to define how the system should behave when a service fails. If you define your own service failover class for a particular service, this should be specified by the <service-type>FailoverPolicyClass.
9. Specify the proxy the service adapters have to use by the HTTPProxy property.

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Example 6-1 Sample atlas.properties file

```
logDirectory=C:\\WebSphere\\LAS\\logs
logFileName=atlas.log traceFileName=atlas.trace
registryClassname=com.ibm.atlas.system.PropertiesFileServiceRegistry
servicePropertiesRoot=C:\\WebSphere\\LAS\\las\\service_properties
useConsoleLog=false
useConsoleTrace=false
# Set to one of 'warn', 'info' or 'error'.
logLevel = warn
#Set to one of "high", "medium", "low", or "none".
traceLevel = none
clientName = dummy
clientPassword = dummy
defaultUserLanguagePreference = en
#<service-type>FailoverPolicyClass =
#
# Specifies the default failover policy class. If not set, defaults to
# com.ibm.atlas.system.DefaultServiceFailoverPolicy.
#
#defaultFailoverPolicyClass =
#Coordinate reference system classes
CRS.WGS84.className = com.ibm.atlas.geometry.WGS84ReferenceSystem
CRS.EPSG:4326.className = com.ibm.atlas.geometry.WGS84ReferenceSystem
HTTPProxy=
```

10. Modify the service properties and the properties file of the service provider. The properties file must be located in the directory as specified in the atlas.properties file. For the adapters provided along with Location Aware Services, the properties file are under the directory <WebSphere>/LAS/las/service_properties.
11. The properties file is used by the Location Aware Services Engine to select the appropriate adapter depending on the serviceType and serviceName (service provider). Also, this properties file specifies the location of the initPropertiesFile. Example 6-2 shows the service properties file for the mapping service provided by Webraska.
12. The service provider properties file contains information required by the adapter. The parameters in the properties file depend on the service provider. Example 6-3 on page 215 shows the Webraska adapter's properties file.

Example 6-2 Mapping Service properties

```
serviceType = mapping
className = com.ibm.atlas.adapters.webraska.WebraskaMappingService
serviceName = webraska-na.MappingService
initPropertiesFile = webraska-na/init.properties
```

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Example 6-3 Webraska service init properties

```
server = dummy.webraska.com
path = /gns
clientName = demo clientPassword = demo
connectionTimeout = -1
#geolang = en
```

> **Note:** To learn about the different parameters that are required by the adapters that are provided by WebSphere Everyplace Access, see the InfoCenter (select **Location Aware Services** → **Managing** → **Administrative Services** → **Properties for Service Provider Configuration Profile**).

13. Initialize the service as shown in Example 6-4.

Example 6-4 Initializing the service

```
GeocodingService geocodingService = new GeocodingService(geoProps);
MappingService mappingService = new MappingService(mapProps);
```

This command invokes the Atlas core components, which connects to the appropriate service provider using the property files. The code allocates two Location Aware Services that are used in the application: geocoding and mapping. The Location Aware Services provide access to multiple providers of the location services. Location Aware Services searches among the registered services for the one that fits the specifications provided in the properties file, such as the geography, and returns the first match. GeocodingService is defined in the package com.ibm.atlas.Geocoding. GeocodingService determines the location of the given address. MappingService is defined in the package com.ibm.atlas.Mapping. MappingService returns a map of the given location.

14. The Construct and Address object is used by GeocodingService to obtain the location. The address is defined in the package com.ibm.atlas.GeoCoding. This class represents an address and is loosely based on RFC 2426 and ISO/ISE 11180.

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15. GeocodingService returns the location of the given address (Example 6-5).

Example 6-5 Constructing the address and getting the Geocoded location

```
// Construct the Address
Address addr = new Address();
addr.setStreet(street);
addr.setCity(city);
addr.setState(state);
addr.setCountry(country);
GeocodedAddress[] locations = geocodingService.geocode(addr);
```

If there are multiple locations matching the given address, all the locations are returned. Multiple locations can be found, for example if the entered address was not unique. For example, the Geocoding address City Center, Durham, gave multiple locations such as Durham Oregon, Durham Washington, Durham Indiana, and so on.

16. The given locations could be presented to the user to select the best match, or the application can choose to give the first match. In our application, the first location is chosen and the map is provided. This example creates a boundary of five square kilometers around the point of interest.

Example 6-6 Sample location and map

```
Point pt = geoAddress[0].getPoint();
Box bounds = new Box(pt.getCoordinates(), 5000.0, 5000.0);
```

17. A MappingOptions object contains the options for creating the map image, such as the length and height given in number of pixels. The format of the map data should be returned, such as GIF, JPG, and so on. The application requests a map image of 240x240 pixels and in the GIF format.

Example 6-7 Mapping options

```
MappingOptions options = new MappingOptions(240, 240, "gif");
```

18. A MapOverlay object is used to specify what information should be overlaid on the requested map. The MapOverlay object could be used to overlay a single or multiple point of interests on the map, routing information about the map, and so on. The application requests that the point of location be overlaid on the map.

Example 6-8 MapOverlay object

```
MapOverlay [] overlays = new MapOverlay[] {new MapOverlay(pt)};
```

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19. Finally the MappingService is used to request the map specifying the bounds, the mapping options, and the overlay. The Map object represents a map that includes image data, width, height, and format, and the geographical area covered by the map.

Example 6-9 Requesting the map

```
Map map = mappingService.getMap(bounds, options, overlays);
```

20. The Map.getData() returns the map as a byte array. This can be used to render the map on a canvas, save it as a GIF file and render it as an HTML and so on.

6.4 Developing a Location Aware Services adapter

Location Aware Services uses adapters that can be dynamically plugged in for enabling services from service providers. Service providers should write custom adapters that communicate with their infrastructure to provide the necessary service. Location Aware Services provides adapters for several service providers. See Chapter 5, “Location Aware Services” on page 155 for a list of supported service providers.

In order to enable Location Aware Services to use your custom adapter to provide the service, you should develop the adapter in accordance with the interfaces defined and register the adapter for the specific service.

All service adapters for Location Aware Services must extend the com.ibm.atlas.adapters.LocationServiceAdapter class.

The LocationServiceAdapter class is an abstract class that contains the following methods:

- public void init(LocationServiceConfig config)
- public LocationServiceConfig getConfig()
- public void setClientOptions(ServiceRequestOptions options)
- public abstract ServiceCapabilities getCapabilities()

The Location Service Factory calls the init method when the adapter is first created. The adapter can override this method to perform any required initialization procedures, including authentication if it is session-based, or testing communication with the remote provider's site. If the adapter overrides this method, it should call super.init first. The setClientOptions method sets the clientName, clientPassword and userLanguagePreference properties in the ServiceRequestOptions object to values given in the adapter's init properties or,

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if not given there, to defaults specified in the atlas.properties file. All adapters must call this method when their main service methods are invoked.

The getCapabilities method returns a service-specific subclass of ServiceCapabilities. A DirectoryServiceAdapter must return a DirectoryCapabilities object, a GeocodingServiceAdapter must return a GeocodingCapabilities object, and so on. Since the ServiceCapabilities subclasses provide constructors that take a Properties object as a parameter, each adapter's responsibility is to retrieve the service's properties from the Service Registry and pass them to the constructor. Thus, a MappingService adapter's getCapabilities method would typically be implemented as illustrated in Example 6-10.

Example 6-10 Sample MappingService adapter's getCapabilities method

```
ServiceCapabilities getCapabilities() {
   ServiceRegistry svcReg = config.getFactory().getServiceRegistry();
   Properties svcProps = svcReg.getServiceProperties(config.getName());
   return new MappingCapabilities(svcProps);
}
```

For location service providers that offer two or more of the Location Aware Services, it may be desirable to create a superclass that is extended by all the provider's service adapters. This superclass would extend LocationServiceAdapter and would typically handle the low-level communication with the service provider that is common to all the adapters.

Depending on the type of service, service adapters should implement one of the service interfaces. These service interfaces are defined in the com.ibm.adapters package. The following interfaces are included in this package:

- DevicePositionServiceAdapter
- DirectoryServiceAdapter
- GeocodingServiceAdapter
- MappingServiceAdapter
- ReverseGeocodingServiceAdapter
- RoutingServiceAdapter

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6.4.1 Location Aware Services Adapter coding

The following steps are necessary for developing a custom adapter. This example develops a dummy mapping adapter using WebSphere Studio Site Developer.

1. Open WebSphere Studio Site Developer and click **New Project**. Select a Java project and click **Next**.
2. Enter a project name and click **Next**.
3. In the Java Settings pane, click the Libraries tab and select **Add External JARS**. Add the atlas.jar file, which you can find in the <WebSphere>/LAS/las/lib folder. Click **Finish**.
4. Click your project and create a new Java Class. Set the super class as com.ibm.atlas.adapters.LocationServiceAdapter. Set the interface as com.ibm.atlas.adapters.MappingServiceAdapter. Click **Finish**.
5. You should get skeleton code as shown in Example 6-11. Modify the GetMap methods to return the map. The MapOverlay object contains the necessary information about the location and the details required for the map.

Example 6-11 Dummy map adapter

```
package com.dummy
import com.ibm.atlas.ServiceCapabilities;
import com.ibm.atlas.ServiceFailureException;
import com.ibm.atlas.ServiceRequestException;
import com.ibm.atlas.adapters.LocationServiceAdapter;
import com.ibm.atlas.adapters.MappingServiceAdapter;
import com.ibm.atlas.geometry.Box;
import com.ibm.atlas.geometry.PointCircle;
import com.ibm.atlas.mapping.Map;
import com.ibm.atlas.mapping.MapOverlay;
import com.ibm.atlas.mapping.MappingCapabilities;
import com.ibm.atlas.mapping.MappingOptions;
import com.ibm.atlas.system.ServiceRegistry;
public class MappingService extends LocationServiceAdapter implements
            MappingServiceAdapter {

public ServiceCapabilities getCapabilities() {
   ServiceRegistry serviceRegistry = config.getFactory().getServiceRegistry();
   java.util.Properties serviceProperties =
               serviceRegistry.getServiceProperties(config.getName());
   return new MappingCapabilities(serviceProperties);
}

public Map getMap(Box arg0, MappingOptions arg1, MapOverlay[] arg2) throws
            ServiceFailureException, ServiceRequestException {
   Map map=new Map();
```

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```
   // Use the Mapping Options, Map Overlay to get the Map Data
   return map;
}

public Map getMap( PointCircle arg0, int arg1, MappingOptions arg2,
MapOverlay[] arg3) throws ServiceFailureException,ServiceRequestException {
   Map map=new Map();
   byte [] buffer=null;
   // Use the PointCircle, Mapping Options, Map Overlay to get the Map Data
return map;
}
}
```

6.4.2 Registering the custom adapter

After the adapter class is ready, it has to be registered with the Location Aware Services. When registering an adapter, you must specify such information as the class to be loaded, service provider properties, the service type, and so on.

Location Aware Services provides an Administration portlet through which the custom adapters can be added and configured. For details about registering and configuring your custom adapter, see 6.4.2, “Registering the custom adapter ” on page 220.

During the registration of the service adapter, a class has to specified that will be loaded by the Location Aware Services if the service adapter was matched and selected for service. This class has to put in the directory which is in the class path of the WebSphere Application Server. If the class was com.dummy.GeoCoding, then this class has to be present in the <WAS_HOME>/lib/com/dummy directory.

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6.5 Location Aware Services API

Location Aware Services provides an application developer API. The Location Aware Services Java API provides a flexible interface that allows simple access to straight forward services, while still providing access to the more sophisticated capabilities offered by some services. The documentation for the API can be located in the WebSphere installation directory <WebSphere>/LAS/Doc/API.

Table 6-1 lists the Location Aware Services packages.

Table 6-1 Location Aware Services packages

Package	Description
com.ibm.atlas	The Atlas API.
com.ibm.atlas.directory	Classes for making directory searches for points of interest and business places (yellow pages).
com.ibm.atlas.geocoding	Classes for specifying address and locations to get Geocoded address. This package also consists of classes for reverse geocoding a given Geocoded address. It consists of necessary data types for making requests and getting responses.
com.ibm.atlas.geometry	Defines several geometrical shapes, points and coordinates used by the Atlas.
com.ibm.atlas.mapping	Classes for requesting maps, specifying the desired features of the map
com.ibm.atlas.positioning	Classes for requesting the position of the device. Consists of data types for making requests and holding the responses.
com.ibm.atlas.routing	Classes for requesting routes and necessary data types for making requests and getting responses.
com.ibm.atlas.uom	(Units of measure) Classes associated with unit of distance, speed, angles, time, and so on.

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6.6 Other sources of information

The WebSphere Everyplace Access InfoCenter has sections covering Location Aware Services. The WebSphere Everyplace Access InfoCenter is installed along with WebSphere Everyplace Access.

To view the InfoCenter, click **Start** → **Programs** → **IBM WebSphere** → **Everyplace Access** → **View InfoCenter**. You can also find it online at:

http://publib.boulder.ibm.com/infocenter/weahelp

6.6.1 WebSphere Studio InfoCenter

You can access the WebSphere Studio Site Developer InfoCenter from the Help menu within WebSphere Studio Site Developer or online at:

http://publib.boulder.ibm.com/infocenter/ad51help

6.6.2 Portal and the Everyplace Toolkit

The portal toolkit is installed during the Everyplace Toolkit installation process, and both toolkits add information to the WebSphere Studio Site Developer and WebSphere Studio Application Developer Online Help. Simple open the online help, and look in the table of contents for references to Portal development or the Everyplace Toolkit.

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7

Clustering WebSphere Everyplace Access nodes

This chapter discusses how to cluster WebSphere Everyplace Access nodes. It also discusses how clustering is achieved in WebSphere Everyplace Access, the components which can be clustered, and the steps for setting up an WebSphere Everyplace Access cluster.

Note: This chapter provides details on the installation steps and procedures for Windows operating system. The logical steps remain the same for the AIX system. However, there are additional pre-requisites which are required for AIX systems.

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7.1 Overview of clustering

In a production environment, when the number of users accessing WebSphere Everyplace Access Services increases, you might experience slow response times or connections that are refused. The setup can even fail under critical load conditions. Applications need to scale for increasing numbers of simultaneous users. One way to achieve a reliable and scalable environment is clustering.

The advantages of a cluster setup are:

- Improved availability by enabling services and applications in the server cluster to continue providing service during hardware or software component failure or during planned maintenance.
- Increased scalability by adding new servers to the cluster when the number of users increase On Demand.
- Increased reliability as server clustering boosts reliability and eases failover.
- Improved manageability by enabling administrators to manage servers, configurations, and resources within the entire cluster as though they were managing a single server.

WebSphere Everyplace Access uses WebSphere Application Server clustering techniques. You can only implement WebSphere Application Server clustering using Network Deployment. WebSphere Application Server clustering occurs between identically defined application servers.

7.2 Clustering using Network Deployment

WebSphere Application Server Network Deployment provides workload management, dynamic caching, and performance management tools that distribute workload across multiple servers through load balancing and clustering capabilities. Network Deployment also provides central administration of application servers in a cell.

Servers that belong to a cluster are members of that cluster set and must all have identical application components deployed on them. Other than the applications configured to run on them, cluster members do not have to share any other configuration data. One cluster member might be running on a huge multi-processor enterprise server system while another member of that same cluster might be running on a small mobile computer. The server configuration settings for each of these two cluster members are very different, except in the area of the application components that are assigned to them. In that area of configuration, they are identical.

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Figure 7-1 shows the WebSphere Application Server Cluster using Deployment Manager.

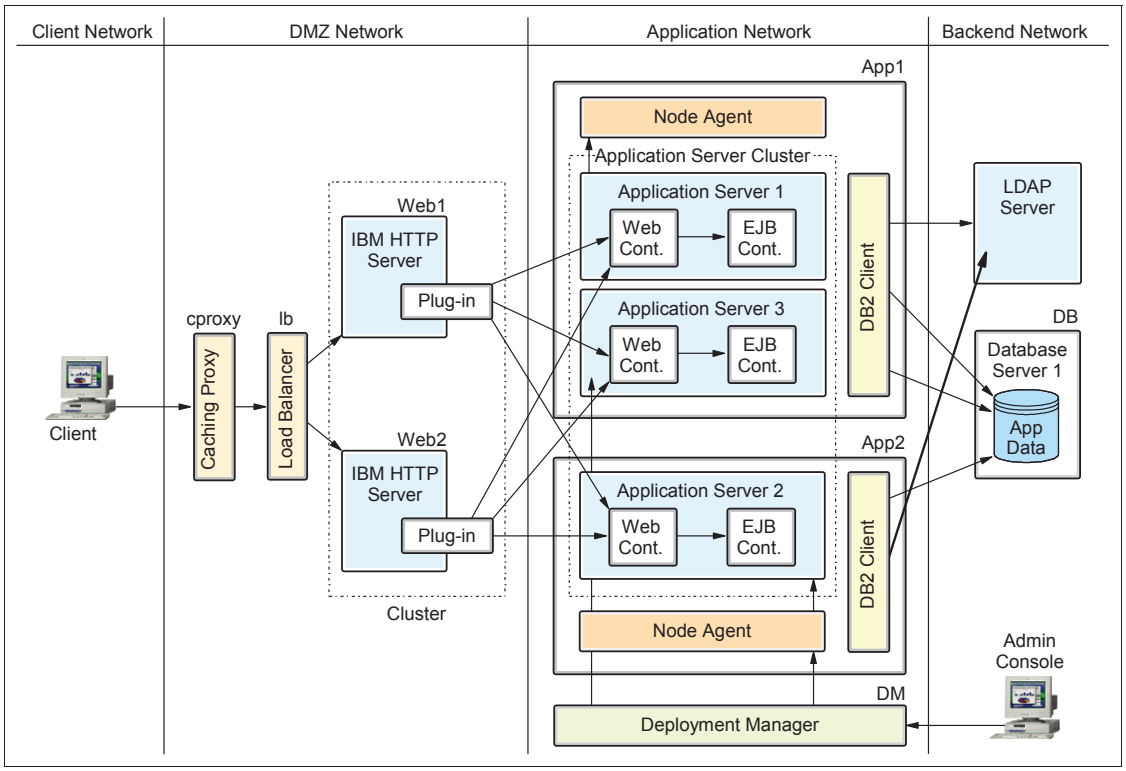

Figure 7-1 Generic WebSphere Application Server cluster

WebSphere Application Server traffic is controlled through the Work Load Management (WLM) technique that is available through WebSphere Application Server Network Deployment. The incoming HTTP traffic is managed using Edge Server load balancer. Any HTTP request that is carrying session information is routed to the same Application Server that handled the previous request from this client, using session affinity management possible through the WebSphere plug-in.

In a clustered Web server environment, the load balancer monitors the availability of the Web servers. If a Web server has failed, no more requests are sent to the failed system. Instead, all requests are routed to other, active Web servers. It is also recommended that you ensure high availability of the load balancer system itself to eliminate it as a single point of failure.

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A load balancer software is used to dispatch the load to the Web servers in the cluster. It uses a load-balancing mechanism usually known as *IP spraying*, which intercepts the HTTP requests and redirects them to the appropriate machine in the cluster, providing scalability, load balancing, and failover.

The Web container manages the J2EE components, servlets, and JSPs that are accessed from the Web. Traffic for these components is workload managed by configuring clusters within a cell in WebSphere Application server and then configuring Web servers to access cluster members. This workload management process also sets up failover and backup servers in the event that one or more of the cluster members should fail or all primary servers fail. WebSphere Application Server V5.1 supports a variety of Web servers. These Web servers are necessary for directing traffic from users' browsers to the applications that are running in WebSphere. This is achieved by installing the WebSphere plug-in on the Web servers. The plug-in is a module that runs as part of the Web server process. It acts as a router, deciding what traffic is for WebSphere and what traffic should be handled by the Web server itself.

The Web server plug-in uses HTTP and HTTPS as its transport protocol between the Web server and WebSphere Application Server. The plug-in also provides Weighted round robin workload management.

HTTP sessions allow applications to maintain state information across multiple user visits. The Java servlet specification provides a mechanism for applications to maintain all session information at the server and exchange minimal information with a user's browser. The methods used to manage the sessions are very important in a workload-managed environment. There are different methods of identifying, maintaining affinity, and persisting the sessions. After a session has been created, all requests need to go to the application server that created the session. This session affinity is provided by the WebSphere plug-in.

7.2.1 WebSphere Application Server Network Deployment terminology

This section provides an overview of the WebSphere Application Server Network Deployment terminology.

Application server

An application server extends the ability of a Web server to handle Web application requests and allows a server to generate dynamic, customized responses to client requests.

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Cell

A group of related nodes and their node agents constitute a cell. Administrators define the nodes that make up a cell according to criteria that is appropriate in their environment.

A cell contains a Deployment Manager from which all the administrative tasks for the nodes in that cell are handled. A Deployment Manager for the cell has a master configuration repository that contains the configuration data for the nodes and servers within the cell. Configuration changes made at the cell level are propagated to the nodes and servers the next time synchronization occurs. Therefore, all configuration changes must be made at the cell level.

Although each node and server in a cell have their own local configuration files, configuration changes made at the node or server level are temporary and are overlaid with the data from the cell repository that is maintained by the Deployment Manager.

Node and node agent

A node is a logical grouping of WebSphere Application Server managed server processes that share common configuration control. A node usually corresponds to a physical computer with a distinct IP address. A node is normally associated with one physical installation of WebSphere Application Server. The node name is typically identical to the host name of the computer. A node contains one or more application servers, XML configuration files, and an activated node agent.

The node agent communicates directly with the Deployment Manager and is used for configuration, synchronization and administrative tasks such as stopping or starting of individual application servers and performance monitoring on the application server node.

Deployment Manager

The Deployment Manager is a special application server which manages the configuration of multiple application servers across multiple nodes in a cell. Deployment Manager includes an administrative console for implementing the configuration management.

The Deployment Manager is part of an WebSphere Application Server Network Deployment V5 or later installation. It provides a central point of administrative control for all elements in a distributed WebSphere cell. The Deployment Manager is a required component for any vertical or horizontal scaling.

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Cluster

A cluster is a logical collection of application server processes that are grouped together solely for the purpose of providing workload distribution and failover. Servers which are members of a cluster set must all have identical application components deployed on them.

The servers that are members of a cluster can be on located on the same host computer and node, which is called *vertical* clustering, or on different host computers and nodes, which is called *horizontal* clustering.

A cluster is not the same as a cell. A Network Deployment cell can have zero clusters, one cluster, or multiple clusters.

Edge Server Load Balancer

The load balancer distributes the workload among the Web servers in a cluster. The *load balancer* is also known as a network dispatcher. The load balancer is included in WebSphere Application Server Network Deployment V5 and Enterprise Edition.

7.3 WebSphere Everyplace Access clustering topologies

WebSphere Everyplace Access has several servers such as Portal Server, WebSphere Everyplace Access Synchronization Server, Device Management Server, Intelligent Notification Server, Location Aware Services, and DB2 WebSphere Everyplace Access Server. All these servers can be clustered individually. Also, you can install the WebSphere Everyplace Access servers and services on a single node, create a clone of this node, and then cluster it.

7.3.1 WebSphere Everyplace Access clone topology

In this topology, all the WebSphere Everyplace Access servers and its services are on a single box, and this server is cloned and clustered. For achieving this, the database server and the directory server should be installed on a different system. Figure 7-2 on page 229 illustrates this topology. You can install a network dispatcher, which is optional, to provide load balancing for HTTP servers.

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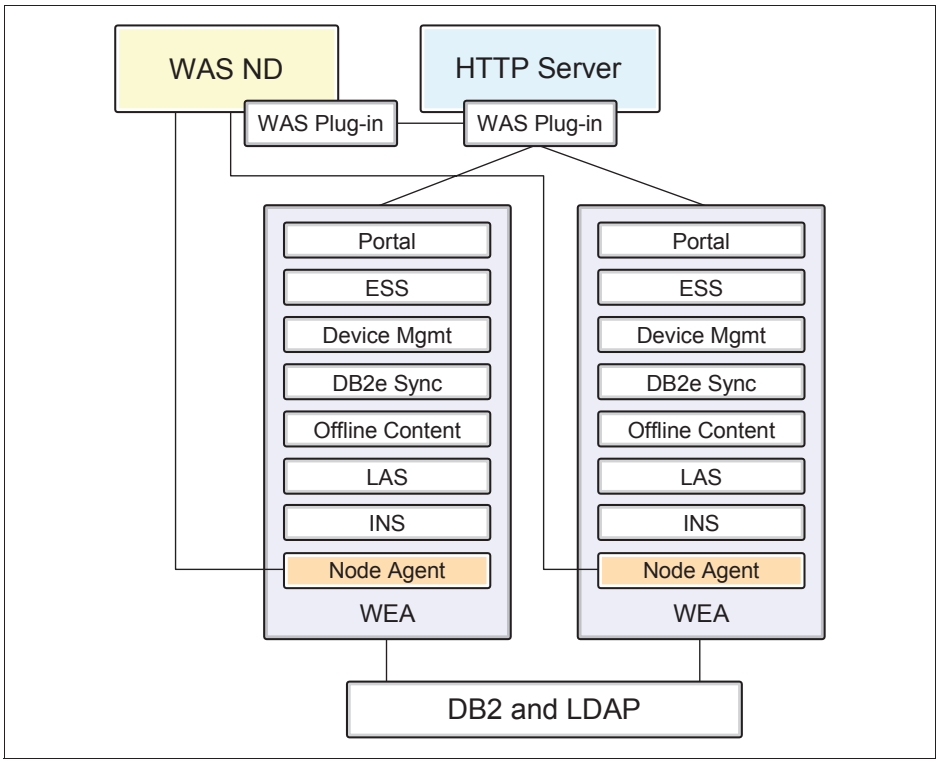

Figure 7-2 WebSphere Everyplace Access *clone topology*

7.3.2 Distributed Application Server and portal topology

In distributed WebSphere Application Server and WebSphere Portal topology, the WebSphere Application Server and WebSphere Portal are installed separately. The WebSphere Everyplace Access servers are installed on WebSphere Application Server, and the associated administration portlets are installed on the WebSphere Portal box. The WebSphere Application Server boxes can be cloned. Also, multiple WebSphere Application Server boxes can be set up for individual servers, and several clusters can be setup for each server.

You can use the Network Dispatcher, which is an optional component, if you use multiple HTTP servers. The Portal server can also be clustered. However, in the topology illustrated in Figure 7-3 on page 230, all the different WebSphere Everyplace Access servers are installed on a the same WebSphere Application Server node, and a single WebSphere Portal Server is installed. The DB2 and Lightweight Directory Access Protocol (LDAP) server can be on separate nodes.

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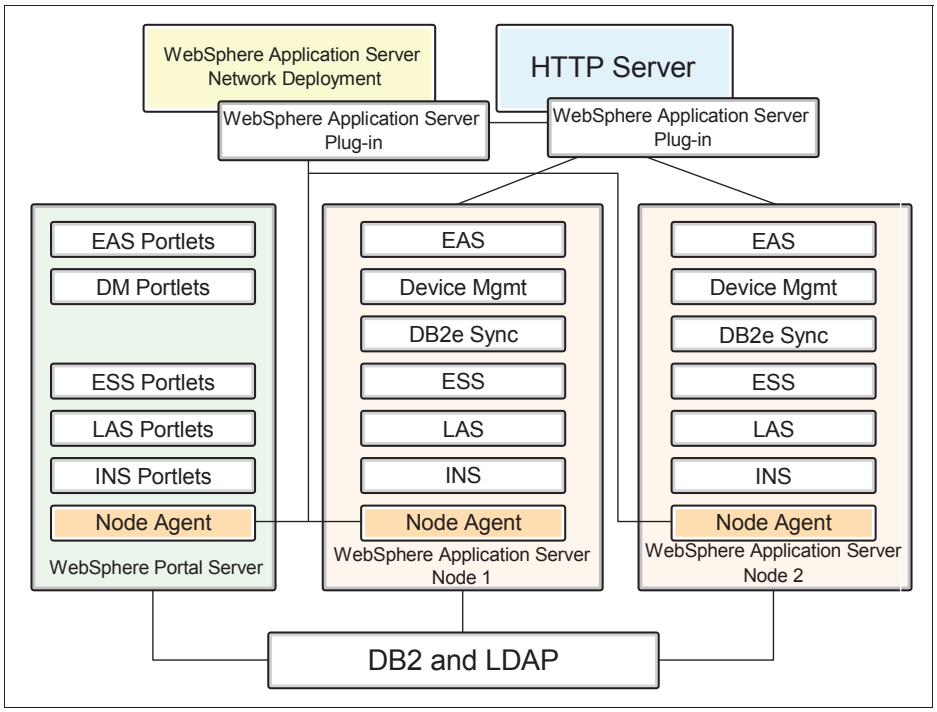

Figure 7-3 Distributed WebSphere Application Server and WebSphere Portal Topology

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7.4 Setting up the individual components

The first step in building the WebSphere Everyplace Access cluster is to set up the required individual components. Figure 7-3 on page 230 illustrates a distributed WebSphere Everyplace Access setup. In this setup, there are separate nodes for DB2 and LDAP servers. The figure shows the setup with the host names.

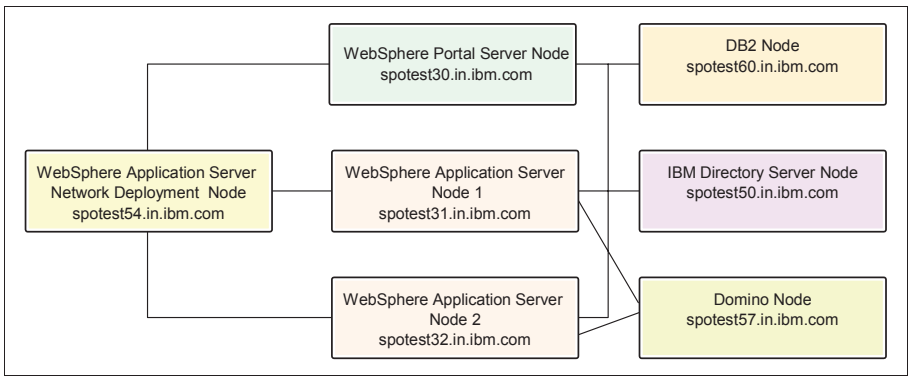

Figure 7-4 WebSphere Everyplace Access distributed setup

The following needs to be setup on each node:

- DB2 Node: Install DB2 V 8.1 Server.
- IBM Directory Server Node: Install DB2 V8.1 and IBM Directory Server V5.0. Import the ldif file that contains the portal users and groups.
- Domino Node: Install Lotus Domino Server. Create the administrative ID and a few users.
- WebSphere Application Server Network Deployment Node: Install WebSphere Application Server Network Deployment Enterprise Edition V5.0.2.3.
- WebSphere Application Server Nodes: Install WebSphere Application Server V5.0.2.3 Enterprise server. Enable security. Add the nodes to a WebSphere Application Server Network Deployment cell.
- WebSphere Portal Node: Install WebSphere Portal V5.0.2.1. Migrate WebSphere Portal to use DB2. Enable Security. Add the nodes to the WebSphere Application Server Network Deployment cell.

The subsequent sections take you through the various steps involved in setting up this topology. For this scenario, Windows 2000 Advanced Server was used. These sections do not discuss the use of Network Dispatcher or how to cluster the portal server.

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Note: This scenario assumes that you are using the WebSphere Everyplace Access Setup CDs. If you are doing a network install, you need to mount the appropriate images.

7.4.1 Windows operation system pre-requisites

The following are the pre-requisites that must be done on all the nodes which are to be a part of the cluster:

1. WebSphere Everyplace Access requires Service Pack 4 for Windows 2000 Server and Advanced Server. Service Pack 4 must be installed before you begin the WebSphere Everyplace Access installation.
2. Select Network Settings, you require static IP addresses and fully qualified domain names for all the nodes.
3. Create an WebSphere Everyplace Access administrator ID. The ID should meet the following requirements:
   - Can contain characters a through z, A through Z, 0 through 9
   - Cannot begin with a numeric character
   - Cannot be longer than 12 characters
   - Cannot include spaces, non-ASCII characters, or diacritics (such as umlauts)
   - Cannot be the words *users*, *admins*, *guests*, *public*, *local*, or any SQL reserved word list in SQL Reference
   - Cannot start with *SQL*, *SYS*, or *IBM* (also applies to the password)
4. The Administrator ID should have the following access rights:
   - Act as part of the operating system
   - Create a token object
   - Increase quotas
   - Replace a process level token
   - Log on as a Service

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7.4.2 Database node

On the database node, you need to install the DB2 Server V8.1.6. This section provides details on that installation and setup.

Installing DB2 UDB V8.1.6

To install DB2 UDB V8.1.6, follow these steps:

1. Insert CD1 and run the install.bat file. Go to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
2. From the Component Selection window, select **DB2 Universal Database™ Workgroup V8.1.6** and click **Next**.

   The IBM DB2 Setup Launchpad opens.
3. Click **Install Product**.
4. Select **DB2 UDB Workgroup Server Edition** and click **Next**.
5. Click **Next** on the DB2 Setup Wizard – DB2 Workgroup Server Edition window.
6. Accept the license agreement and click **Next**.

   The Select the installation type window appears.
7. Select **Typical** and click **Next**. (Do not select Data warehousing.)

   The Select installation folder window appears.
8. Accept the default location for DB2 and click **Next** (for example, C:\Program Files\IBM\SQLLIB\).

   The Set user information for the DB2 Administration Server window appears.
9. Enter the following:
   - Domain: leave empty
   - User Name: db2admin
   - Password: PASSWORD
   - Confirm Pwd: PASSWORD
10. Click **Next**.
11. Select **Use the same user name and password for the remaining DB2 services**.

    The Set up the administration contact list window appears.
12. Select **Local – Create a contact list on this system** and leave Enable notification cleared. Then, click **Next**.
13. Click **OK** on the warning window.

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The Configure DB2 Instances window appears. You should see one instance under DB2 Instances.

14. Click **Next**.

    The Prepare the DB2 tools catalog window appears.

15. Accept the default, and click **Next**.

    The Specify a contact for health monitor notification window appears.

16. Select **Defer the task until after installation is complete**, and click **Next**.

17. Review the summary shown in the Start copying files window, and click **Install**.

    When the install completes, the Setup is complete window opens.

18. Review the summary, and click **Finish**.

19. Close the IBM DB2 First Steps window.

20. Click **Close** in the Component Selection WebSphere Everyplace Access V5 installation window.

21. Click **Yes** to exit the installer program.

Modifying the configuration of DB2 Server

Next, you need to increase the number of concurrent databases, because all of the components you are about to install will exceed the default. One of the symptoms of exceeding the default is if you are logged into the portal and you make a change on the offline browsing administration portal, click save, it refreshes, but the changes are not saved.

To increase the number of concurrent databases:

1. From the desktop, click **Start** → **Programs** → **IBM DB2** → **Command Line Tools** → **Command window**.

2. Update the number of concurrent databases to `25`, and then run the following command:

   ```
   db2 update dbm cfg using NUMDB 25 DEFERRED
   ```

3. To verify the updated configuration, run the following command:

   ```
   db2 get dbm cfg
   ```

4. Update the MON_HEAP_SZ parameter, by running the following command:

   ```
   db2 update dbm cfg using MON_HEAP_SZ 512 DEFERRED
   ```

5. Update the NOTIFYLEVEL parameter, by running the following command:

   ```
   db2 update dbm cfg using NOTIFYLEVEL 1 DEFERRED
   ```

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Installing the DB2 hotfix

To install the DB2 hotfix:

1. Insert the WebSphere Everyplace Access CD1-1.
2. Navigate to the .\hotfix directory.
3. Copy the hotfixpkg_11633.exe file to a temporary drive, such as C:\temp\db2hotfix_temp.
4. Stop the following DB2 processes. (Only running the **db2stop** command is not enough.)
   - DB2DAS – DB2DAS00
   - DB2 Security Server
   - DB2 Remote Command Server
   - DB2 License Server
   - DB2 JDBC Applet Server
   - DB2 – LDAPDB2
   - DB2 – DB2
5. Open a command prompt and change to the directory to where you copied the hotfixpkg_11633.exe file.
6. Run the following command to stop all processes and to apply the hotfix:

   ```
   hotfixpkg_11633 -a –f
   ```

7. Change to the location where DB2 is installed.
8. Run the following command to verify that the hotfix was applied:

   ```
   hotfix –l
   ```

   Note: The parameter is a lowercase letter l, and not the numeral one.

9. Reboot the machine.

7.4.3 LDAP node

On this node, you need to set up an LDAP server. WebSphere Everyplace Access supports the following types of LDAP servers:

- IBM Directory Server
- Microsoft Active Directory
- Lotus Domino

This section explains how to install IBM Directory Server V5.1, which is packaged along with WebSphere Everyplace Access V5. IBM Directory Server uses DB2 internally. IBM Directory Server comes with its own version of DB2. You can either install the DB2 that comes with IBM Directory Server, or you can

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install DB2 V 8.1.6 initially and then install IBM Directory Server. To install DB2 V8.1.6 separately, see 7.4.2, “Database node” on page 233. You can skip the tweaking of DB2 V8.1.6.

Installing IBM Directory Server V5.1

To install IBM Directory Server:

1. From the Component Selection window, select **IBM Directory Server V5.1**, and click **Next**.

   The IBM Directory Server 5.1 language selection window opens.
2. Select the appropriate language, and click **Next**.
3. Click **Next** on the IBM Directory Server welcome window.
4. Accept the license agreement and click **Next**.
5. In the next window, you should see the message: *DB2 Already Installed, The DB2 installed version is: 8.1.4*. Click **Next**.
6. In the next window, accept the default directory (C:\Program Files\IBM\LDAP), and click **Next**.
7. In the next window, select the appropriate language, and click **Next**.
8. Select **Custom** and click **Next**.

   The Select the features to install window opens.
9. Select the following options, and click **Next**:
   - Client SDK 5.1
   - Server 5.1
   - GSKit
10. Deselect the following options:
    - Web Administration V5.1
    - IBM WebSphere Application Server – Express V5.0
    - DB2 V8.1
11. Review the installation summary, and click **Next** to begin the install.

    The GSKit Installation window opens.
12. Click **OK**.

    The IBM Directory Server Version 5.1 Client Readme window opens.
13. Review the readme, and click **Next**.
14. When prompted, click **Yes** to restart the system, and click **Next**.
15. Click **Finish**.
16. After the machine reboots, log in as pvcadmin.

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Configuring IBM Directory Server

When the machine reboots, the IBM Directory Server Configuration Tool should launch automatically.

> **Note:** You can launch this tool manually by selecting **Start** → **Programs** → **IBM Directory Server 5.1** → **Directory Configuration**.

Before you start the configuration, you need to create a user and add that user to the administrator group:

1. Create a new user with the following options:
   - User Name: ldapdb2
   - Full Name: ldapdb2
   - Password: PASSWORD
   - Confirm Pwd: PASSWORD
   - Deselect **User must change password at next logon**
   - Select **Password never expires**
2. Add the user to the administrators group:
   a. Click **Groups**.
   b. Double-click **Administrators**.
   c. Click **Add**.
   d. Select **ldapdb2** and click **Add**.
3. In the Directory Configuration tool, click **Administrator DN/password** in the list.
4. Enter a password for cn=root, and click **OK**.
   - Administrator password: `PASSWORD`
   - Confirm password: `PASSWORD`
5. Click **OK**.
6. Click **Configure Database** in the list.
7. Select **Create a new database** and click **Next**.
8. Enter the following user information and click **Next**:
   - User ID: `ldapdb2`
   - Password: `PASSWORD`

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9. Enter the database name `idsdb`, and click **Next**.
10. Select **Create a universal DB2 database (UTF-8/UCS-2)**, and click **Next**.
11. Select **C** for the Database Location, and click **Next**.
12. Review the summary, and click **Finish**.

    When the configuration completes, you will see the message *IBM Directory Server Configuration complete*.
13. Click **Close** to bring you back to the Welcome screen.
14. Click **Manage suffixes** in the left column.
15. Enter the suffix `dc=in,dc=ibm,dc=com`, then select **Add**, and click **OK**.
16. Close the IBM Directory Server Configuration Tool.
17. Start the IBM Directory Server.
    a. Click Start → Run → services.msc.
    b. Click **OK**.The services console should launch.
    c. Right click IBM Directory Server V5.1, and click **Start**.

Importing the portal users ldif file

The ldif file contains information about users and groups. Instead of adding users and groups through the administrative console, you can easily populate users and groups using this file. A sample ldif file is located in CD2-1. Copy the file to the local file system, and edit it to suite your environment.

Example 7-1 on page 239 shows the ldif file that was edited for the sample scenario.

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Example 7-1 PortalUsers.ldif file

