For those information elements that cannot be mapped to standard STD 11 "header fields" the "X-" extensions mechanism shall be used with an "X-MMS-" prefix.

The mapping of information elements to commonly used (RFC 1327) [53] or standard STD 11 "header fields" is shown in following tables.

8.4.4.2 MM4_Forward.REQ Header Mappings

The MM4 Forward request header mappings are detailed below.

Table 49: MM4_Forward.REQ Information Elements to STD 11 Header Mappings

Information element	STD 11 Headers
3GPP MMS Version	X-Mms-3GPP-MMS-Version:
Message Type	X-Mms-Message-Type:
Transaction ID	X-Mms-Transaction-ID:
Message ID	X-Mms-Message-ID:
Recipient(s) address	To:, Cc: , Bcc:
Sender address	From:
Content type	Content-Type:
Message class	X-Mms-Message-Class:
Date and time	Date:
Time of Expiry	X-Mms-Expiry:
Delivery report	X-Mms-Delivery-Report:
Originator R/S delivery report	X-Mms-Originator-R/S-Delivery-Report
Priority	X-Mms-Priority:
Sender visibility	X-Mms-Sender-Visibility:
Read reply	X-Mms-Read-Reply:
Subject	Subject:
Acknowledgement Request	X-Mms-Ack-Request:
Forward counter	X-Mms-Forward-Counter:
Previously-sent-by	X-Mms-Previously-sent-by:
Previously-sent-date and-time	X-Mms-Previously-sent-date-and-time:
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info
Content Class	X-Mms-Content-Class:
DRM Content	X-Mms-Drm-Content:
Adaptations	X-Mms-Adaptation-Allowed:
Originator-Sytem-Address	X-Mms-Originator-System
Content	*<message body>*
-	Sender:
-	Message-ID:

The table above indicates the mappings from MM4_Forward.REQ information elements to the corresponding STD 11 [5] headers.

The MM4 information element Message ID is not directly mapped to a corresponding STD 11 "Message-ID:" header. Each STD 11 message must have a unique message id, which is carried in the "Message-ID:" header.

Content-type maps directly since both are defined as being MIME content types as specified in RFC 2046 [6].

The STD 11 "From:" header is determined by the mail user agent, or, in this case, the MMS User Agent. This corresponds to the MM4 information element Sender address, as set by the MMS User Agent or MMS Relay/Server.

STD 11 messages are required to have a "Sender:" header that indicates the originator address (as determined by the SMTP "MAIL From" command).

The STD 11 “X-Mms-Originator-System:” header shall be used to indicate the system address that the recipient MMS Relay/Server shall use as the recipient address with MM4_Forward.RES.

In case there are only blind carbon-copy recipient(s) ("Bcc:"), the behaviour shall be as recommended by RFC2821 [22], Appendix B, i.e. the originating MMS Relay/Server shall only insert an empty "Bcc:" header and no "To:" or "Cc:" headers. The recipient(s) shall then only be indicated in the SMTP command layer (RCPT TO:).

In case there are both "To:" / "Cc:" and "Bcc:" recipients, the "Bcc:" headers shall be removed by the originating MMS Relay/Server and the "Bcc:" recipients shall only be indicated in the SMTP command level (RCPT TO:). This is in accordance with the functionality recommended by RFC2821 [22], Appendix B.

8.4.4.3 MM4_Forward.RES Header Mappings

The MM4 Forward response information element mappings are detailed in the table below.

The transmission of the Forward Response from the recipient MMS Relay/Server requires a properly addressed STD 11 message. While the addressing of the MM4_Forward.REQ is clearly that of the intended recipients and originator, the MM4_Forward.RES addressing is related to neither the recipients nor the originator of the original MM. Instead, the MM4_Forward.RES addressing is based on the MMS Relay/Server system address as provided in the MM4_Forward.REQ via the X-Mms-Originator-System header.

The STD 11 "To:" header value shall be according to the STD 11 "X-Mms-Originator-System:" header value provided in MM4_Forward.REQ.

Table 50: MM4_Forward.RES Information Elements to STD 11 Header Mappings

Information element	STD 11 Header
3GPP MMS Version	X-Mms-3GPP-MMS-Version:
Message Type	X-Mms-Message-Type:
Transaction ID	X-Mms-Transaction-ID:
Message ID	X-Mms-Message-ID:
Request Status	X-Mms-Request-Status-Code:
Request Status text	X-Mms-Status-Text:
Request Recipients	X-Mms-Request-Recipients
-	Sender:
-	To:
-	Message-ID:
-	Date:

The STD 11 "Sender: " and "To:" headers contain system addresses as described above, and do not map to MM4_Forward.RES information elements. The STD 11 message requires a "Date:" header, but there currently is no corresponding MM4_Forward.RES information element.

8.4.4.4 MM4_Delivery_report.REQ Header Mappings

The mappings of the MM4_Delivery_report.REQ information elements to STD 11 headers is detailed in the table below.

Table 51: MM4_Delivery_report.REQ Information Elements to STD 11 Header Mappings

Information element	STD 11 Header
3GPP MMS Version	X-Mms-3GPP-MMS-Version:
Message Type	X-Mms-Message-Type:
Transaction ID	X-Mms-Transaction-ID:
Message ID	X-Mms-Message-ID:
Recipient address	From:
Sender address	To:
Date and time	Date:
Acknowledgement Request	X-Mms-Ack-Request:
Forward to Originator UA	X-Mms-Forward-To-Originator-UA
MM Status	X-Mms-MM-Status-Code:
MM Status Extension	X-Mms-MM-Status-Extension
MM Status Text	X-Mms-Status-text:
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info
-	Sender:
-	Message-ID:

The meaning of Recipient address is that of the original MM, from whose MMS User Agent this Delivery-report is being generated. The meaning of Sender address is that of the original MM, to whom the Delivery-report is being sent.

The value of the STD 11 "Sender:" header is the system address, to which the corresponding response will be sent.

The STD 11 "Sender:" header value is automatically set to the system address of the MMS Relay/Server.

The STD 11 "Message-ID:" value is automatically generated by the MMS Relay/Server, in conformance to STD 11 [5].

The other header mappings from information elements are similar to those already described above.

8.4.4.5 MM4_Delivery_report.RES Header Mappings

The mappings of the M4_Delivery_report.RES information elements to STD 11 headers is detailed in the table below.

Table 52: MM4_Delivery_report.RES Information Elements to STD 11 Header Mappings

Information element	STD 11 Header
3GPP MMS Version	X-Mms-3GPP-MMS-Version:
Message Type	X-Mms-Message-Type:
Transaction ID	X-Mms-Transaction-ID:
Message ID	X-Mms-Message-ID:
Request Status	X-Mms-Request-Status-Code:
Request Status text	X-Mms-Status-Text:
-	Sender:
-	To:
-	Message-ID:
-	Date:

The STD 11 "Sender:" header value is automatically set to the system address of the MMS Relay/Server that is replying to the MM4_Delivery_report.REQ.

The STD 11 "To:" header value of the MM4_Delivery_report.RES abstract message is obtained from the STD 11 "Sender:" header value of the corresponding MM4_Delivery_report.REQ.

The STD 11 "Date" and "Message-ID:" headers, which have no corresponding MM4_Forward.RES information elements, are automatically provided values by the MMS Relay/Server.

8.4.4.6 MM4_Read_reply_report.REQ Header Mappings

The mappings of the MM4_Read_reply_report.REQ information elements to STD 11 headers is detailed in the table below.