```
dn: dc=in,dc=ibm,dc=com
objectclass: domain
objectclass: top
# Add lines according to this scheme that correspond to your suffix
dc: in,dc=ibm,dc=com
dc: in
dn: cn=users,dc=in,dc=ibm,dc=com
objectclass: container
objectclass: top
cn: users
dn: cn=groups,dc=in,dc=ibm,dc=com
objectclass: top
objectclass: container
cn: groups
dn: uid=pvcadmin,cn=users,dc=in,dc=ibm,dc=com
objectclass: organizationalPerson
objectclass: person
objectclass: top
objectclass: inetOrgPerson
uid: pvcadmin
userpassword: <PASSWORD>
sn: admin
givenName: wps
cn: wps admin
dn: uid=wpsbind,cn=users,dc=in,dc=ibm,dc=com
objectclass: top
objectclass: person
objectclass: organizationalPerson
objectclass: inetOrgPerson
uid: wpsbind
userpassword: <PASSWORD>
sn: bind
givenName: wps
cn: wps bind
dn: cn=wpsadmins,cn=groups,dc=in,dc=ibm,dc=com
objectclass: groupOfUniqueNames
objectclass: top
uniquemember: uid=pvcadmin,cn=users,dc=in,dc=ibm,dc=com
cn: wpsadmins
```

After you edit the file, execute the following command:

```
ldapmodify –a –v –h pvc9356153.austin.ibm.com –D cn=root –w <PASSWORD> -f
c:\tmp\PortalUsers.ldif
```

Review the output in the command console to verify that there were no errors.

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7.4.4 WebSphere Application Server nodes

On the WebSphere Application Server nodes, you need to install WebSphere Application Server V5.0.2.3. To install WebSphere Application Server V5.0.2.3, you need to install the following in the sequence specified:

1. WebSphere Application Server V5.0
2. WebSphere Application Server Enterprise V5.0
3. WebSphere Application Server V5.0.2 Fixpack
4. WebSphere Application Server EnterpriseV5.0.2 Fixpack
5. WebSphere Application Server V5.0.2 e-fixes
6. WebSphere Application Server V5.0.2.2 Fixpack
7. WebSphere Application Server Enterprise V5.0.2.2 Fixpack
8. WebSphere Application Server V5.0.2.3 Fixpack
9. WebSphere Application Server V5.0.2.3 e-fixes.

The following sections provide detail on each step to get you to the appropriate WebSphere Application Server level.

Installing WebSphere Application Server V5.0

To install WebSphere Application Server V5.0, follow these steps:

1. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
2. From this window, select **WebSphere Application Server V5.0 (includes IBM HTTP Server)**, and click **Next**.
3. Select the appropriate language, and click **OK**.
4. Click **Next** on the Welcome screen.
5. Read and accept the license agreement, and click **Next**.

   The Select the features for IBM WebSphere Application Server, Version 5 window appears.

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6. In this window, select the following:
   - Application Server
   - Administration
   - Admin Scripting
   - Administrative Console
   - Application Assembly and Deployment Tools
   - Application Assembly Tool
   - Deploy Tool
   - Ant Utilities
   - Embedded Messaging
   - Server and Client
   - IBM HTTP Server Version 1.3.26
   - Web Server Plug-ins
   - IBM HTTP Server
   - Performance And Analysis Tools
   - Tivoli® Performance Viewer
   - Dynamic Cache Monitor
   - Performance Servlet
   - Log Analyzer
   - Javadocs
7. In this window, clear the following:
   - Application Server samples
   - Client Only
   - Message-driven Bean Samples
   - Apache Web Server
   - Microsoft Internet Information Services
   - iPlanet Web Server
   - Lotus Domino Web Server
8. Start and stop the server to verify the install.

Installing WebSphere Application Server Enterprise V5.0

To install WebSphere Application Server Enterprise V5.0, follow these steps:

1. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
2. From this window, select **WebSphere Application Server Enterprise V5.0**, and click **Next**.
3. In the Install Directory window, accept the default **Add to the existing copy of WebSphere Application Server V5.0**, and click **Next**.
4. Choose **Typical install**, and click **Next**.
5. Clear **Register this product now**, and click **Next**.

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6. Click **Finish**.

   The Component Selection window appears. You can either continue with the next step, or you can click **Close** and continue later.

7. To verify the installation of WebSphere Application Server Enterprise V5.0, start and stop the server.

Installing WebSphere Application Server V5.0.2 FixPack

To install WebSphere Application Server V5.0.2 FixPack, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select the appropriate language, and click **OK**.
5. Select **Install fix packs**, and click **Next**.

   The Enter the directory where fix packs are located window appears.

6. Click **Browse**.
7. Navigate to cd3-3.
8. Select **WAS502BASE**, and click **Open**.
9. Select **was50_fp2_win**, and click **Next**.
10. Verify that IBM HTTP Server and Embedded Messaging are selected and that the directories are correct. Then, click **Next**.
11. Review the summary, and click **Next** to begin the install.

Installing Application Server Enterprise V5.0.2 Fixpack

To install Application Server Enterprise V5.0.2 Fixpack, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select **Install fix packs**.

   The Enter the directory where fix packs are located window opens.

5. Click **Browse**.

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6. Navigate to cd3-3.
7. Click **WAS502PME**, and click **Open**.
8. Select **was50_pme_fp2_win**, and click **Next**.
9. Verify the installation summary, and click **Next** to begin the install.

Installing WebSphere Application Server V5.0.2 e-fixes

To install WebSphere Application Server V5.0.2 e-fixes, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select **Install fixes**, and click **Next**.

   The Enter the directory where fix packs are located window opens.
5. Click **Browse**.
6. Navigate to cd3-3.
7. Click **WAS502EFIX**, and click **Open**.
8. Select all of the e-fixes, and click **Next**.
9. Verify the installation summary, and click **Next** to begin the install.
10. After the installation completes, click **Run Wizard Again**.
11. Select **Install fixes**, and click **Next**.

    The Enter the directory where fix packs are located window opens.
12. Click **Browse**.
13. Navigate to cd3-3.
14. Click **WAS502EFIX2**, and click **Open**.
15. Select all of the e-fixes, and click **Next**.
16. Verify the installation summary, and click **Next** to begin the install.

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Installing WebSphere Application Server V5.0.2.2 FixPack

To install WebSphere Application Server V5.0.2.2 FixPack, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select **Install fix packs**, and click **Next**.

   The Enter the directory where fix packs are located window opens.
5. Click **Browse**.
6. Navigate to cd3-3.
7. Click **WAS5022BASE**, and click **Open**.
8. Verify that **was502_cf2_win** is selected, and click **Next**.
9. Review the installation summary, and click **Next** to begin the install.

Installing Application Server Enterprise V5.0.2.2 FixPack

To install Application Server Enterprise V5.0.2.2 FixPack, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select **Install fix packs**, and click **Next**.

   The Enter the directory where fix packs are located window opens.
5. Click **Browse**.
6. Navigate to cd3-3.
7. Click **WAS5022PME**, and click **Open**.
8. Verify that **was502_pme_cf2_win** is selected, and click **Next**.
9. Review the installation summary, and click **Next** to begin the install.

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Installing WebSphere Application Server V5.0.2.3 FixPack

To install WebSphere Application Server V5.0.2.3 FixPack, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select **Install fix packs**, and click **Next**.

   The Enter the directory where fix packs are located window opens.
5. Click **Browse**.
6. Navigate to cd3-3.
7. Click **WAS5023BASE**, and click **Open**.
8. Click **Next**.
9. Verify that **was502_cf3_win** is selected, and click **Next**.
10. Review the installation summary, and click **Next** to begin the install.

Installing WebSphere Application Server V5.0.2.3 e-fixes

To install WebSphere Application Server V5.0.2.3 e-fixes, follow these steps:

1. Make sure that IBM HTTP Server, WebSphere Application Server, and Portal Server are *not* running.
2. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
3. From this window, select **WebSphere Application Server Fix Pack and Interim Fix**, and click **Next**.
4. Select **Install fixes**, and click **Next**. The Enter the directory where fixes are located window opens.
5. Click **Browse**.
6. Navigate to cd3-3.
7. Click **WAS5023EFIX**, and click **Open**.

   Note: Be sure to click **WAS5023EFIX** and not **WAS5022EFIX**.

8. Select all the fixes in the list under **Carefully review and select fixes to install for your product**, and click **Next**.
9. Review the installation summary, and click **Next** to begin the install.

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7.4.5 WebSphere Portal node

WebSphere Everyplace Access V5.0 requires WebSphere Portal V5.0.2.1. WebSphere Portal Server runs on WebSphere Application Server. Before you install the WebSphere Portal V5.0, you need to install WebSphere Application Server V5.0.2.

> **Note:** The steps for installing WebSphere Application Server V5.0.2 are documented in the previous sections.

After you install WebSphere Application Server V5.0.2, you install the following in the specified sequence:

1. WebSphere Portal V5.0
2. WebSphere Portal V5.0.2 Fixpack
3. WebSphere Application Server V5.0.2.2 Fixpack
4. WebSphere Application Server Enterprise V5.0.2.2 Fixpack
5. WebSphere Application Server V5.0.2.3 Fixpack
6. WebSphere Application Server V5.0.2.3 e-fixes
7. WebSphere Portal V5.0.2.1 Fixpack

The following sections provide details for each step.

Installing WebSphere Portal Server V5.0

To install WebSphere Portal Server V5.0, follow these steps:

1. From the Component Selection window, select **WebSphere Portal Server V5.0**, and click **Next**.

   The Install Shield Wizard launches.
2. Select the appropriate language, and click **OK**.
3. Click **Next** on the Welcome screen.
4. Read and accept the license agreement, and click **Next**.

   The Existing WebSphere Application Server instances window opens.
5. Click **Next**.

   You should see one WebSphere Application Server instance listed (C:\Program Files\WebSphere\AppServer).

   Then, you will see the message *Validating Installation of WebSphere Application Server Enterprise*. Validation can take as much as five minutes to complete.

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6. Accept the default WebSphere Portal installation directory (C:\Program Files\WebSphere\PortalServer), and click **Next**.

   The Enter the Portal Administrative user and password window opens.

7. Enter the following:
   - Portal Administrative User: `pvcadmin`
   - Portal Administrative password: `PASSWORD`
   - Confirm password: `PASSWORD`
8. Click **Next**.
9. Click **Next** again to begin the install.

> **Note:** The installation can take as much as three hours.

Installing WebSphere Portal Server V5.0.2 Fixpack

To install WebSphere Portal Server V5.0.2 Fixpack, follow these steps:

1. Make sure that WebSphere Application Server and WebSphere Portal Server are *not* running.
2. Edit the file C:\Progra~1\IBMHttpServer\conf\httpd.conf:

   Add the following line to this file:

   ```
   Listen 80
   ```

   Comment out the following lines in this file if they exist. (Insert a number sign character, #, at the beginning of each line.)

   ```
   #AfpaEnable
   #AfpaCache on
   #AfpaPort 80
   #AfpaLogFile "C:\Program Files\IBMHttpServer/logs/afpalog" V-ECLF
   ```
3. Save the file.
4. Click **Start** → **Run,** enter `cmd`, and click **OK** to open a command prompt window.
5. Navigate to the *was_home*\bin directory.
6. Set up the Java environment by executing the following command from the AppServer\bin directory:

   ```
   .\setupCmdLine.bat
   ```
7. Create the *wps_home*\update directory using the following command:

   ```
   mkdir \progra~1\WebSphere\PortalServer\update
   ```
8. Copy the contents of CD2-2 to the .\PortalServer\update directory.
9. Create the \progra~1\WebSphere\PortalServer\update\fixpacks directory.

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10. Move the following files to the .\PortalServer\update\fixpacks directory:
   - .\PortalServer\update\WP_PTF_502.jar
   - .\PortalServer\update\WPCP_PTF_502.jar
11. Run the WebSphere Portal update installer to apply the Fixpack by running the following command:

```
cd C:\Program Files\WebSphere\PortalServer\update
updatePortal -fixpack -installDir "C:\Program Files\WebSphere\PortalServer"
-fixpackDir "C:\Program Files\WebSphere\PortalServer\update\fixpacks"
-install -fixpackID WP_PTF_502
```

12. Start the HTTP Server by clicking **Start** → **Programs** → **IBM HTTP Server 1.3.26** → **Start Administration Server**.
13. Click **Start** → **Programs** → **IBM HTTP Server 1.3.26** → **Start HTTP Server**.
14. Run the configuration script.

```
cd \Progra~1\WebSphere\PortalServer\config
.\WPSconfig.bat WP-PTF-502 –D PortalAdminPwd=<pvcadmin_password>
```

15. Verify that WebSphere Application Server and Portal Server are running by the following command from a command prompt window:

```
cd \Progra~1\WebSphere\AppServer\bin
serverStatus –all
```

   Make sure both servers are listed as `STARTED`.
16. If the servers are not running, start WebSphere Application Server and Portal Server.
17. Verify that you can connect to the portal by opening a Web browser and opening the following URL:

```
http://<FullyQualifiedServerName:9081/wps/portal/
```

18. Delete the *wps_home*\update directory.

Installing WebSphere Application Server V5.0.2.2 Fixpack

For detailed steps on how to install WebSphere Application Server V5.0.2.2 Fixpack, see 7.4.4, “WebSphere Application Server nodes” on page 240.

Installing WebSphere Application Server Enterprise V5.0.2.2 Fixpack

For detailed steps on how to install Application Server Enterprise V5.0.2.2 Fixpack, see 7.4.4, “WebSphere Application Server nodes” on page 240.

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Installing WebSphere Application Server V5.0.2.3 Fixpack

For detailed steps on how to install WebSphere Application Server V5.0.2.3 Fixpack, see 7.4.4, “WebSphere Application Server nodes” on page 240.

Installing WebSphere Application Server V5.0.2.3 e-fixes

For detailed steps on how to install WebSphere Application Server V5.0.2.3 e-fixes, see 7.4.4, “WebSphere Application Server nodes” on page 240.

Installing WebSphere Portal V5.0.2.1 Fixpack

To install WebSphere Portal V5.0.2.1 Fixpack, follow these steps:

1. Make sure HTTP Server and Administrative Server are running.
2. Make sure WebSphere Application Server and Portal Server are *not* running.
3. Create the *wps_home*\update directory.
4. Copy the contents of CD2-3 to the .\PortalServer\update directory:
5. Create the \progra~1\WebSphere\PortalServer\update\fixpacks directory.
6. Move the following files to the .\PortalServer\update\fixpacks directory:
   - WP_PTF_5021.jar
   - WPCP_PTF_5021.jar
7. In the *was_home*\properties directory, edit the soap.client.props file. Change `com.ibm.SOAP.requestTimeout=180` to `com.ibm.SOAP.requestTimeout=6000`.
8. Setup the environment by running the following command:

   ```
   c:\Progra~1\WebSphere\AppServer\bin\setupCmdLine.bat
   ```

9. Navigate to the C:\Program Files\WebSphere\PortalServer\update directory.
10. Run the updatePortal command:

    ```
    updatePortal -fixpack -installDir "C:\Program Files\WebSphere\PortalServer"
    -fixpackDir "C:\Program Files\WebSphere\PortalServer\update\fixpacks"
    -install -fixpackID WP_PTF_5021
    ```

11. Re-start the HTTP Server.
12. Run the configuration script in the \Progra~1\WebSphere\PortalServer\config directory:

    ```
    WPSconfig.bat WP-PTF-5021 –DPortalAdminPwd=<pvcadmin_password>
    ```

13. Verify that WebSphere Application Server and Portal Server are running.
14. Verify you can connect to the portal by opening a Web browser and opening the following URL:

    ```
    http://<FullyQualifiedServerName:9081/wps/portal/
    ```

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Note: Later during the installation, you will change the HTTP port to 80.

7.4.6 Configuring the portal to use DB2

To configure the portal to use DB2, follow these steps:

1. Make sure that the HTTP Server and Administrative Server are running.
2. Make sure that WebSphere Application Server and Portal Server are running.
3. Run the **WPSconfig** command to export the data from the Cloudscape™ database.
4. Navigate to the \Program files\WebSphere\PortalServer\config directory.
5. Run the following command to export the data:

   ```
   .\WPSconfig.bat database-transfer-export
   ```

   You should see a `BUILD SUCCESSFUL` message when complete.
6. Backup the wpconfig.properties file.
7. Edit the transfer_db2.properties file, as shown in Example 7-2.

Example 7-2 transfer_db2.properties file

```
DbLibrary=C:/Program Files/IBM/SQLLIB/java/db2java.zip
DbUser=db2admin
DbPassword=<DB2ADMIN_PASSWORD>
WmmDbUser=db2admin
WmmDbPassword=<DB2ADMIN_PASSWORD>
WpcpDbUser=db2admin
WpcpDbPassword=<DB2ADMIN_PASSWORD>
FeedbackDbUser=db2admin
FeedbackDbPassword=<DB2ADMIN_PASSWORD>
```

8. Import the transfer_db2.properties file into the wpconfig.properties file by running the following command:

   ```
   WPSconfig –D parentProperties=”C:\Program
   Files\WebSphere\PortalServer\config\helpers\transfer_db2.properties”
   –DSaveParentProperties=true
   ```
9. Create the local database, and run the following command:

   ```
   WPSconfig.bat create-local-database-db2
   ```

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10. Validate configuration properties by running the following commands from the *wps_home*\config directory

```
WPSconfig.bat validate-database-connection-wps –DDbPassword=<dbpassword>
WPSconfig.bat validate-database-connection-wmm –DWmmDbPassword=<dbpassword>
WPSconfig.bat validate-database-connection-wpcp
–DWpcpDbPassword=<dbpassword>
WPSconfig.bat validate-database-driver
```

11. Run the import configuration task:

```
WPSconfig.bat database-transfer-import
```

12. Execute a reorganization check to improve performance.

13. Connect to each database, and for each database, click **Start** → **Programs** → **IBM DB2** → **Command window**. Then, run the following commands for the wps50, fdbk50, and wpcp50 databases.

```
db2 connect to <dbname> user db2admin using <dbpassword>
db2 reorgchk update statistics on table all
db2 terminate
db2rbind <dbname> -l db2rbind.out -u db2admin -p <dbpassword>
```

14. Verify that AppServer is running.

15. Log in as wpsbind.

16. Click **Servers** → **Application Servers**, and then click **WebSphere Portal**.

17. Click **Process Definition**, and then click **Java Virtual Machine**.

18. Enter the following in the Classpath field:

```
C:/Progra~1/IBM/SQLLIB/java/db2java.zip
Appended the above to the following statement: -
${WPS_HOME}/shared/app/wmm
```

19. Click **OK**.

20. Click **Save link** to go to the save page, and then click **Save**.

21. Click **LogOut**, and then close the browser.

22. Start the Portal Server.

23. Verify that you can log in to the portal.

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Tuning DB2 for Portal Server

To tune DB2 for Portal Server, follow these steps:

1. Start the DB2 window.
2. Run the following commands:

```
db2set DB2_EVALUNCOMMITTED=YES
db2set DB2_INLIST_TO_NLJN=YES
db2 connect to wpcp50 user db2admin using <db2admin_password>
db2 update db cfg for WPCP50 using locklist 1024
db2 connect to wps50 user db2admin using <db2admin_password>
db2 CREATE INDEX db2admin.IX2110D ON db2admin.PROT_RES (PARENT_OID, OID)
db2 CREATE INDEX db2admin.IX2140B ON db2admin.LNK_USER_ROLE (ROLE_INST_OID)
```

Configuring WebSphere Portal security

To configure WebSphere Portal security:

1. Ensure that your directory server is running
2. Create a backup of the wpconfig.properties file.
3. Create a backup of the security_ibm_dir_server.properties file, and edit it.
4. Edit the values as shown in Example 7-3 in the security_ibm_dir_server.properties file.

Example 7-3 Editing the security_ibm_dir_server.properties file

```
WasUserid=uid=wpsbind,cn=users,dc=in,dc=ibm,dc=com
WasPassword=<WPSBIND_PASSWORD>
WpsHostName=<PORTAL_SERVER_HOST_NAME>
PortalAdminId=uid=pvcadmin,cn=users,dc=in,dc=ibm,dc=com
PortalAdminIdShort=pvcadmin
PortalAdminPwd=<PVCADMIN_PASSWORD>
PortalAdminGroupId=cn=wpsadmins,cn=groups,dc=in,dc=ibm,dc=com
LTPAPassword=<PASSWORD>
SSODomainName=in.ibm.com
LDAPHostName=<LDAP_HOST_NAME>
LDAPAdminUId=cn=root
LDAPAdminPwd=<ROOT_PASSWORD>
LDAPBindID=uid=wpsbind,cn=users,dc=in,dc=ibm,dc=com
LDAPBindPassword=<WPSBIND_PASSWORD>
LDAPSuffix=dc=in,dc=ibm,dc=com
```

5. Save the security_ibm_dir_server.properties file.
6. Start the AppServer.
7. Stop the Portal Server.

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8. Run the following command to import the changes from the security_ibm_dir_server.properties file into the wpconfig.properties file:

```
.\WPSconfig –DparentProperties="C:\Progra~1\WebSphere\PortalServer
\config\helpers\ security_ibm_dir_server.properties" –D
saveParentProperties=true
```

9. Validate the new values in the wpconfig.properties file by running the following command:

```
WPSconfig.bat validate-ldap
```

10. Enable the security with the following command:

```
WPSconfig.bat enable-security-ldap
```

7.4.7 WebSphere Application Server Network Deployment node

This section provides a sample installation of WebSphere Application Server Network Deployment.

Installing WebSphere Application Server Network Deployment

To install WebSphere Application Server Network Deployment, follow these steps:

1. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
2. From this window, select **WebSphere Application Server Network Deployment V5.0**, and click **Next**.
3. Accept the default features to install, and click **Next**.
4. Verify the Node Name, Host Name or IP Address, and Cell Name. These will be populated when the installation Wizard can detect the information. Click **Next**.
5. If you want to run Network Deployment as a service, select **Run WebSphere Application Server Network Deployment as a service**. Specify the User ID and Password that you use to log on to the computer as an administrator. Click **Next**.
6. Review the summary panel, and click **Next** to start the install.

Installing WebSphere Application Server Enterprise V5.0

To install WebSphere Application Server Enterprise V5.0, follow these steps:

1. Run the install.bat file and get to the Component Selection window in the WebSphere Everyplace Access V5 Component Installer.
2. From this window, select **WebSphere Application Server Enterprise V5.0**, and click **Next**.

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3. Select **Add to existing copy of WebSphere Application Server Network Deployment, V5.0**. Click **Next**.
4. Select **Typical install type**, and click **Next**.
5. Review the summary panel, and click **Next** to start the install.

Verifying Network Deployment installed successfully

To verify the Network Deployment installation, follow these steps:

1. Run the First Steps tool from the /Deployment Manager/bin/firststeps.bat file.
2. Click **Verify Installation**. If the server installed successfully, you will see the message *IVT Verification Succeeded*.
3. After it starts, launch the Deployment Manager administrative console. Point your browser to http://*DMNode*:9090/admin, where *DM Node* is the name of the Deployment Manager node.
4. Click **Stop the Server**, and then click **Exit** to close First Steps.

7.5 Installing WebSphere Everyplace Access and clustering

After installing the base components, you need to set up the various WebSphere Everyplace Access servers and services and begin the clustering.

Cluster members have identical application components but can be sized differently in terms of weight, heap size, and other environmental factors. The weighted load balancing policies are defined and controlled by the Web server plug-in. Starting or stopping the cluster automatically starts or stops all the cluster members. Changes to the application are propagated to all Synchronization Server instances in the cluster. The servers share the same database and the same WebSphere Portal Server.

The following steps are the generic guidelines for setting up the cluster for any of the WebSphere Everyplace Access servers.

1. Add the Nodes WPS, WAS1, and WAS2 to a cell in WebSphere Application Server Network Deployment.
2. Install the WebSphere Everyplace Access server databases on the database node.
3. Catalog the databases on the WebSphere Portal Node and the WebSphere Application Server Nodes which are to be a part of the cluster.
4. Install the portlets of all the servers on the WebSphere Portal Node.

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5. Install and configure the WebSphere Everyplace Access servers on the one WebSphere Application Server node. This node is the first cluster member and acts as a template for additional WebSphere Application Server nodes which are added to the cluster.
6. Create a new cluster and add the WebSphere Application Server node on which the servers are configured as the first cluster member. This node is a template for the subsequent WebSphere Application Server nodes which are added as cluster members.
7. Install the WebSphere Everyplace Access servers on the additional WebSphere Application Server nodes which have to be part of the cluster. Installation means, just laying down the file sets. No configuration needs to be performed. Add the second WebSphere Application Server node as a member of the cluster. Adding the new WebSphere Application Server node as a cluster members ensures that the configuration and settings are copied to the second WebSphere Application Server node.
8. Regenerate the Web server plug-in.
9. Restart Deployment Manager and all the associated nodes.

The following sections discuss each of these steps in detail. With regard to the setting up of servers are concerned, setup of only WebSphere Everyplace Access server and WebSphere Everyplace Access Synchronization server is covered in this chapter. For information about setting up other servers, see the InfoCenter at:

http://www-306.ibm.com/software/pervasive/ws_everyplace_access/library/

7.5.1 Adding portal nodes and WebSphere Application Server nodes to a cell

After installing the pre-requisites, you must add the portal node and the WebSphere Application Server nodes to a cell in Network Deployment. After adding the node to the Deployment Manger cell, you should not manage the WebSphere Application Server from the node. WebSphere Application Server configuration is managed from Deployment Manager.

To add these nodes to a cell, open a command prompt on the node and enter the following command:

```
was_home/bin/addNode.bat dm_host dm_port -username admin_user_id -password
admin_password -includeapps
```

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The variables in this command are as follows:

- *was_home* is the directory where WebSphere Application Server is installed.
- *dm_host* is the host name of the computer where you installed Deployment Manager.
- *dm_port* is the Deployment Manager SOAP connector-address. The default value is 8879.
- *admin_user_id* is the administrator ID that you used to administer the application server and log in to the WebSphere Application Server Administrative Console.
- *admin_password* is the password for the administrator ID used to administer the application server.

The **`includeapps`** command transfers the complete set of applications installed on this node into the master configuration for Deployment Manager. This should be included only when adding the first node to the cell.

To avoid Web server plug-in configuration problems, the WpsAdminconsole Enterprise Application must be removed from the master configuration of the cell.

7.5.2 Installing WebSphere Everyplace Access Services

The base component for WebSphere Everyplace Access is the WebSphere Everyplace Access Services. All other servers should be installed only after installing the WebSphere Everyplace Access Services. Installing WebSphere Everyplace Access Services is a two-step process. The first step is to laydown the installation file set and then configure the specific components, such as the database, portal extensions, or the server on appropriate nodes. The install files have to copied to the database machine, server machine, and the portal machine.

Installing the WebSphere Everyplace Access Services file set

You must install the WebSphere Everyplace Access Services files on the database node, WebSphere Portal node, and the WebSphere Application Server nodes. Installing the WebSphere Everyplace Access Services file set copies the files onto the local file system. You have to configure the WebSphere Everyplace Access Services databases, portal integration services, and the client services on appropriate nodes later. To lay down the install file sets:

1. Insert the Setup disc into the CD-ROM drive and run install.bat from the root directory of the CD.
2. Select **Component Install** and click **Next**.

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3. Select **Everyplace Access Services V5.0** from the list of WebSphere Everyplace Access components. Click **Next** to continue.
4. Insert the CD for WebSphere Everyplace Access Services as instructed on the panel. If you are using a network image or have copied the CD contents to a network drive, click **Browse** and find the CD directory on the shared network drive. Click **Next** to continue. If the install program can find the CD automatically, you will not be prompted for a CD location, and the WebSphere Everyplace Access Services install will start automatically.
5. Select the language for the installation, and click **OK**. The welcome panel of the WebSphere Everyplace Access Services install program opens. Click **Next** to continue.
6. Enter the directory where you want to install WebSphere Everyplace Access Services. If the directory that you specify does not exist, it is created. Click **Next**.
7. Review the summary information to validate the install directory. Click **Next** to start copying files.

Configuring WebSphere Everyplace Access Services databases

The WebSphere Everyplace Access Services database stores information about Offline Portal Content and packages for Device Management.

After you lay down the install file set, you need to run the configuration tasks to install the databases by running a configuration task. The input to this configuration is through the file EASinstallconfig.properties file, which is in the eas_install\config folder. You need to modify the properties shown in Example 7-4 on page 258 to suite your environment.

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Example 7-4 Modifying the EASinstallconfig.properties file

```
instDatabaseInstall=true
instServerInstall=false
instPortalIntegration=false
instNotesPortlets=false
instExchangePortlets=false
instDMS=false
instBlackBerry=false

instDBType=db2
instDBPath=C:/Program Files/IBM/SQLLIB
instDBAdminName=db2admin
instDBAdminPassword = {ENCODED}2747119a11d039
instJDBCDriverName=COM.ibm.db2.jdbc.app.DB2Driver
instJDBCImplementationClassname=COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource
instJDBCDriverPath=C:/Program Files/IBM/SQLLIB/java/db2java.zip
instDBServerHostname=spotest60.in.ibm.com
instDBLocalInstance=DB2
instWEASDB=WEASDB
instWPSHostname=spotest30.in.ibm.com
```

After you modify the configuration file, run the following command to configure the WebSphere Everyplace Access Services database:

```
EASDBconfig.bat eas-db-config
```

Note: After you have installed the WebSphere Everyplace Access Services database, open the EASinstallconfig.properties file and set the instDatabaseInstall property to `false`.

Cataloging WebSphere Everyplace Access Services databases Application Server and portal node

If the WebSphere Everyplace Access Services database is on a different computer than application and portal servers, then you need to catalog the WebSphere Everyplace Access Services databases on these nodes. By cataloging, you are specifying database information such as which machine to connect, which node to connect, which administrative ID should be used, and so on.

To catalog the databases:

1. Log in as a user with administrative privileges.
2. Set DB2COMM to TCP/IP using the command:

   ```
   db2set DB2COMM=tcpip
   ```

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3. Catalog the TCP/IP node with the IP address of the remote database server using the command:

   ```
   db2 catalog tcpip node node_name remote database_server_node server
   connection_port
   ```

   In this command:

   – *node_name* is the alias_name of the database server that you are defining for the WebSphere Application Server node name.

   – *database_server_node* is the fully qualified host name of your database server computer.

   – *connection_port* is the port that the database server is listening on.

   For example:

   ```
   db2 catalog tcpip node SPOTEST60  remote spotest60.in.ibm.com server 50000
   ```

4. Catalog the WebSphere Everyplace Access Services databases using the command:

   ```
   db2 catalog db remote_db as alias_name at node node_name
   ```

   In this command:

   – *remote_db* is the catalogued name of the WebSphere Everyplace Access Services database on the server computer. (The default database is WEASDB.)

   – *alias_name* is the database alias name that you are defining.

   – *node_name* is the name that was used previously when you catalogued the TCP/IP node in the previous step.

5. Log out using the **exit** command.

6. Test the remote connection by issuing the following command in the DB2 command window:

   ```
   db2 connect to alias_name user username using password
   ```

   In this command:

   – *alias_name* is the alias name that you defined.
   – *username* is the database user.

7. Reset the connection to the database using the command:

   ```
   db2 connect reset
   ```

8. Restart the database server.

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Configuring WebSphere Everyplace Access Services on the WebSphere Application Server node

Client Services includes enterprise applications that run on the Application Server. Therefore, you should execute Client Services configuration tasks on the computer where the Application Server is installed. Client Services includes Offline Portal Content and Device Management enterprise applications. If you have distributed WebSphere Everyplace Access Services across multiple computers, run these tasks on the WebSphere Application Server computer.

To configure Client Services:

1. Log in as a local administrative user. (Do not log in as a domain administrative user.) Make sure the WebSphere Application Server is running. Verify that security is enabled for the portal and application server. Make sure the database is running.
2. Edit the \eas_install\config\EASinstallconfig.properties file in a text editor. Example 7-5 on page 261 shows the required property values which were edited for the sample scenario.
3. After you edit the configuration properties, run the following command to configure WebSphere Everyplace Access Services on the WebSphere Application Server node:

   ```
   EASWASconfig.bat eas-was-config
   ```

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Example 7-5 The edited EASinstallconfig.properties file

```
instServerInstall=true
instPortalIntegration=false
instDatabaseInstall=false

Provice information of the WAS node
instWASInstallLocation=C:/Program Files/WebSphere/AppServer
instWASAdminNode=spotest31
instWASAdminCell=spotest54Network (For cluster setup this should be the cell
the WAS node is added)
instWASUsername=wpsbind
instWASPassword = {ENCODED}2747119a11d039
instWASHostName=spotest54.in.ibm.com (For cluster setup this should point to
the WAS ND node
instDBDatasourceHelper=com.ibm.websphere.rsadapter.DB2DataStoreHelper

Provide information about the database server installation:
instDBType=db2
instDBPath=C:/Program Files/IBM/SQLLIB
instDBAdminName=pvcadmin
instDBAdminPassword = {ENCODED}2747119a11d039
instJDBCDriverName=COM.ibm.db2.jdbc.app.DB2Driver
instJDBCImplementationClassname=COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource
instJDBCDriverPath=C:/Program Files/IBM/SQLLIB/java/db2java.zip
instDBServerHostname=spotest60.in.ibm.com
instDBLocalInstance=DB2
instWEASDB=WEASDB
```

You have now configured WebSphere Everyplace Access Services on the first WebSphere Application Server node. On the second WebSphere Application Server node, you need to install the WebSphere Everyplace Access Services file sets and add those to the cluster. The configuration of the first WebSphere Application Server node would be propagated.

Configuring Portal Integration Services

You configure Portal Integration Services on the computer where the portal server is installed. To configure Portal Integration Services:

1. Log in as a local administrative user. Make sure the WebSphere Portal Server and WebSphere Application Server are running. Verify that security is enabled for the portal and application server.
2. Edit properties in the \eas_install\config\EASinstallconfig.properties file as shown in Example 7-6 on page 262.

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Example 7-6 Editing the EASinstallconfig.properties file

```
EAS Target Properties

instServerInstall=false
instDatabaseInstall=false
instPortalIntegration=true
instNotesPortlets=true
instExchangePortlets=false
instDMS=false (DMS Portlets can be configured seperately)


WPS Properties

instWPSInstallLocation=C:/Program Files/WebSphere/PortalServer
instWPSHostname=spotest30.in.ibm.com
instWPSHome=/portal
instWPSCustomPage=/myportal
instWPSBaseURL=/wps
instWPSAdminName=pvcadmin
instWPSAdminPassword = {ENCODED}2747119a11d039
instWPSPort=80

WAS Properties

instWASInstallLocation=C:/Program Files/WebSphere/AppServer
instWASAdminNode=spotest30
instWASAdminCell=spotest54Network (WAS ND Cell that the node is a part of)
instWASUsername=wpsbind
instWASPassword = {ENCODED}2747119a11d039
instWASHostName=spotest54.in.ibm.com (For cluster setup this has to be the
WASND hostname)
instDBDatasourceHelper=com.ibm.websphere.rsadapter.DB2DataStoreHelper

Database Properties

instDBType=db2
instDBPath=C:/Program Files/IBM/SQLLIB
instDBAdminName=pvcadmin
instDBAdminPassword = {ENCODED}2747119a11d039
instJDBCDriverName=COM.ibm.db2.jdbc.app.DB2Driver
instJDBCImplementationClassname=COM.ibm.db2.jdbc.DB2ConnectionPoolDataSource
instJDBCDriverPath=C:/Program Files/IBM/SQLLIB/java/db2java.zip
instDBServerHostname=spotest60.in.ibm.com
instDBLocalInstance=DB2
instWEASDB=WEASDB
```

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3. Save the EASinstallconfig.properties file. Open a command prompt, and navigate to the directory to where the EASinstallconfig.properties file is located.
4. Run the following command to configure Portal Integration Services:

   ```
   EASWASconfig.bat eas-wps-config
   ```

5. The portlets need to be activated after installation when installing in a distributed environment. To activate the portlets, run the following command on the computer where Portal Integration Services is installed:

   ```
   EASWASconfig.bat eas-deactivate-activate-portlets
   ```

   Note: If Device Management portlets are selected for installation, you need to specify information about the Device Manager server. The configuration tasks to setup Device Management portlets can also be done later.

7.5.3 Setting up WebSphere Everyplace Access Synchronization server

This section explains how to set up WebSphere Everyplace Access Synchronization server.

Note: Before you instal WebSphere Everyplace Access Synchronization server, you have to set up WebSphere Everyplace Access Services as defined in 7.5.2, “Installing WebSphere Everyplace Access Services” on page 256.

Installing WebSphere Everyplace Access Synchronization server file sets

To install WebSphere Everyplace Access Synchronization server file sets:

1. Insert the Setup disc into the CD-ROM drive and run install.bat from the root directory of the CD.
2. Select **Component Install**, and click **Next**.
3. Select **Everyplace Synchronization Server V5.0** from the list of WebSphere Everyplace Access components. Click **Next** to continue.
4. Insert the CD for WebSphere Everyplace Access Synchronization server as instructed on the panel. If you are using a network image or have copied the CD contents to a network drive, click **Browse** and find the CD directory on the shared network drive. Click **Next** to continue. If the install program can find

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the CD automatically, you will not be prompted for a CD location, and the WebSphere Everyplace Access Synchronization server install will start automatically.

5. Select the language for the installation, and click **OK**. The welcome panel of the WebSphere Everyplace Access Synchronization server install program opens. Click **Next** to continue.
6. Enter the directory where you want to install WebSphere Everyplace Access Synchronization server. If the directory that you specify does not exist, it is created. Click **Next**.
7. Review the summary information to validate the install directory. Click **Next** to start copying files.

Configuring WebSphere Everyplace Access Synchronization server database

On the machine where DB2 is installed, laydown the WebSphere Everyplace Access Synchronization server install file set as specified in the previous section. To configure the database, open the ESSinstallconfig.properties file in a text editor and edit the properties as shown in Example 7-7.

Example 7-7 Editing the ESSinstallconfig.properties file

```
Install Flags

instDatabaseInstall=true
instServerInstall=false
instPortletsInstall=false

Database Properties

instDBType=db2
instDBUserid=essadmin
instDBPassword = {ENCODED}2747119a11d039
instDBPath=C:/Program Files/IBM/SQLLIB
instDBURL=jdbc:db2:
instDBDriver=com.ibm.db2.jcc.DB2Driver
instDBLibPath=C:/Program Files/IBM/SQLLIB/java/db2java.zip;c:/Program
Files/IBM/SQLLIB/java/db2jcc.jar;c:/Program
Files/IBM/SQLLIB/java/db2jcc_license_cu.jar
instDBHostName=spotest60.in.ibm.com
instDBDropFlag=true
instDBPort=50000

Directory Paths Properties

instJavaPath=C:/Program Files/WebSphere/IBMSyncServer/java/jre
instWASPath=C:/Program Files/WebSphere/AppServer
instHttpServerPath=C:/Program Files/IBMHttpServer
```

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8. Save the configuration properties file. Then, from the *install_root*/WebSphere/IBMSyncServer/config directory, run:

   ```
   ESSDBconfig.bat db-config
   ```

9. To verify a successful configuration, open the logs/ConfigTrace.log file and see if the following message appears at the end of the file:

   ```
   ESSC1003I Database install finished for "db2".
   ```

Configuring the WebSphere Everyplace Access Synchronization portlets

On the machine where WebSphere Portal is installed, laydown the WebSphere Everyplace Access Synchronization server installation files. Make sure that IBM HTTP Server, directory server, the WebSphere Application Server (server1), and WebSphere Portal are running. To configure the portlets open the *ess_home*/config/ESSinstallconfig.properties file in a text editor and edit the properties as shown in Example 7-8.

Example 7-8 Editing the ess_home/config/ESSinstallconfig.properties file

```
Install Flags

instDatabaseInstall=false
instServerInstall=false
instPortletsInstall=true

WAS Server Properties

instCell=spotest54Network
instWASUserName=wpsbind
instWASPassword = {ENCODED}2747119a11d039

WebSphere Portal Server Properties

instWPSHost=spotest30.in.ibm.com
instWPSHome=/portal
instWPSPath=C:/Program Files/WebSphere/PortalServer
instWPSUrlPrefix=/wps
instWPSUsername=pvcadmin
instWPSPassword = {ENCODED}2747119a11d039
instWPSPort=80
instWPSAdminGroup=wpsadmins
instUserGroup1=essusers
instUserGroup2=essusers
instNonLockUserGroup=essusers_nonlock
instAdminGroup1=essadmins
instAdminGroup2=essadmins
```

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```
instESSAdmin1=pvcadmin
instESSAdmin2=pvcadmin
instESSAdminPwd1 = {ENCODED}2747119a11d039
instESSAdminPwd2 = {ENCODED}2747119a11d039

Directory Paths Properties

instJavaPath=C:/Program Files/WebSphere/IBMSyncServer/java/jre
instWASPath=C:/Program Files/WebSphere/AppServer
instHttpServerPath=C:/Program Files/IBMHttpServer

Backend Adapters
instBackendDomino=true
```

10. Save the configuration properties file.
11. On the WebSphere Portal Server computer, begin the portlet configuration by entering the following command from the *install_root*/WebSphere/IBMSyncServer/config directory:

    ```
    ESSWASconfig.bat portlets-config
    ```

12. In a distributed environment, the WebSphere Everyplace Access Synchronization server portlets need to be activated when the portlet configuration has completed successfully. To activate the WebSphere Everyplace Access Synchronization server portlets from the *install_root*/WebSphere/IBMSyncServer/config directory, run:

    ```
    ESSWASconfig.bat ess-deactivate-activate-portlets
    ```

13. To verify a successful install, open the logs/ConfigTrace.log file and see if the `BUILD SUCCESSFUL` message appears near the end of the file.