Table 53: MM4_Read_reply_report.REQ Information Elements to STD 11 Header Mappings

Information element	STD 11 Header
3GPP MMS Version	X-Mms-3GPP-MMS-Version:
Message Type	X-Mms-Message-Type:
Transaction ID	X-Mms-Transaction-ID:
Recipient address	From:
Sender address	To:
Message ID	X-Mms-Message-ID:
Date and time	Date:
Acknowledgement Request	X-Mms-Ack-Request:
Read Status	X-Mms-Read-Status:
Read Status text	X-Mms-Status-Text:
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info
-	Sender:
-	Message-ID:
-	Date:

The meaning of Recipient address is that of the original MM, from whose MMS User Agent this Read-reply-report is being generated. The meaning of Sender address is that of the original MM, to whom the Read-reply-report is being sent.

The value of the Sender: header is a system address, to which the corresponding MM4_Read_reply_report.RES shall be sent.

The "Message-ID:", and "Date:" headers, which have no corresponding information element in the MM4_Read_reply_report.REQ, are automatically provided appropriate values by the MMS Relay/Server.

8.4.4.7 MM4_Read_reply_report.RES Header Mappings

The mappings of the MM4_Read_reply_report.RES information elements to STD 11 headers is detailed in the table below.

Table 54: MM4_Read_reply_report.RES Information Elements to STD 11 Header Mappings

Information element	STD 11 Header
3GPP MMS Version	X-Mms-3GPP-MMS-Version:
Message Type	X-Mms-Message-Type:
Transaction ID	X-Mms-Transaction-ID:
Request Status	X-Mms-Request-Status-Code:
Request Status text	X-Mms-Status-Text:
-	Sender:
-	To:
-	Message-ID:
-	Date:

The STD 11 "Sender:" header value shall be the system address of the MMS Relay/Server that is replying to the MM4_Read_reply_report.REQ.

The STD 11 "To:" header value of the MM4_Delivery_report.RES abstract message shall be obtained from the corresponding MM4_Read-reply_report.REQ Sender: header value.

The STD 11 "Date:" and "Message-ID:" headers, which do not have corresponding information elements, shall be provided appropriate values automatically by the MMS Server/Relay.

8.4.4.8 Header Field Value Range

MMS information elements that are mapped to standard STD 11 "header fields", i.e. which do not have an "X-Mms-" prefix, should be used according to [5].

The rest of the header definitions used in this clause, including the mechanisms and pre-defined tokens, are described in an augmented Backus-Naur Form (BNF) defined in [48], similar to that used by RFC 2822 [5]. Implementers will need to be familiar with the notation in order to understand these definitions.

For the residual MMS information elements the following applies:

X-Mms-3GPP-MMS-Version:

```
3GPP-MMS-Version = "X-Mms-3GPP-MMS-Version" ":"  1*DIGIT "." 1*DIGIT "."
1*DIGIT
```

Note that the numbers MUST be treated as separate integers and that each may be incremented higher than a single digit. Thus, 2.1.4 is a lower version than 2.1.13, which in turn is lower than 2.3.0 Leading zeros shall be ignored by recipient MMS Relay/Server and shall NOT be sent. The version is according to the version of the present document (see also clause "Foreword").

X-Mms-Message-Type:

```
Message-type = "X-Mms-Message-Type" ":" ( "MM4_forward.REQ" |
"MM4_forward.RES" | "MM4_delivery_report.REQ" | "MM4_delivery_report.RES" |
"MM4_read_reply_report.REQ" | "MM4_read_reply_report.RES" )
```

X-Mms-Transaction-Id:

```
Transaction-id =  "X-Mms-Transaction-ID" ":" quoted-string
```

X-Mms-Message-Id:

```
Message-id =  "X-Mms-Message-ID" ":" quoted-string
```

X-Mms-Message-Class:

```
Message-class = "X-Mms-Message-Class" ":" ( Class-identifier | quoted-string
)

Class-identifier = "Personal" | "Advertisement" | "Informational" | "Auto"
```

X-Mms-Expiry:

```
Expiry-value = "X-Mms-Expiry" ":" ( HTTP-date | delta-seconds )
```

X-Mms-Delivery-Report:

```
Delivery-report =  "X-Mms-Delivery-Report" ":" ( "Yes" | "No" )
```

X-Mms-Originator-R/S-Delivery-Report:

```
Originator-R/S-Delivery-Report =  "X-Mms-Originator-R/S-Delivery-Report" ":"
( "Yes" | "No" )
```

X-Mms-Priority:

```
Priority = "X-Mms-Priority" ":" ( "Low" | "Normal" | "High" )
```

X-Mms-Sender-Visibility:

```
Sender-visibility = "X-Mms-Sender-Visibility" ":" ( "Hide" | "Show" )
```

X-Mms-Read-Reply:

```
Read-reply = "X-Mms-Read-Reply" ":" ( "Yes" | "No" )
```

X-Mms-Ack-Request:

```
Ack-Request = "X-Mms-Ack-Request" ":" ( "Yes" | "No" )
```

X-Mms-Forward-To-Originator-UA:

```
Forward-To-Originator-UA = "X-Mms-Forward-To-Originator-UA" ":" ( "Yes" |
"No" )
```

X-Mms-Request-Status-Code:

```
Request-status-Code =  "X-Mms-Request-Status-Code" ":" ( "Ok" | "Error-
unspecified" | "Error-service-denied" | "Error-message-format-corrupt" |
"Error-sending-address-unresolved" | "Error-message-not-found" | "Error-
network-problem" |   "Error-content-not-accepted" | "Error-unsupported-
message" )
```

The meaning of the X-Mms-Request-Status-Code header field is further described in section 8.4.4.10 of this specification.

X-Mms-MM-Status-Code:

```
MM-Status-Code = "X-Mms-MM-Status-Code" ":" ( "Expired" | "Retrieved" |
"Rejected" | "Deferred" | "Indeterminate" | "Forwarded" | "Unrecognised" )
```

X-Mms-MM-Status-Extension:

```
MM-Status-Extension =  "X-Mms-MM-Status-Extension" ":" ( "Rejection-By-MMS-
Recipient" | "Rejection-by-Other-RS" )
```

The meaning of the X- Mms-Status-Extension header field is further described in section 8.4.4.11 of this specification.

X-Mms-Read-Status:

```
Read-Status = "X-Mms-Read-Status" ":" ( "Read" | "Deleted without being read" )
```

X-Mms-Forward-Counter

```
Forward-Counter = "X-Mms-Forward-Counter" ":" 1*DIGIT
```

X-Mms-Previously-sent-by

```
Previously-sent-by = "X-Mms-Previously-sent-by" ":" 1*DIGIT "," mailbox
```

The address should be machine-usable, as defined by "mailbox" in RFC 2822 [5].

NOTE: The number indicates the chronological order of the submission and forwarding event(s). The number "0" is associated with the submission of the MM. A higher number indicates an event at a later point in time.

X-Mms-Previously-sent-date-and-time

```
Previously-sent-date-and-time = "X-Mms-Previously-sent-date-and-time" ":"
1*DIGIT "," HTTP-date
```

The date should be machine-usable, as defined by "HTTP-date" in RFC 2616 [48].

NOTE: The number indicates the chronological order of the submission and forwarding events. The number "0" is associated with the submission of the MM. The number indicates the correspondence to the MMS User Agent's address in the "X-Mms-Previously-sent-by" header field with the same number.

X-Mms-Applic-ID

```
Applic-ID = "X-Mms-Applic-ID" ":" application-id | quoted-string
```

X-Mms-Reply-Applic-ID

```
Reply-Applic-ID = "X-Mms-Reply-Applic-ID" ":" application-id | quoted-string
```

X-Mms-Aux-Applic-Info

```
Aux-Applic-Info = "X-Mms-Aux-Applic-Info" ":" application-id | quoted-string

application-id = manufacture_domain [1*(package-name)] class-name

manufacture_domain = 1*applicationID-symbol "."

package-name = 1*applicationID-symbol "."

class-name = 1*applicationID-symbol

applicationID-symbol = ALPHA | DIGIT |"."|"_"
```

X-Mms-Content-Class:

```
Content-class = "X-Mms-Content-Class" ":" ("text" | "image-basic" | "image-
rich" | "video-basic" | "video-rich" | "megapixel" | "content-basic" |
"content-rich")
```

X-Mms-Drm-Content:

```
Drm-content =  "X-Mms-Drm-Content" ":" ( "Yes" | "No" )
```

X-Mms-Adaptation-Allowed:

```
Adaptations =  "X-Mms-Adaptation-Allowed" ":" ( "Yes" | "No" )
```

X-Mms-Request-Recipients:

```
X-Mms-Request-Recipients = X-Mms-Request-Recipients ":" MMS-address *("," MMS-
address)
```

Note: The X-Mms-Request-Recipients header contains a comma separated list of the recipient(s) MMS-addresses to whom the status code in the X-Mms-MM-Status-Code header applies. The encoding of MMS-address is defined in section 8.4.5.1.

8.4.4.9 Message Encoding on MM4

The SMTP "mail" message shall be encoded according to STD 11 [5].

8.4.4.10 Request Status Codes Clarification

The table below dictates how the originator MMS Relay/Server should interpret the possible values of the X-Mms-Request-Status-Code header field.

Table 55: Clarification of the Request Status Codes

X-Mms-Request-Status-Code	Meaning
Ok	The corresponding request and some or all of its contents were accepted without errors.
Error-unspecified	An unspecified error occurred during the processing or reception of the corresponding request.
Error-service-denied	The corresponding request was rejected due to failure of authentication or authorisation of the originating MMS Relay/Server.
Error-message-format-corrupt	An inconsistency with the message format was detected when the corresponding request was parsed.
Error-sending-address-unresolved	There were no MMS address (From:, To:, Cc:, Bcc:) in its proper format or none of the addresses belong to the recipient MMS Relay/Server.
Error-message-not-found	This status code is obsolete
Error-network-problem	The recipient MMS Relay/Server was not able to accept the corresponding request due to capacity overload.
Error-content-not-accepted	The MM content was not accepted due to size, media type, copyrights or some other reason.
Error-unsupported-message	The recipient MMS Relay/Server does not support the corresponding request abstract message.

8.4.4.11 MM-Status-Extension

The table below indicates how the originator MMS Relay/Server should interpret the possible values of the X-Mms-MM-Status-Extension header field.

Table 56: MM Status Extension

X-Mms-MM-Status-Extension	Meaning
Rejection-by-mms-recipient	The corresponding MM-Status request was rejected because the intended recipient refused to receive a message (i.e., recipient does not want to retrieve).
Rejection-by-other-rs	The corresponding MM-Status request was rejected because the MMS Relay/Server of the intended recipient refused to receive the message.

8.4.5 Message Transfer Protocol on MM4

Interworking between different MMSEs shall be based on SMTP according to STD 10 [22] as depicted in figure 5.

8.4.5.1 Addressing

The originator MMS Relay/Server shall derive the sender address to be used in the SMTP "MAIL FROM:" command from the originator address as indicated in the corresponding MM/abstract message and shall derive the recipient(s) address(es) to be used in the SMTP "RCPT TO:" command from the recipient(s) address(es) as indicated in the corresponding MM/abstract message.

The table below provides a summary of the addresses used on both message level and message transport level for all abstract messages supported on the MM4 interface.

Table 57: MM4 Addressing on Message and Message Transport Level

Message Type	Message Level Addressing				Transport Level Addressing	
	From header	Sender header	To, Cc, Bcc header	X-Mms-Originator-System header	MAIL FROM command	RCPT TO command
MM4_forward.REQ	Originator MMS-address	Originator SMTP-address	Recipient(s) MMS-address(es)	Originator MMS Relay/Server SMTP address	Originator SMTP-address	Recipient SMTP-address(es)
MM4_forward.RES	-	Recipient MMS Relay/Server system-address	Originator MMS Relay/Server system-address	-	Recipient MMS Relay/Server system-addressmailto:	Originator MMS Relay/Server system-addressmailto:
MM4_delivery_report.REQ	Recipient MMS-address	Recipient MMS Relay/Server system-address	Originator MMS-address	-	Recipient MMS Relay/Server system-address	Originator SMTP- address if the origination user agent has requested the delivery report, Originator system- address if the originating MMS Relay/Server has requested the delivery report.
MM4_delivery_report.RES	-	Originator MMS Relay/Server system-address	Recipient MMS Relay/Server system-address	-	Originator MMS Relay/Server system-address	Recipient MMS Relay/Server system-address
MM4_read_reply_report.REQ	Recipient MMS-address	Recipient MMS Relay/Server system-address	Originator MMS-address	-	Recipient MMS Relay/Server system- address	Originator SMTP address
MM4_read_reply_report.RES	-	O riginator MMS Relay/Server system-address	Recipient MMS Relay/Server system-address	-	Originator MMS Relay/Server system-address	Recipient MMS Relay/Server system-address

If the originator or recipient address on message level contains the originator or recipient MMS Relay/Server system address, then these addresses shall be used on transport level unmodified. MMS Service Provider should configure appropriate system addresses which will be used as both the recipient and originator of these administrative messages.

If the recipient address on message level conforms to the E.164 numbering plan, then the MMS Relay/Server shall apply E.164 address resolution to derive the addresses used on message transport level.

In the case the address resolution returns an RFC 2822 recipient address (ENUM based resolution), this address shall become the 'forward-path' argument to the 'RCPT TO:' SMTP command as it is described in [22].

In the case the address resolution returns only the domain of the recipient MMSE, then the MMS Relay/Server shall derive the 'forward-path' argument to the 'RCPT TO:' SMTP command according to the MM4 address model.

If the sender address on message level conforms to the E.164 numbering plan, then the MMS Relay/Server shall derive the 'reverse-path' argument to the 'MAIL FROM:' SMTP command according to the MM4 address model.

MM4 Address Model:

The MM4 Address Model defines the encoding rules of user addresses used on the MM4 interfaces. The following addresses are defined:

- SMTP-address; the MMS user's address on message transport level (SMTP)
- MMS-address; the MMS user's address on message level
- system-address, the address of user(s) being originator or recipient of administrative messages. This address is used on both message and message transport level.

The following schema defines the encoding of these addresses.

```
system-address = system-user "@" host-subdomain MMSE-domain
```

```
SMTP-address = ( MMS-address "@" MMSE-domain ) | mailbox
                            ; "mailbox" according to the definition
                            ; of STD 10 [22]

MMS-address = ( "+" E.164 "/TYPE=PLMN" ) | mailbox ; "mailbox" according
                                                   ; to the definition of
                                                   ; STD 11 [5]

E.164 = 1*DIGIT

system-user = local-part ; according to the definition of STD 11 [5],
                         ; string identifying the system user being
                         ; originator or recipient of administrative
                         ; messages

host-subdomain = *( dom-fragment "." ) ; subdomain of the MMS
                                       ; Relay/Server host

MMSE-domain = dom-fragment *( "." dom-fragment ) ; domain of the MMSE

dom-fragment = ( ALPHA | DIGIT ) *( ALPHA | DIGIT | "-" )
```

Example:

If the recipient's address is an E.164 number, the recipient address fields used in the MM4_Forward.REQ shall be composed as follows:

RCPT TO:<+E.164/TYPE=PLMN@MMSE-domain>

To: +E.164/TYPE=PLMN

MM4 MMSE Domain Name:
For the addressing of the MMSE on the MM4 interface an unique domain name should be used. To allow inter PLMN DNS translation the MM4 MMSE domain name should be composed as follows:

mms.mnc<MNC>.mcc<MCC>.gprs, where

- <MNC> identifies the network operator. The MNC shall consist of 3 digits. For two digit MNC a "0" digit shall be inserted at the left side [79].
- <MCC> identifies the country of the network operator. The MCC shall consist of 3 digits [79].