Configuring the WebSphere Everyplace Access Synchronization server

On the machine where WebSphere Application Server is installed, laydown the WebSphere Everyplace Access Synchronization server installation files. Make sure that IBM HTTP Server, directory server, the WebSphere Application Server are running.

Before you configure the WebSphere Everyplace Access Synchronization server, you have to prepare the back-end system. The WebSphere Everyplace Access Synchronization server supports the back-end Microsoft Exchange and Lotus Domino e-mail servers. In the sample scenario, the WebSphere Everyplace Access Synchronization server is configure with Lotus Domino.

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To prepare the system for Lotus Domino, you do the following:

1. Install Lotus Notes Client V6.
2. Create an administrative ID on the Lotus Domino Server who has access to mail.box.
3. Configure the Lotus Notes Client on the node where server is being installed with this administrative ID. Check if you are able to login to the server.
4. Navigate to the path where notes is installed and get to the data directory.
5. Create a folder under *ESS_HOME* and name it NotesData.
6. Copy the contents of the data directory to this folder.

To configure the server, open the *ess_home*/config/ESSinstallconfig.properties file in a text editor and edit it as shown in Example 7-9.

Note: For the first node before the node is added to the cluster, set the property `instClusteredServer` to `false`. For the subsequent nodes after they are added to the cluster, set this property to `true` before running the configuration script.

Example 7-9 Editing the ess_home/config/ESSinstallconfig.properties file

```
Flags for Install Feature Properties
instDatabaseInstall=false
instServerInstall=true
instPortletsInstall=false

Database Properties
instDBType=db2
instDBUserid=essadmin
instDBPassword = {ENCODED}2747119a11d039
instDBPath=C:/Program Files/IBM/SQLLIB
instDBURL=jdbc:db2:
instDBDriver=com.ibm.db2.jcc.DB2Driver
instDBLibPath=C:/Program Files/IBM/SQLLIB/java/db2java.zip;c:/Program
Files/IBM/SQLLIB/java/db2jcc.jar;c:/Program
Files/IBM/SQLLIB/java/db2jcc_license_cu.jar
instDBHostName=spotest60.in.ibm.com
instDBDropFlag=false
instDBPort=50000

Server Properties

instCell=spotest54Network
```

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```
instNode=spotest31
instWASUserName=wpsbind
instWASPassword = {ENCODED}2747119a11d039


Portlets Properties
instWPSHost=spotest30.in.ibm.com
instWPSHome=/portal
instWPSPath=C:/Program Files/WebSphere/PortalServer
instWPSUrlPrefix=/wps
instWPSUsername=pvcadmin
instWPSPassword = {ENCODED}2747119a11d039
instWPSPort=80
instWPSAdminGroup=wpsadmins

Directory Paths Properties

instJavaPath=C:/Program Files/WebSphere/IBMSyncServer/java/jre
instWASPath=C:/Program Files/WebSphere/AppServer
instHttpServerPath=C:/Program Files/IBMHttpServer

instInfoLocale=en

Flags for Backend Adapter Properties

instBackendDomino=true

Lotus Domino Adapter Properties

instDominoDataRoot=C:/Program Files/WebSphere/IBMSyncServer/NotesData
instNotesDataPath=C:/Program Files/WebSphere/IBMSyncServer/NotesData
instNotesPath=C:/Program Files/lotus/notes
instDominoHost=spotest57.in.ibm.com
instDominoUserid=pvcadmin
instDominoPassword = {ENCODED}2747119a11d039
instDominoAbbreviatedServerName=spotest57/ibm

Common Install and Database Properties
instClusteredServer=false ( This should be set to false for the first node, for
the subsequent nodes it should be set to true as they will be a part of the
cluster)
instInstanceID=essadmin
instContextRoot=/ess
instESSAdminRMIPort=20000
instDBDefaultDB2=db2admin
```

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7. Save the configuration properties file.
8. On the WebSphere Application Server computer, begin the server configuration by entering the following command from the install_root/WebSphere/IBMSyncServer/config directory:

   ```
   ESSWASconfig.bat server-config
   ```

9. To verify a successful install, open the logs/ConfigTrace.log file and see if the `BUILD SUCCESSFUL` message appears near the end of the file.

If the build is successful, regenerate the Web server Plug-in as described in the next section.

7.5.4 Regenerating the plug-in configuration

On the WebSphere Application Server Network Deployment node, use the WebSphere Application Server Administrative Console to regenerate the Web server plug-in.

1. Login to the WebSphere Application Server Administrative Console.
2. Select **Environment** → **Update Web Server Plug-in**.
3. Click **OK**.

If you are using a remote Web server, copy the updated plug-in configuration file to the external Web server's plug-in configuration directory. You can find the plug-in configuration file in the following directory, where *cell_name* is the current cell name:

/WebSphere/DeploymentManager/config/*cell_name*/plugin-cfg.xml

7.5.5 Recycling the Deployment Manager

To recycle the Deployment Manager:

1. Stop the node agent on the WebSphere Portal and WebSphere Application Server nodes. The command for stopping the node agent is:

   ```
   WASHOME\bin\stopNode.bat -username was_admin_id -pasword password
   ```

2. Stop the Deployment Manager on the WebSphere Application Server Network Deployment node. The command for stopping the deployment manager is:

   ```
   NDHOME\bin\stopManager -username was_admin -pasword password
   ```

3. Start the Deployment Manager on the WebSphere Application Server Network Deployment node. The command for starting the deployment manager is:

   ```
   NDHOME\bin\startManager
   ```

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4. Start the node agent on WebSphere Portal and WebSphere Application Server nodes. The command for starting the node agent is:

   ```
   WASHOME\startNode.bat
   ```

7.5.6 Creating the cluster and first cluster member

This section shows how to create the first cluster member and additional cluster members.

Creating the first cluster member

To create the first cluster member:

1. Login to the Deployment Manager administrative console:

   ```
   http://Deployment Manager hostname:9090/admin
   ```

2. From the left frame select **Servers** → **Clusters** → **New**, and specify a Cluster Name (for example, ESS Cluster).
3. Select **Prefer local enabled**.
4. Select **Create Replication Domain for this cluster**.
5. Select the option **Select an existing server to add to this cluster**.
6. Choose the application server name for the server that you want to be the first cluster member. The application servers for Synchronization Servers are named Everyplace_Synchronization.
7. Select **Create Replication Entry in this Server**.
8. Click **Next** to get to the Create New Clustered Servers page.

   On this page, you can create a second cluster member, as described in the next section. For now, skip creating a second cluster member, and click **Next**.
9. Validate the information that appears in the summary page. (The Clone Type should be existing.) Click **Finish** to create the WebSphere Everyplace Access Synchronization server cluster.
10. Save the configuration.

Creating additional cluster members

To create additional cluster members:

1. Login to the Deployment Manager administrative console:

   ```
   http://Deployment Manager hostname:9090/admin
   ```

2. From the left frame, select **Servers** → **Clusters** → ***Cluster_Name*** → **Additional Properties** → **Cluster Members** → **New**. (The *Cluster_Name* will be the name of the cluster.)

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3. Define the name and node of the cluster member on Node 4. For example:
   - Member Name: Everyplace_Synchronization_A (needs to be different than the first cluster member)
   - Select Node: clusterNodeName
   - Weight: 2
   - HTTP Ports: Generate Unique HTTP Ports (leave this box selected)
4. Click **Apply** and then click **Next** to view the summary.
5. Validate the information that appears in the summary page. (The Existing Server Template should be the first WebSphere Everyplace Access Synchronization server in the cluster.)
6. Click **Finish** to create the WebSphere Everyplace Access Synchronization server cluster.
7. Save the configuration changes.

When you have completed these steps, you can view the cluster topology by selecting the **Servers** → **Cluster Topology** view.

The application server view lists the new server cluster members.

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8

Using Everyplace Connection Manager HTTP Access Services

Today, more and more users access information and applications, using HTTP protocols such as company Web pages, applications delivered through Web services, and client server applications that use HTTP tunneling.

This chapter presents an overview of HTTP Access Services as implemented in Everyplace Connection Manager. It also includes a sample scenario to illustrate the required configuration.

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8.1 Overview of HTTP Access Services

HTTP Access Services in Everyplace Connection Manager allow network external users to access internal resources that use HTTP transport layer securely. HTTP Access Services provides a secure tunnel for HTTP access using Secure Socket Layer (SSL).

It is not unusual for a company to have internal servers that are not designed to be secure, allowing anonymous access without data encryption to anyone on the enterprise intranet. For these servers, HTTP Access Services can add access control (authentication), confidentiality (encryption), and authorization (certification).

Even for servers deployed with SSL, there are several benefits in having HTTP Access Services. The most relevant benefits are:

- Servers can be out of the demilitarized zone (DMZ), with only the Everyplace Connection Manager within the DMZ.
- There is no need to open ports through the external firewall.
- All external SSL connections are to Everyplace Connection Manager. Clients only need to recognize and trust the Everyplace Connection Manager digital certificate. This allows deploying a widely recognized digital certificate from a well known authority (for example, Verisign, RSA, and Thawte) on the Everyplace Connection Manager machine.

Internal servers can use less expensive certificates or even self-signed certificates since they only need to be trusted by resources within the enterprise.

This section includes some architectural approaches, describes a typical HTTP Access Services scenario, and shows what you need to do to have HTTP Access Services up and running.

> **Note:** The HTTP Access Services in Everyplace Connection Manager do not require the use of Mobility Client software in the client device. That is, the Wireless Link Protocol (WLP) is not used in this case.

Many unique architectures can be built to deliver HTTP access using Everyplace Connection Manager HTTP Access Services. This chapter covers the following scenarios:

- Multiple Web application servers behind a reverse proxy server, using a single host name
- Multiple Web application servers behind a reverse proxy server, using multiple host names

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8.1.1 Multiple Web application servers using a single host name

Often the requirements include access to multiple Web application servers. The previous configuration can be extended by adding a reverse proxy server between Everyplace Connection Manager and the Web application servers, as shown in Figure 8-1.

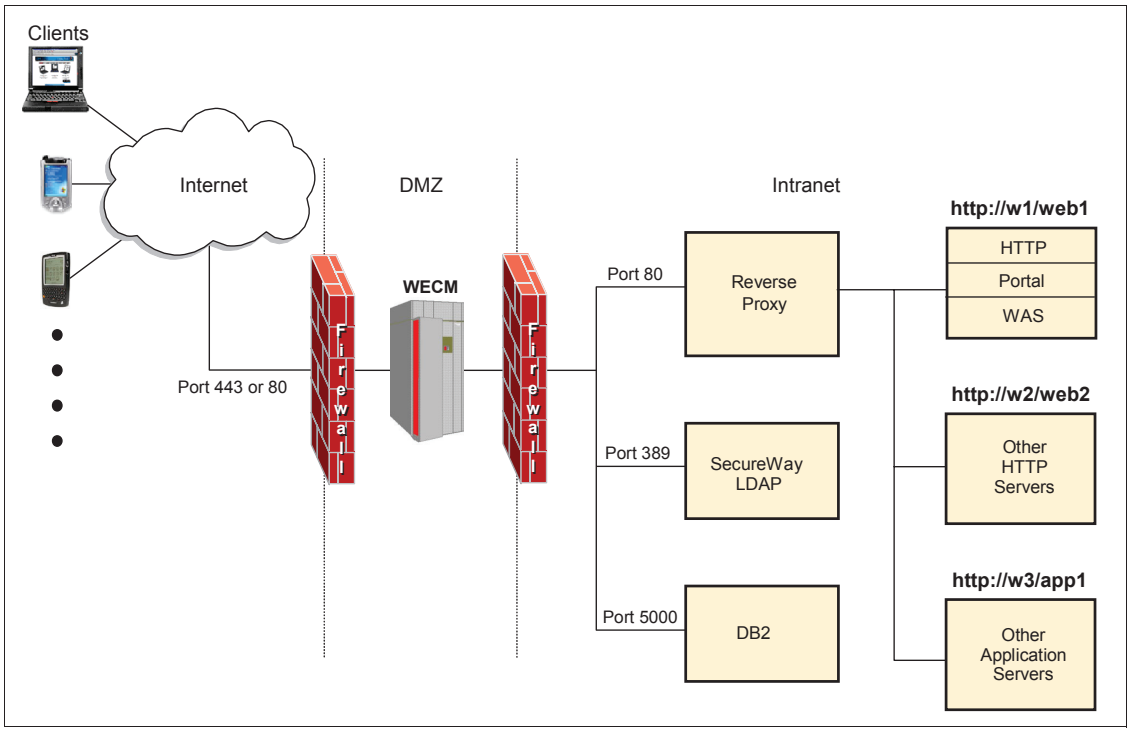

Figure 8-1 Multiple Web application servers using a single host name

In this case, a reverse proxy such as IBM WebSphere Edge Server includes a reverse proxy component and passes HTTP traffic to one of several servers based on the URL received from the Everyplace Connection Manager machine.

This configuration has several advantages:

- Secure access to multiple Web application servers.
- All Web sites applications are exposed through a single host name, giving a corporate site a consistent look.
- Servers can easily be added, deleted, turned off, and so forth, requiring no change on the clients' URL.
- A single digital certificate is used.

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8.1.2 Multiple Web application servers using multiple host names

In some cases, the URL naming scheme used in 8.1.1, “Multiple Web application servers using a single host name” on page 275 might not work. For example, an enterprise might not want to organize Web pages and applications on existing servers in order to support the URL naming conventions required. Another issue is that servers can have different URLs when accessed from the intranet than through Everyplace Connection Manager.

Many reverse proxy servers allow translation of the host name, not just the URL. In this case, it is possible to use the configuration illustrated in Figure 8-2.

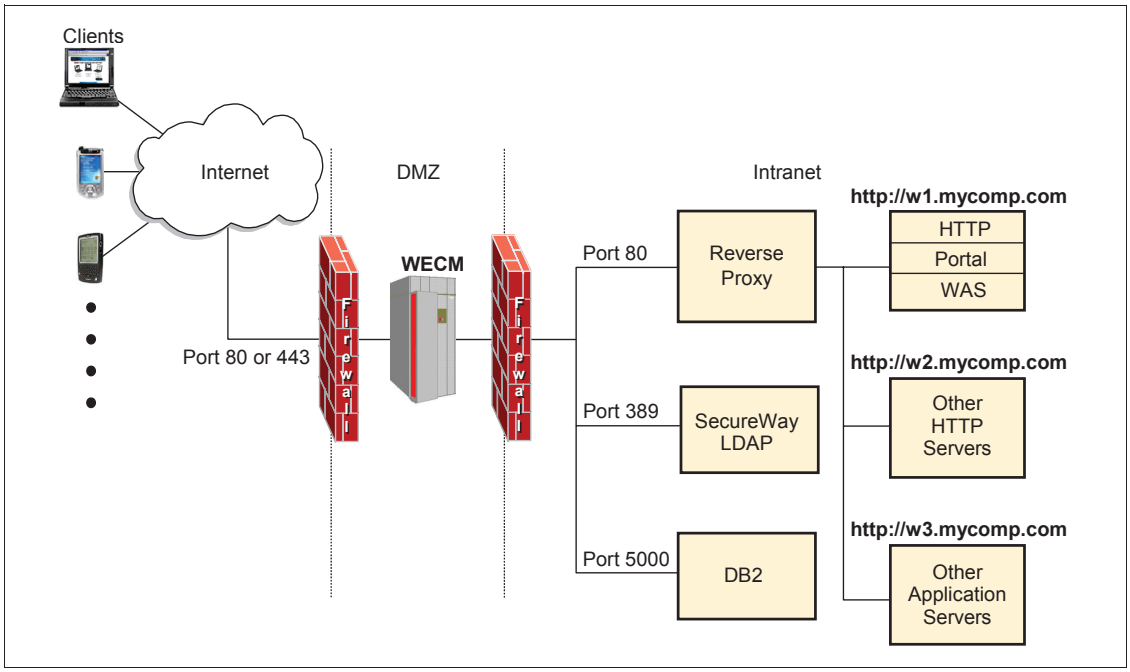

Figure 8-2 Multiple Web application servers using multiple host names

With this configuration, secure access can be allowed to any Web application server in the mycompany.com domain. To allow access to a http://wx.mycompany.com (*x* can be in that scenario 1, 2, or 3) using this configuration requires the following:

- Everyplace Connection Manager needs a valid IP address on the Internet.
- The internal server’s host names must resolve to the IP address of the Everyplace Connection Manager machine using a public DNS.
- An internal DNS server is used by the reverse proxy.

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- The reverse proxy must be configured to proxy host names with w1.mycompany.com translating to w1.mycompany.com.
- Everyplace Connection Manager machine must have a valid wildcard digital certificate for *.mycompany.com.

This scheme works because the host name in the URL http://w1.mycompany.com is resolved differently by clients on the Internet and the proxy server using the internal DNS. This results in the client sending HTTP requests to the Everyplace Connection Manager machine, which the proxy then forwards to the correct internal IP address of the actual server. Significantly, this scheme uses the same server host name internally and externally avoiding the need for the complex URL rewriting that would otherwise be required.

The wildcard certificate is required because the Everyplace Connection Manager can only have one certificate. It will use this certificate to create a secure SSL regardless of the URL used to reach the Everyplace Connection Manager machine. If all servers are in the mycompany.com domain and the digital certificate is used to *.mycompany.com by a certificate authority recognized by the user will not see any warnings. If the servers are not in the same domain or a wildcard certificate is not used, the connection can still be made but the user will be warned that the server name in the certificate does not match the server in the URL entered by the user.

Note: Secure Sockets Layer (SSL) is required between HTTP clients and Everyplace Connection Manager. HTTP requests using configured unsecure ports (default is port 80) are rerouted to the HTTPS secure port (default 443).

8.2 Sample scenario

This section includes a sample scenario that is configured to illustrate the HTTP Access Services function implemented in Everyplace Connection Manager. This sample scenario uses the following machines:

- Everyplace Connection Manager machine
  - SUSE Linux® Enterprise Server 8 (Service Pack 3)
  - IBM DB2 Universal Database 8.2
  - IBM Directory Services V5.2
  - IBM WebSphere Everyplace Connection Manager V5.1
- Reverse Proxy Server
  - Microsoft Windows 2000 Server (Service Pack 4)
  - IBM WebSphere Edge Server V2.0

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- WebSphere Everyplace Access Server
  - Microsoft Windows 2000 Server (Service Pack 4)
  - IBM WebSphere Everyplace Access V5.0
- Gatekeeper Client
  - Microsoft Windows 2000 Professional (Service Pack 4)l
  - IBM WebSphere Everyplace Connection Manager Gatekeeper V5.1
- HTTP Client
  - Microsoft Windows 2000 Professional (Service Pack 4)
  - Microsoft Internet Explorer V6.0
- PDA Client
  - Microsoft Pocket PC 2003

Figure 8-3 illustrates the sample scenario.

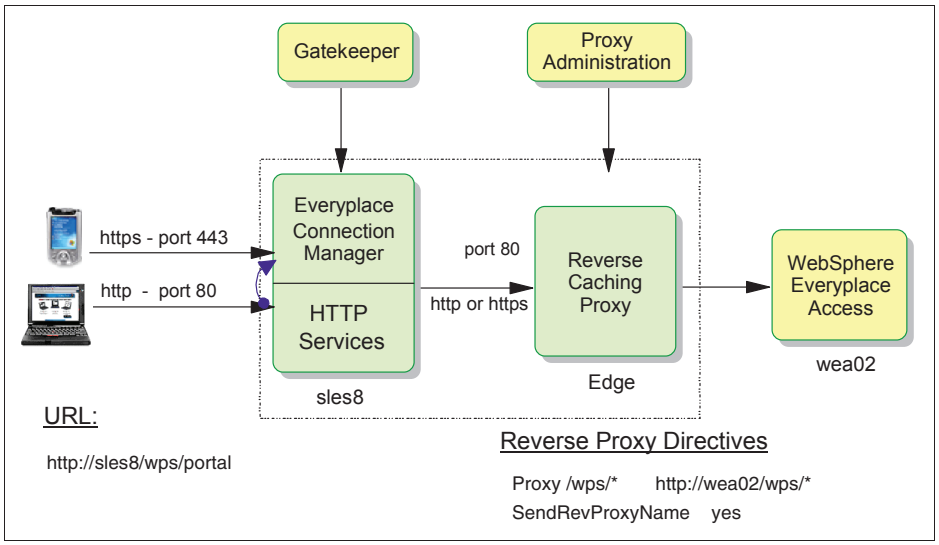

Figure 8-3 HTTP Access Services sample scenario

WebSphere Everyplace Access

Application Server runs WebSphere Everyplace Access V5. This scenario uses the portal component in WebSphere Everyplace Access. For more information about Everyplace Connection Manager and WebSphere Everyplace Access integration, see Chapter 9, “WebSphere Connection Manager integration” on page 301.

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Reverse Proxy Server

The reverse proxy machine plays a major role in the architecture; it is responsible to redirect the Everyplace Connection Manager messages to the application servers and vice-versa.

The reverse proxy must be specifically configured to work with Everyplace Connection Manager. Configuration options need to be made in the ibmproxy.conf file. For Windows machines, this file is located in the C:\Program Files\IBM\edge\cp\etc\en_US directory, assuming that you are using default values when you installed IBM WebSphere Edge Server.

Port directive

The port used by the reverse proxy in this scenario is the edge server ibmproxy.conf default. It only needs to match the HTTP Access Services configuration. The HTTP configuration is shown in Example 8-1.

Example 8-1 Port directive

```
#        Port directive:
#        Port used by the server.
#        Default:  80
#        Syntax:   Port <num>
Port 80
```

SendRevProxyName directive

This directive must be configured so that application servers will also send HTTP traffic back to the reverse proxy. The configuration is illustrated in Example 8-2.

Example 8-2 SendRevProxyName

```
#        SendRevProxyName directive:
#
#        In a reverse proxy scenario, WTE normally sends the destination
#        origin server name in the HOST header of the request to the origin
#        server.  If this directive is set to yes, WTE will instead send
#        the WTE host name in the HOST header of the request to the origin
#        server.  This allows the origin server to use the WTE host name in
#        redirects sent back.  Therefore, subsequent requests to redirected
#        locations will go through WTE.
#
#        Default:  no
#        Syntax:   SendRevProxyName <yes | no>
#
# Example:
# SendRevProxyName      yes

SendRevProxyName  yes
```

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Mapping rules

You need to update the mapping rules because they vary for different scenarios because applications use different paths for their content location. Example 8-3 illustrates the added directives for this sample scenario.

Example 8-3 Mapping Rules

```
# ================================================================== #
##        Mapping rules
## ================================================================= #

Exec  /admin-bin/* C:\PROGRA~1\IBM\edge\cp\server_root\admin-bin\*
Pass  /wsApplet/* C:\PROGRA~1\IBM\edge\cp\server_root\admin-bin\webexec\*
#
# HTTP Access Services changes - sample scenario
#Pass  /*       C:\PROGRA~1\IBM\edge\cp\server_root\pub\en_US\*
#
#        URL translation rules; If your documents are under
#
# NOTE: The installation defaults should be added below
# *** ADD NEW MAPPING RULES HERE ***
#
Pass  /pub/*    C:\PROGRA~1\IBM\edge\cp\server_root\pub\en_US\*
Proxy /wps/*    http://wea02.itso.ral.ibm.com/wps/*
# End of HTTP Access Services changes#
```

8.2.1 Creating an Everyplace Connection Manager server certificate

HTTP Access Services in Everyplace Connection Manager requires secure connections with client devices by using SSL. This section describes the configuration required to create the server certificate to establish a secure connection with HTTP clients using the IBM Key Management version 7.0.1.13 for Linux.

The connection between Everyplace Connection Manager and the Reverse Proxy can also be secure with SSL. However, this is optional and, therefore, is not documented in this chapter.

Note: A self-signed certificate is used for this scenario. However, for better security, it is recommended that you obtain and import a server certificate from an authorized Certificate Authority (CA).

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To create an Everyplace Connection Manager server certificate, follow these steps:

1. Log on to Everyplace Connection Manager machine with the correct privileges.
2. Search for the ikeyman file, and run this file from a terminal window. In this scenario, the ikeyman file is located on /opt/IBMJava2-141/jre/bin. It can be different depending how you install Everyplace Connection Manager and its related products (for example, DB2, Directory Server).
3. The IBM Key Management window should open. Select **Key Database File** → **Open** as shown in Figure 8-4.

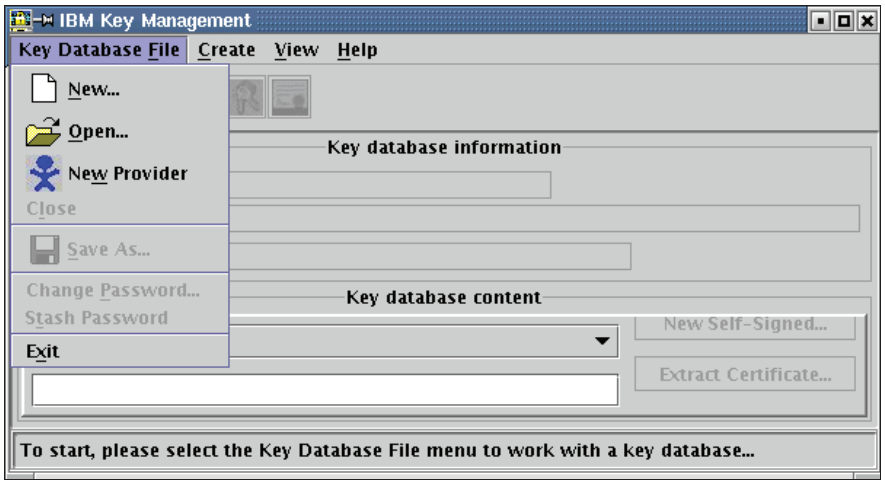

Figure 8-4 IBM Key Management initial window

4. In the Open window, select **CMS** as the key database type, and browse for the http.trusted.kdb file which must be in the /opt/IBM/wecm directory (Figure 8-5).
5. Click **OK** to enter the password.

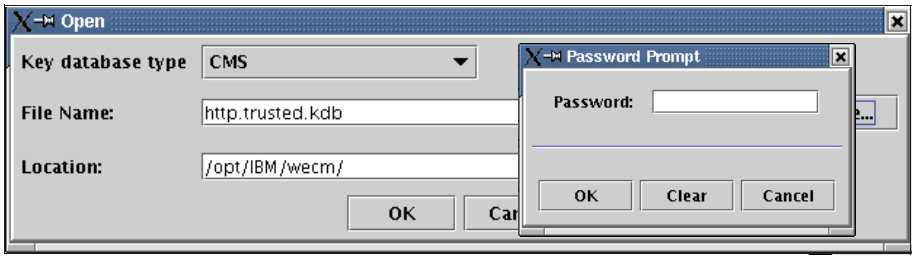

Figure 8-5 Open Key Database

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6. The default password used by Everyplace Connection Manager is `trusted`. Initially, enter this password, and click **OK** to access the key database as illustrated in Figure 8-6.
7. For this sample scenario a self-signed certificate is used. Select **Create** → **New Self-Signed Certificate** from the menu. The Create New Self-Signed Certificate form appears.

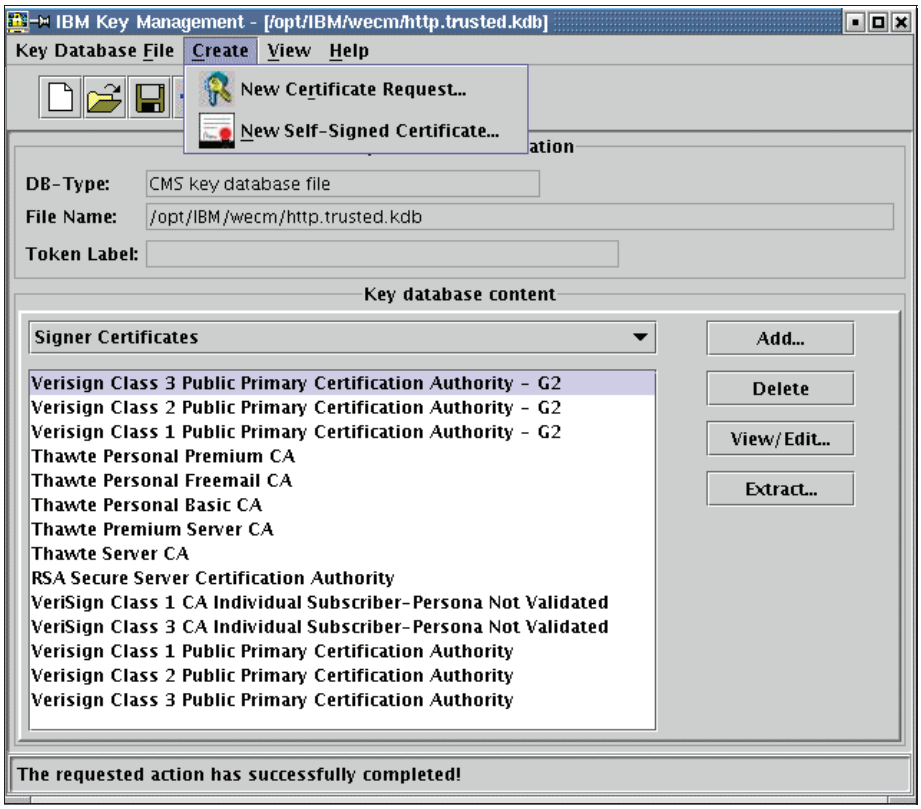

Figure 8-6 Create a New Self-Signed certificate (1 of 2)

8. Provide the information needed to create the certificate (see Figure 8-7 on page 283).
9. Click **OK** to create the certificate. If there is more than one certificate created, you are asked if the certificate is the default (active) key in the database.

> **Note:** You can store many certificates in the database. However, only one certificate can be active at the server side.

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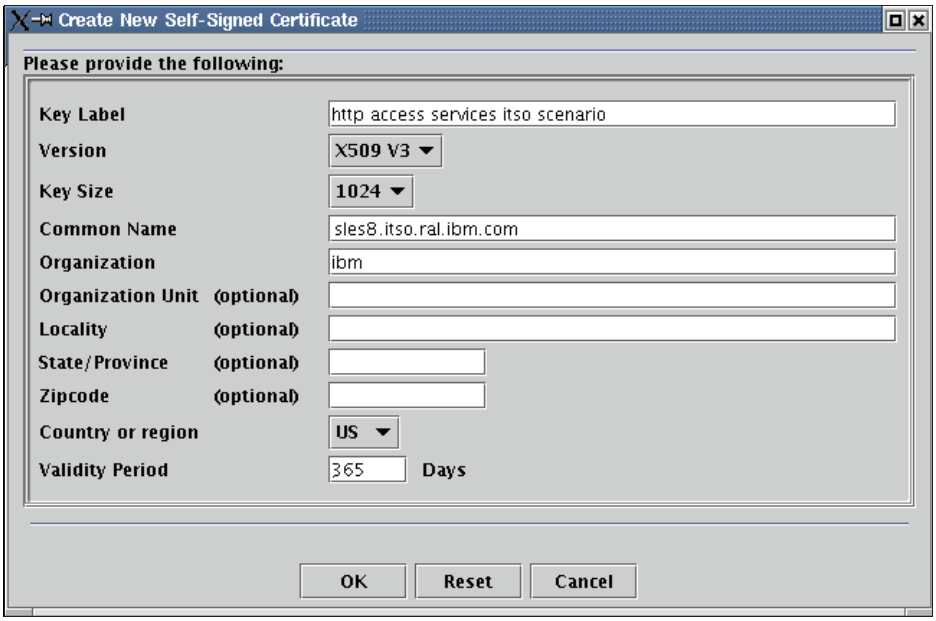

Figure 8-7 Create a New Self-Signed certificate (2 of 2)

10. Exit the IBM Key Management tool after the self-signed certificate has been created.

8.2.2 HTTP Access Services configuration

This section includes an HTTP Access Services sample configuration using the Gatekeeper administration tool.

> **Note:** To start the Gatekeeper administration in a Linux environment, go to the /opt/IBM/Gatekeeper/ directory and enter the **`wgcfg`** command.

To include an HTTP Access Services sample configuration:

1. Log in to the Gatekeeper, right-click, and add HTTP Access Service as illustrated in Figure 8-8 on page 284.

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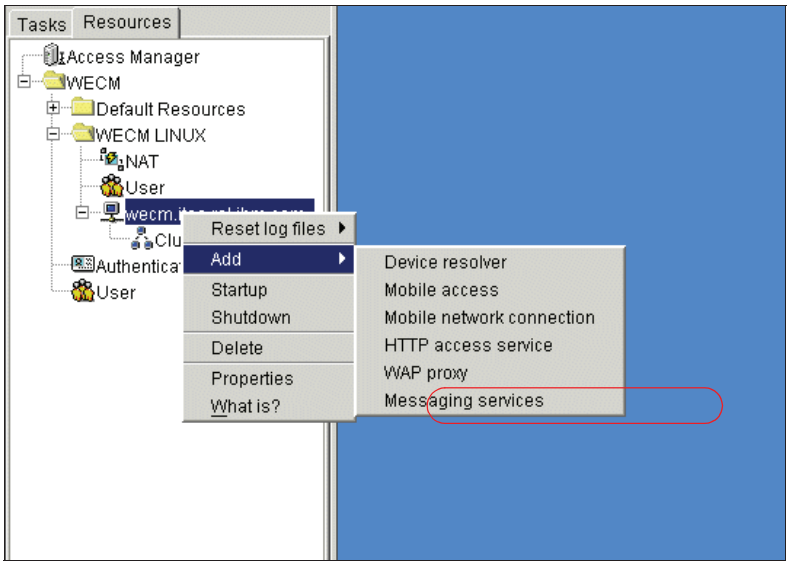

Figure 8-8 Add HTTP Access Service

2. Specify the service URL used by the HTTP clients and the secure port (Figure 8-9).

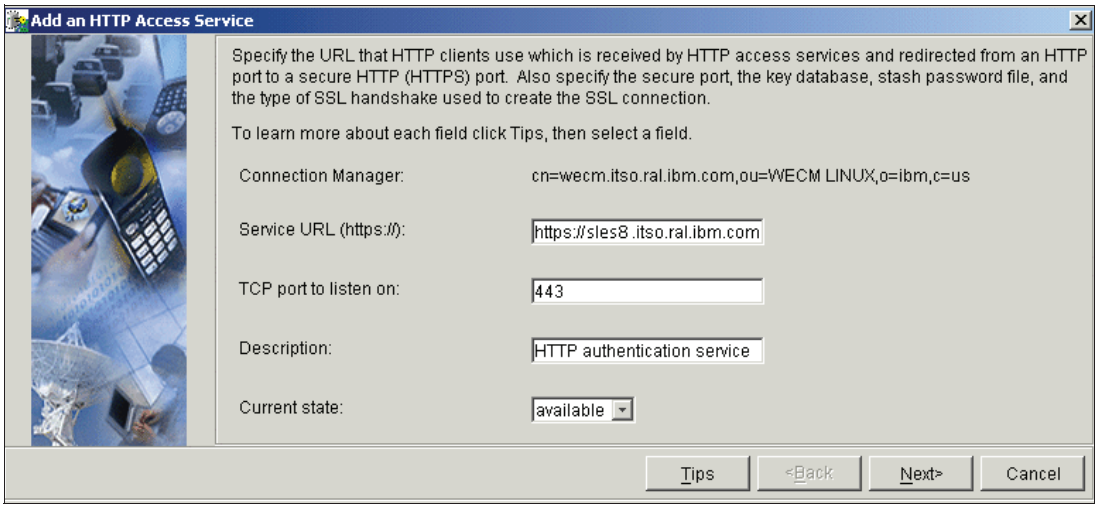

Figure 8-9 Adding HTTP Access Services

Note: Unsecure client requests are redirected to the secure port.

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3. Configure the operational mode used by HTTP Access Service. This sample scenario uses secure HTTP access. The HTTP proxy address is the IP address of the reverse proxy machine (as illustrated in Figure 8-10) and 80 is the listening port.

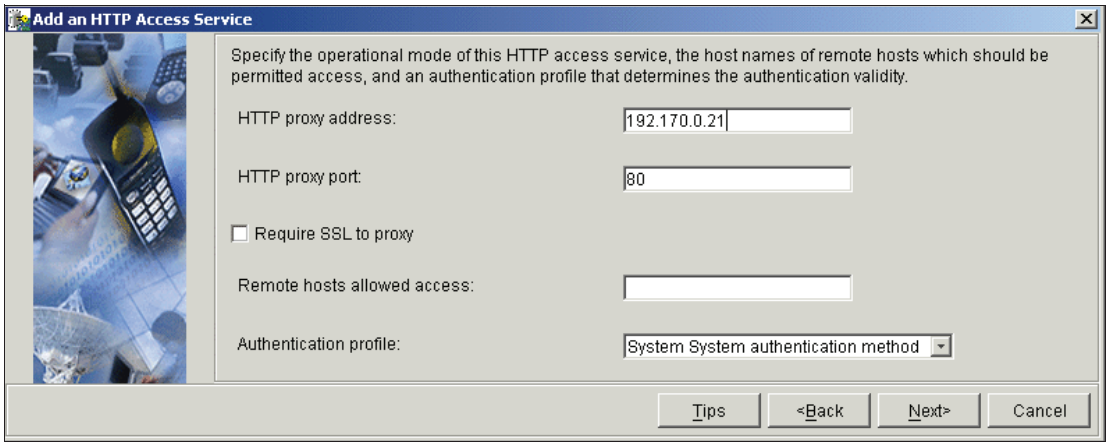

Figure 8-10 Reverse proxy configuration

4. Select **Require SSL to proxy** if HTTP Access Services are also used a secure connection to the reverse proxy machine (optional).

> **Note:** As an alternative, HTTP Access Services can also receive client credentials from an application server in the HTTP header. If this option is used, HTTP Access Services checks the validity of the credentials according to the authentication profile selected (the default is Authorization). However, this option does not support Lightweight Third Party Authentication (LTPA) for single sign-on (SSO). For information about SSO with LTPA tokens, see Chapter 10, “WebSphere Connection Manager single sign-on using LTPA” on page 327.

5. List the HTTP ports that is redirected to the secure port (Figure 8-11 on page 286). This sample scenario uses only the unsecure port 80. Take the default values or provide the maximum number of processing threads and the maximum idle time if needed.

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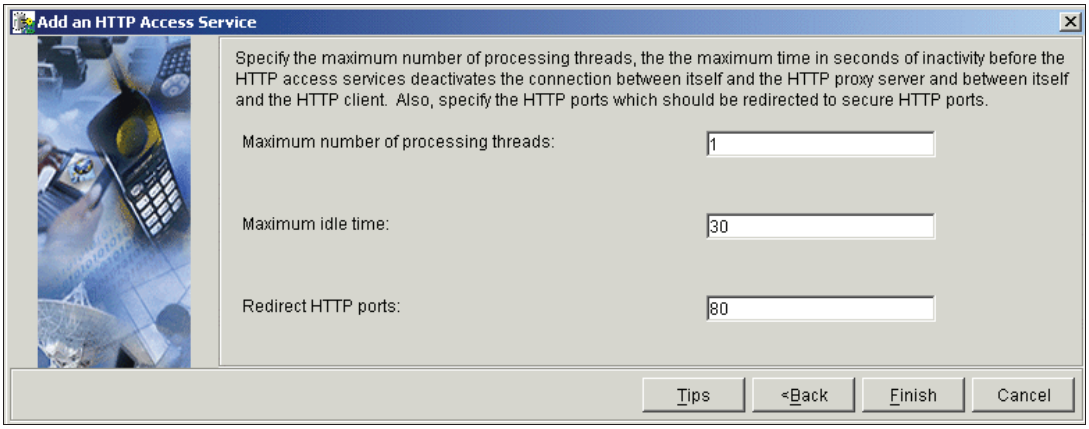

Figure 8-11 Configure unsecure ports to be redirected

Note: It is important to guarantee that these ports are not used by any other application in the Everyplace Connection Manager machine. For example, an HTTP server required to access LDAP Directory Services should be closed or its configuration changed to use different ports. Otherwise, port conflicts can occur.

8.3 Running the sample scenario

Before running the scenario, you might want to recycle Everyplace Connection Manager to guarantee that all modifications done are considered.

To run the sample scenario, follow these steps:

1. Log in to the Everyplace Connection Manager box and enter the following command to stop the services:

   ```
   wgstop
   ```

2. Verify that Everyplace Connection Manager stopped with the command:

   ```
   ps -ef | grep wga
   ```

3. Enter the following command to re-start the services:

   ```
   wgstart
   ```

4. Verify that Everyplace Connection Manager started with the command:

   ```
   ps -ef | grep wga
   ```

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A complete Everyplace Connection Manager recycle is shown in Figure 8-12 on page 287.