In addition to the standardised MM4 MMSE Domain Name network operators may utilise additional public MM4 domain names for the MMSE, e.g. to allow interworking with networks not utilising the E.212 [79] network identification.

If the MMS Relay/Server supports interworking with MMSE(s) identified by the Domain Name specified above ("gprs" TLD) and MMSE(s) identified by public MM4 domain names (generic or ccTLD) in parallel, it shall ensure consistency of the originator's and recipient's domains for messages transferred via the MM4 interface in the following way.

If the recipient MMSE is identified by the MM4 MMSE domain name specified above, the originating MMS Relay/ Server shall identify the originator (SMTP-address) and itself (system-address) utilising the MM4 domain name complying to the definition above.

If the recipient MMSE is identified by a public MM4 domain name, the originating MMS Relay/ Server shall identify the originator (SMTP-address) and itself (system-address utilising the public MM4 domain name.

In addition the MMSE implementation shall take public addressing requirements into account, e.g. for the MMS interworking with external (legacy) messaging systems via the MM3 interface.

MM4 MMS Host Relay/Server Address:

For the addressing of administrative messages on the MM4 interface the hosting MMS Relay/Server needs to be addressed directly. A system-address shall be allocated per MMS Relay/Server by means of a system user address. (system-user@host-subdomain.mmse-domain).

8.4.5.2 Message Transfer

The originator MMS Relay/Server shall use an SMTP connection to transfer MMs/abstract messages.

There are two options to forward MMs with multiple recipients served by the same MMSE via the MM4 interface.

Option 1:

The originating MMS Relay/Server may transfer MMs destined for multiple recipient users served by the same MMSE utilising one MM4_forward.REQ per recipient. Only one SMTP "RCPT TO" command shall be used per message transfer transaction.

For example, if an MMS originator sends an MM to 3 recipients (e.g., To: userA, Cc: userB; Bcc: userC), all served by the same MMS Relay/Server, differing from the originator's MMS Relay/Server; the originator MMS Relay/Server shall send:

an SMTP MM4_Forward.REQ, with RCPT To: = userA,

a different SMTP MM4_Forward.REQ, with RCPT To: = userB,

and another SMTP MM4_Forward.REQ, with RCPT To: = userC.

Option 2:

The originating MMS Relay/Server may transfer MMs destined for multiple recipient users served by the same MMSE utilising one MM4_forward.REQ conveying the message to all relevant recipients. Multiple SMTP "RCPT TO" commands shall be used per message transfer transaction.

If there is one or multiple recipients being transferred by the originator MMS Relay/Server using the SMTP "RCPT TO" command the recipient MMS Relay/Server should accept all recipients with a "250 OK" as indicated in [22]. This will ensure that if the originator MMS Relay/Server requested an acknowledgement the recipient MMS Relay/Server shall send the response. The originator MMS Relay/Server should use SMTP "DATA" command to transfer the message.

8.4.5.3 Other Definitions

Private agreements may utilise additional connection and security (e.g. IPSec) methods. Such methods are out of the scope of standardisation for this release.

8.4.5.2 SMTP Service Extensions

This section specifies the usage of SMTP service extensions [22] over MM4.

The following SMTP service extensions should be supported by the MMS Relay/Server for the interworking over MM4:

- SMTP Service Extension for Message Size Declaration [57]
- SMTP Service Extension for 8bit-MIME transport [58]

8.4.6 Version Handling on MM4

The following rules shall apply when different 3GPP MMS versions are supported on the MM4 Interface.

The MMS Relay/Server shall use the 3GPP MMS version number it supports in the MM4 abstract messages.

All unrecognized header fields and values received in an MM4 Request or MM4 Response shall be ignored by the MMS Relay/Server that receives the MM4 abstract message.

The MMS Relay/Server should be able to handle an MM4 Request or an MM4 Response with header fields and values of earlier 3GPP MMS versions if it is supporting a later 3GPP MMS version.

NOTE: When sending an MM4 Request message an originator MMS Relay/Server is not expected to know in advance the 3GPP MMS version of the recipient MMS Relay/Server.

8.5 Technical realisation of MMS on reference point MM5

This clause may be specified further in future releases.

8.6 Technical realisation of MMS on reference point MM6

This reference point is outside the scope of this release of the present document.

8.7 Technical realisation of MMS on reference point MM7

The MMSE may support Value Added Services in addition to the basic messaging services defined for MMS. These Value Added Services may be provided by the network operator of the MMSE or by third-party Value Added Service Providers (VASP). This clause defines the interworking between the MMS Relay/Server and the VASP.

The following figure illustrates an example data-flow of the message exchange involved in a VAS distribution of a MM as outlined by the abstract messages specified here:

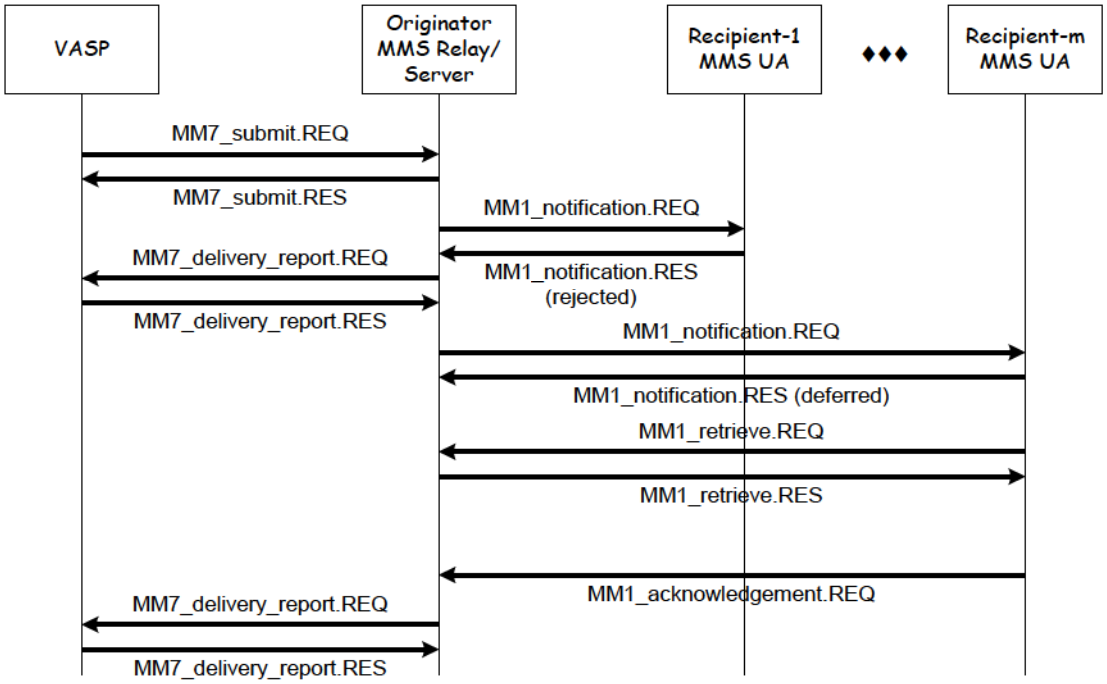


Figure 8. Sample data flow of MM7 message distribution

Subsequent sub-clauses will specify the abstract messages that will define the MM7 protocol.

Protocol version handling:

An entity (i.e., MMS Relay/Server or VASP) receiving an MM7 message formatted per a higher XML schema version than the one it supports, should handle the message according to its known functional level (e.g., it should ignore unknown XML tags and subsets of unknown schema structure).

An entity (i.e., MMS Relay/Server or VASP) receiving an MM7 message formatted per a lower XML schema version than it supports, should handle the message per its own schema version. The receiver may use default values for the data missing from the received lower version schema, if this data is relevant to the receiver.

The entity responding may either use its own XML schema version, or the sender's XML schema version.

8.7.1 Submitting a VAS MM

This section addresses the operations necessary for a VASP to provide the service by sending a multimedia message to one or more subscribers or to a distribution list. The involved abstract messages are outlined in the table below from type and direction points of view.

Table 58: Abstract messages for submitting VAS message

Abstract messages	Type	Direction
MM7_submit.REQ	Request	VASP -> MMS Relay/Server
MM7_submit.RES	Response	MMS Relay/Server -> VASP

8.7.1.1 Normal Operation

The VASP submits a message to the MMS Relay/Server by sending the MM7_submit.REQ supplying the multimedia message (MM) as the payload of the message. The message may be directed to one or more subscribers or to a distribution list. If the MMS Relay/Server accepts the submission, the MMS Relay/Server must send a MM7_submit.RES with a "success" status. This in no way indicates that the MM was actually delivered to the destinations but states that the request has been accepted.

Support for MM7_submit.REQ and MM7_submit.RES is mandatory for all MMS Relay/Servers that support MM7.

8.7.1.2 Abnormal Operation

The MMS Relay/Server should reject the MM7_submit.REQ if the VAS cannot be authorized or if the parameters of the request exceed the service level for the service being employed, or if the Relay/Server does not support third party charging. Similarly, if none of the destinations can be resolved then the response status should indicate an error. If one or several (but not all) addresses can be resolved, the MMS Relay/Server should deliver the message to those addresses and respond to the VAS using the MM7_submit.RES with a partial success to the VASP. Partial success does not indicate that the MM was actually delivered to the destinations but states that the request has been at least partially accepted.

8.7.1.3 Features

Authorisation: The VASP must supply its own identifier or the VAS identifier as part of the request.

Addressing: The VASP may direct the MM to a one or more subscribers or to a distribution list. In the addressing information, it may be indicated whether a recipient address is meant for informational purposes only or to be used for routing. In the addressing information, it may be indicated whether a recipient address has been encrypted or obfuscated. The originator of a submitted MM may be indicated in addressing-relevant information field(s) of the MM7_submit.REQ

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message Type: The type of message used on reference point MM7 indicating MM7_submit.REQ and MM7_submit.RES as such.

Transaction Identification: The VASP shall provide an unambiguous transaction identification within an MM7_submit.REQ. The MM7_submit.RES shall unambiguously refer to the corresponding MM7_submit.REQ using the same transaction identification.

Linked message identification: The VASP will supply a message identifier when submitting a message, that defines a correspondence to a previous message that was delivered by the MMS Relay/Server to the VASP.

NOTE: Use case examples:

1) The Linked ID can be used by the Relay/Server to logically relate a VASP reply (MM7_Submit.REQ) to an original user's request (MM1_Submit.REQ, and MM7_Deliver.REQ), in which case the Linked ID corresponds to the Message ID returned in the original MM1_Submit.RES.

2) The LinkedID can as well be used by the VASP to keep track of a sequence of MM7_Submit.REQ (e.g. MMs to multiple users) triggered by a single MM7_Deliver.REQ (e.g. which was triggered by a user's MM1_submit.REQ).

Message class, priority, and subject: The VASP may qualify the MM further by adding a message class, a priority and/or subject to the MM7_submit.REQ.

Service code: The VASP may mark the content of the message with a service code that may be transferred by the MMS Relay/Server in the form of charging information for use by the billing system to properly bill the user for the service being supplied.

Time stamping: The VASP may time stamp the MM.

Time constraints: The VASP may request an earliest desired time of delivery of the MM. The VASP may request a time of expiry for the MM

Reply-Charging: The originator VASP may indicate that it wants to pay for a reply-MM and convey the reply-charging limitations (e.g. the latest time of submission and/or the maximum size of a reply-MM) in the MM7_submit.REQ.

Delivery reporting: The VASP may request a delivery report for the MM

Read reporting: The VASP may request a read-reply report when the user has viewed the MM.

Content adaptation restriction: The VASP may request that the content of the MM will not be subjected to content adaptation.

NOTE: From REL-6 onwards, in case of misalignment, DRM-protection rules shall prevail on the Content Adaptation Restriction feature.

Content Information: The VASP may provide information about the nature of the content in the message. The content information could be in terms of indications that:

- classifies content of the MM based on e.g. media types/formats, size, presentation formats [85]
- the MM contains DRM-protected content

In case of conflict with the adaptation restriction provided by the VASP, DRM-protection rules in content adaptation shall prevail over the adaptation restriction.

Content type: The MIME type of the multimedia content shall always be identified in the MM7_submit.REQ.

Content: The VASP may add content in the MM7_submit.REQ.

Message identification: The MMS Relay/Server shall always provide a message identification for an MM, which it has accepted for submission in the MM7_submit.RES.

Request status: The MMS Relay/Server shall indicate the status of the MM7_submit.REQ in the associated MM7_submit.RES. The reason code given in the status information element of the MM7_submit.RES may be supported with an explanatory text further qualifying the status.

Charged-Party: The VASP may indicate in the MM7_submit.REQ which party is expected to be charged for an MM submitted by the VASP, e.g. the sending, receiving, both parties or neither.

Charged party ID: The address of the third party which is expected to pay for the MM.

Message Distribution Indication: The VASP may indicate whether the content of the MM is intended for redistribution.

NOTE: From REL-6 onwards, in case of misalignment, DRM-protection rules shall prevail on the Message Distribution Indication feature.

Delivery Condition: The VASP may indicate a condition which needs to be met to allow delivery. If the condition is not met the MM shall be discarded by the MMS Relay/Server.

Applic-ID: The presence of this information element indicates that this abstract message shall be provided to an application residing on an MMS User Agent. It contains the identification of the destination application.

Reply-Applic-ID: If present, this information element indicates a "reply path", i.e. the identifier of the application to which delivery reports, read-reply reports and reply-MMs are addressed if any.

Aux-Applic-Info: If present, this information element indicates additional application/implementation specific control information (cf. 7.1.18.1).