```
Shell - Konsole
Session  Edit  View  Settings  Help
sles8:~ # wgstop
sles8:~ # ps -ef | grep wga
root     27265 24696  0 14:30 pts/1    00:00:00 grep wga
sles8:~ # wgstart
sles8:~ # ps -ef | grep wga
root     27292     1  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgattachd
root     27293 27292  2 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27294 27292  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgattachd
root     27295 27294  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgattachd
root     27296 27293  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27297 27296 37 14:31 pts/1    00:00:02 /opt/IBM/wecm/bin/wgated
root     27299 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27300 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27301 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27302 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27303 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27305 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27306 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27307 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27308 27296  0 14:31 pts/1    00:00:00 /opt/IBM/wecm/bin/wgated
root     27310 24696  0 14:31 pts/1    00:00:00 grep wga
sles8:~ #
New  Shell
```

Figure 8-12 Everyplace Connection Manager recycle

The sample scenario included in this chapter has been tried using the following client devices connected to Everyplace Connection Manager:

- Desktop browser client running on a Windows machine
- PDA client, a Pocket PC is used

8.3.1 Desktop clients

This section describes how desktop clients access the portal application.

Portal application

The portal sample application is a set of WebSphere Everyplace Access portlet applications. Follow these steps to access the portal:

1. Open Internet Explorer and enter the following URL:

   `http://sles8.itso.ral.ibm.com/wps/portal`

2. If required, click **Yes** to accept the self-signed certificate for the secure connection (SSL) with Connection Manager.

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3. If required, enter the proper user ID and password to log in to Connection Manager and click **Login Now** as shown in Figure 8-15 on page 289.
4. If the user ID and password were correct, the Portal welcome page should open, as shown in Figure 8-13.

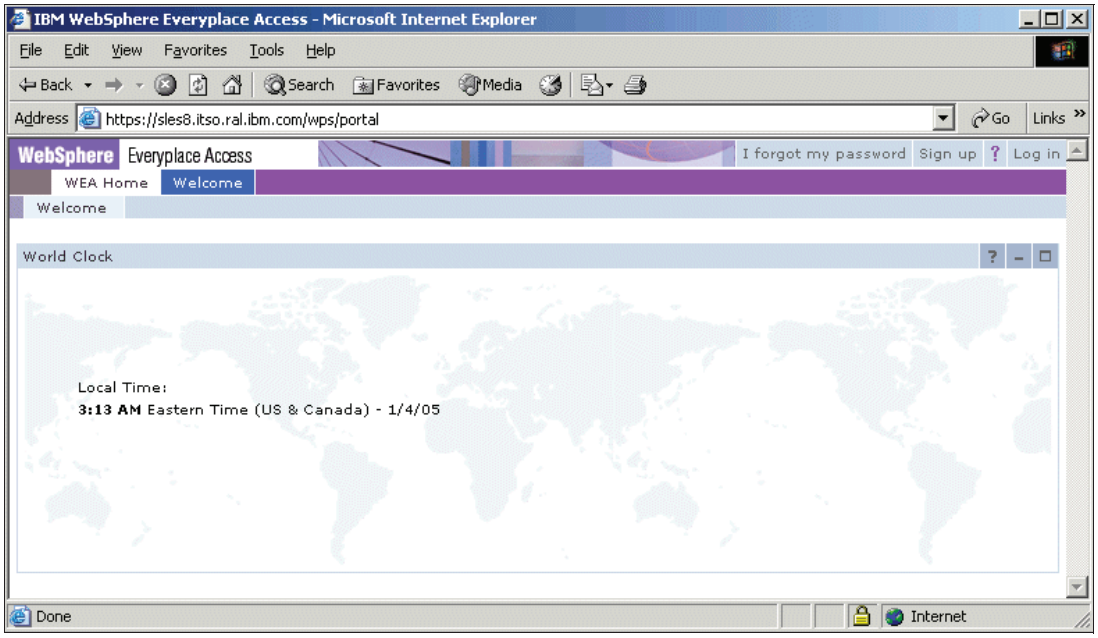

Figure 8-13 Portal application access using Everyplace Connection Manager

8.3.2 PDA clients

In this section, a PDA (Pocket PC 2003) is used to access the sample application. The access is through Everyplace Connection Manager and its associated reverse proxy.

WebSphere Everyplace Access portal application

The portal application is a set of WebSphere Everyplace Access portlet applications. Follow these steps to access this server:

1. Open Internet Explorer from the PDA and enter the following URL:

   `http://sles8.itso.ral.ibm.com/wps/portal`

2. Select **Yes** to accept the self-signed certificate for the secure connection (SSL) with Everyplace Connection Manager, as shown in Figure 8-14 on page 289.

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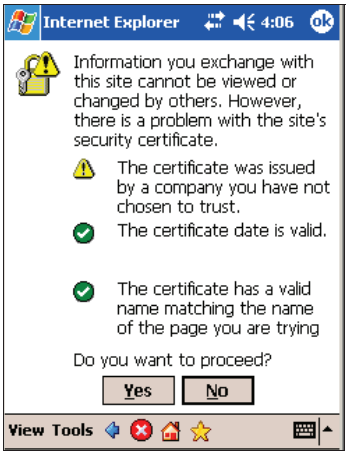

Figure 8-14 Accepting Everyplace Connection Manager self certificate

3. Login to Everyplace Connection Manager. Remember that this user should be created on the local LDAP (Figure 8-15).

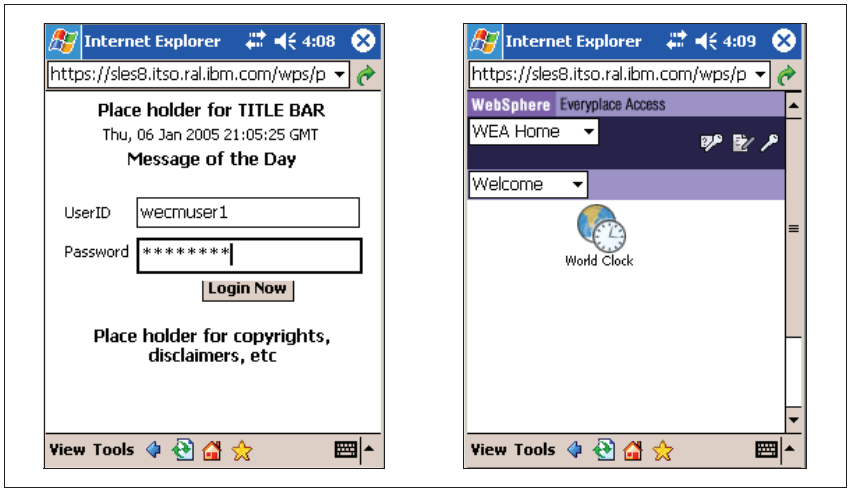

Figure 8-15 Everyplace Connection Manager login

4. Login to WebSphere Everyplace Access (Figure 8-16 on page 290). Remember that this user now is located on the WebSphere Everyplace Access LDAP.

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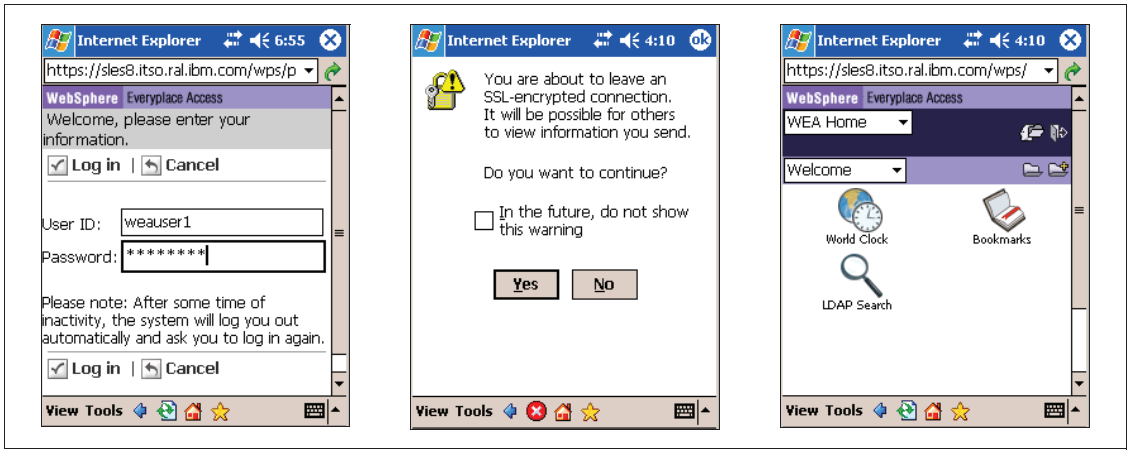

Figure 8-16 WebSphere Everyplace Access login

8.4 Troubleshooting

This section provides some guidelines to help you troubleshoot potential issues that you might encounter when implementing HTTP Access Services in Everyplace Connection Manager.

Application issues

In general, you need to make sure that the applications run properly when not going through Everyplace Connection Manager. For example, for the sample scenario included in this chapter, you can use the following URL to access the applications directly from a desktop browser:

`http://wea02.itso.ral.ibm.com/wps/portal`

Reverse proxy issues

It is recommended that you follow the request progress using the reverse proxy activity monitor function. For example, follow these steps:

1. Access the WebSphere Edge Server Caching Proxy front page.:

   `http://edge/pub/FrntPage.html`

2. Click **Configuration and Administration Forms** and log on to caching proxy administration.
3. Click **Server Activity Monitor** → **Activity Statistics**.

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Note: It is a good procedure to clear the activity statistics before running your scenario by refreshing the IBM Caching Proxy service.

Figure 8-17 illustrates the statistics for the reverse proxy traffic.

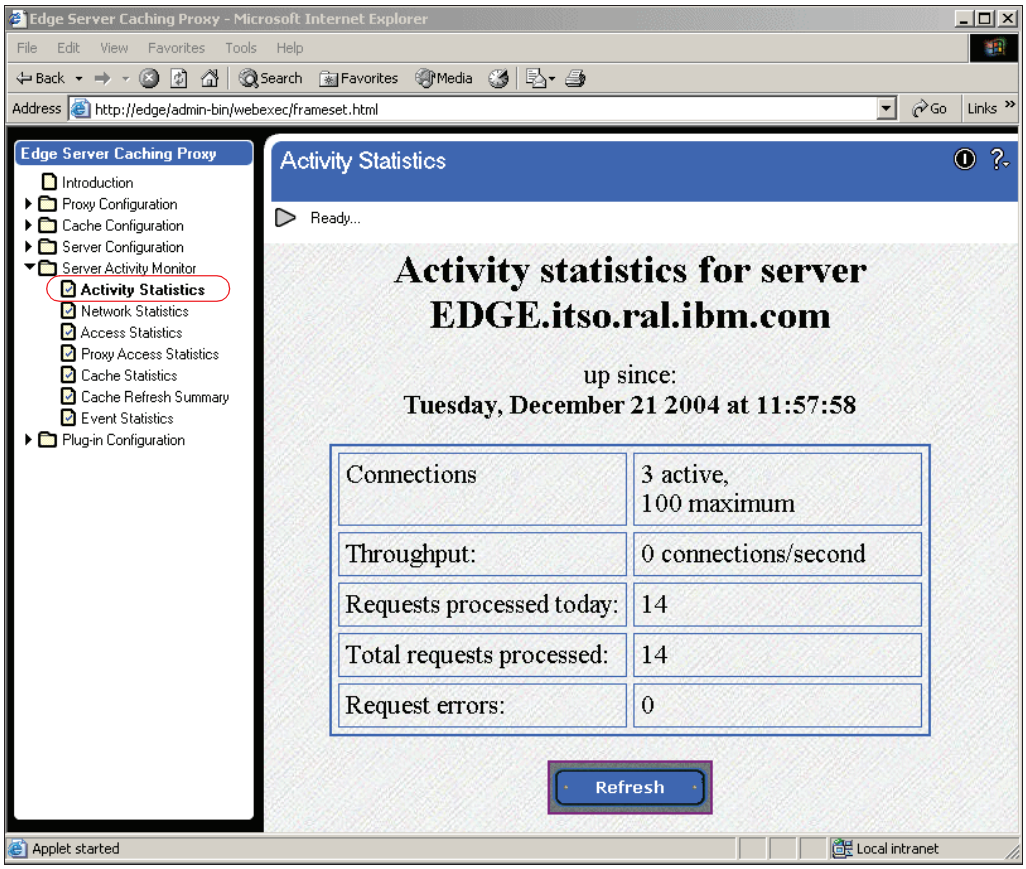

Figure 8-17 IBM WebSphere Edge Server activity statistics

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HTTP Access Services startup problems

To make sure HTTP Access Services has been started properly, open the wg.log file. This file is located on /var/adm and look for HTTP_Service. Example 8-4 shows a successful HTTP Access Service startup.

Example 8-4 Successful HTTP Access Services start up

```
2599: 1026 (Jan 04 05/12:40:20.0755):http-service0: connection established
(TCP/listen:443)
2599: 1026 (Jan 04 05/12:40:20.0757):TcpPort::listen: (entry)
599: 1026 (Jan 04 05/12:40:20.0758):TcpPort::open: (entry)
2599: 1026 (Jan 04 05/12:40:20.0761):TcpPort::open: (return), rc=0
2599: 1026 (Jan 04 05/12:40:20.0763):TcpPort::listen: (return), rc=0
2599: 1026 (Jan 04 05/12:40:20.0765):http-service0: connection established
(TCP/listen:80)
2599: 1026 (Jan 04 05/12:40:20.0770):AUTH_Server::startup: (entry)
2599: 1026 (Jan 04 05/12:40:20.0777):TcpPort::listen: (entry)
2599: 1026 (Jan 04 05/12:40:20.0779):TcpPort::open: (entry)
2599: 1026 (Jan 04 05/12:40:20.0781):TcpPort::open: (return), rc=0
2599: 1026 (Jan 04 05/12:40:20.0782):TcpPort::listen: (return), rc=0
```

Everyplace Connection Manager logging

It is recommended to enable logging when troubleshooting HTTP Access Services problems in Everyplace Connection Manager. A sample configuration is shown in Figure 8-18 on page 293, where logging levels are set and the location of the log files are defined.

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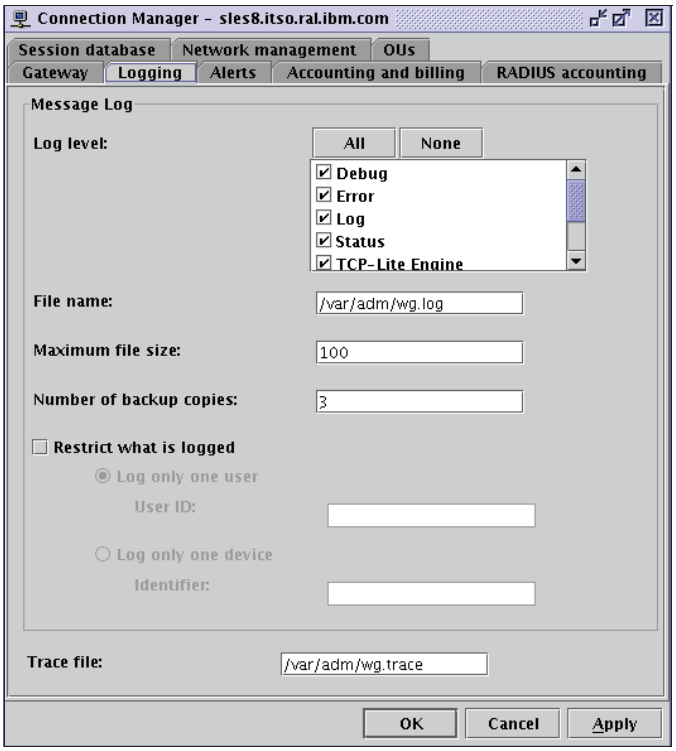

Figure 8-18 Logging configuration

8.5 Everyplace Connection Manager on SUSE Linux

This section provides some helpful hints for those that are not familiar with Linux Operating System, specially SUSE Linux Enterprise Server 8, which is the version used on the Everyplace Connection Manager scenarios.

The topics considered are:

- Linux files that are relevant to network connectivity.
- Software versions for the products that have to be installed in order to run the scenario.
- Services that need to be started before running the scenario.
- Log files that can help you debugging Linux installation.

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Linux Files

The files that are described in this section are a non-exhaustive list. However, they are among the ones with which many people have issues.

- HOSTNAME

  This file has the Everyplace Connection Manager host name.

Example 8-5 HOSTNAME

```
sles8.itso.ral.ibm.com
```

- hosts.allow and hosts.deny

  These files have the filters for the machines that are allowed to access the Everyplace Connection Manager server. Many combinations are possible. Example 8-6 and Example 8-7 show the combination that is used for the Everyplace Connection Manager scenarios. These setup allows all the machines that are in the domain itso.ral.ibm.com.

Example 8-6 hosts.allow

```
ALL:   itso.ral.ibm.com
```

Example 8-7 hosts.deny

```
ALL:   ALL
```

- hosts

  The Everyplace Connection Manager sample scenarios included in this book do not use a DNS server. Thus, the hosts file plays a major role. The same statement applies to the other machines.

Example 8-8 hosts

```
127.0.0.1localhost

192.170.0.21   edge.itso.ral.ibm.com edge
192.170.0.24   wea02.itso.ral.ibm.com wea02
192.170.0.111  w2ks.itso.ral.ibm.com w2ks
192.170.0.250  dirs.itso.ral.ibm.com dirs
192.170.0.251  sles8.itso.ral.ibm.com sles8
```

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- passwd

  One way to check whether the DB2 users and LDAP users were created is to check this file. You should have statement similar to the ones show in Example 8-9,

Example 8-9 passwd

```
uucp:x:10:14:Unix-to-Unix CoPy system:/etc/uucp:/bin/bash
db2admin:x:501:0:Pedro Siena Neto:/home/db2admin:/bin/bash
dasusr1:x:510:101::/home/dasusr1:/bin/bash
db2inst1:x:512:102::/home/db2inst1:/bin/bash
db2fenc1:x:513:103::/home/db2fenc1:/bin/bash
ldap:x:514:200::/home/ldap:/bin/bash
wgdb:x:517:500::/home/wgdb:/bin/bash
```

- services

  This file shows all the ports that are assigned to this machine. If the Everyplace Connection Manager installation was successful, this file must contain Everyplace Connection Manager exclusive ports (Example 8-10).

Example 8-10

```
#WECM ports

wgmgr            9555/tcp                # IBM Wireless Access Manager
wgmgrs           9559/tcp                # IBM Wireless Access Manager SSL
DB2_wgdb         60016/tcp
DB2_wgdb_1       60017/tcp
DB2_wgdb_2       60018/tcp
DB2_wgdb_END     60019/tcp
db2cwgdb         50002/tcp
```

Software Versions

Software versions are a major issue and a potential source of misunderstanding. To solve this, at least for the Everyplace Connection Manager, you can use YaST to make sure of what you should have installed before running the scenario as well as what product versions are used.

Linux

Everyplace Connection Manager requires for SUSE Linux Enterprise Server 8, kernel level above 2.4.21, and glibc level above glibc 2.2.5 (Figure 8-19 on page 296 and Figure 8-20 on page 296). For other Linux distributions, a complete list is available in the guide *WebSphere Everyplace Connection Manager for Linux Quick Start Guide Version 5.1*.

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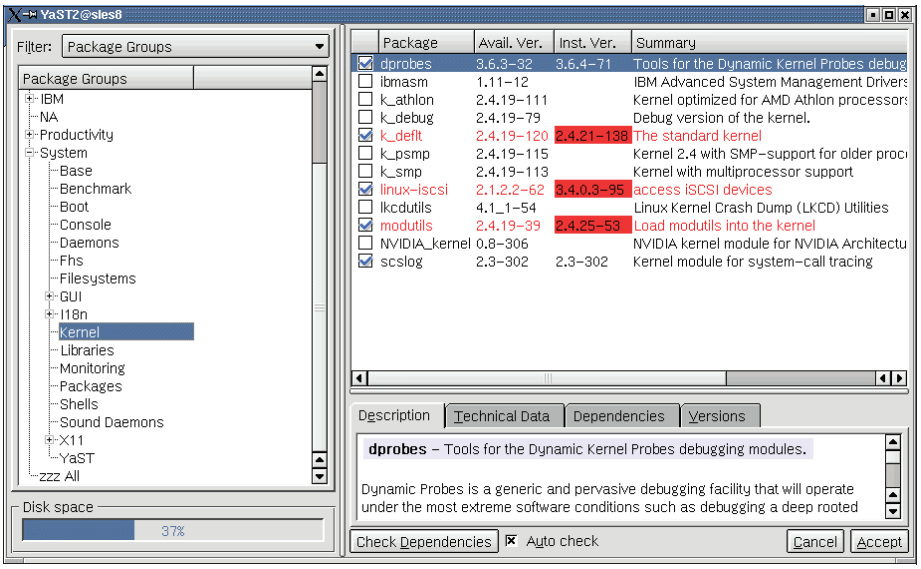

Figure 8-19 kernel level

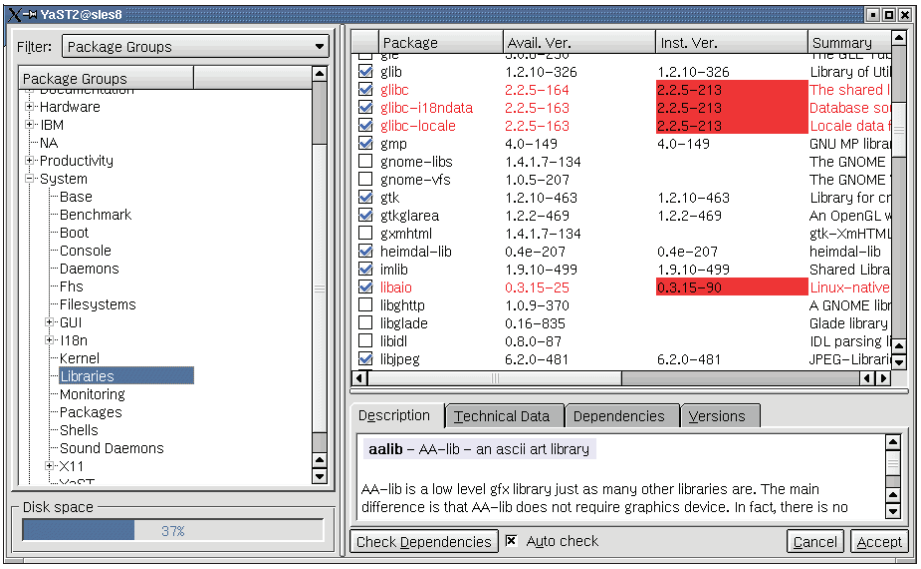

Figure 8-20 glibc level

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Java Runtime Level

Everyplace Connection Manager requires JRE. For Linux machines any version above 1.4.1.2 is allowed (Figure 8-21). If your version is below that, uninstall it before installing Everyplace Connection Manager, and then the Everyplace Connection Manager installation installs it for you (included in the package).

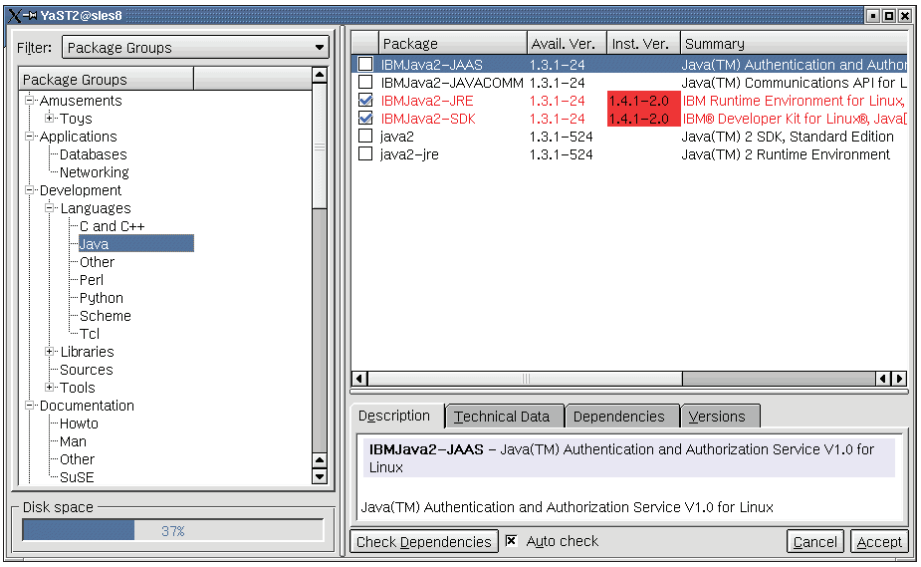

Figure 8-21 Java Runtime level

DB2 level

An ODBC client must be installed before Everyplace Connection Manager installation. DB2 was chosen for Everyplace Connection Manager scenarios, and the version must be DB2 8.1 Fixpack 3 or later. We installed DB2 Server 8.1 Fixpack 7 and its client (Figure 8-22 on page 298).

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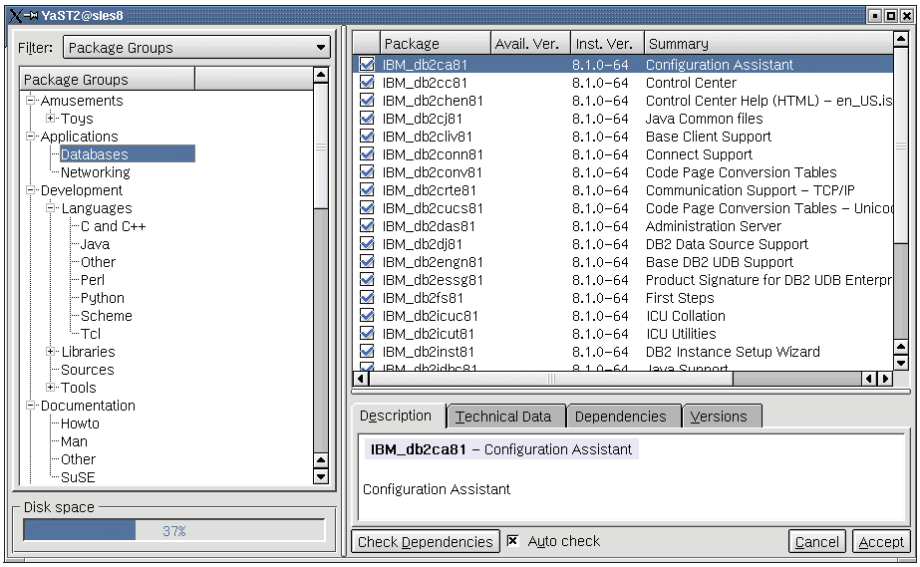

Figure 8-22 DB2 level

Everyplace Connection Manager level

After Everyplace Connection Manager installs, you should see their packages (GSK included) as shown on in Figure 8-23 and Figure 8-24 on page 299.

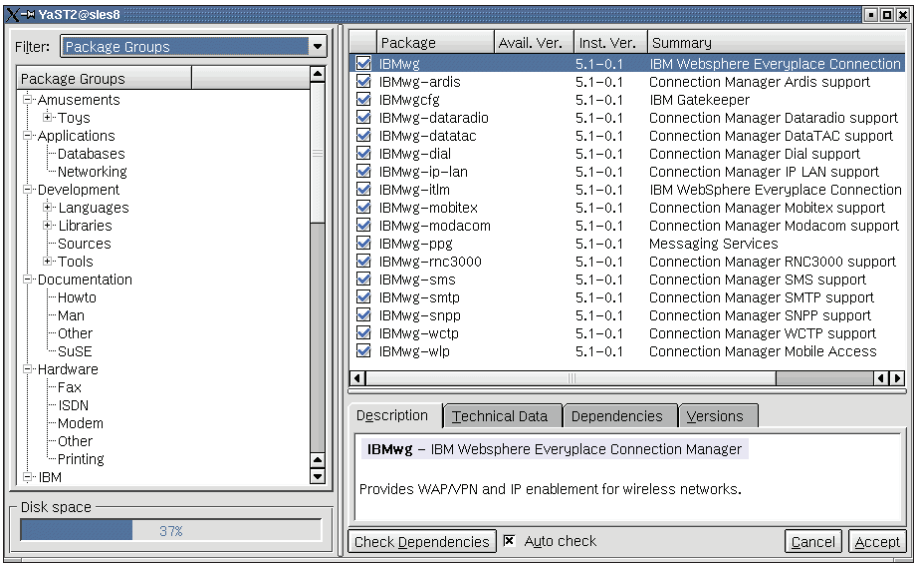

Figure 8-23 Everyplace Connection Manager level

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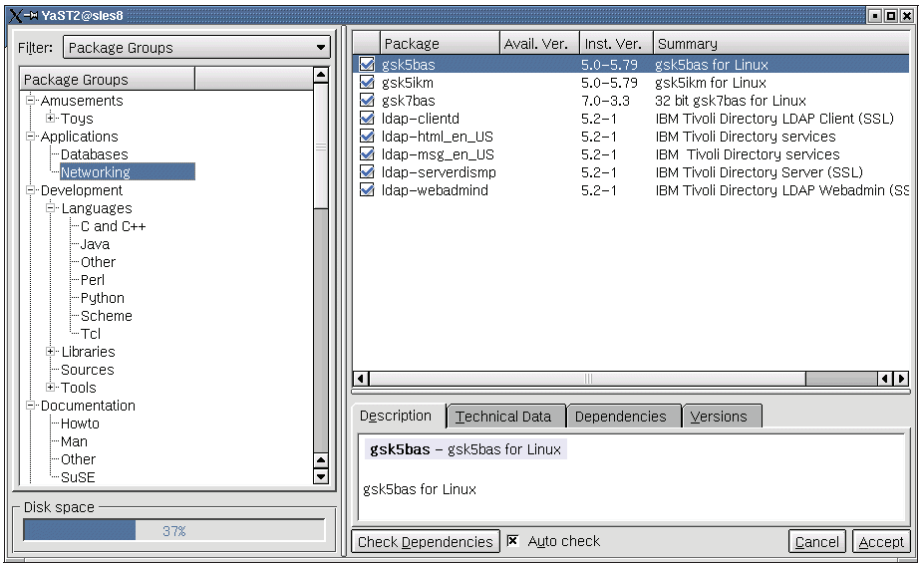

Figure 8-24 Global Security Kit level

Checking Services

In some cases, you may want to verify that all services are running as expected. Some recommended procedures are:

- inetd

  During the Linux installation, this daemon could be set to not come up automatically. If so, you need to do start it. To check whether it is running, enter the following command:

  ```
  ps -ef | grep inetd
  ```

  If you do not see it in the list, go to the path where this file is located, and enter the following command:

  ```
  ./inetd start
  ```

- db2

  Enter the following command to determine whether DB2 is running:

  ```
  ps -ef | grep db2
  ```

  You should see any services with a DB2 prefix. Look for `db2wdog` and `db2inst1`. These services are among those that can give you a good idea that DB2 is running. If you do not see these services, Start DB2. (For details about starting DB2, see *IBM DB2 Universal Database Command Reference Version 8.2*.)

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- ldap

  Everyplace Connection Manager scenarios use a local ldap, at least for configurations parameters. So, it must be running independently of the scenario that you chose.

  You can issue the command:

  ```
  ps -ef | grep ibmslapd
  ```

  If you do not see it in the list, go to the path where this file is located, and enter the following command:

  ```
  ./ibmslapd
  ```

  Many status lines would come up. Make sure that no error is shown, and wait for a successful end.

Log Files

Usually, for each service that you start, there is a source file that is associated with it. It is good practice to take a look at each source file as soon as you start the services and look for errors and warnings.

The filename usually points to the services. Some of them are:

- ibmslapd.log (directory server log) usually located on /var/ldap
- wg.log (everyplace connection manager log) usually located on /var/adm
- wgmgrd.log (access manager log) usually located on /var/adm

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9

WebSphere Connection Manager integration

This chapter presents an overview on how WebSphere Everyplace Connection Manager and WebSphere Everyplace Access work together.

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9.1 WebSphere Everyplace Access integration

Everyplace Connection Manager is commonly found in enterprises with a significant number of mobile users. WebSphere Everyplace Access is similarly targeted at mobile users. Its themes, skins, and transcoding technology generate Web content optimized for a wide variety of devices including Mobile Phones, PDAs, Laptops, and Desktop Systems. Indeed, IBM has designed WebSphere Everyplace Access and Everyplace Connection Manager to work together.

WebSphere Everyplace Access is intended to extend corporate applications, e-mail, and PIM data to mobile users. Given the sensitive nature of such data, many enterprises choose to locate WebSphere Everyplace Access servers on their intranets. A Everyplace Connection Manager server is then used to allow mobile users; inside, and outside of the corporation, a secure and optimized access to the WebSphere Everyplace Access servers.

Everyplace Connection Manager provides WebSphere Everyplace Access users two ways to securely access their WebSphere Everyplace Access servers:

- Using portal access through a Web browser, Everyplace Connection Manager provides secure HTTP access.
- Using the Mobility Client, Everyplace Connection Manager provides full access to the WebSphere Everyplace Access server (portal, synchronizations services, device management, alerts, and so forth).

Note: Either method improves security by providing robust authentication, authorization, and confidentiality (by means of encryption).

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9.1.1 Common configurations

Configuring Everyplace Connection Manager and WebSphere Everyplace Access in a large enterprise can involve a large number of separate servers. A typical configuration might include:

- Everyplace Connection Manager servers
- WebSphere Everyplace Access portal servers
- WebSphere Everyplace Access synchronization
- Corporate LDAP servers
- Database servers
- Domino servers
- Application servers
- Sametime servers
- Intelligent notification servers

Note: Scalability and redundancy requirements can further add complexity to the scenario.

9.2 LDAP considerations

Both Everyplace Connection Manager and WebSphere Everyplace Access use Lightweight Directory Access Protocol (LDAP) to store and retrieve user and configuration information. In addition, the following options should be taken into consideration when integrating these two products:

- Everyplace Connection Manager and WebSphere Everyplace Access both offer the choice of creating a local LDAP or using a remote LDAP.
- Everyplace Connection Manager can also be configured in a split LDAP configuration with configuration data and user data in separate LDAPs.

In general, the LDAP strategy is a complex approach. This book does not discuss it in detail. However, some highlights are important to understand in a WebSphere Everyplace Access and Everyplace Connection Manager integration, and this chapter attempts to cover the most important issues in a few common scenarios.

You can consider the configurations described in the following sections.

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Case 1: Using separate user directories

This is the non-integrated approach where Everyplace Connection Manager and WebSphere Everyplace Access implement their own independent LDAP directory. The scenario is illustrated in Figure 9-1.

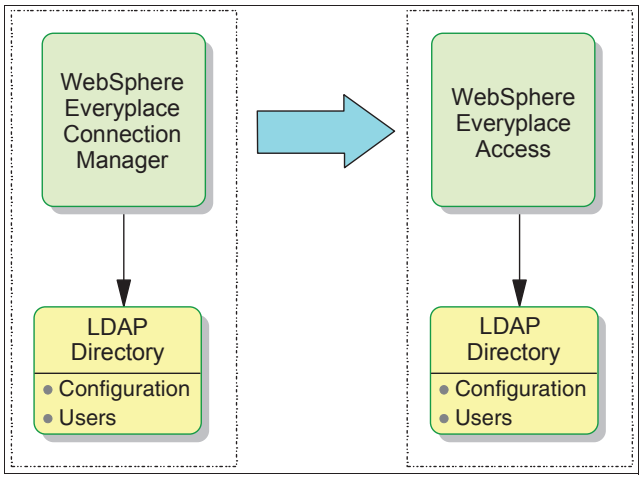

Figure 9-1 Separate LDAP directories

This configuration where Everyplace Connection Manager and WebSphere Everyplace Access use separate LDAP directory servers, gives you the benefit that LDAP directories run on different machines, which gives to each product independency, and better performance. However, it creates a user management overhead since users must reside on both directories.

Note: This is the sample scenario described in Chapter 8, “Using Everyplace Connection Manager HTTP Access Services” on page 273

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Case 2: Sharing user directory

In this scenario, you configure Everyplace Connection Manager to access the user entries residing in the WebSphere Everyplace Access LDAP directory server. Only the user directory is shared and the Everyplace Connection Manager configuration values still reside in its own LDAP directory. The scenario is illustrated in Figure 9-2.

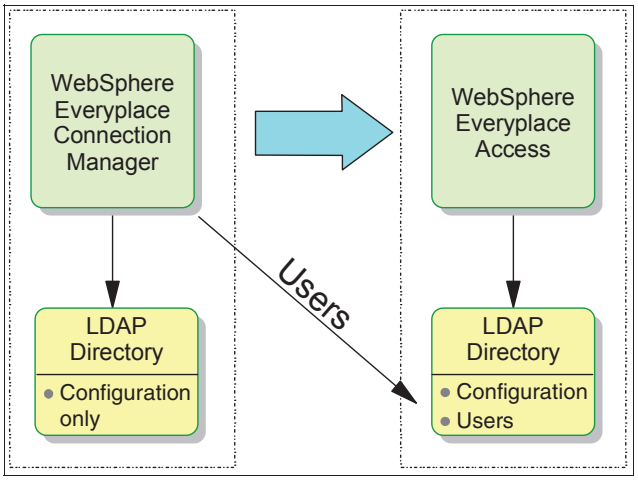

Figure 9-2 Sharing user LDAP directory

This scenario provides the following benefits:

- Centralizes user management in a single directory
- Deploys the WebSphere Everyplace Access LDAP directory behind the firewalls providing better security for the user information.

Note: This is the approach that is included as a sample scenario in this chapter in 9.3, “Sample scenario” on page 308.

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Case 3: Sharing user directory and configuration

In this scenario, you configure Everyplace Connection Manager to access both its configuration values and the user entries residing in the WebSphere Everyplace Access LDAP directory. The scenario is illustrated in Figure 9-3.

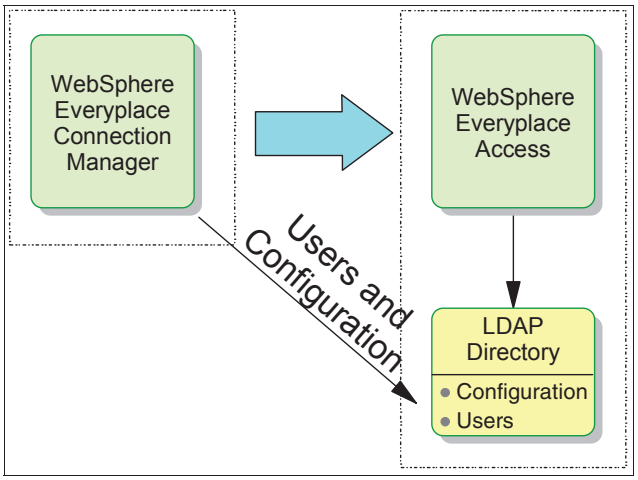

Figure 9-3 Sharing LDAP for users and configuration

This scenario provides the following benefits:

- Centralizes user management in a single directory.
- Deploys the WebSphere Everyplace Access LDAP directory behind the firewalls providing better security for both the Everyplace Connection Manager configuration values and its user information.

The drawback in this scenario is that Everyplace Connection Manager has a dependency on WebSphere Everyplace Access for configuration changes.

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Case 4: LDAP Enterprise Directory

In this scenario, you configure both Everyplace Connection Manager and WebSphere Everyplace Access to access a centralized LDAP Directory. The scenario is illustrated in Figure 9-4.

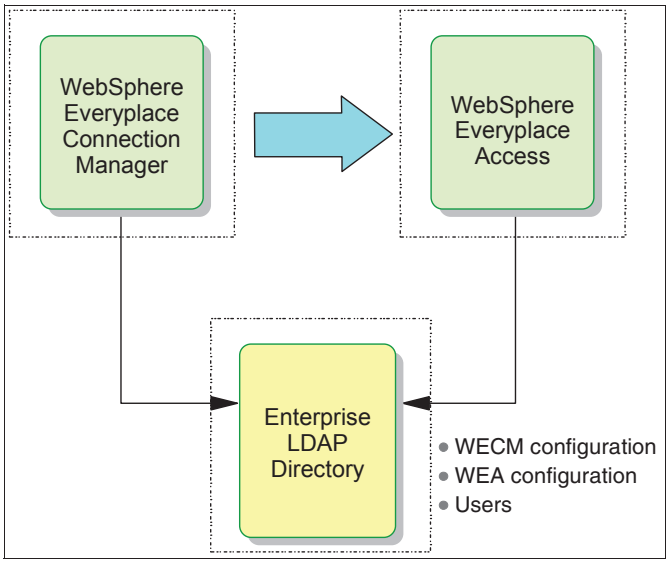

Figure 9-4 LDAP Enterprise directory

This scenario provides the following benefits:

- Centralizes user management in a single directory.
- The enterprise LDAP directory resides behind the firewalls and therefore provides better security for both the Everyplace Connection Manager and WebSphere Everyplace Access configuration values and the user information.

The drawback in this scenario is that both products have a dependency on the enterprise LDAP directory for configuration changes.

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9.3 Sample scenario

The scenario illustrated in Figure 9-5 is used throughout this chapter with the following characteristics:

- The same techniques can be applied to other deployments.
- Everyplace Connection Manager configuration remains in its own LDAP directory.
- Everyplace Connection Manager LDAP does not include any users.
- Everyplace Connection Manager has access to the users in the WebSphere Everyplace Access LDAP directory.

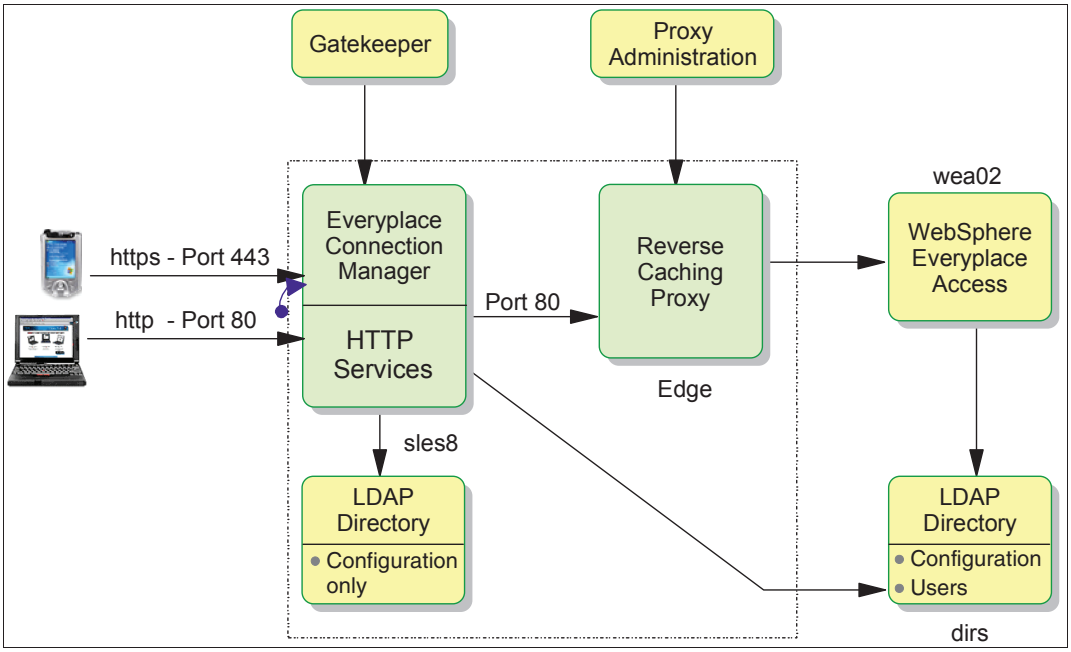

Figure 9-5 WebSphere Everyplace Access integrated sample scenario

To build this scenario, the following machines are used:

- Everyplace Connection Manager server
  - SUSE Linux Enterprise Server 8 (Service Pack 3)
  - IBM DB2 Universal Database 8.2
  - IBM Directory Services V5.2
  - IBM WebSphere Everyplace Connection Manager V5.1

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- Reverse Caching Proxy server
  - Microsoft Windows 2000 Server ServicePack 4
  - IBM WebSphere Edge Server 2.0
- WebSphere Everyplace Access server
  - Microsoft Windows 2000 Server ServicePack 4
  - IBM WebSphere Everyplace Access V5
- LDAP Directory server
  - Microsoft Windows 2000 Server ServicePack 4
  - IBM Tivoli Directory Server 5.1
- Gatekeeper client
  - SUSE Linux Enterprise Server 8 (Service Pack 3)
  - IBM WebSphere Everyplace Connection Manager Gatekeeper 5.1
- HTTP client
  - SUSE Linux Enterprise Server 8 (Service Pack 3)
  - Mozzila 1.8a3

9.3.1 Scenario set up

This scenario relies on the HTTP Access Service scenario shown in Chapter 8, “Using Everyplace Connection Manager HTTP Access Services” on page 273. The scenario is illustrated using a step-by-step approach. The Gatekeeper tool is used to update the Everyplace Connection Manager configuration. In addition, Everyplace Connection Manager needs to be recycled after configuration changes are done, this procedure has already been described in Chapter 8, “Using Everyplace Connection Manager HTTP Access Services” on page 273.

Note: For details about HTTP clients such as desktop browsers and PDAs, see Chapter 8, “Using Everyplace Connection Manager HTTP Access Services” on page 273.

Creating a Directory Services Server definition

In this scenario, the Everyplace Connection Manager user directory is moved from a local LDAP directory to a remote LDAP directory (in the WebSphere Everyplace Access box) so that Everyplace Connection Manager and WebSphere Everyplace Access share the same users. For this reason, Everyplace Connection Manager must know where the user directory is located.

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Follow these steps to add a directory server:

1. Log in to the Gatekeeper tool to add a directory server definition as shown in Figure 9-6. Select **Add Resource** → **Directory server**.

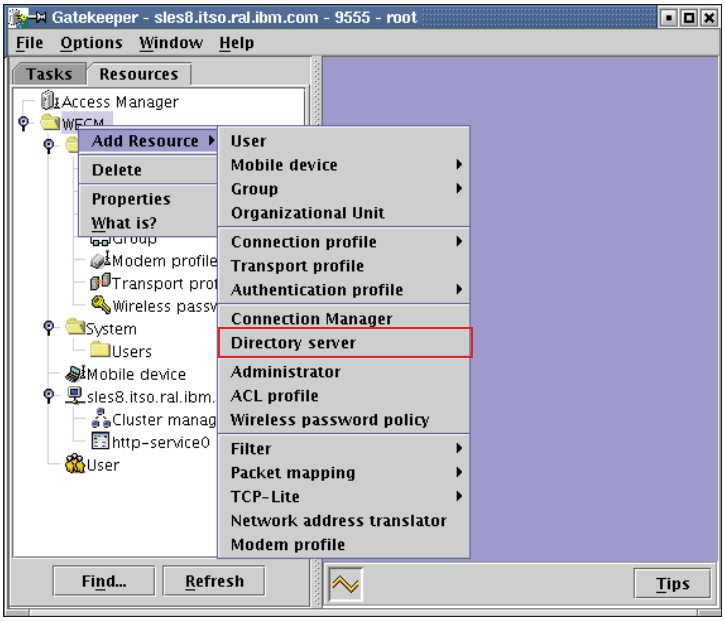

Figure 9-6 Create a Directory server definition

2. Enter the common name of the resource, the host name or IP address where LDAP is located (for this scenario, LDAP is located in the LDAP Directory server box), and the Base Distinguished Name (DN).

> **Note:** The base distinguished name must match exactly. For example, you can logon to Directory Server using the Web Administration Tool to double-check this information in the target LDAP directory.

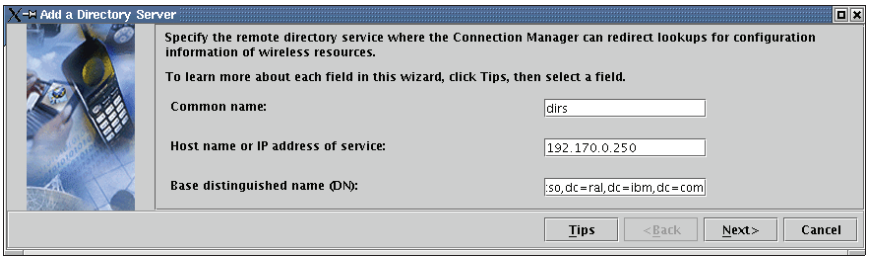

Figure 9-7 Adding a Directory server

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3. Enter the administrator's distinguished name and password (that is, the LDAP administrator and password). This information was entered when the directory server was installed. Click **Next**.

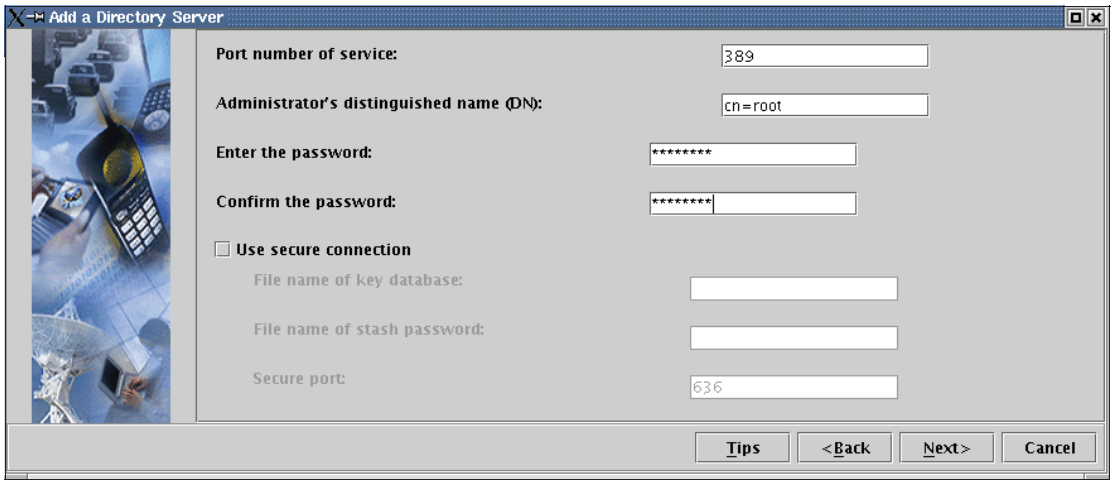

Figure 9-8 Enter LDAP port number and administrator credentials

4. Verify or (if required) change the primary Organizational Unit of this resource. Click **Finish.**

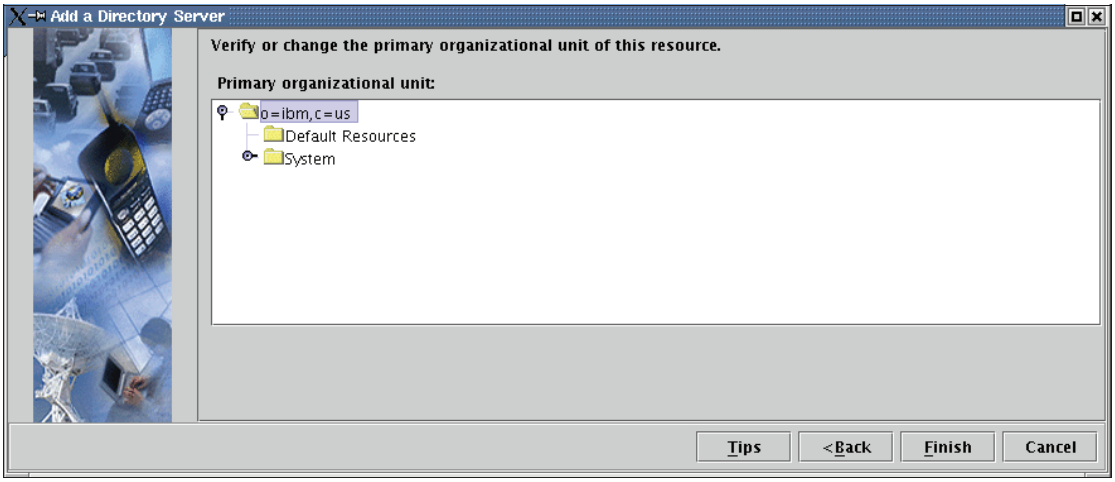

Figure 9-9 Verify or change the primary Organizational Unit

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Configure Access Manager

After you have defined the new Directory server, Everyplace Connection Manager needs to know which Directory server should be used. This option is specified in the Access Manager properties. For example:

1. Right-click **Access Manager** and select **Properties** as shown in Figure 9-10.

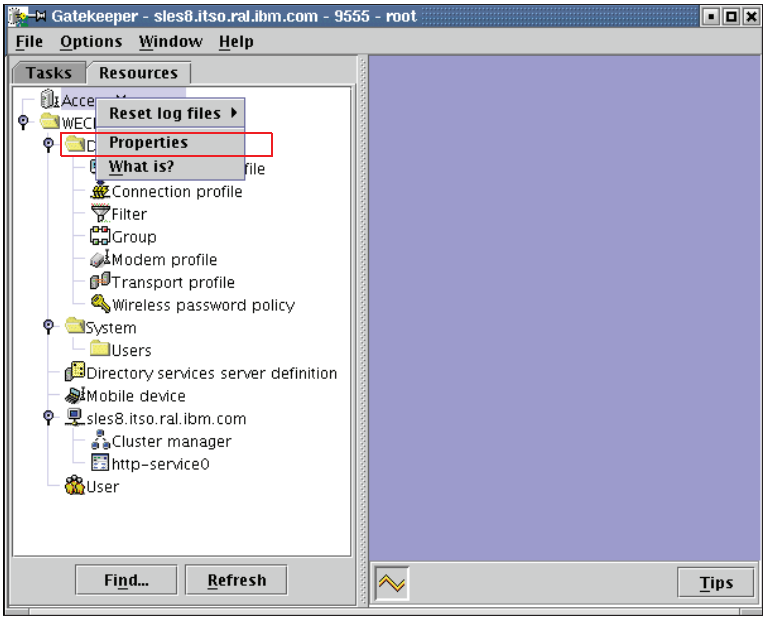

Figure 9-10 Configure Access Manger properties

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2. Click the User DSS tab. Inside the Directory server configuration for user accounts frame, select **Use enterprise directory server** and check the DSS that you created in 9.3.1, “Scenario set up” on page 309. Click **OK.**

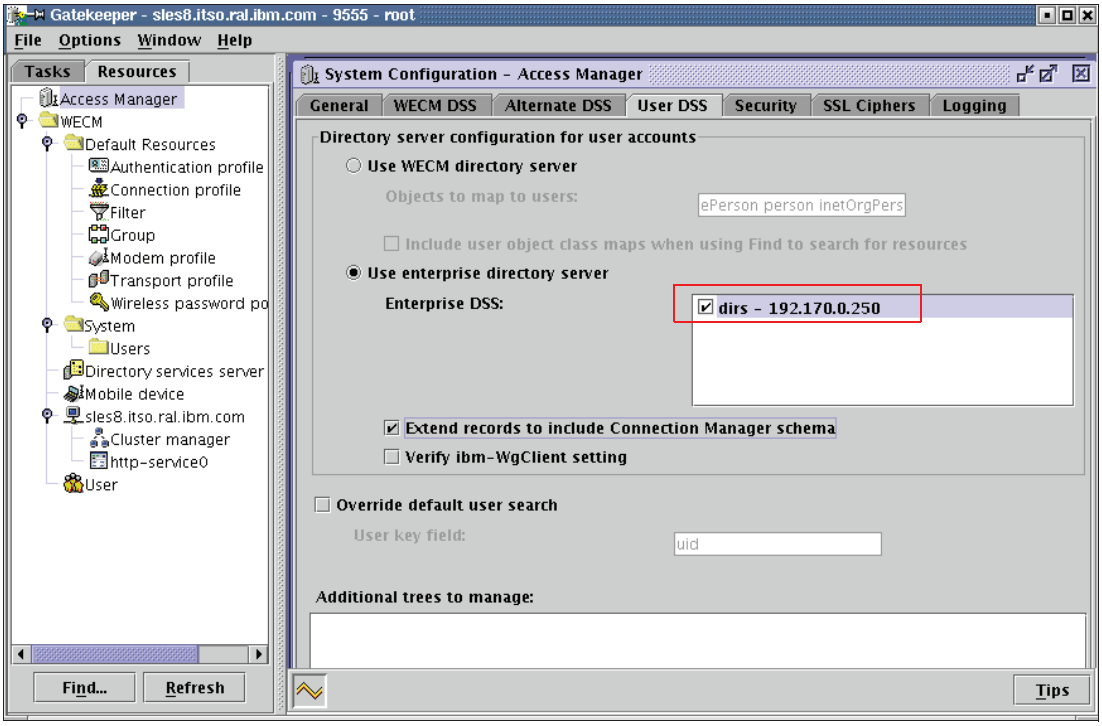

Figure 9-11 Enable previously created directory definition

3. Recycle Everyplace Connection Manager to pick up the new configuration values.

WebSphere Everyplace Access server configuration

This section illustrates the following issues related to this sample scenario:

1. Checking WebSphere Everyplace Access security settings.
2. Creating a user to log in to Everyplace Connection Manager and WebSphere Everyplace Access.
3. Enabling Everyplace Connection Manager to access WebSphere Everyplace Access users.
4. Keeping the WebSphere Everyplace Access session through Everyplace Connection Manager.

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Step 1: Checking the Security Center

You will need to check security settings by following these steps:

1. Select **Programs** → **IBM** → **WebSphere** → **Application Server** → **Administrative Console** and enter the user ID and password to login.

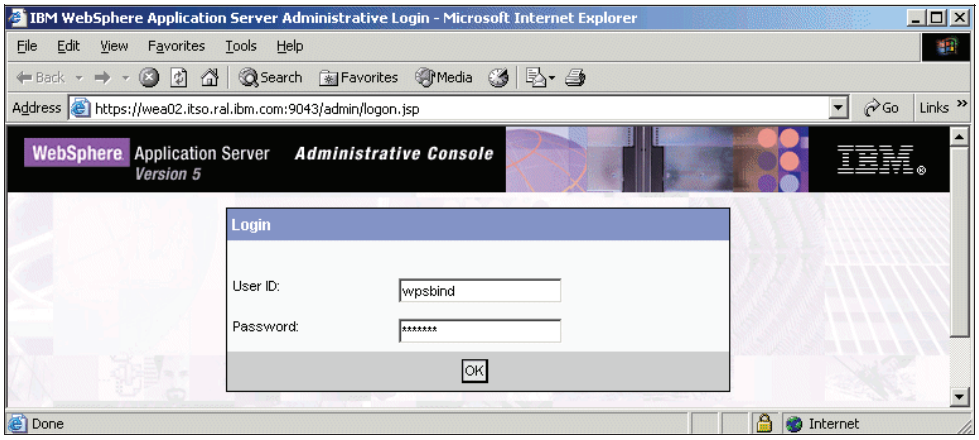

Figure 9-12 WebSphere Everyplace Access Login

2. Select **Security** → **Global Security** on the left-hand menu.

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3. If it is not enabled, you need to enable it as illustrated in Figure 9-13.

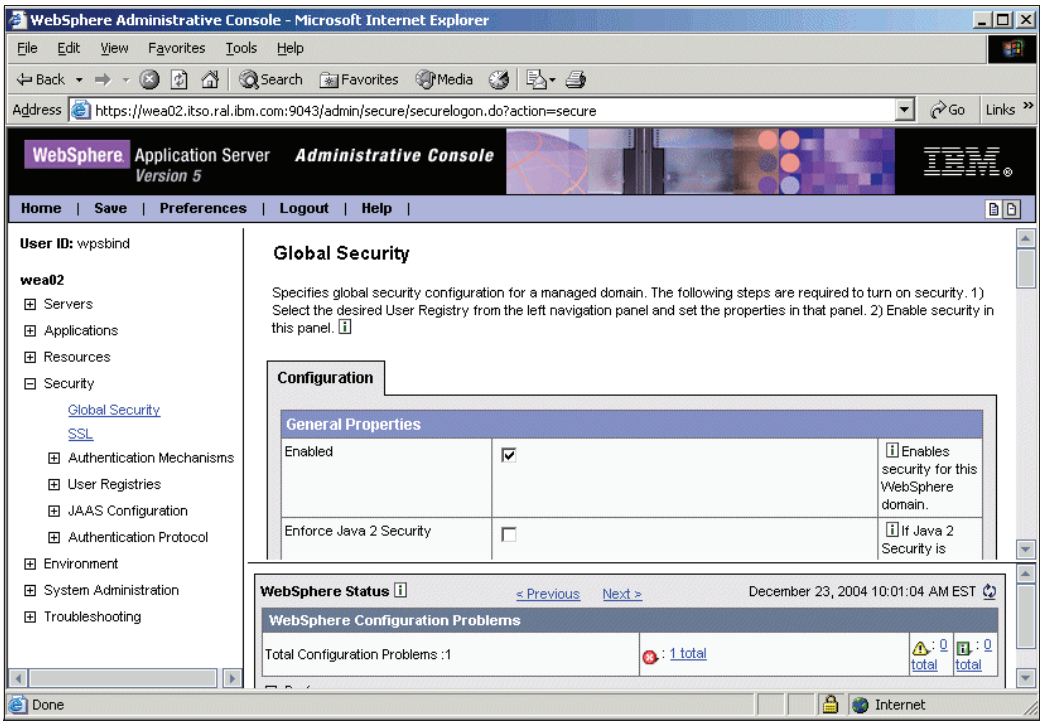

Figure 9-13 Enable Global Security

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4. Select **Authentication Mechanism** → **LTPA** on the left-hand menu as shown in Figure 9-14.

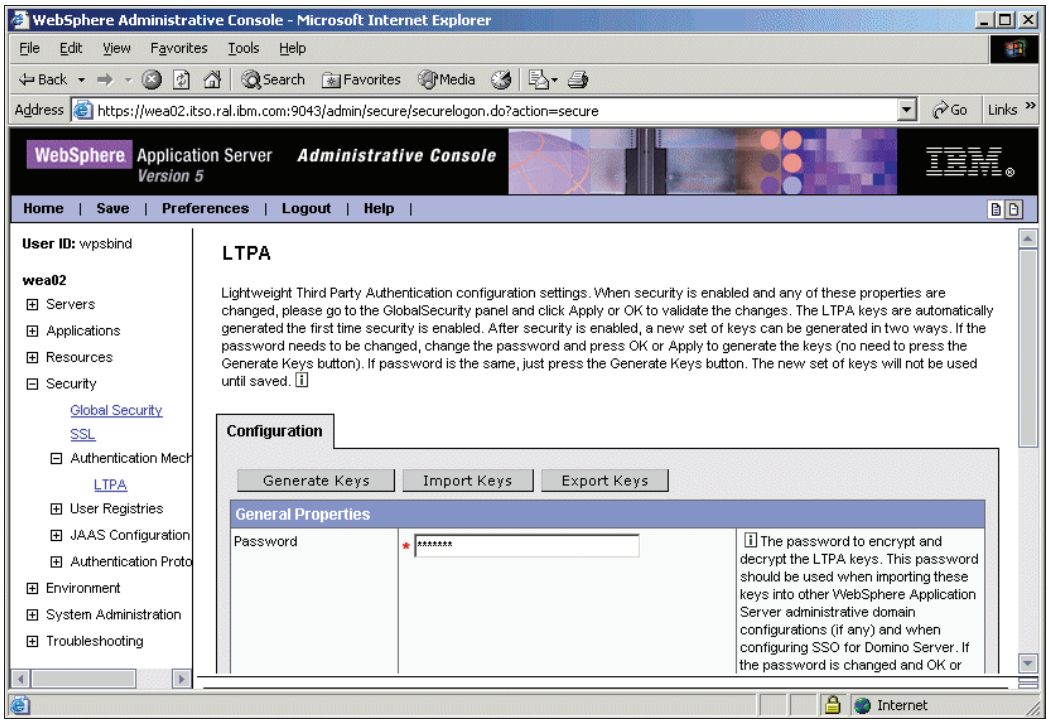

Figure 9-14 Authentication LTPA

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5. Select **SSO** at the bottom and make sure it is not enabled as shown in Figure 9-15.

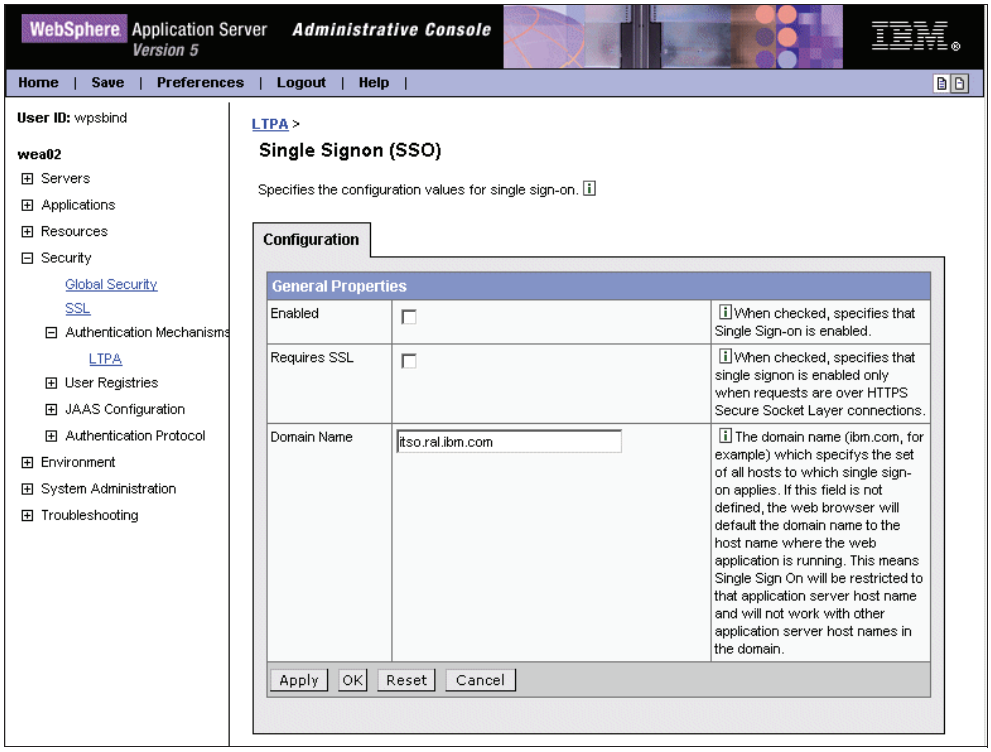

Figure 9-15 SSO Disabled

In this scenario, SSO is not required. Therefore, do not select the check box at this time. Do not select Enable Web trust association either. Other parameters are default values from WebSphere Everyplace Access installation.

Step 2: Creating a user

At this time, you can start adding users to be accessed by both WebSphere Everyplace Access and Everyplace Connection Manager. To do this:

1. Access the portal to create a self-enrolled user. For this sample scenario, the URL is as follows:

   `http://wea02/wps/portal`

   In this URL, `wea02` is the WebSphere Everyplace Access server name.

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2. In the Welcome page, click **Sign Up** and enter the fields that are required to create a user. Figure 9-16 on page 318 illustrates a sample user entered for testing.

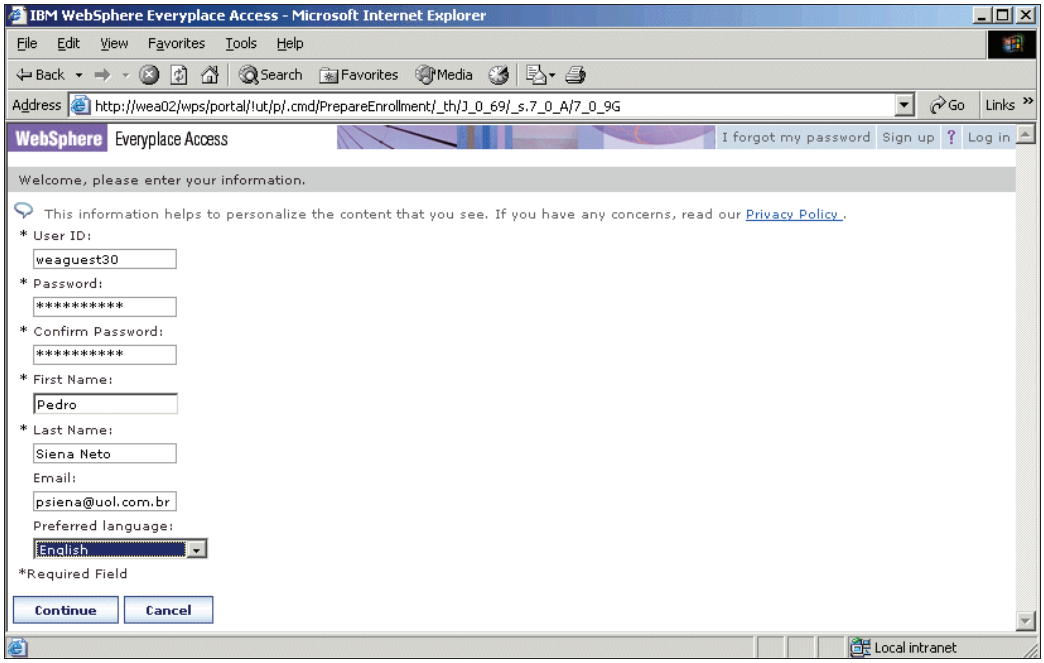

Figure 9-16 Create a user

3. Click **Continue** to confirm and finish the self-enrollment process.

Step 3: Enabling Everyplace Connection Manager to access users

Everyplace Connection Manager should now have access to the users. However, a search of users using Gatekeeper will not show the WebSphere Everyplace Access users because Everyplace Connection Manager requires its users to have an LDAP object of class wlUser. So, it is necessary to add this object to the WebSphere Everyplace Access users. This process can be done manually or automatically. For this sample scenario the manual approach is used.

1. Open IBM Directory Server Web Administration Tool on the Directory server. That is, open Internet Explorer (or any browser which is available) and enter the URL:

   `http://localhost:9080/IDSWebApp/IDSjsp/Login.jsp`

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Note: To start the Web Administration Tool, you must start the application server in which it was installed. For the embedded version of IBM WebSphere Application Server Express, go to the directory where you installed the IBM Tivoli Directory Server and issue the following command:

- UNIX®-based platforms:

```
<IDSdir>/ldap/appsrv/bin/startServer.sh server1
```

- Windows platforms:

```
<IDSdir>\ldap\appsrv\bin\startServer.bat server1
```

2. Select the Directory server as shown in Figure 9-17. Type its user name and password. Click **Login**.

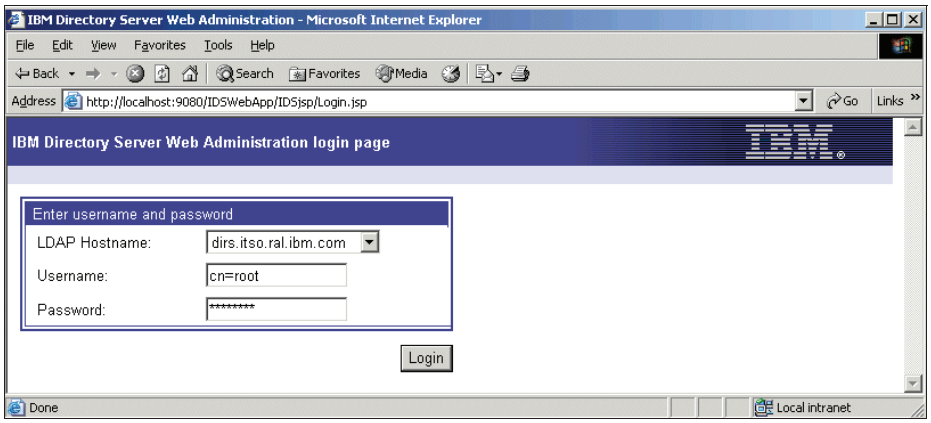

Figure 9-17 IBM Directory Server Web Administration login

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3. On the left-hand menu, select **Directory management** → **Manage entries** as shown in Figure 9-18. Select RDN™ related to the domain object class where the users were created.

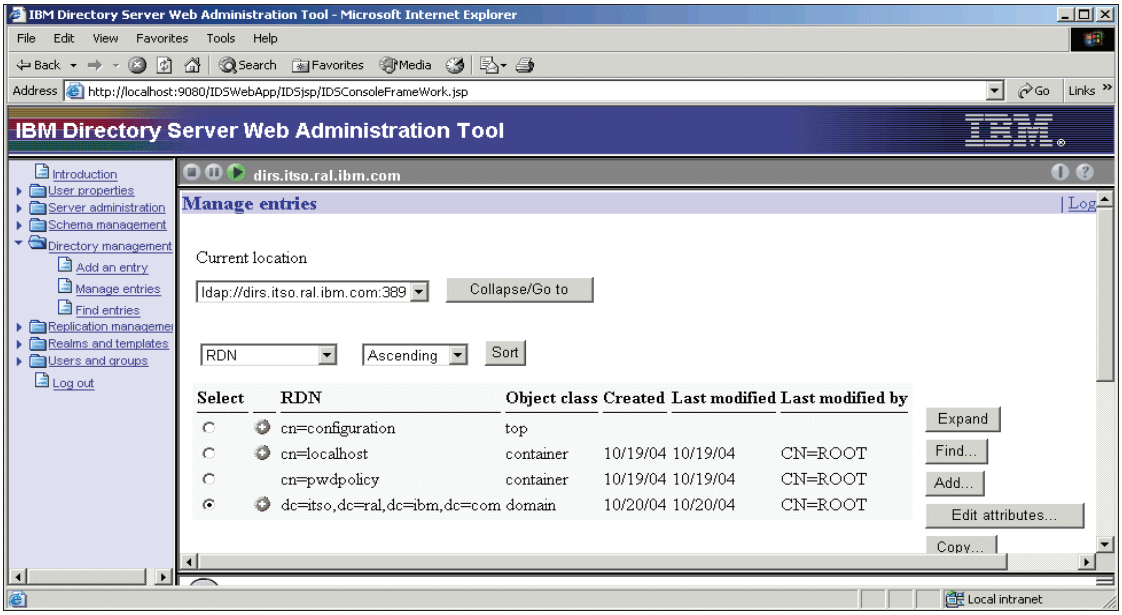

Figure 9-18 Manage entries

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4. Click **Expand**. In the next screen, select the Object class container, where RDN equals cn=users. Click **Expand** as illustrated in Figure 9-19.

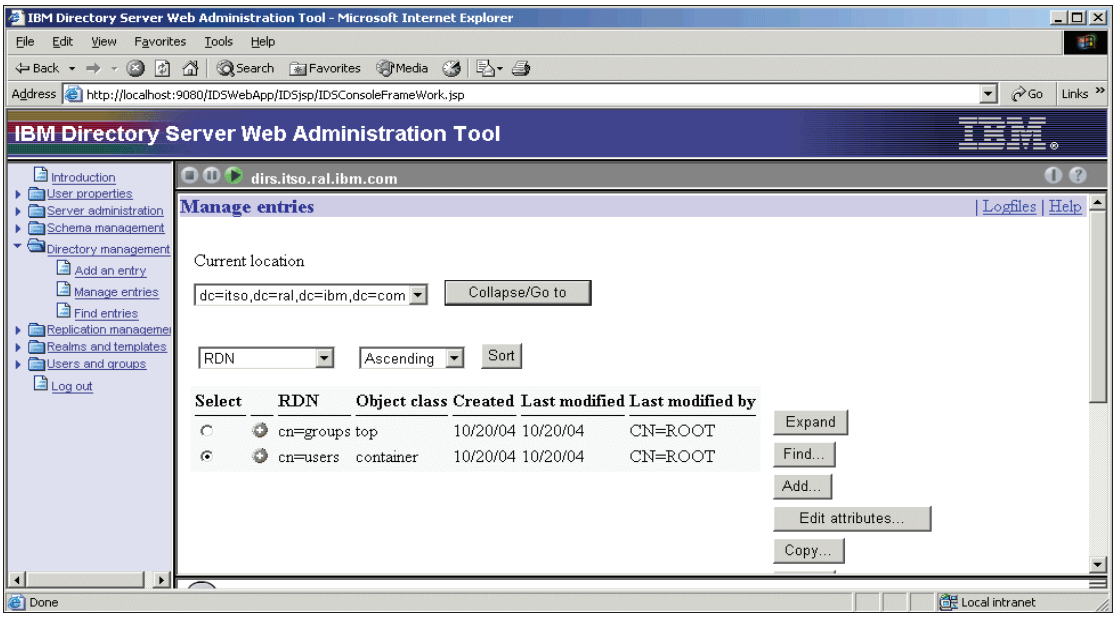

Figure 9-19 Manage entries (expanding branches)

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5. Select a previously created user (for example, `weauser1`), and click **Add auxiliary class** as shown in Figure 9-20.

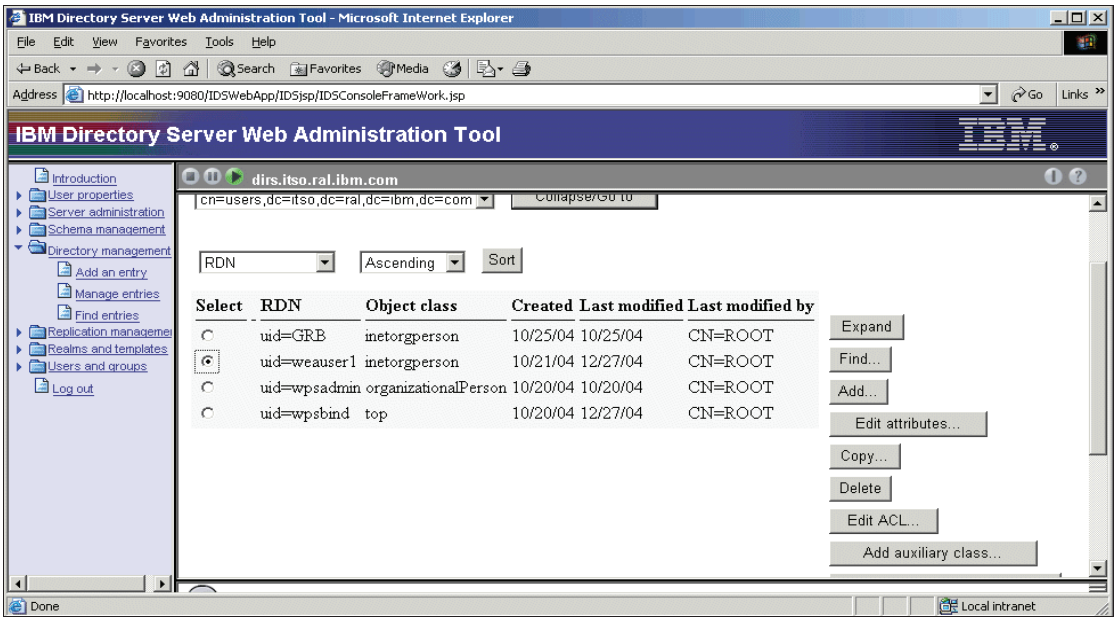

Figure 9-20 Add auxiliary class (1 of 2)

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6. Select the class **ibm-wlUser**. Click **Add** as shown in Figure 9-21.

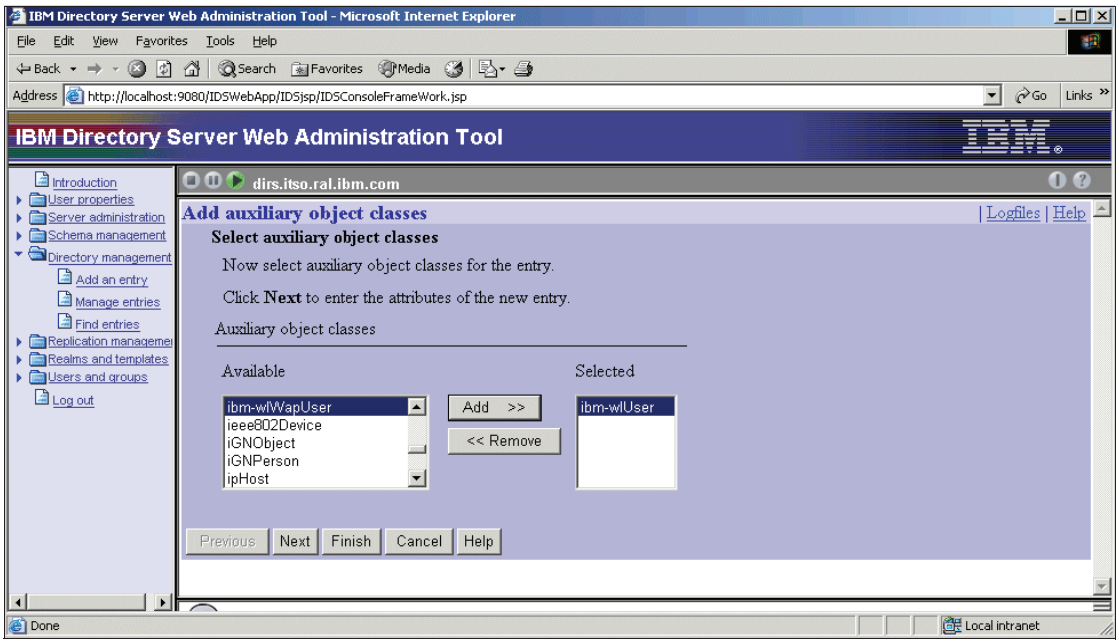

Figure 9-21 Add auxiliary class (2 of 2)

7. Click **Next**, and then **Finish**. Logout from IBM Directory Server Web Administration Tool.

9.3.2 Running the sample scenario

When you run the sample scenario, log in to Everyplace Connection Manager using the WebSphere Everyplace Access user, which has also been enabled for Everyplace Connection Manager. For example, using Everyplace Connection Manager HTTP Services:

1. Access WebSphere Everyplace Access portal by connecting to Everyplace Connection Manager using the following URL:

   `http://sles8.itso.ral.ibm.com/wps/myportal`

2. When receiving a certificate signed by an unrecognized Certificate Authority (for example, a self-signed certificate), you will receive a security alert. For testing purposes, accept the security alert.

3. As shown in Figure 9-22 on page 324, log in to Connection Manager with a valid user. Click **Login Now**.

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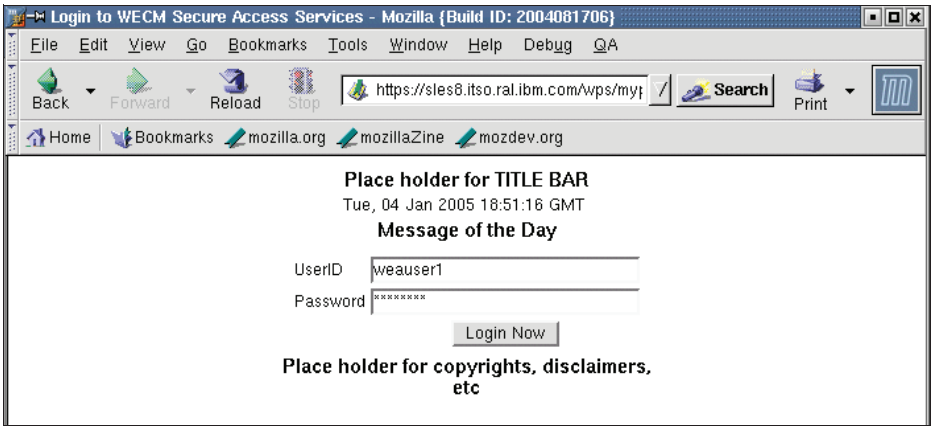

Figure 9-22 Everyplace Connection Manager integrated login

4. After you are authenticated by Everyplace Connection Manager, you have access to the WebSphere Everyplace Access welcome page. Log in to WebSphere Everyplace Access with the same user ID and password as shown in Figure 9-23.

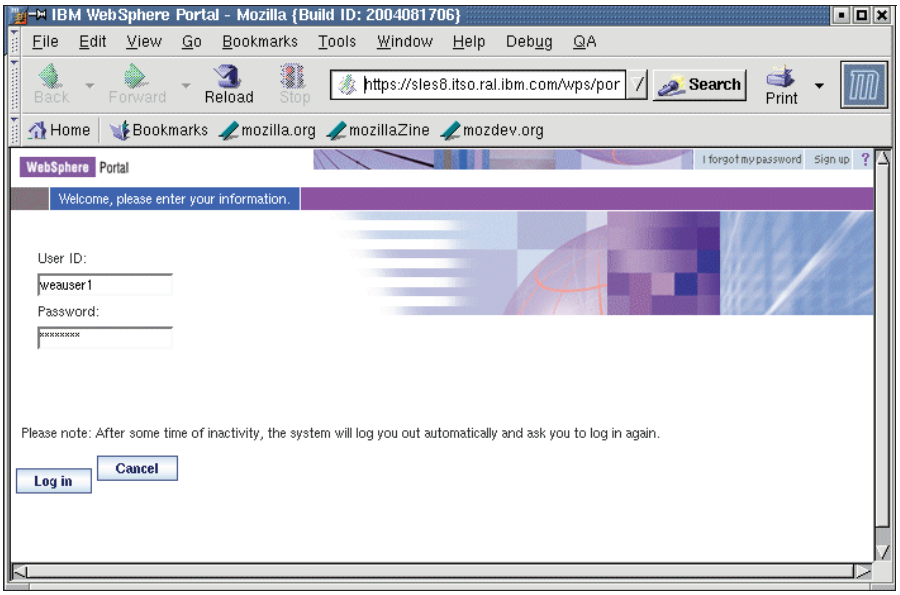

Figure 9-23 WebSphere Everyplace Access integrated login

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Although in this scenario WebSphere Everyplace Access is sharing users with Everyplace Connection Manager, you still need to log in initially to Everyplace Connection Manager and then to WebSphere Everyplace Access. This situation is solved by implementing SSO using the LTPA. For details about SSO and a sample scenario see Chapter 9, “WebSphere Connection Manager integration” on page 301.

9.3.3 PDA clients

In this section, a PDA (Pocket PC 2003) is used to access the sample application. The access is through Everyplace Connection Manager and its associated reverse proxy.

WebSphere Everyplace Access portal application

The portal application is a set of WebSphere Everyplace Access portlet applications. For example, follow these steps to access this server:

1. Open Internet Explorer from the PDA and enter the following URL:

   `http://sles8.itso.ral.ibm.com/wps/portal`

2. Select **Yes** to accept the self-signed certificate for the secure connection (SSL) with Everyplace Connection Manager as shown in Figure 9-24.

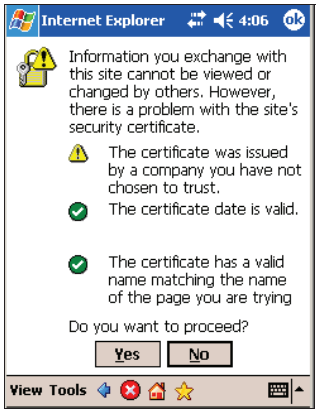

Figure 9-24 Accepting Everyplace Connection Manager self certificate

3. Login to Everyplace Connection Manager. Remember that this user now is located on a remote LDAP, and is the same one used by WebSphere Everyplace Access as shown in Figure 9-25 on page 326.

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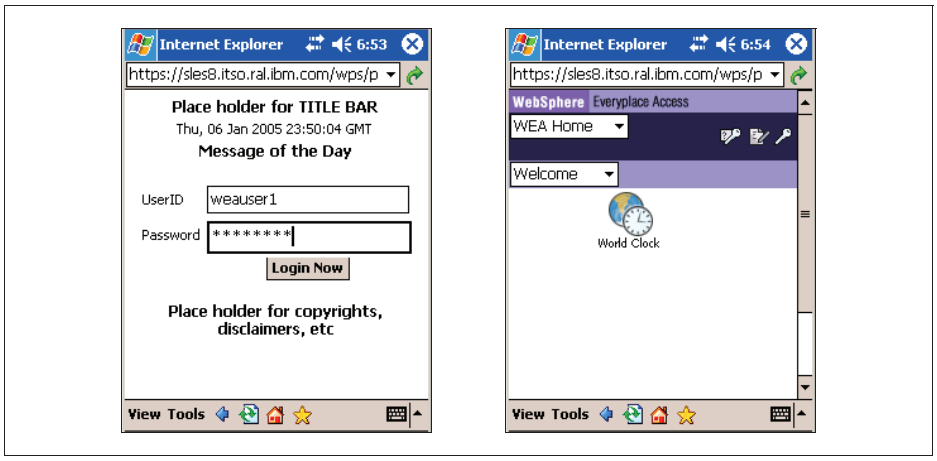

Figure 9-25 Everyplace Connection Manager login

4. Login to WebSphere Everyplace Access as shown in Figure 9-26.

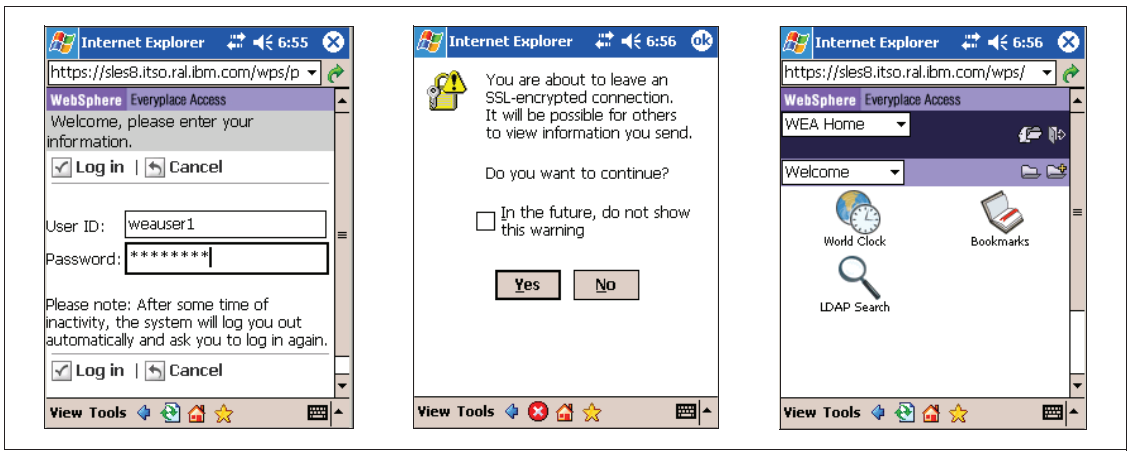

Figure 9-26 WebSphere Everyplace Access login

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10

WebSphere Connection Manager single sign-on using LTPA

This chapter provides information to establish single sign-on (SSO) between Everyplace Connection Manager and WebSphere Everyplace Access using the Lightweight Third Party Authentication (LTPA). SSO provides a way of enhancing usability by reducing the number of authentication challenges presented to a user. So, the only time a user has to enter credentials is at the initial challenge that is provided by Everyplace Connection Manager.

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10.1 Overview of SSO using LTPA

Many Everyplace Connection Manager environments include at least one application server used to process and serve data to a range of clients. These applications may require the user to be authenticated prior to sending any requests. WebSphere Everyplace Access is an example of such an application whereby the user is presented with a challenge prior to being authenticated in the system.

In a standard Everyplace Connection Manager environment, such a challenge by an application means that the user has to re-enter credentials despite already having done so to log in to the Everyplace Connection Manager. For the sake of enhanced usability, it is recommended that you avoid this type of double authentication.

This section discusses techniques that you can apply in an Everyplace Connection Manager environment to establish a relationship between Everyplace Connection Manager and downstream applications servers, thus creating SSO. With SSO, the user is only required to supply credentials for the initial Everyplace Connection Manager login. Any following requests to appropriately configured application servers recognizes that the user has already been authenticated and treats the requests accordingly.

Lightweight Third Party Authentication

Everyplace Connection Manager is able to generate LTPA tokens that can be used as the mechanism for establishing SSO between Everyplace Connection Manager and other supported applications for HTTP Access Services using HTTP access client authentication method. This connection is supported by both RADIUS and LDAP-bind type authentication profiles.

When enabled, an LTPA token is generated when an HTTP-based user is authenticated by Everyplace Connection Manager. This token is stored in a browser cookie to support SSO with other LTPA-enabled application servers.

All servers using Everyplace Connection Manager's LTPA support must have the same LTPA keys and password and must reside in the same DNS domain. The key may be generated either through the Gatekeeper or through a suitable application servers console, such as WebSphere Everyplace Access.

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Important: The SSO scenario shown in this chapter requires the latest fixpacks and code fixes. Visit the Connection Manager support Web site to get the latest fixes:

http://www.ibm.com/software/pervasive/ws_everyplace_connection_manager/support/

You should apply these fixes prior to using the sample scenario described in this chapter.

10.2 Sample scenario

In this section, a sample scenario shown in Figure 10-1 on page 330, is configured to illustrate the HTTP Access Services function implemented in Everyplace Connection Manager. In this sample scenario, the following machines are used:

- Everyplace Connection Manager server
  - SUSE Linux Enterprise Server 8 (Service Pack 3)
  - IBM DB2 Universal Database 8.2
  - IBM Directory Services V5.2
  - IBM WebSphere Everyplace Connection Manager V5.1
- LDAP Directory server
  - Microsoft Windows 2000 Server ServicePack 4
  - IBM Tivoli Directory Server 5.1
- Reverse Caching Proxy server
  - Microsoft Windows 2000 Server ServicePack 4
  - IBM WebSphere Edge Server 2.0
- WebSphere Everyplace Access server
  - Microsoft Windows 2000 Server ServicePack 4
  - IBM WebSphere Everyplace Access V5
- Gatekeeper
  - Microsoft Windows 2000 Professional
  - IBM WebSphere Connection Manager Gatekeeper V5.0
- HTTP client
  - SUSE Linux Enterprise Server 8 (Service Pack 3)
  - Mozzila 1.8a3

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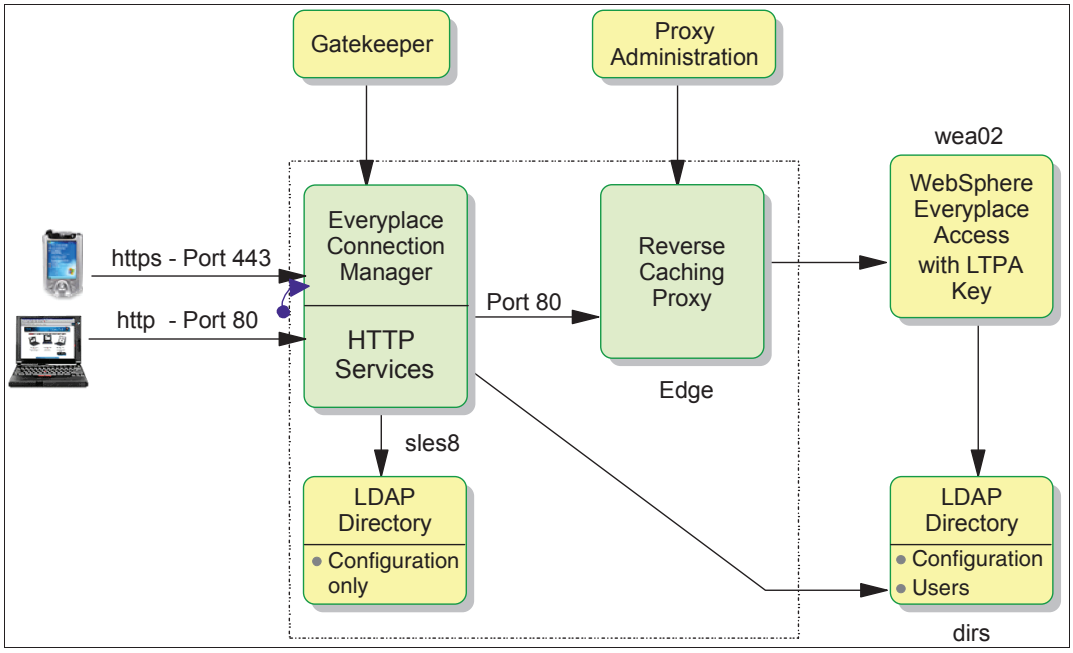

Figure 10-1 SSO using LTPA sample scenario

Everyplace Connection Manager

This machine runs HTTP Access Services in Everyplace Connection Manager V5.1.0.1. For details about HTTP Access Services, see Chapter 8, “Using Everyplace Connection Manager HTTP Access Services” on page 273.

Note: Everyplace Connection Manager V5.1.0.1 or later is required for this scenario. It is recommended that you verify this requirement before implementing SSO with LTPA. Execute the following command to make sure this version is installed:

```
lswg -V
```

The result should be similar to the output shown in Example 10-1.

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Example 10-1 Verifying Everyplace Connection Manager version

```
IBM WebSphere Everyplace Connection Manager Version 5.1.0.1 (5724-E80)
C) COPYRIGHT International Business Machines Corp. and others 1994, 2004
Licensed Material -- Program Property of IBM --
All Rights Reserved
Nov 17 2004 / 15:44:21
Supported MNCs:
wctp  Wireless Communications Transfer Protocol (WCTP)
snpp  Simple Network Paging Protocol (SNPP)
```

LDAP Directory server

The LDAP Directory server runs Tivoli Directory Server 5.1, and the installation for this scenario includes these components:

- Tivoli Directory Server 5.1
- DB2 Universal Database Server 8.1
- Tivoli Directory Server Web Administration Tool 5.1

Reverse Caching Proxy server

The reverse proxy machine plays a major role in the architecture, and it is responsible for redirecting the Everyplace Connection Manager messages to the WebSphere Everyplace Access server and vice-versa.

The reverse proxy must be specifically configured to work with Everyplace Connection Manager. Configuration options need to be made in the ibmproxy.conf file.

Note: For Windows machines, this file is located in the C:\Program Files\IBM\edge\cp\etc\en_US directory, assuming that you used the default values when you installed IBM WebSphere Edge Server.

Port directive

The reverse proxy configuration file (ibmproxy.conf) port directive is used in this sample scenario and should look as shown in Example 10-2.

Example 10-2 Port directive

```
#        Port directive:
#        Port used by the server.
#        Default:  80
#        Syntax:   Port <num>
Port 80
```

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Note: Versions before Everyplace Connection Manager 5.0.1.1 did not accept port 80 as a valid port.

SendRevProxyName directive

This directive must be configured so that application servers also send HTTP traffic back to the reverse proxy. The configuration is illustrated in Example 10-3.

Example 10-3 SendRevProxyName

```
#        SendRevProxyName directive:
#
#        In a reverse proxy scenario, WTE normally sends the destination
#        origin server name in the HOST header of the request to the origin
#        server.  If this directive is set to yes, WTE will instead send
#        the WTE host name in the HOST header of the request to the origin
#        server.  This allows the origin server to use the WTE host name in
#        redirects sent back.  Therefore, subsequent requests to redirected
#        locations will go through WTE.
#
#        Default:  no
#        Syntax:   SendRevProxyName <yes | no>
#
# Example:
# SendRevProxyName no

SendRevProxyName yes
```

Mapping rules

The mapping rules need to be updated because they vary for different scenarios. Applications use different paths for their content location. The added directives for this sample scenario are illustrated in Example 10-4 on page 333.

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Example 10-4 Mapping rules

```
# ================================================================== #
##        Mapping rules
## ================================================================== #

Exec  /admin-bin/* C:\PROGRA~1\IBM\edge\cp\server_root\admin-bin\*
Pass  /wsApplet/* C:\PROGRA~1\IBM\edge\cp\server_root\admin-bin\webexec\*
#
# HTTP Access Services changes - sample scenario
#Pass  /*       C:\PROGRA~1\IBM\edge\cp\server_root\pub\en_US\*
#
#        URL translation rules; If your documents are under
#
# NOTE: The installation defaults should be added below
# *** ADD NEW MAPPING RULES HERE ***
#
Pass  /pub/*    C:\PROGRA~1\IBM\edge\cp\server_root\pub\en_US\*
Proxy /wps/*    http://wea02.itso.ral.ibm.com/wps/*
# End of HTTP Access Services changes#
```

Note: After updating the configuration, restart the caching proxy service.

WebSphere Everyplace Access server

This machine runs WebSphere Everyplace Access V5.0, and the installation for this scenario includes WebSphere Everyplace Access Core Services. For this scenario the services are manually started in a specific sequence. Figure 10-2 shows that the WebSphere Application Server is not running.

```
C:\>cd C:\Program Files\websphere\AppServer\bin

C:\Program Files\websphere\AppServer\bin>serverStatus -all -user wpsbind -passwo
rd wpsbind
ADMU0116I: Tool information is being logged in file C:\Program
           Files\WebSphere\AppServer\logs\serverStatus.log
ADMU0500I: Retrieving server status for all servers
ADMU0505I: Servers found in configuration:
ADMU0506I: Server name: DMS_AppServer
ADMU0506I: Server name: Everyplace_Synchronization
ADMU0506I: Server name: server1
ADMU0506I: Server name: WEA_Server
ADMU0506I: Server name: WebSphere_Portal
ADMU0509I: The Application Server "DMS_AppServer" cannot be reached. It appears
           to be stopped.
ADMU0509I: The Application Server "Everyplace_Synchronization" cannot be
           reached. It appears to be stopped.
ADMU0509I: The Application Server "server1" cannot be reached. It appears to be
           stopped.
ADMU0509I: The Application Server "WEA_Server" cannot be reached. It appears to
           be stopped.
ADMU0509I: The Application Server "WebSphere_Portal" cannot be reached. It
           appears to be stopped.

C:\Program Files\websphere\AppServer\bin>_
```

Figure 10-2 Checking the initial status

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Figure 10-3 illustrates how to start the WebSphere Application Server manually.

```
C:\Program Files\websphere\AppServer\bin>startServer server1 -user wpsbind -pass
word wpsbind
ADMU0116I: Tool information is being logged in file C:\Program
           Files\WebSphere\AppServer\logs\server1\startServer.log
ADMU3100I: Reading configuration for server: server1
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server server1 open for e-business; process id is 1648

C:\Program Files\websphere\AppServer\bin>startServer WebSphere_Portal -user wpsb
ind -password wpsbind
ADMU0116I: Tool information is being logged in file C:\Program
           Files\WebSphere\AppServer\logs\WebSphere_Portal\startServer.log
ADMU3100I: Reading configuration for server: WebSphere_Portal
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server WebSphere_Portal open for e-business; process id is 2000

C:\Program Files\websphere\AppServer\bin>startServer WEA_Server -user wpsbind -p
assword wpsbind
ADMU0116I: Tool information is being logged in file C:\Program
           Files\WebSphere\AppServer\logs\WEA_Server\startServer.log
ADMU3100I: Reading configuration for server: WEA_Server
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server WEA_Server open for e-business; process id is 2208

C:\Program Files\websphere\AppServer\bin>_
```

Figure 10-3 Starting the servers manually

Figure 10-4 shows that the WebSphere Application Server is running.