8.7.1.4 Information Elements

Table 59: Information elements in the MM7_submit.REQ .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_submit.REQ/ MM7_submit.RES pair.
Message type	Mandatory	Identifies this message as a MM7_submit request.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Sender address	Optional	The address of the MM originator.
Recipient address	Mandatory	The address of the recipient MM. Multiple addresses are possible or the use of the alias that indicates the use of a distribution list. It is possible to mark an address to be used only for informational purposes. It is possible to mark that a recipient address is provided in encrypted or obfuscated format. E.g. the address was originally provided in encrypted or obfuscated form in an associated MM7_deliver.REQ.
Service code	Optional	Information supplied by the VASP which may be included in charging information. The syntax and semantics of the content of this information are out of the scope of this specification.
Linked ID	Optional	This identifies a correspondence to a previous valid message delivered to the VASP.
Message class	Optional	Class of the MM (e.g. advertisement, information service, accounting)
Date and time	Optional	The time and date of the submission of the MM (time stamp).
Time of Expiry	Optional	The desired time of expiry for the MM (time stamp).
Earliest delivery time	Optional	The earliest desired time of delivery of the MM to the recipient (time stamp).
Delivery report	Optional	A request for delivery report.
Read reply	Optional	A request for confirmation via a read report to be delivered as described in section 8.1
Reply-Charging	Optional	A request for reply-charging.
Reply-Deadline	Optional	In case of reply-charging the latest time of submission of replies granted to the recipient(s) (time stamp).
Reply-Charging-Size	Optional	In case of reply-charging the maximum size for reply-MM(s) granted to the recipient(s).
Priority	Optional	The priority (importance) of the message.
Subject	Optional	The title of the whole multimedia message.
Content Class	Optional	Classifies the content of the MM to the smallest content class to which the message belongs [85].
DRM Content	Optional	Indicates if the MM contains DRM-protected content
Adaptations	Optional	Indicates if VASP allows adaptation of the content (default True) (NOTE 1)
Charged Party	Optional	An indication which party is expected to be charged for an MM submitted by the VASP, e.g. the sending, receiving, both parties third party or neither.
Content type	Mandatory	The content type of the MM's content.
Content	Optional	The content of the multimedia message
Message Distribution Indicator	Optional	If set to "false" the VASP has indicated that content of the MM is not intended for redistribution. If set to "true" the VASP has indicated that content of the MM can be redistributed. (NOTE 2)
Charged Party ID	Optional	The address of the third party which is expected to pay for the MM
Delivery Condition	Optional	In the event of a single "Delivery Condition", then if the condition is met the MM shall be delivered to the recipient MMS User Agent, otherwise the MM shall be discarded. In the event of multiple "Delivery Condition", then if all conditions are met the MM shall be delivered to the recipient MMS User Agent, otherwise the MM shall be discarded. Upon receipt of an unknown Delivery Condition, the MMS Relay/Server ignores it and continues processing. See 8.7.8.4 for the definition of the Delivery Conditions.
Applic-ID	Optional	Identification of the destination application.

Reply-Applic-ID	Optional	Identification of an application to which reply-MMs, delivery reports and read-reply reports are addressed.
Aux-Applic-Info	Optional	Auxiliary application addressing information.
NOTE 1: From REL-6 onwards, in case of misalignment between the value assigned to Adaptations and DRM-protection rules, the latter shall prevail. NOTE 2: From REL-6 onwards, in case of misalignment between the value assigned to MDI and DRM-protection rules, the latter shall prevail.		

Table 60: Information elements in the MM7_submit.RES .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_submit.REQ/ MM7_submit.RES pair.
Message type	Mandatory	Identifies this message as a MM7_submit response.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
Message ID	Conditional	If status indicates success then this contains the MMS Relay/Server generated identification of the submitted message. This ID may be used in subsequent requests and reports relating to this message.
Request Status	Mandatory	Status of the completion of the submission, no indication of delivery status is implied.
Request Status text	Optional	Text description of the status for display purposes, should qualify the Request Status.

8.7.2 Delivery Request

This section addresses cases where a message that is passed by the MMS Relay/Server to a VASP for processing. For example, this may include cases where the message originated from the MMS User-Agent.

The involved abstract messages are outlined in the table below from type and direction points of view.

Table 61: Abstract messages for demanding a service from a VASP

Abstract messages	Type	Direction
MM7_deliver.REQ	Request	MMS Relay/Server -> VASP
MM7_deliver.RES	Response	VASP -> MMS Relay/Server

8.7.2.1 Normal Operation

The MMS Relay/Server will deliver messages to the VASP by supplying the MM as the payload of the MM7_deliver.REQ. The message originates, for example, from a MMS User Agent, an external application, or from outside the MMSE. This delivery may include an identification of the request that may be used by the VASP to correlate a response to the message. The VASP should reply with a MM7_deliver.RES message indicating that the message has been successfully received and will be processed.

The following figure illustrates the data flow of a use case where a MMS User Agent requesting a service from a VAS that requires a response.

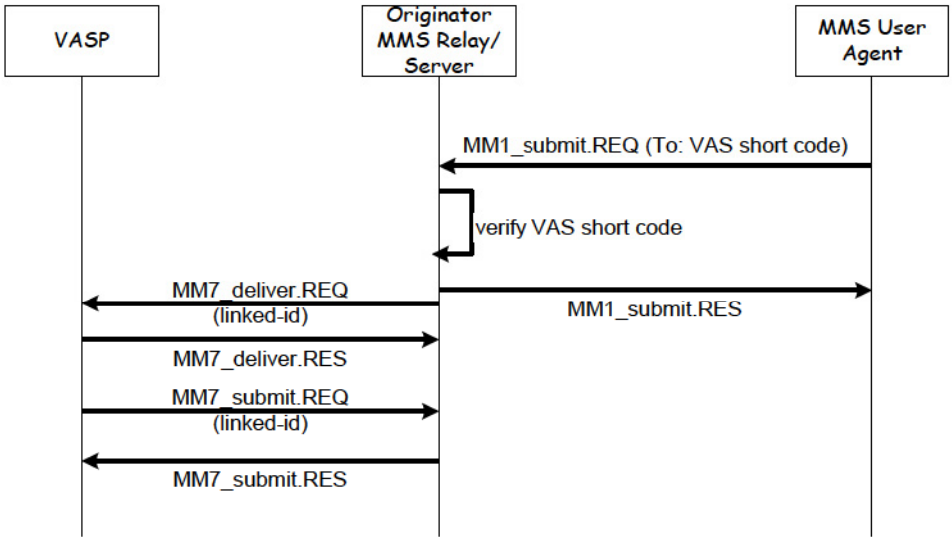


Figure 9: Use of MM7_deliver and subsequent response

Support for MM7_deliver.REQ and MM7_deliver.RES is mandatory for a MMS Relay/Server that supports MM7

8.7.2.2 Abnormal Operation

If the VASP cannot identify the requested content then it should indicate the failure in the MM7_deliver.RES status fields.

If the delivered content does not fulfil the conditions the VASP expected e.g. service not booked by the user, the VASP should indicate this failure in the MM7_deliver.RES status field.

8.7.2.3 Features

Authentication: The MMS Relay/Server may supply its own identifier as part of the request.

Addressing: All relevant address information for the delivery of the message to the VASP – including the addressing information from the original message and from the MMS Relay/Server should be included in the relevant information elements of MM7_deliver.REQ. In the addressing information, it may be indicated whether a certain recipient address is meant for informational purposes only or to be used for routing. In the addressing information, it may be indicated whether the sender address has been encrypted or obfuscated.

Previously-sent-by: The address(es) of the MMS User Agent(s) that submitted or forwarded the MM prior to the last forwarding MMS User Agent. In the multiple forwarding case the order of the provided addresses shall be indicated and the address of the originator MMS User Agent shall be marked, if present.

NOTE: The address of the last forwarding MMS User Agent is carried in other addressing elements.

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message Type: The type of message used on reference point MM7 indicating MM7_deliver.REQ and MM7_deliver.RES as such.

Transaction Identification: The VASP shall provide an unambiguous transaction identification within a request. The response shall unambiguously refer to the corresponding request using the same transaction identification.

Message priority and subject: The MMS Relay/Server may qualify the MM further by adding a priority and/or subject to the MM7_deliver.REQ. This information will originate from the end-user's original request.

Linked message identification: The MMS Relay/Server will supply an identifier for the request that may be used by the VASP.

NOTE: Use case examples:

1) The Linked ID can be used by the Relay/Server to logically relate a VASP reply (MM7_Submit.REQ) to an original user's request (MM1_Submit.REQ, and MM7_Deliver.REQ), in which case the Linked ID corresponds to the Message ID returned in the original MM1_Submit.RES.

2) The LinkedID can as well be used by the VASP to keep track of a sequence of MM7_Submit.REQ (e.g. MMs to multiple users) triggered by a single MM7_Deliver.REQ (e.g. which was triggered by a user's MM1_submit.REQ).

Service code: The VASP may mark the response to the message with a service code that will be transferred to the charging information for use by the billing system to properly bill the user for the service being supplied.

Service Provider Identification: The MMS Relay/Server may provide the SPI (Service Provider Identification) for the sender. In case a message is delivered to a VASP based on the recipient address, the MMS Relay/Server may provide the SPI for the recipient. The SPI information can originate from e.g. a user profile or a MAP query.

Time stamping: The MM may include the date and time-of the most recent handling of the MM by an MMS User Agent (i.e. either submission or forwarding of the MM). In the case of forwarding the MM7_deliver.REQ may carry the date and time of the submission of the MM.

Reply-Charging: In case of reply-charging when the reply-MM is submitted within the MM7_deliver.REQ MMS Relay/Server should indicate that the message is free-of-charge reply.

Content type: The MIME type of the multimedia content shall always be identified in the MM7_deliver.REQ.

Content: The originator of the MM may supply content that is delivered to the VASP in the MM7_deliver.REQ.

Request status: The MMS Relay/Server shall indicate the status of the request in the associated response. The reason code given in the status information element of the response may be supported with an explanatory text further qualifying the status.

MMS User Agent capabilities: The MMS Relay/Server may supply information about the capabilities of the MMS User Agent that originated the MM. This information may be used by the VAS or VASP when creating subsequent MM7_submit.REQ messages to that particular recipient MMS User Agent. This information should be provided by the MMS Relay/Server either from information received from the MMS User Agent or other MMS Relay/Server-based proprietary means.

Applic-ID: This information element contains the identification of the destination application. Upon reception, the recipient MMS VAS Application shall provide this MM7_Deliver.REQ to the specified destination application.

Reply-Applic-ID: If present, this information element indicates a "reply path". It contains the application identifier which shall be used by the recipient MMS VAS Application when a reply-MM or a read-reply report is created.

Aux-Applic-Info: If present, this information element indicates additional application/implementation specific control information (cf. 7.1.18.1).

8.7.2.4 Information Elements

Table 62: Information elements in the MM7_deliver.REQ .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_deliver.REQ/ MM7_deliver.RES pair.
Message type	Mandatory	Identifies this message as a MM7_deliver request.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
MMS Relay/Server ID	Optional	Identifier of the MMS Relay/Server
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Linked ID	Optional	Identifier that may be used by the VASP in a subsequent MM7_submit.REQ
Sender address	Mandatory	The address of the MM originator. It is possible to mark that the sender address has been encrypted or obfuscated by the MMS Relay/Server.
Recipient address	Optional	The address(es) of the intended recipients of the subsequent processing by the VASP or the original recipient address(es). It is possible to mark an address to be used only for informational purposes.
Previously-sent-by	Optional	In case of forwarding this information element contains one or more address(es) of MMS User Agent(s) that handled (i.e. forwarded or submitted) the MM prior to the MMS User Agent whose address is contained in the Sender address information element. The order of the addresses provided shall be marked. The address of the originator MMS User Agent shall be marked, if present.
Previously-sent-date-and-time	Optional	The date(s) and time(s) associated with submission and forwarding event(s) prior to the last handling of the MM by an MMS User Agent (time stamps).
Sender SPI	Optional	The SPI of the MM originator.
Recipient SPI	Optional	The SPI of the intended MM recipient, in case the MM was delivered to VASP based on the recipient address.
Date and time	Optional	The time and date of the submission of the MM (time stamp).
Reply-Charging-ID	Optional	In case of reply-charging when the reply-MM is submitted within the MM7_deliver.REQ this is the identification of the original MM that is replied to.
Priority	Optional	The priority (importance) of the message.
Subject	Optional	The title of the whole MM.
Content type	Mandatory	The content type of the MM's content.
MMS User Agent capabilities	Optional	Information about the capabilities of the MMS User Agent that originated the MM. In this context, the associated timestamp shall not be populated.
Applic-ID	Optional	Identification of the destination application.
Reply-Applic-ID	Optional	Identification of an application to which reply-MMs and read-reply reports are addressed.
Aux-Applic-Info	Optional	Auxiliary application addressing information.
Content	Optional	The content of the multimedia message

Table 63: Information elements in the MM7_deliver.RES .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_deliver.REQ/ MM7_deliver.RES pair.
Message type	Mandatory	Identifies this message as a MM7_deliver response.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
Service code	Optional	Information supplied by the VASP which may be included in charging information. The syntax and semantics of the content of this information are out of the scope of this specification.
Request Status	Mandatory	Status of the completion of the request.
Request Status text	Optional	Text description of the status for display purposes, should qualify the Request Status

8.7.3 Cancel and replace of MM

This section details the requests that should be supported in MM7 to allow a VASP to control or change the distribution of a message. These operations will allow the VASP to cancel a submitted message prior to delivery or replace a submitted message with a new message.

The involved abstract messages are outlined in the table below from type and direction points of view.

Table 64: Abstract messages for controlling Distribution MM

Abstract messages	Type	Direction
MM7_cancel.REQ	Request	VASP -> MMS Relay/Server
MM7_cancel.RES	Response	MMS Relay/Server -> VASP
MM7_replace.REQ	Request	VASP -> MMS Relay/Server
MM7_replace.RES	Response	MMS Relay/Server -> VASP

The following figure illustrates the interaction between the different MMS entities in canceling a VASP message.

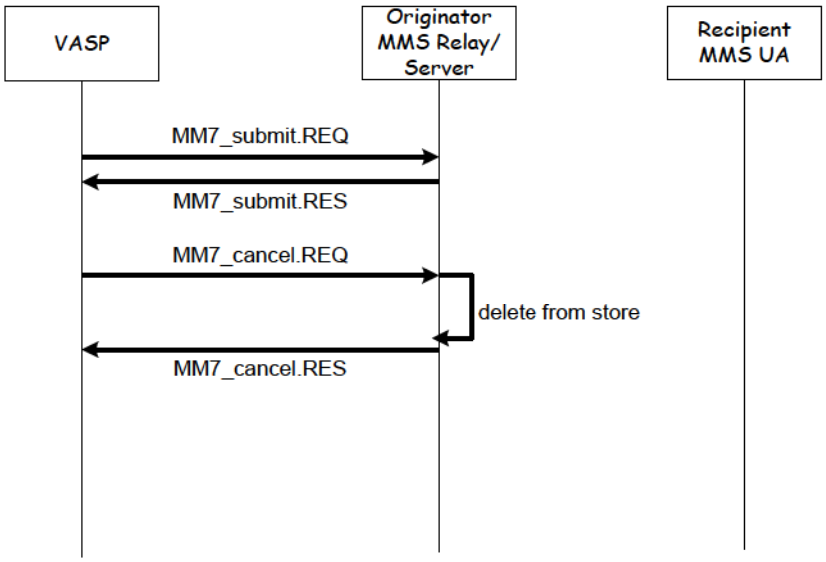


Figure 10: Data flow of VASP canceling a submitted message

8.7.3.1 Normal Operation

If the VASP has decided to cancel the delivery of a MM that it has already submitted, then the VASP should indicate this by sending the MM7_cancel.REQ message to the MMS Relay/Server. The MMS Relay/Server should check the status of the message indicated by the Message ID and cancel delivery to all destinations for which the MMS Relay/Server has not sent out a notification. The MMS Relay/Server should respond to the request with a MM7_cancel.RES indicating that the request was processed.