```
C:\Program Files\websphere\AppServer\bin>serverStatus -all -user wpsbind -passwo
rd wpsbind
ADMU0116I: Tool information is being logged in file C:\Program
           Files\WebSphere\AppServer\logs\serverStatus.log
ADMU0500I: Retrieving server status for all servers
ADMU0505I: Servers found in configuration:
ADMU0506I: Server name: DMS_AppServer
ADMU0506I: Server name: Everyplace_Synchronization
ADMU0506I: Server name: server1
ADMU0506I: Server name: WEA_Server
ADMU0506I: Server name: WebSphere_Portal
ADMU0509I: The Application Server "DMS_AppServer" cannot be reached. It appears
           to be stopped.
ADMU0509I: The Application Server "Everyplace_Synchronization" cannot be
           reached. It appears to be stopped.
ADMU0508I: The Application Server "server1" is STARTED
ADMU0508I: The Application Server "WEA_Server" is STARTED
ADMU0508I: The Application Server "WebSphere_Portal" is STARTED

C:\Program Files\websphere\AppServer\bin>
```

Figure 10-4 Checking the final status

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10.3 Everyplace Connection Manager configuration

The Everyplace Connection Manager configuration for this scenario is done through Gatekeeper. The resources involved are:

- Authentication Profile
- HTTP Access Services
- Directory Services Server Definition
- Access Manager

10.3.1 Authentication profile

This section describes how to generate and export an LTPA key using the WebSphere Everyplace Connection Manager gatekeeper administrative tool.

1. If it is not already created, add an authentication profile resource.
2. After creating the authentication profile, double-click **Authentication Profile resource (**Figure 10-5).

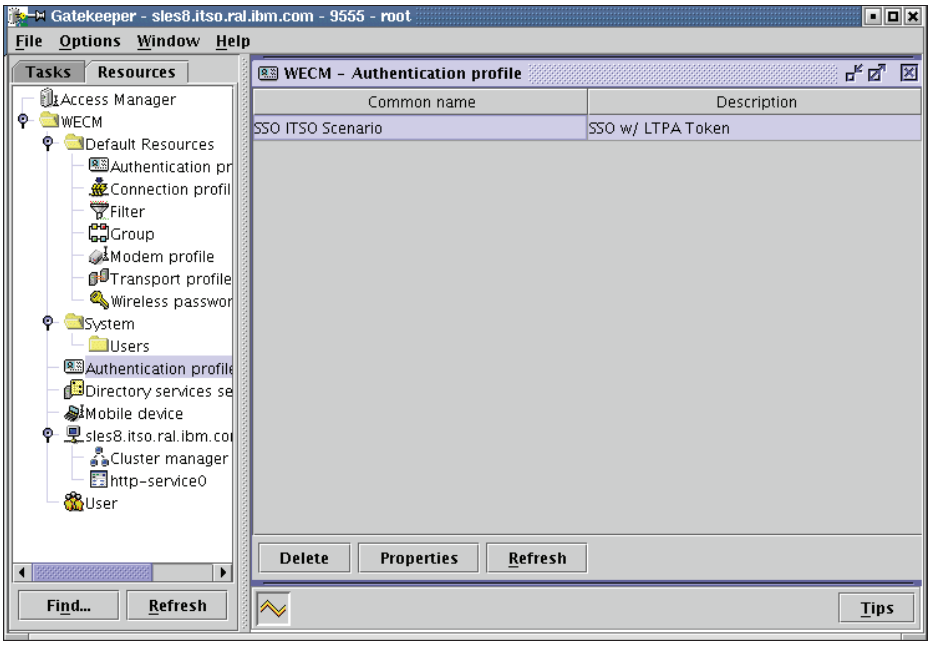

Figure 10-5 Authentication Profile List

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3. Select **Authentication Profile Common Name**, and click **Properties** (Figure 10-6).

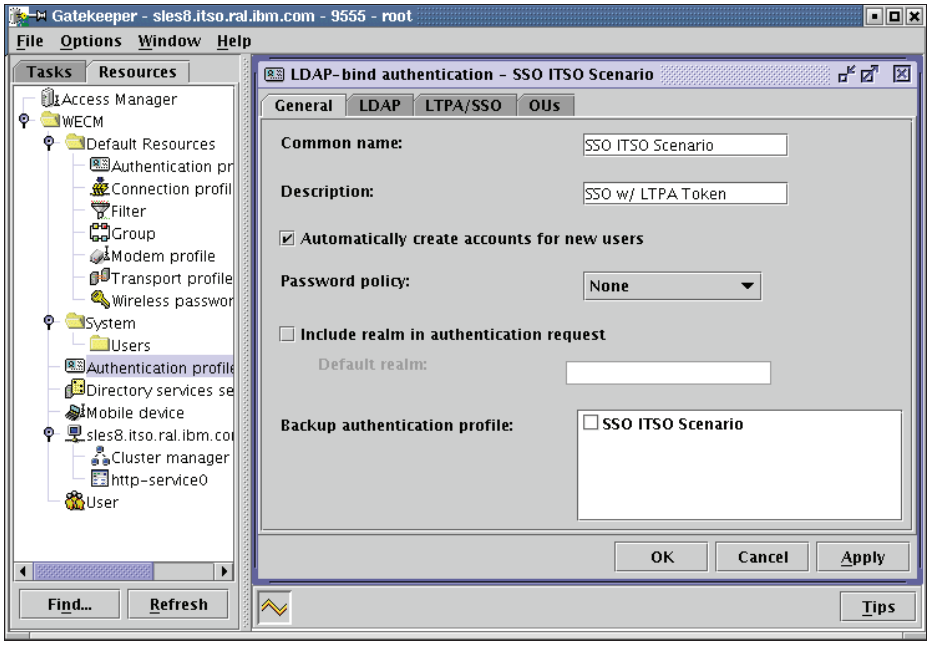

Figure 10-6 Authentication Profile (General tab)

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4. Select the LDAP tab (Figure 10-7). In the Directory Servers options, select the Directory server where the user data is located. The generated LTPA token contains this name, which is required to match when you import the key. Otherwise, the tokens do not match, and the scenario does not work properly.

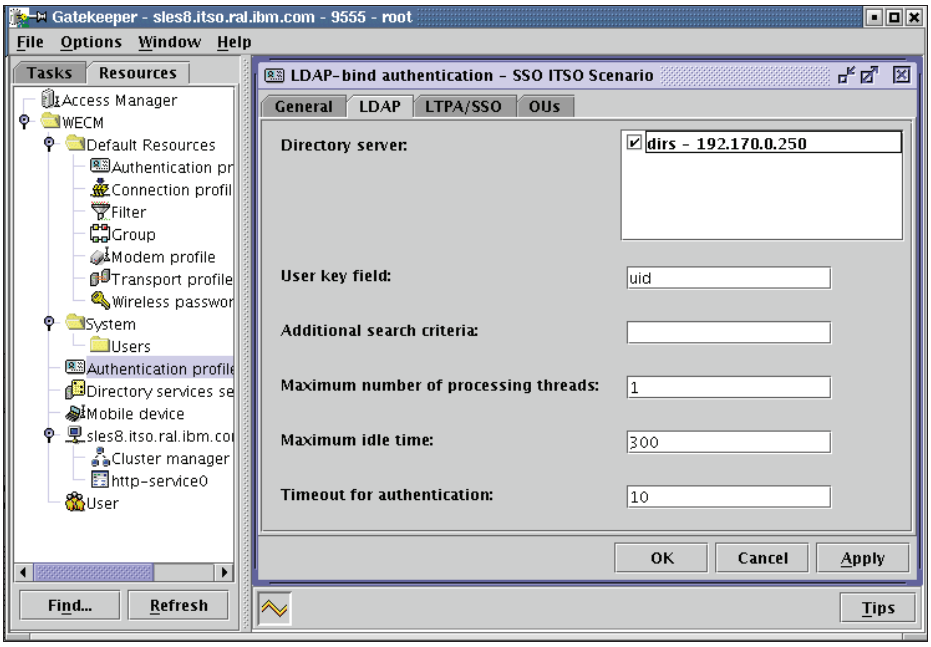

Figure 10-7 Authentication Profile (LDAP tab)

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5. Select the LTPA/SSO tab (Figure 10-8), and generate a new LTPA key by selecting **Generate new keys**, and then entering and confirming a password.

> **Note:** Keep and remember this password because it will be requested during the WebSphere Everyplace Access key import procedure.

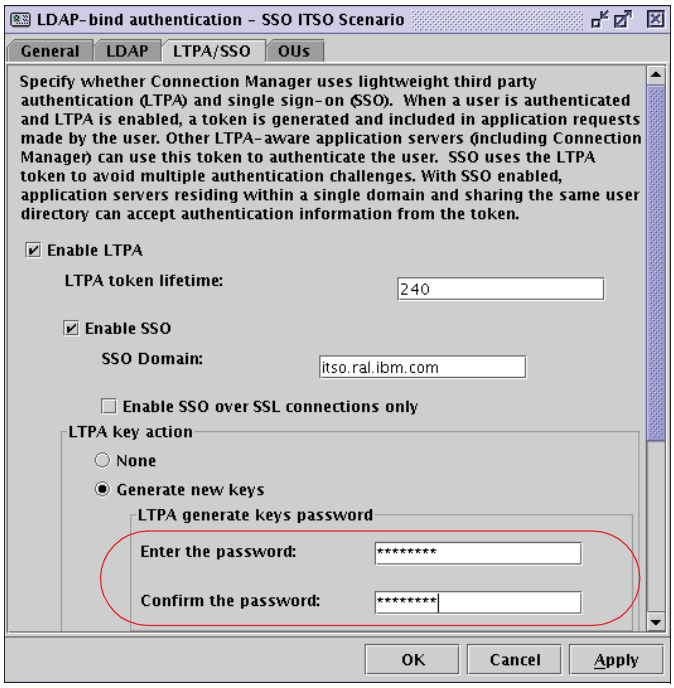

Figure 10-8 Authentication profile, generating a new LTPA key

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6. After the key has been generated, it has to be exported to a file (Figure 10-9). The LTPA file is created in the /opt/IBM/wecm directory of the Everyplace Connection Manager server.

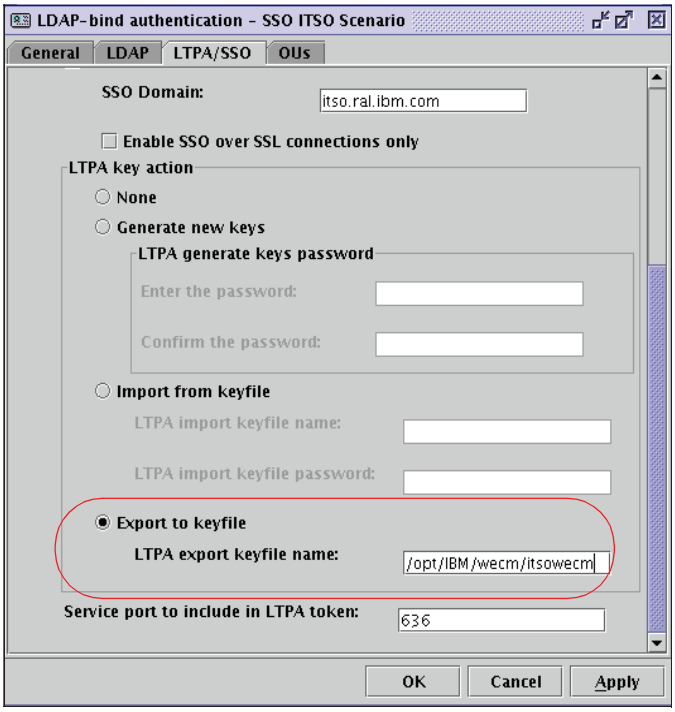

Figure 10-9 Exporting the LTPA key

A sample LTPA key is illustrated in Example 10-5 on page 340.

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Example 10-5 Sample LTPA key

```
#
#IBM WebSphere Everyplace Connection Manager
#Tue Dec 28 10:59:37 EST 2004
com.ibm.websphere.CreationDate=Tue Dec 28 10\:59\:37 EST 2004
com.ibm.websphere.ltpa.PublicKey=APwBAGlFtOeVmtBgQqAr9ptUagR3Rfe9sO6C833vGp5S7V
aKZg3pyRrWHB33W+mVvSsAFLc9Cr1BRTdrgWBmRMOPS4vnYcokrLdTrkkcE7ttiqwOjZHJlovdCNzZO
fYBXeHNvsr4owW7V8ySrkiKm1a861nlZQTDu/SnWGEOf+5HAQAB
com.ibm.websphere.ltpa.PrivateKey=kQY6jn38t8MgLtaalSQlJelr1c6pIbL4dWd/2OMiGOhhu
XyCOwsLvh2wItIj7pEkh8Y2hS3h9K8njFJ89tONv+v5NOpXjzM/Zn9A+SRaBEO6KsmBAI5fpN/Xffn/
CR5vITfz7pYZjUlSYSK6iM314RIs8aJDLnJEPZzuzvtiwFLZnOxeyNfz9u524LPqdQK/jEX4jb+IudQ
XdD7/sUyZO2HJrUvXx6zjfWcmQO5gehdoDT9E4VnOuCXa/LNy4HdYDwBOSG3LWhkuwdAwnFAS9cjrAp
1iSc9pgbQryWIYXKEEDkp4y7zoZ8K26T65F51CcJtD7zVgRZW+2axRVDhK9VjHQfObxjVYUX5g/sONo
2k\=
com.ibm.websphere.ltpa.3DESKey=yUcTnwwjhFiFLuRWVgGmJXEZD3q3PZeOp7ji+BJPSDM\=
com.ibm.websphere.ltpa.Realm=0.0.0.0\:389
com.ibm.websphere.CreationHost=sles8
com.ibm.websphere.ltpa.version=1.0
```

10.3.2 Enabling HTTP Access Services

This section shows the HTTP Access Services configuration for the sample scenario where Everyplace Connection Manager and WebSphere Everyplace Access are integrated to share LDAP users and implement SSO using LTPA.

Execute the following steps to enable HTTP Access Services:

1. Log in to Gatekeeper, right-click and double-click **HTTP Access Service resource**.

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2. The SSL tab is brought up as illustrated in Figure 10-10. In this window, all default fields are used.

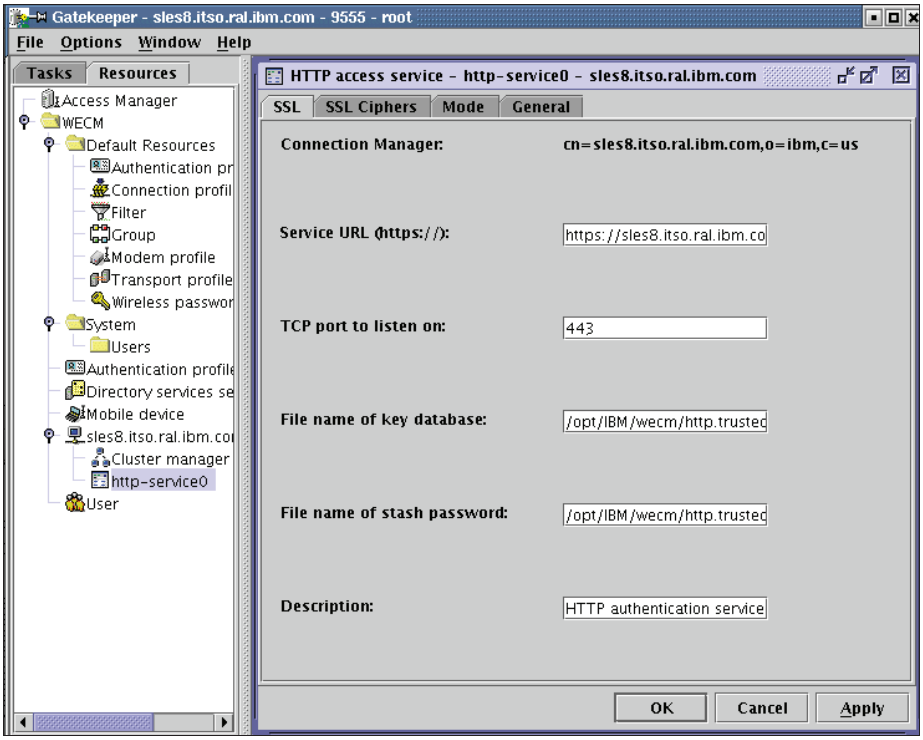

Figure 10-10 HTTP Access Services (SSL tab)

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3. Click the Mode tab, and make sure the Authentication Profile field is set to use the SSO profile previously created.

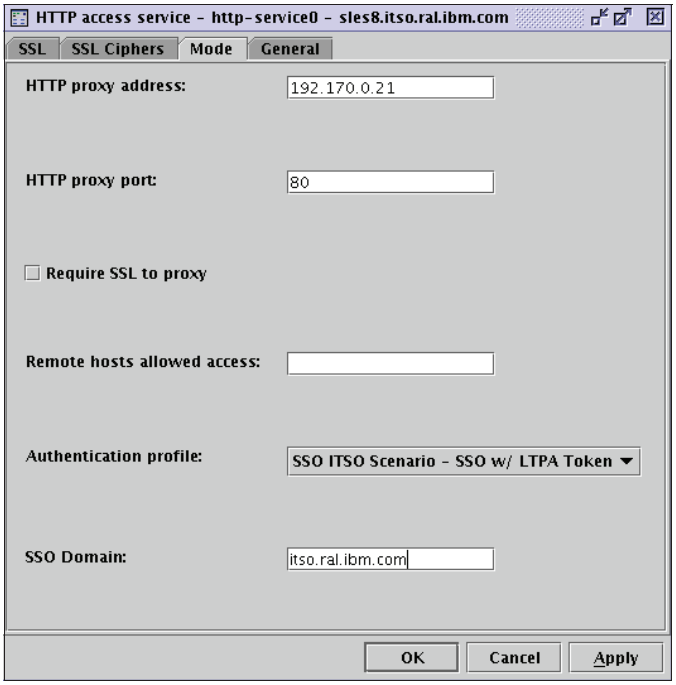

Figure 10-11 HTTP Access Services (Mode tab)

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4. Click the General tab, and check that the Redirect HTTP ports field is set to 80 for this scenario.

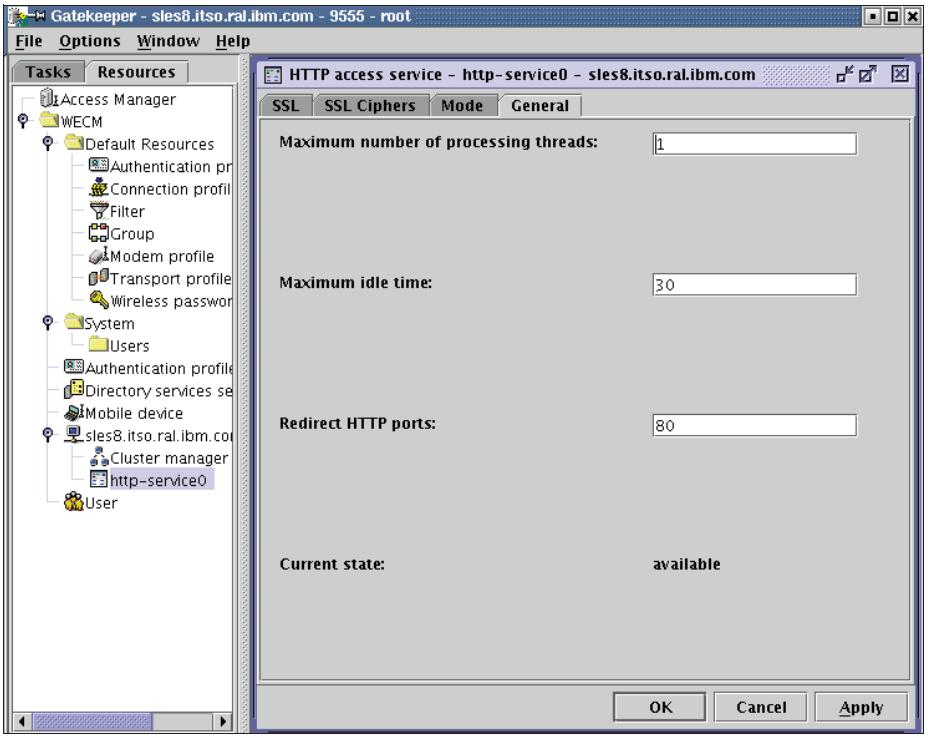

Figure 10-12 HTTP Access Services (General tab)

10.3.3 Directory Services Server

The LDAP directory for users is located in the Directory server, and in order for Everyplace Connection Manager to share the same directory, this resource has to be created.

To create this resource:

1. If it is not already created, add a Directory Services Server resource to Connection Manager.

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2. Double-click **Directory Services Server resource** (Figure 10-13).

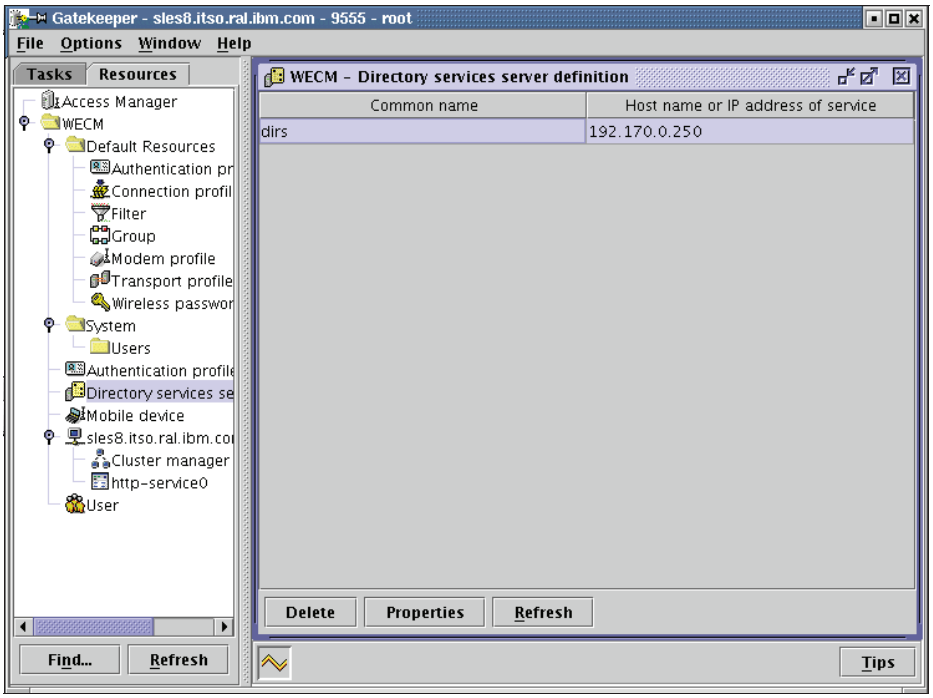

Figure 10-13 Directory Services Server list

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3. Select the resource created and click **Properties** (Figure 10-14). Enter the host name or IP address of the service field with the LDAP server.

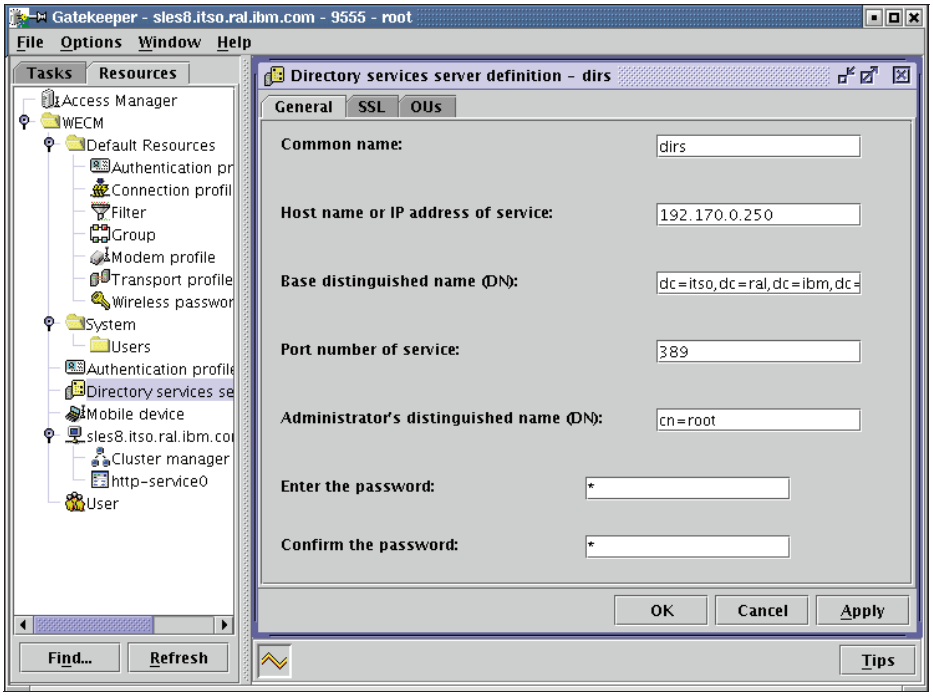

Figure 10-14 Directory Services Server (General tab)

10.3.4 Access Manager

Everyplace Connection Manager has to point its requests for users to the newly created Directory Services Server.

This is done by the Access Manager:

1. Double-click **Access Manager resource** and click the User DSS tab.
2. Select the user enterprise directory server, and select the box that has the Directory Services Server that you created previously.

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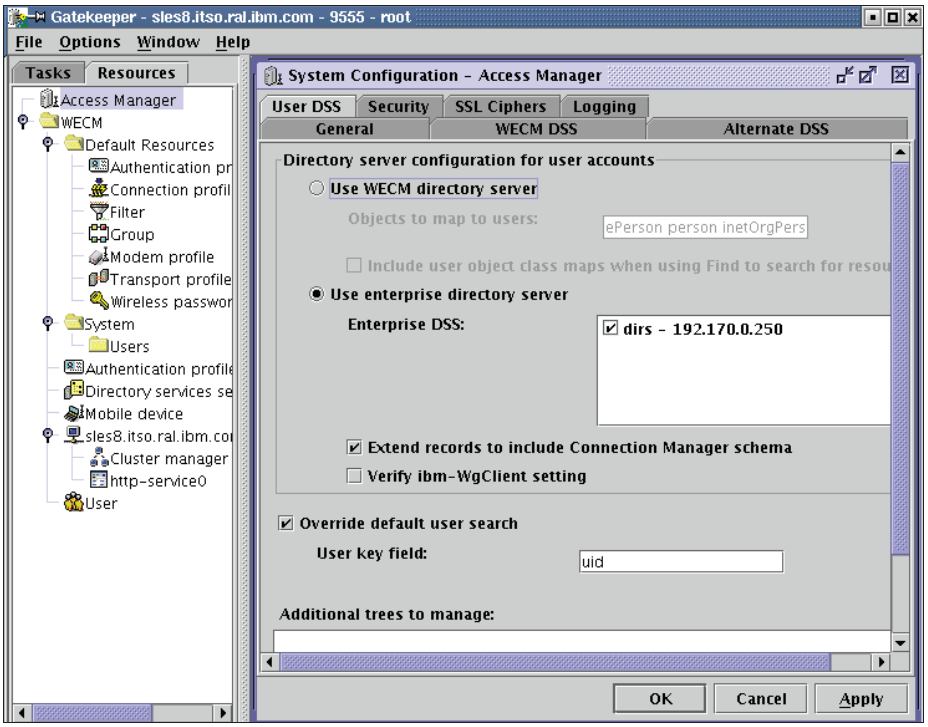

Figure 10-15 Access Manager (User Directory Services Server tab)

Note: At this time, we recommend that you restart Everyplace Connection Manager to make sure all the configuration updates are taken.

10.4 WebSphere Everyplace Access configuration

The exported LTPA key (see details in 10.3.1, “Authentication profile” on page 335) should now be imported into WebSphere Everyplace Access. To import the LTPA key:

1. Select **Start** → **Programs** → **IBM WebSphere** → **Application Server V5.0** → **Administrative Console**.
2. As shown in Figure 10-16 on page 347, log in to WebSphere Everyplace Access with the following parameters:
   - User: wpsbind
   - Password: wpsbind

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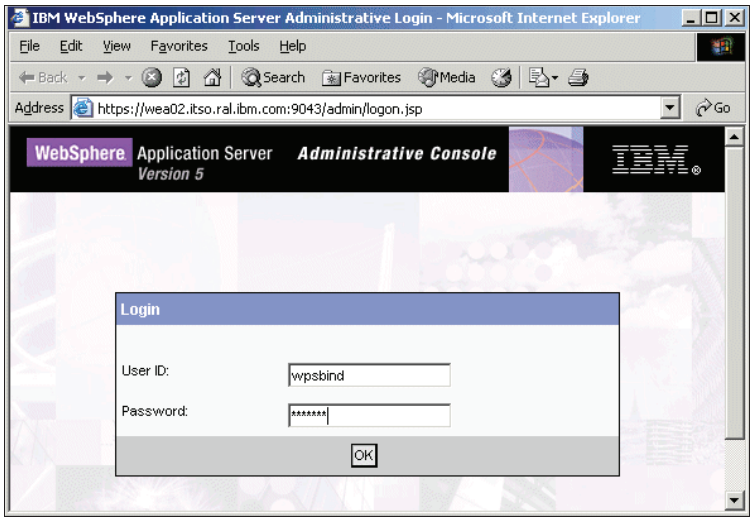

Figure 10-16 WebSphere Everyplace Access Login

3. Select **Security** → **Global Security**, and make sure Security is enabled as shown in Figure 10-17.

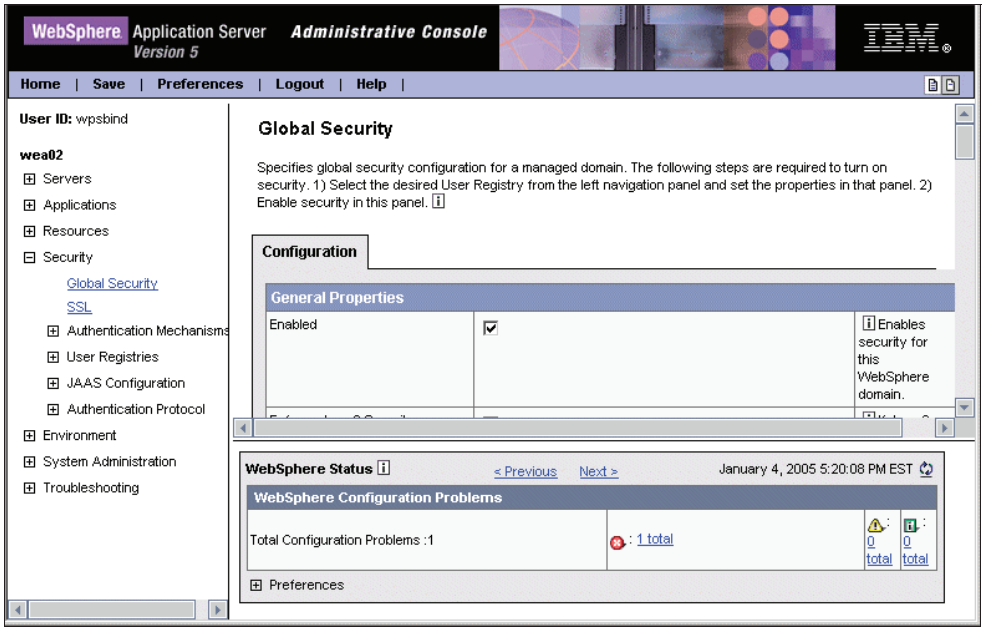

Figure 10-17 Global Security

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4. Click the Authentication Mechanism → LTPA tab to import the LTPA key (Figure 10-18).

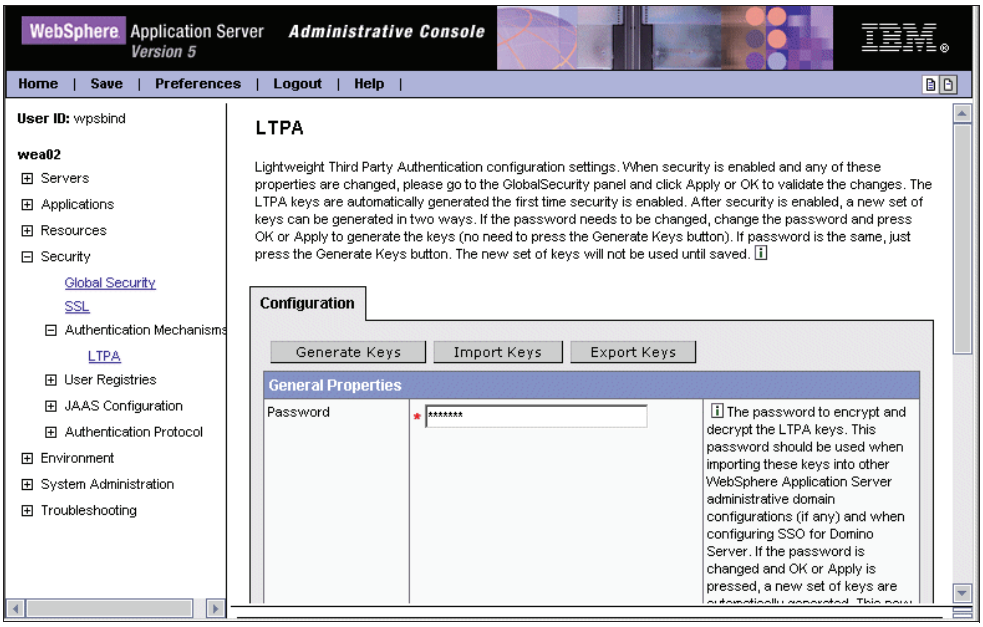

Figure 10-18 Security Center (Authentication tab)

5. Import the generated LTPA key (exported from Everyplace Connection Manager) by filling in the LTPA configuration fields as shown in Table 10-1.

Table 10-1 LTPA configuration fields

Field	Content	Description
Password	itsowecm	The same password when you generated the key
Confirm Password	itsowecm	
Timeout	120	Do not change the default
Key File Name	c:\temp\itsoltpa	The full path where the file was copied to WebSphere Everyplace Access server

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6. Click **Apply** (see Figure 10-19), then click **OK**.

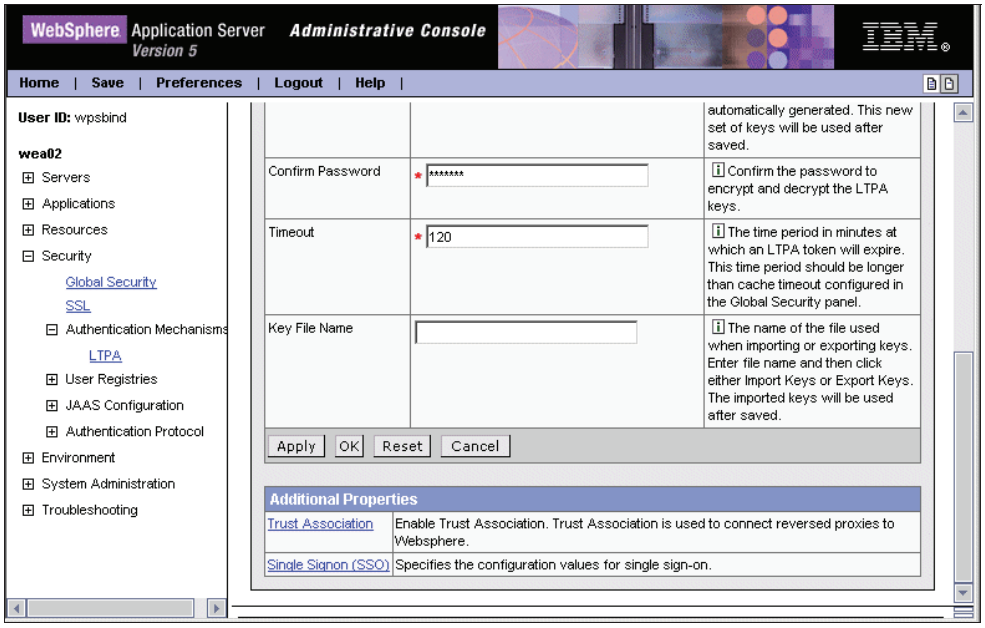

Figure 10-19 Applying the LTPA Token

7. Exit the administrative console.
8. Stop and start the IBM WebSphere Administrative Server V5.0 service to make sure all the changes are enabled.

10.5 Running the scenario

After you have completed the configurations, the scenario is ready to run. To run the scenario:

1. Open Internet Explorer.
2. Enter the following URL:

   `http://sles8.itso.ral.ibm.com/wps/myportal`

3. Press **Enter**.

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4. For testing purposes, click **OK** to any security alert windows (Figure 10-20).

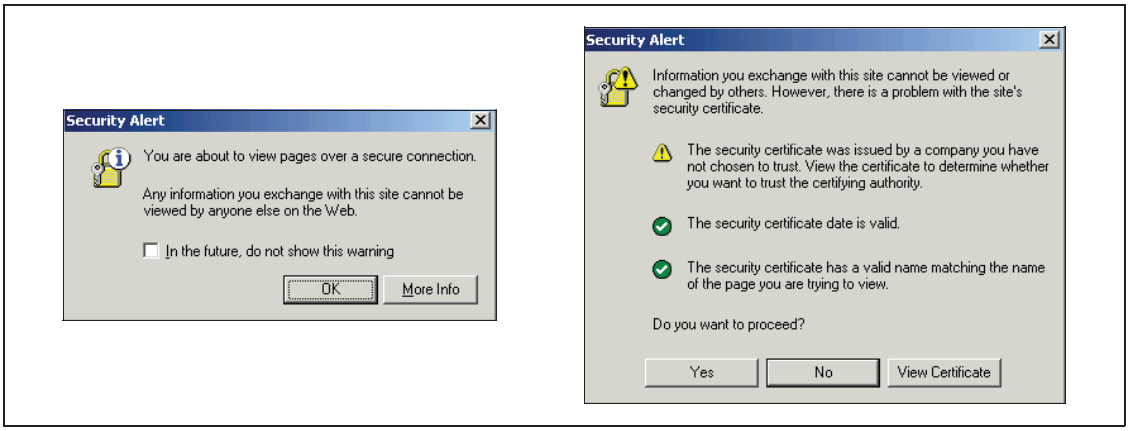

Figure 10-20 Security alert windows

5. Click **Yes** and enter the Everyplace Connection Manager user ID and password. For this scenario, `wpsbind` user ID is used. This user was created by default during the WebSphere Everyplace Access installation.
6. Click **Login Now** to log in to Everyplace Connection Manager and WebSphere Everyplace Access at the same time.

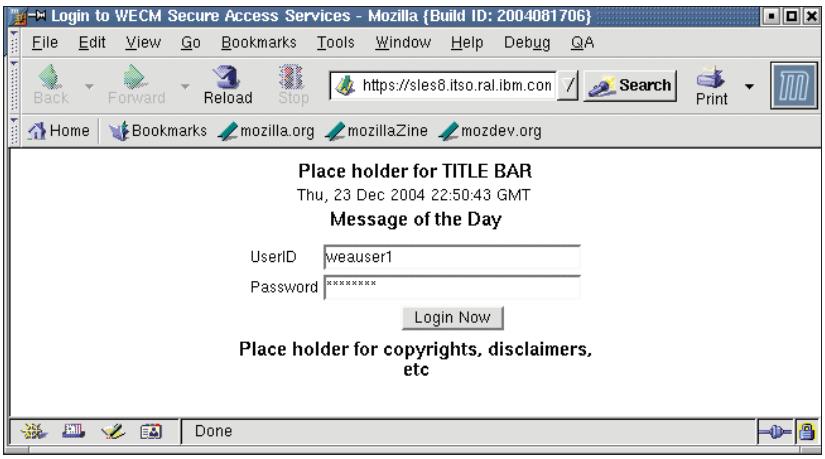

Figure 10-21 Everyplace Connection Manager login window

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7. Everyplace Connection Manager login activates the SSO function using LTPA, and the user is automatically authenticated by WebSphere Everyplace Access and connected to the portal page as shown in Figure 10-22.

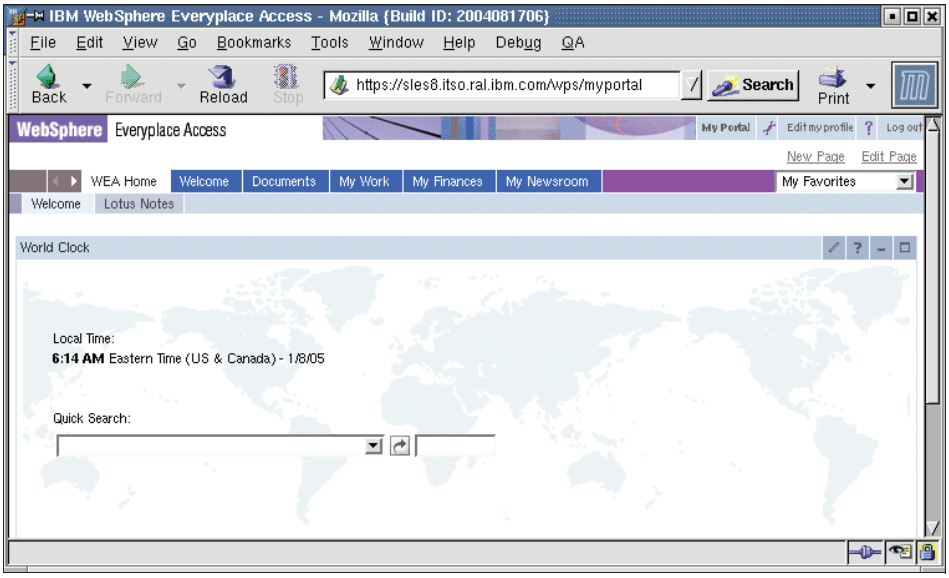

Figure 10-22 WebSphere Everyplace Access portal page

10.5.1 PDA clients

In this section a PDA (Pocket PC 2003) is used to access the sample application. The access is through Everyplace Connection Manager and its associated reverse proxy.

WebSphere Everyplace Access portal application

The portal application is a set of WebSphere Everyplace Access portlet applications. To access this server:

1. Open Internet Explorer from the PDA and enter the following URL:

   `http://sles8.itso.ral.ibm.com/wps/myportal`

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2. Select **Yes** to accept the self-signed certificate for the secure connection (SSL) with Everyplace Connection Manager (Figure 10-23).

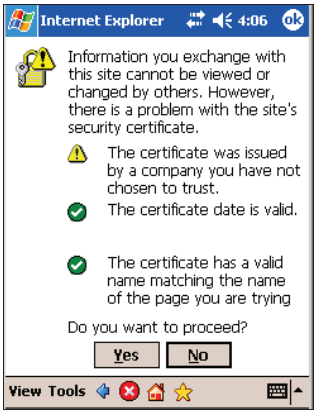

Figure 10-23 Accepting Everyplace Connection Manager self certificate

3. Login to Everyplace Connection Manager. Remember that this user now is located on a remote LDAP and is the same user ID used by WebSphere Everyplace Access. Because you have now implemented SSO, the WebSphere Everyplace Access login will be done automatically for you (Figure 10-24).

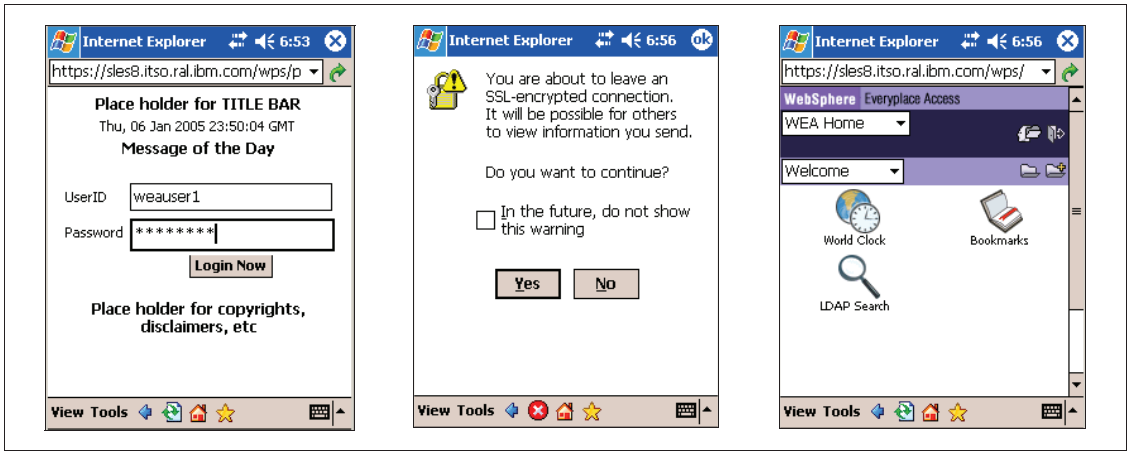

Figure 10-24 WebSphere Everyplace Access login

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10.6 Troubleshooting

This section provides some guidelines to help you troubleshoot potential issues that you might encounter when implementing SSO with an LTPA token in Everyplace Connection Manager.

WebSphere Everyplace Access issues

In general, you need to make sure that the applications run properly when not going through Everyplace Connection Manager. For example, for the sample scenario included in this chapter, the following URL is used to access applications directly from a desktop browser:

`http://wea02.itso.ral.ibm.com/wps/myportal`

Reverse proxy issues

It is recommended that you follow the request progress using the reverse proxy activity monitor function:

1. Access the WebSphere Edge Server Caching Proxy front page.

   `http://edge/pub/FrntPage.html`

2. Click **Configuration and Administration Forms**, and log on to caching proxy administration.
3. Click **Server Activity Monitor** → **Activity Statistics**.

> **Note:** t is a good procedure to clear the activity statistics before running your scenario by refreshing the IBM Caching Proxy service.

Figure 10-25 on page 354 illustrates the statistics for the reverse proxy traffic.

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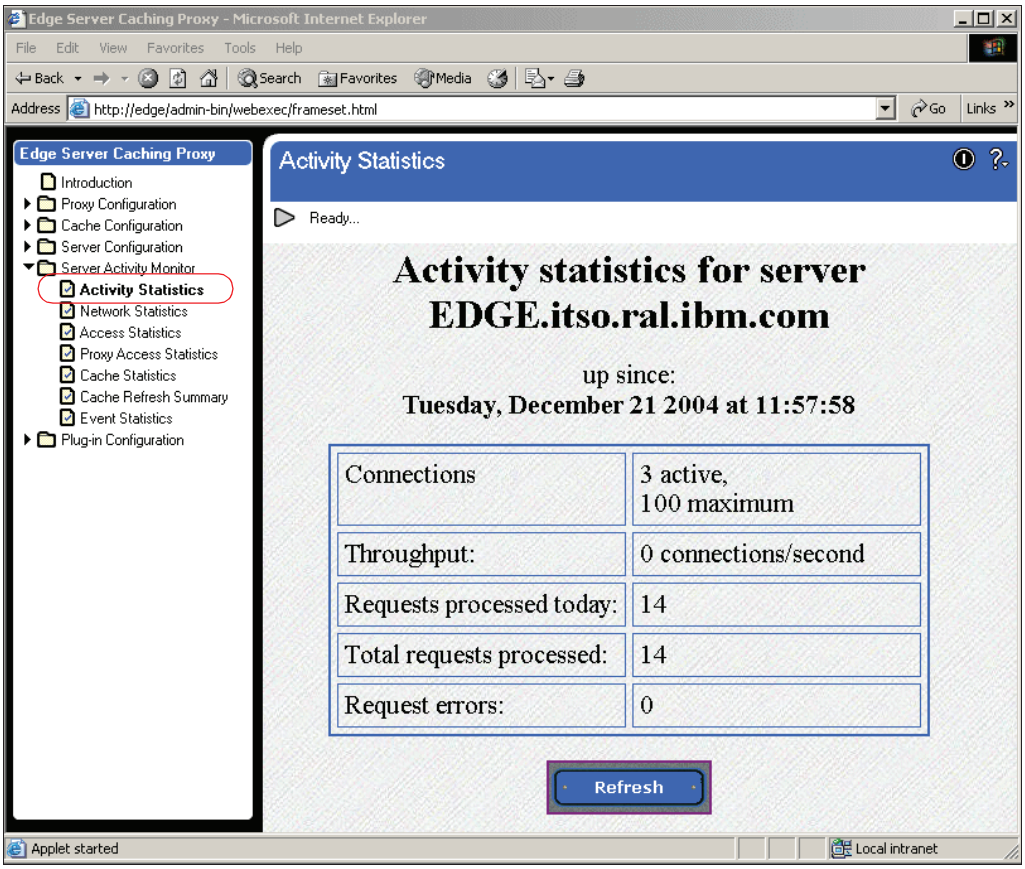

Figure 10-25 IBM WebSphere Edge Server activity statistics

SSO with LTPA transactions

To make sure LTPA has been started properly, open the wg.log file. This file is located in the /var/adm directory.

It is recommended that you enable logging when troubleshooting SSO and LTPA issues in Everyplace Connection Manager. A sample configuration is shown in Figure 10-26 on page 355 where logging levels are set and the location of the log files are defined.

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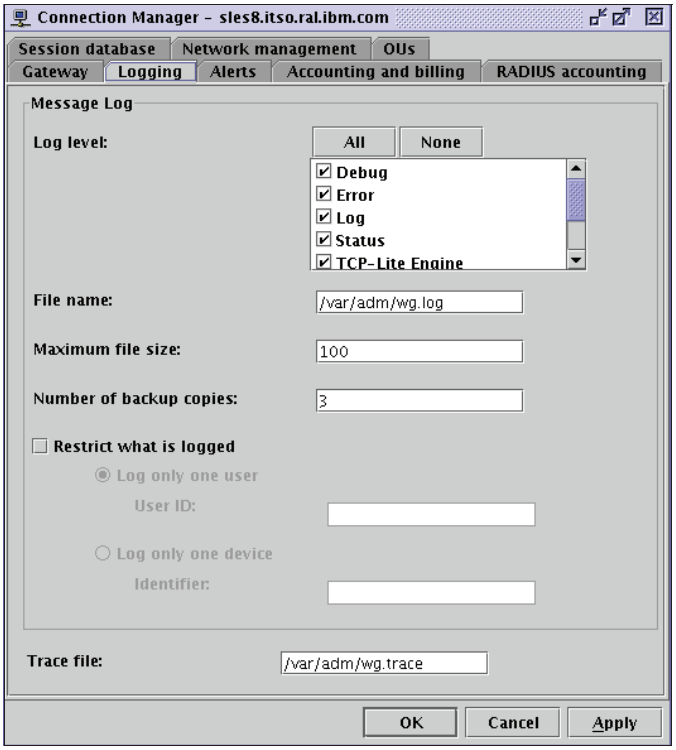

Figure 10-26 Logging configuration

Other miscellaneous recommendations

In general, it is always a good practice to do the following:

- Restart HTTP Access Services when its properties are changed.
- Restart Everyplace Connection Manager whenever an LDAP change is made.
- Restart WebSphere Everyplace Access whenever a change on the security settings is made.

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A

SUSE Linux sample installation

This appendix highlights how to install SUSE Linux Enterprise Server V8 for the IBM WebSphere Connection Manager V5.1 that is used in the integration chapters with WebSphere Everyplace Access. In addition, this appendix includes details about performing common administrative tasks and examples for executing commands.

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Installing SUSE Linux

This section explains the steps to install SUSE Linux Enterprise Server V8 for the ITSO working example. This procedure includes post installation configuration and the installation of SUSE Linux Service Pack 3.

The SUSE Linux installation includes the following tasks:

1. Planning considerations.
2. Installing SUSE Linux Enterprise Server V8.
3. Configuring the SUSE Linux post installation.
4. Installing SUSE Linux Service Pack 3.
5. Installing and updating Perl.
6. Configuring IBM Java Runtime Environment V1.3.1.
7. Installing Mozilla Web browser (optional).
8. Starting VMWare toolbox (optional).

Planning considerations

The SUSE Linux Enterprise Server V8 is built upon the UnitedLinux V1.0 distribution.

Tivoli Directory Server and openldap-client

The openldap-client libraries are installed by default during the SUSE Linux Enterprise Server V8 installation. The Tivoli Directory Server installer overwrites some of the openldap-client libraries. The following are methods to resolve these issues:

- Uninstall openldap-client files if it is not needed.
- Move openldap-client files to avoid configuration conflict and keep shared libraries dependent on the openldap-client needed by many other Linux packages.

> **Note:** We chose this second option for this book. This option moves the openldap-client files to a new directory (/usr/bin/openldapclient) prior to the Tivoli Directory Server. It allows the shared libraries that are dependent on the openldap-client to exist on the node. It also provides an environment that does not conflict with the Tivoli Directory Server.

- Coexistence between openldap-client and Tivoli Directory Server.

  For more information about this option, refer to the following:

  http://www.ibm.com/developerworks/linux/library/l-ss4-itds/

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Java Runtime Environment

By default, SUSE Linux installs the SUN Java Runtime Environment (JRE) V1.3. We found that such applications as DB2 Universal Database (UDB), Tivoli Access Manager, and the IBM GSKit were dependent on the IBM Java Runtime V1.3.1. We found that the SUN JRE caused problems to leave it installed. For this reason, we uninstalled the SUN JRE.

For more information, see “Configuring IBM Java Runtime Environment V1.3.1” on page 366.

Perl required by IBM GSKit installer

Perl is required by the IBM GSKit installer. We need an updated version of the IBM GSKit to properly create the key store and certificates. The version of the IBM GSKit supplied with the IBM Tivoli Directory Server V5.2 does not work properly.

Refer to “Installing and updating Perl” on page 364 for details.

VMWare Workstation tools considerations

If you are using VMWare to build a test environment, as is the case for the ITSO working example test environment, after the SUSE Linux installation, you must install the VMWare tools to optimize performance.

Refer to “Installing VMWare tools” on page 362 for more information.

VMWare Workstation and network configuration

If you are using VMWare to build a test environment, as is the case for the ITSO working example test environment, after the SUSE Linux installation, we recommend that you configure the TCP/IP network using static addresses and use the /etc/hosts file to resolve names. For example, we included the following in /etc/hosts file for each of our nodes:

```
192.168.2.100 ldaplx1.itso.ral.ibm.com ldaplx1
192.168.2.110 wpslx1.itso.ral.ibm.com wpslx1
192.168.2.120 tamlx1.itso.ral.ibm.com tamlx1
192.168.2.130 wslx1.itso.ral.ibm.com wslx1
```

Installing SUSE Linux Enterprise Server V8

To install the SUS Linux Enterprise Server V8:

1. Insert UnitedLinux CD1, and boot it from the drive to start the installer.
2. When you see the SUSE Linux Enterprise Server startup window, select **Installation**.

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3. In the UnitedLinux license agreement window, review the agreement, and click **Accept** if you agree to the conditions of the agreement.
4. In the Welcome to YaST window, select the desired language (for example, English - US), and then click **Accept**.
5. In the Installation Settings window, make the appropriate selections. Then, click **Accept**. For this example, we made the following selections:
   - Mode: new installation (default)
   - Keyboard layout: English - US (default)
   - Mouse: IntelliWheel mouse - Aux-port (default)
   - Partitioning:
     - Create swap partition 1.0 GB on /dev/sda1
     - Create root partition 9.0 GB (/dev/sda2 with reiser)

     Note: In our example, we use VMWare Workstation V4.5.2 with a 10 GB virtual hard disk 1024 MB of virtual memory. For a test environment, we choose to create one root partition for all software to be installed. In a production environment, you may choose to create separate partitions.

   - Software:

     There are many possible software options. We selected or deselected the options shown in Table A-1 for our configuration by clicking **Software** and then clicking **Detailed selection**, making the necessary changes, and then clicking **Accept**.

Table A-1 Software options

Select	Deselect
C/C++ Compiler and Tools gcc, gcc-c++, kernel-source, make	C/C++ Compiler and Tools gdb
KDE Desktop Environment (default)	Gnome system
LSB Runtime Environment (default)	Simple Web server
Help & Support Documentation (default)	Authentication Server - NIS, LDAP, Kerberos
Graphical Base System (default)	DHCP and DNS Server
YaST2 configuration modules	Mail and News Services
Analyzing Tools	SLES Administration Tools
File & Print Server - NFS, Sambak, Cups	

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- Booting: Booting from 1.SCSI 10 GB, /dev/sda, VMWare, -VMWare Virtual S (default)
- Time zone: US/Eastern
- Language: English - US

6. When you are finished, click **Accept**.
7. You may see the following warning message:

   ```
   YaST2 has obtained all the information required to install SUSE LINUX. The
   installation will be carried out according to settings made in the previous
   dialogs. To commit the installation and all choices mad so far, choose
   "Yes". Choose "No" to return to the previous dialog. Start Installation?
   ```

8. Click **Yes, install**.
9. Insert UnitedLinux Version 1.0 CD1 when prompted, and then click **OK** to continue.
10. When the installation is complete, you should see the following message:

    ```
    The base system was successfully installed. Your machine must now be
    rebooted. Please remove all installation media (CD-ROM).
    ```

11. Click *OK*.
12. During the installation, insert UnitedLinux Version 1.0 CD2 when prompted. Click **OK** to continue.
13. During the installation, insert SUSE SLES Version 8 CD1 when prompted. Click **OK** to continue.
14. You should see a message similar to the following:

    ```
    The base system was successfully installed. Your machine must now be
    rebooted. Please remove all installation media (CD-ROM).
    ```

15. Click **OK** to proceed with the system restart.
16. After the system restarts, enter a password for the root user when prompted and then click **Next**.
17. In the Add a new user window, create a user (for example, admin) and then click **Next**.
18. Select **Graphical desktop environment**, and click **Accept**.
19. In the Network Interfaces window, click **Yes** to autodetect. Click **Next**.
20. The system restarts. Then, log on as a root user.

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Configuring the SUSE Linux post installation

This section explains how to configure SUSE Linux after you install the base SUSE Linux for the ITSO working example runtime environment.

Installing VMWare tools

If you have installed Linux in a VMware image, you need to install the VMWare tools to optimize performance of the video and other drivers. You cannot simply install VMWare tools from the menu. You need to copy the tools from the iso image, unpack using the **tar** command, and run the installation as follows:

1. Set the VMWare hot keys to Crtl+Shift+Alt.

   By default, VMWare uses Ctrl+Alt, which is the same key sequence used by Linux to invoke the Text (Ctrl+Alt, F1) and Graphical (Ctrl+Alt, F7) modes. Switching to the Text mode is necessary to install the VMWare tools. To resolve this conflict, set the VMWare hot keys to Crtl+Shift+Alt as follows:

   a. From the VMWare menu, select **Edit** → **Preferences**.
   b. Click the **Hot keys** tab.
   c. Select the **Ctrl+Shift+Alt** radio button (default is Ctrl+Alt) and click **OK**.

   > **Note:** Remember that VMWare now uses Ctrl+Shift+Alt for its hot key sequence in place of Ctrl+Alt.

2. From the VMWare menu, select **VM** → **Install VMWare Tools**. Click **Install**.
3. Press Ctrl+Alt and then F1 to switch to the Linux Text mode in preparation to install the tools.

   > **Note:** The VMWare tools installation invokes the X86Free utility to set the video resolution for Linux. X86Free requires that the program run from Text mode.
   >
   > ► To switch to Text mode, press Ctrl+Alt and then F1.
   > ► To switch to Graphics mode, press Ctrl+Alt and then F7.

4. Enter the following command from the text mode command line:

```
mount /dev/cdrom /mnt
cd /mnt
cp vmware-linux-tools.tar.gz /tmp
cd /tmp
gunzip vmware-linux-tools.tar.gz
tar -xvf vmware-linux-tools.tar
cd vmware-tools-distrib
./vmware-install.pl
```

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5. During the installation of the VMWare Tools, you are prompted for additional information. During the tools installation, the X86Free utility is run to set your video resolution (for example, we used 1024x768).
6. Press Ctrl+Alt and then F7 to switch back to Graphics mode.
7. Select **VM** → **Cancel VMWare Tools Install** because you have already installed the tools.

For more information about installing the VMWare tools on Linux, see the VMWare Web site at:

http://www.vmware.com

TCP/IP network configuration

Refer to “Configuring TCP/IP network” on page 369 for details.

Installing SUSE Linux V8 Service Pack 3

There are several methods to install SUSE Linux V8 Service Pack 3 (download CD image, FTP, HTTP, and so forth). In our example, we download the service pack 3 CD images. For more information about installing service pack 3, see:

http://www.suse.com

To install SUSE Linux V8 Service Pack 3 from the CD images, follow these steps:

1. Click **Start Application** → **System** → **YaST2** to launch YaST2.
2. Double-click **Patch CD Update**.
3. Select **Automatic Update**, accept the default cd:/// for the Installation Source, and click **Next**. This installs the online update patches in preparation for further updates.
4. When you see the following message, click **OK**:

   ```
   Please restart the online update to get all available patches.
   ```

5. When you see the following message, click **OK**.

   ```
   Installation successful.
   ```

6. In the Online Update Confirmation window, click **Finish**.
7. Double-click **Patch CD Update**.
8. Select **Automatic Update**, accept the default cd:/// for the Installation Source, and click **Next**. This installs the Recommended updates, security patches, and Service Pack 3.

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9. You are prompted regarding lilo with instructions on how to proceed. Click **OK** to continue.
10. When you see the following message, click **OK** to continue:

    ```
    Please restart your vncserver processes.
    ```

11. When you see the following message, click **OK** to continue:

    ```
    Reboot the system with the shutdown -r now to load the new kernel.
    ```

12. When you see the following message, click **OK**.

    ```
    For the openssh update package to be to become effective, run the command
    "rcsshd restart" as root.
    ```

13. You then see another lilo message. Click **OK**.

    At the end of the installation summary, you should see the following message:

    ```
    Service Pack 3 and installation finished.
    ```

14. Click **Next**.
15. Click **Finish**.
16. Click **Close** to close YaST.
17. Restart the system.

VMWare tools: After you install SUSE Linux V8 Service Pack 3, ensure the VMWare tools are still active and installed. If your VMWare session displays a message on the bottom of the window that the tools are not installed, reinstall the VMWare tools as described in "Installing VMWare tools" on page 362.

Installing and updating Perl

After installing SUSE Linux V8 Service Pack 3, we found that the Perl package has some inconsistencies. Specifically, the updated perl-XML-DOM rpm had a dependency on perl-XML-RegExp. perl-XML-RegExp is not included in the base SUSE LINUX Enterprise Server V8 distribution CDs, but it is included on the SUSE Linux V8 Service Pack 3 CD1.

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Perl is required by the IBM GSKit installer, which is required for the ITSO working example runtime environment. To install Perl with the perl-XML-RegExp rpm, perform the following steps:

1. To determine if Perl is installed, enter the following command:

   ```
   # rpm -qa | grep perl-XML
   ```

   If the base Perl rpms are installed, you should see the Perl modules listed.

   ```
   perl-XML-Writer-0.4-254
   perl-XML-Generator-0.9-164
   perl-XML-DOM-1.39-95
   ```

   > **Note:** The updated perl-XML-DOM-1-39-95 has a dependency on the perl-XML-RexExp rpm, which is not installed.

   If the base Perl modules are not installed, use YaST to install the Perl package.

2. To update Perl with the perl-XML-RegExp rpm, complete these tasks:

   a. Insert SUSE Linux V8 Service Pack 3 CD1.

   b. Open a terminal window as a root user and mount the CD-ROM:

      ```
      # mount /dev/cdrom /mnt
      ```

   c. Change to the following location on the CD-ROM (/mnt) where the perl-XML-RegExp rpm is located:

      ```
      # cd /mnt/UnitedLinux/i586
      ```

   d. Install the perl-XML-RegExp rpm:

      ```
      # rpm -U --nodeps perl-XML-RegExp-0.03-380.i586.rpm
      ```

   e. Verify Perl rpms are installed, by entering the following command:

      ```
      # rpm -qa | grep perl-XML
      ```

      If the Perl rpms are installed, you should see the following Perl modules listed:

      ```
      perl-XML-Writer-0.4-254
      perl-XML-Generator-0.9-164
      perl-XML-RegExp-0.03-380
      perl-XML-DOM-1.39-95
      ```

3. Click **Start Application** → **System** → **YaST2** to launch YaST2.
4. Double-click **Install or remove software**.
5. From the Filter drop-down list, select **Package Groups**.
6. Select **Developer** → **Libraries** → **Perl**.
7. Click **Accept**.

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8. When prompted, insert *UnitedLinux Version 1.0 CD1* and then click **OK**.
9. Close YaST2.

Configuring IBM Java Runtime Environment V1.3.1

Several of the applications used in the secure portal solution require a JRE (for example, DB2 UDB, IBM GSKit, Tivoli Access Manager PDJRTE, and so forth). By default, the SUSE Linux Enterprise Server V8 installation includes several Java packages and runtime environments, which are not compatible versions with the IBM applications that use the JRE.

There are a few possible solutions to this problem. For example, you can symbolically link the IBM JRE in place of the java2-jre. For simplicity on a production environment, we chose to uninstall the java2-jre and export the JAVA_HOME configured to the IBM JRE.

Table A-2 lists the Java packages that are installed by the default SUSE Linux V8 installation.

Table A-2 Java packages installed with SUSE Linux V8

Package name	Version	Description
IBMJava2-JAAS	1.3.1-24	Java Authentication and Authorization Service (JAAS) V1.0 for Linux
IBMJava2-JAVACOMM	1.3.1-24	Java Communications API for Linux V2.01
IBMJava2-JRE	1.3.1-24	IBM Runtime Environment for Linux, Java 2 Technology Edition, Version 1.3.0
IBMJava2-SDK	1.3.1-24	IBM Developer Kit for Linux, Java 2 Technology Edition
java2-jre	1.3.1-524	Java 2 Runtime Environment

The following procedure explains how to uninstall the java2-jre-1.3.1-524 and set the JAVA_HOME to the IBM JRE:

1. Open a console window as a root user.
2. To uninstall java2-jre-1.3.1-524 included with SUSE Linux, complete these tasks:
   a. To determine if the SUN JRE V1.3.1-524 is installed, enter the following command in a console window:

      ```
      # rpm -qa | grep java2-jre
      ```

      If the SUN JRE is installed, you should see the following output:

      ```
      java2-jre-1.3.1-524
      ```

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b. Click **Start Application** → **System** → **YaST2** to launch YaST2.

c. Double-click **Install or remove software**.

d. From the Filter drop-down list, select **Package Groups**.

e. Select **Developer** → **Languages** → **Java**.

f. Deselect **java2-jre**.

g. Click **Accept**.

h. Close YaST2.

3. Determine if the IBM JRE V1.3.1-24 is installed by entering the following command:

```
# rpm -qa | grep IBMJava2
```

If the JRE is installed, you should see the following output:

```
IBMJava2-JAAS-1.3.1-24
IBMJava2-JAVACOMM-1.3.1-24
IBMJava2-JRE-1.3.1-24
IBMJava2-SDK-1.3.1-24
```

4. Modify the JAVA_HOME variable in /etc/profile.local as follows:

> **Note:** The /etc/profile is a global file. We recommend that you do not update this file directly, but rather update profile.local.

a. Open a shell console and navigate to the /etc directory:

```
# cd /etc
```

b. Open /etc/profile.local in an editor to add the variable:

```
# kate profile
```

c. Add the following lines to the profile.local file:

```
JAVA_HOME=/usr/lib/IBMJava2-1.3.1
export JAVA_HOME
PATH=$PATH:$JAVA_HOME/bin
export PATH
```

d. Save and close the file.

5. Verify that the JRE is configured properly.

a. Enter the following command to display the JAVA_HOME:

```
# $JAVA_HOME
```

You should see the following output:

```
bash: /usr/lib/IBMJava2-1.3.1: is a directory
```

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b. Enter the following command to test that the JRE bin is in the path:

```
# java -version
```

You should see the following output:

```
Java(TM) 2 Runtime Environment, Standard Edition (build 1.3.1)
Classic VM (build 1.3.1, J2RE 1.3.1 IBM build cxia32131-20020622 (JIT
enabled: jitc))
```

Installing Mozilla Web browser (optional)

Installing the Mozilla Web browser is optional. We use Mozilla instead of the built-in SUSE Linux Konqueror Web browser. For details about installing Mozilla for Linux, refer to the following Web site:

http://www.mozilla.org/products/mozilla1.x/

By default the Mozilla Web browser is installed to the /usr/local/mozilla directory and can be started with the following command:

```
./mozilla
```

Note: As an alternative to the Mozilla Web browser, you may consider Firefox, which you can find on the Web at:

http://www.mozilla.org/products/firefox/

Starting VMWare toolbox (optional)

To run the VMWare toolbox in Linux for such tasks as shrinking a disk, use these steps:

1. Open a console window as a root user.
2. Start the VMWare toolbox. Enter the following command:

```
# vmware-toolbox
```

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Configuring the network

This section explains the following procedures:

- Configuring TCP/IP network
- Configuring Samba

Configuring TCP/IP network

You can configure the TCP/IP network settings by updating the configuration files manually or using the YaST graphical user interface (GUI).

Configuring DHCP TCP/IP

When using DHCP, you are required only to define the host name and domain. The DHCP client automatically retrieves the proper DNS and default router. Alternatively, these values can be manually set when using DHCP.

By default, after you install SUSE Linux, the system TCP/IP network is configured to use DHCP. The /etc/sysconfig/network/ifcfg-eth0 file is configured for DHCP as shown in Example A-1 to retrieve the network information.

Example: A-1 Sample ifcfg-eth0 configuration for DHCP

```
STARTMODE="onboot"
BOOTPROTO="dhcp"
```

To configure the host name and domain for DHCP using YaST, follow these steps:

1. Click **Start Application** → **System** → **YaST2** to launch YaST2.
2. Select **Network/Basic** → **Network card configuration**.
3. Select the already configured network adapter and click **Change**.
4. For the eth0 device, click **Edit**.
5. Select **Automatic address setup (via DHCP)**.
6. Click **Host name and name server**.
7. Click **Accept** to update name server and search list via DHCP.
8. In the Host name and DNS window, enter the following values as we did in our example:
   a. For Host name, type `sles8`.
   b. For Domain name, type `itso.ral.ibm.com`.
   c. Deselect **Change host name via DHCP**.
   d. Click **Finish**.

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9. Click **Next**.
10. Click **Next** to continue.
11. Click **Finish**.
12. Click **Close** to close YaST.

Configuring static IP TCP/IP

To configure Linux to use a static IP address using YaST, use these steps:

1. Click **Start Application** → **System** → **YaST2** to launch YaST2.
2. Select **Network/Basic** → **Network card configuration**.
3. Select the already configured network adapter and click **Change**.
4. For the eth0 device, click **Edit**.
5. Select **Static address setup**. Then enter the following values:
   - IP address: `192.168.2.100`
   - Subnet mask: `255.255.255.0`
6. Click **Host name and name server**.
7. In the Host name and DNS window, enter the following values:
   - For Host name, type `sles8`.
   - For Domain name, type `itso.ral.ibm.com`.
   - For Name server, type `192.168.2.1`.
   - For Domain search, type 1: `itso.ral.ibm.com`.
   - Click **Next**.
8. Click **Routing**.
9. In the Routing window, for the Default gateway, enter an IP address. We entered `192.168.2.1`. Then click **Next**.
10. Click **Next** to continue.
11. Click **Finish**.
12. Click **Close** to close YaST.
13. Verify the configuration.

    The YaST tool updates the following files:

    - Modifies the /etc/sysconfig/network/ifcfg-eth0 for your environment to retrieve the network information statically (Example A-2 on page 371).

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Example: A-2 Sample ifcfg-eth0 configuration for static IP address

```
STARTMODE=‘onboot‘
BOOTPROTO=static’
IPADDR=192.168.2.100
NETMASK=255.255.255.0
BROADCAST=192.168.2.255
```

– Modifies the /etc/resolv.conf file.

  This file defines the Domain Name Server (DNS), domain, and the domain search order; for example, out /etc/resolv.conf file contains:

  ```
  search itso.ral.ibm.com
  nameserver 192.168.2.1
  ```

– Adds the routing configuration to /etc/sysconfig/network/routes.

  ```
  default 192.168.2.1
  ```

– At the end of the YaST Network card configuration, runs the **SuSEconfig** command.

Verifying the network

This section explains how to verify that the Linux system networking is working properly.

1. Verify the /etc/hosts file. If you do not have a host entry for the host name of your node, add it. For example, the sample /etc/hosts file contains:

   ```
   127.0.0.1 localhost.localdomain localhost
   192.168.2.100 sles8.itso.ral.ibm.com sles8
   ```

2. Verify the /etc/resolv.conf file. This file defines the Domain Name Server (DNS), domain, and the domain search order. For example, the sample /etc/resolv.conf file contains:

   ```
   search itso.ral.ibm.com
   nameserver 192.168.2.1
   ```

3. Verify the network configuration using the **ifconfig** command. The **ifconfig** command returns:

   ```
   # ifconfig
   ```

4. Verify the route:

   ```
   # route -n
   ```

   Verify that you can access other systems and your system by name (resolves name with DNS or hosts file).

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Configuring Samba

Samba uses the Server Message Block (SMB) protocol based on NetBIOS over TCP/IP. Samba can be used to provide file and print sharing that is compatible with Microsoft Windows systems.

This section explains the basic steps for configuring a Samba server and configuring a client to access Samba files shares on Linux systems as well as Windows file shares. The samba package is required to be installed on SUSE LINUX for both the server and client.

Configuring the Samba server

This section explains how to configure a Samba file share. The /etc/samba/smb.conf file is used to define file and printer shares as shown in Example A-3. The smb.conf file is organized into two sections, global and shares. The Samba server can be configured manually or by using the swat GUI interface.

For more information about Samba, see the Samba Web site at:

http://www.samba.org

Example: A-3 Sample smb.conf

```
# Global parameters
[global]
   encrypt passwords = Yes
   map to guest = Bad User
   time server = Yes
   unix extensions = Yes
   socket options = SO_KEEPALIVE IPTOS_LOWDELAY TCP_NODELAY
   printcap name = CUPS
   os level = 2
   printing = cups
   veto files = /*.eml/*.nws/riched20.dll/*.{*}/

# ################################################################
# Home directories
[homes]
   comment = Home Directories
   valid users = %S
   read only = No
   create mask = 0640
   directory mask = 0750
   browseable = No

# ################################################################
# File share
[software]
   comment = Secure Portal for Linux software
   path = /home/resident/software
```

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To configure the Samba server and create a file share using the swat GUI, follow these steps:

> **Note:** For illustration purposes, we create a file share named *software* in the /home/resident/software directory owned by user resident. We used this file share as a repository for all the application software needed to be installed in the ITSO working example runtime environment.
>
> We found that the WebSphere Portal Installer failed when installing over the Samba network share. We recommend that you copy the images locally, unpack them, and then install them from the local drive.

1. Create a Linux user named admin using YaST.
   a. Click **Start Application** → **System** → **YaST2** to launch YaST2.
   b. Select **Security and Users** → **Edit and create users**.
   c. Click **Add**.
   d. In the Add a new user window, complete the following steps as we did for this example:
      i. For First name, type `Redbook`.
      ii. For Last name, type `Resident`.
      iii. For User login, type `resident`.
      iv. Enter a password.
      v. Re-enter the password for verification.
      vi. Click **Create**.

      > **Note**: If you want to change the default groups, login shell, and so forth, click **Details**.

   e. Click **Finish**.
   f. Close **YaST**.
2. Enable the swat service.
   a. Click **Start Application** → **System** → **YaST2** launch YaST2.
   b. Select **Network/Basic** → **Start/stop services (inetd)**.
   c. In the Network services window, select **On with custom configuration** and then click **Next**.
   d. Scroll down the list, select **swat** and then click **Activate or Deactivate** (toggle). The swat status should now be *Active*.
   e. Click **Finish**.

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3. Access the swat GUI from a Web browser to configure the Samba server.
   a. Enter the following URL in a Web Browser:

      `http://hostname:901`

   b. Enter a user ID and password when prompted.
4. Create a file share from the swat GUI.
   a. From the swat home page, click **Shares**.
   b. In the Create share text field, enter the sharename (for example, `software`) and then click **Create share**.
   c. On the Share Parameters page, enter the values for Comment and Path. We entered the following values for sw share:
      - Comment: `Secure Portal for Linux software`
      - Path: `/home/resident/software`

      Note: We accepted the defaults for the remaining configuration options.

   d. Click **Commit Changes**.
5. Create Samba users using the swat GUI.
   a. From the swat home page, click **Password**.
   b. Under Server management, enter the user name and password that you want to create and then click **Add New User** (for example, we entered the resident user and password).
   c. In the User name field, enter the desired user name, click **Enable user**.
6. Ensure that the Samba services are running.
   a. From the swat home page, click **Status**.
   b. Click **Start smbd** and **Start nmbd** if the server status is not already running.

The resident user can now access the software file share.

Configuring the Samba client

The Samba client allow you to connect from a Linux system to Windows or other Linux systems Samba server file and printer shares.

For example, you may want to mount a Windows 2000 Server file share (`websphere` is the server, `sw` is the share) from your Linux server (Samba client) to

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access software during the installation process. We include two methods to mount a Samba file share. The first method is:

```
# mount -t smbfs -o username=WindowsUserID,password=WindowsUserPassword
//<WindowsMachineName>/WindowsShare /DirectoryOnLinuxServer
```

For example, we would enter:

```
# mount -t smbfs -o username=admin,password=password //websphere/sw /mnt
```

The second method is:

```
# smbmount /WindowsMachineName/WindowsShare /DirectoryOnLinuxServer -o
username=WindowsUsername,password=WindowsPW
```

Common commands

This section highlights common Linux commands and tasks:

- Shutdown
  - To shut down now without a file system check, enter:

    ```
    shutdown -f now
    ```

  - To shut down and reboot without a file system check, enter:

    ```
    shutdown -f -r now
    ```

- Mount a CD-ROM

  ```
  mount /dev/cdrom /media/cdrom
  ```

- Unmount a CD-ROM

  ```
  unmount /media/cdrom
  ```

- Add users

  ```
  adduser<username
  ```

- Add groups

  ```
  groupadd groupname
  ```

- Change a users password

  ```
  passwd user id
  ```

- Monitor disk space and file system usage

  ```
  df
  du
  ```

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- Directory listing

  ```
  ls -l (long form list)
  ls -al (hidden files)
  ls (short form list)
  ```

- Showing the processes running

  ```
  ps -axf
  ps -axf -width=240
  ps -ef
  ```

- Finding a file

  ```
  locate file name
  find target directory -name file name -print
  ```

- Determining the network IP address

  ```
  ifconfig -a
  ```

- Network restart commands **ifdown** and **ifup**

  ```
  ifdown eth0 (bring ethernet interface down)
  ifup eth0 (bring ethernet interface up)
  ```

- Utility to check, add, or delete a service in /etc/init.d

  ```
  chkconfig
  ```

- **tar** command
  - Extract files:

    ```
    tar -xvf filname.tar
    ```

  - Compress files:

    ```
    tar -cvf * filname.tar
    ```

- **gunzip** command

  ```
  gunzip -d -c filename.gz
  ```

  - Variation with *filename*.tar.gz

    ```
    gunzip -d -c filename.tar.gz | tar -xvf -
    ```

  - Variation with *filename*.taz

    ```
    gunzip -d -c filename.taz | tar -xvf -
    ```

- **unzip** command

  ```
  unzip filname.zip
  ```

- **vmstat** - check memory usage

  ```
  vmstat
  ```

.

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Additional material

This redbook refers to additional material that can be downloaded from the Internet as described below.

Locating the Web material

The Web material associated with this redbook is available in softcopy on the Internet from the IBM Redbooks Web server. Point your Web browser to:

`ftp://www.redbooks.ibm.com/redbooks/SG246677`

Alternatively, you can go to the IBM Redbooks Web site at:

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Select the **Additional materials** and open the directory that corresponds with the redbook form number, SG246677.

Using the Web material

The additional Web material that accompanies this redbook includes the following files:

File name	*Description*
sg246677.zip	Zipped Code Samples

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System requirements for downloading the Web material

The following system configuration is recommended:

Hard disk space: 13 MB minimum
Operating System: Windows
Processor: 1 GB or higher
Memory: 512 MB

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Create a subdirectory (folder) on your workstation, and unzip the contents of the Web material zip file into this folder.

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Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

IBM Redbooks

For information about ordering these publications, see “How to get IBM Redbooks” on page 381. Note that some of the documents referenced here may be available in softcopy only.

- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume I: Installation and Administration*, SG24-6462
- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume II: Application Development*, SG24-6463
- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume III: E-Mail and Database Synchronization*, SG24-6676
- *IBM WebSphere Everyplace Access V5 Handbook for Developers and Administrators, Volume IV: Advanced Topics*, SG24-6677
- *IBM WebSphere Everyplace Access Version 4.3 Handbook for Developers*, SG24-7015
- *IBM WebSphere Everyplace Connection Manager V5 Handbook*, SG24-7049
- *RDB Synchronization, Transcoding and LDAP Directory Services in IBM WebSphere Everyplace Access Version 4.1.1*, SG24-6856
- *IBM WebSphere Portal V5 A Guide for Portlet Application Development*, SG24-6076
- *IBM Redbook IBM Replication Solutions for Pervasive Computing with DB2 Everyplace and DB2 Satellite Edition*, SG24-6217
- *IBM WebSphere Everyplace Server Service Provider and Enable Offerings: Enterprise Wireless Applications*, SG24-6519
- *Getting the Most From Your Domino Directory*, SG24-5986

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Other publications

These publications are also relevant as further information sources:

- *IBM DB2 Everyplace Sync Server Administration Guide 7.2*, SC27-0845
- *DB2e Application Development Guide Version 8 Release 1*, SC18-7185
- *IBM DB2 Everyplace Sync Server Administration Guide Version 8 Release 1*, SC18-7186

Online resources

These Web sites and URLs are also relevant as further information sources:

- WebSphere Everyplace Access:

  http://www.ibm.com/software/pervasive/ws_everyplace_access
- WebSphere Portal:

  http://www.ibm.com/software/websphere/portal
- WebSphere Application Server:

  http://www.ibm.com/software/webservers/appserv
- Lightweight Directory Access Protocol standard:

  http://www.ietf.org/rfc/rfc1777.txt
- WebSphere Studio:

  http://www.ibm.com/software/websphere/studio/
- WebSphere Transcoding Publisher:

  http://www.ibm.com/software/webservers/transcoding
- Lotus product information:

  http://www.lotus.com/home.nsf/welcome/products
- WebSphere Everyplace Suite:

  http://www.ibm.com/pvc/products/wes_provider/index.shtml
- Java Community Process, JSR 168:

  http://jcp.org/jsr/detail/168.jsp

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Add Intelligent Notification Services to your enterprise applications

Learn about clustering Everyplace Server nodes

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