If the VASP has new content that it wishes to submit in place of the content that was originally submitted it should submit the new replacement content using the MM7_replace.REQ message. The MMS Relay/Server should check the status of the message indicated by the Message ID and replace the message content for all destinations that have not retrieved or forwarded the message as yet. The MMS Relay/Server should redistribute the new content to the destination list from the original MM7_submit.REQ. Optional information elements that appear in the MM7_replace.REQ message shall replace the corresponding information elements of the original submission (the VASP shall not replace information elements that were already provided in the previously sent notification),

information elements that do not appear in the MM7_replace.REQ message shall retain the original submission values. Replacement of messages that have been retrieved may be specified in future releases.

Support for MM7_cancel.REQ, MM7_cancel.RES, MM7_replace.REQ, and MM7_replace.RES is optional for all MMS Relay/Server that support MM7

8.7.3.2 Abnormal Operation

The MMS Relay/Server should reject a request to cancel or replace a message if it is unable to authorise the VAS to cancel or replace MMs, or find the Message ID indicated in the request, or cannot determine that the indicated message was originally submitted by the VASP.

8.7.3.3 Features

Authorisation: The VASP must supply its own identifier or the VAS identifier as part of the request. An application which resides on a MMS VAS application may supply its own identifiers as part of the request.

Addressing: When replacing a previously sent message the replacement shall be addressed to the same recipients as the original being replaced.

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message type: The type of message used on reference point MM7 indicating MM7_cancel.REQ, MM7_cancel.RES, MM7_replace.REQ, and MM7_replace.RES as such.

Transaction identification: The VASP shall provide an unambiguous transaction identification within a request. The response shall unambiguously refer to the corresponding request using the same transaction identification.

Service code: The VASP may mark the content of the message with a service code that may be transferred by the MMS Relay/Server in the form of charging information for use by the billing system to properly bill the user for the service being supplied.

Time stamping: The VASP may time stamp the MM.

Time constraints: The VASP may also request the earliest desired time of delivery of the MM to be changed.

Read reporting: The VASP may request a read-reply report when the user has viewed the MM.

Content adaptation restriction: While replacing an MM, the VASP may request that the content of the MM will not be subjected to content adaptation.

NOTE: From REL-6 onwards, in case of misalignment, DRM-protection rules shall prevail on the Content Adaptation Restriction feature.

Content Information: While replacing an MM, the VASP may provide information about the nature of the content in the message. The content information could be in terms of indications that:

- classifies content of the MM based on e.g. media types/formats, size, presentation formats [85]
- the MM contains DRM-protected content

In case of conflict with the adaptation restriction provided by the VASP, DRM-protection rules in content adaptation shall prevail over the adaptation restriction.

Content type: The MIME type of the multimedia content shall always be identified in the MM7_replace.REQ if content is replaced.

Content: The content of the multimedia message if provided by the VASP may be conveyed in the MM7_replace.REQ.

Message identification: The MMS Relay/Server shall always provide a message identification for an MM, which it has accepted for submission in either the MM7_replace.REQ or in the MM7_cancel.REQ. The VASP shall supply this message identification when requesting to cancel or replace a previously submitted message. When replacing a MM the updated message retains the identification of the original (replaced) message.

Request status: The MMS Relay/Server shall indicate the status of the request in the associated response. The reason code given in the status information element of the response may be supported with an explanatory text further qualifying the status.

Applic-ID: The presence of this information element indicates that this abstract message shall be provided to an application residing on an MMS User Agent. It contains the identification of the destination application.

Reply-Applic-ID: If present, this information element indicates a "reply path", i.e. the identifier of the application to which delivery reports, read-reply reports and reply-MMs are addressed if any.

Aux-Applic-Info: If present, this information element indicates additional application/implementation specific control information (cf. 7.1.18.1).

8.7.3.4 Information Elements

Table 65: Information elements in the MM7_cancel.REQ .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_cancel.REQ/ MM7_cancel.RES pair.
Message type	Mandatory	Identifies this message as a MM7_cancel request.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Sender address	Optional	The address of the MM originator.
Message ID	Mandatory	Identifier of the message to cancel.
Applic-ID	Optional	Identification of the destination application.
Reply-Applic-ID	Optional	Identification of an application to which reply-MMs, delivery reports and read-reply reports are addressed.
Aux-Applic-Info	Optional	Auxiliary application addressing information.

Table 66: Information elements in the MM7_cancel.RES .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_cancel.REQ/ MM7_cancel.RES pair.
Message type	Mandatory	Identifies this message as a MM7_cancel response.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
Request Status	Mandatory	Status of the completion of the request.
Request Status text	Optional	Text description of the status for display purposes, should qualify the Request Status

Table 67: Information elements in the MM7_replace.REQ .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_replace.REQ/ MM7_replace.RES pair.
Message type	Mandatory	Identifies this message as a MM7_replace request.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Message ID	Mandatory	Identifier of the message that current message replaces.
Service code	Optional	Information supplied by the VASP which may be included in charging information. The syntax and semantics of the content of this information are out of the scope of this specification.
Date and time	Optional	The time and date of the submission of the MM (time stamp).
Earliest delivery time	Optional	The earliest desired time of delivery of the MM to the recipient (time stamp).
Read reply	Optional	A request for confirmation via a read report to be delivered as described in section 8.1
Content Class	Optional	Classifies the content of the MM to the smallest content class to which the message belongs [85].
DRM Content	Optional	Indicates if the MM contains DRM-protected content
Adaptations	Optional	Indicates if VASP allows adaptation of the content (default True) (NOTE 1)
Content type	Conditional	The content type of the MM's content. If the Content IE appears, then the Content type IE must appear.
Applic-ID	Optional	Identification of the destination application.
Reply-Applic-ID	Optional	Identification of an application to which reply-MMs, delivery reports and read-reply reports are addressed.
Aux-Applic-Info	Optional	Auxiliary application addressing information.
Content	Optional	The content of the multimedia message
Message Distribution Indicator	Optional	If set to "false" the VASP has indicated that content of the MM is not intended for redistribution. If set to "true" the VASP has indicated that content of the MM can be redistributed. (NOTE 2)
NOTE 1: From REL-6 onwards, in case of misalignment between the value assigned to Adaptations and DRM-protection rules, the latter shall prevail. NOTE 2: From REL-6 onwards, in case of misalignment between the value assigned to MDI and DRM-protection rules, the latter shall prevail.		

Table 68: Information elements in the MM7_replace.RES.

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_replace.REQ/ MM7_replace.RES pair.
Message type	Mandatory	Identifies this message as a MM7_replace response.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
Request Status	Mandatory	Status of the completion of the request.
Request Status text	Optional	Text description of the status for display purposes, should qualify the Request Status

8.7.4 Delivery reporting to VASP

This part of MMS service covers the generation of a delivery report from the MMS Relay/Server to the VASP. The involved abstract messages are outlined in the table below from type and direction points of view.

Table 69: Abstract messages for delivery reports to VASP

Abstract Message	Type	Direction
MM7_delivery_report.REQ	Request	MMS Relay/Server -> VASP
MM7_delivery_report.RES	Response	VASP -> MMS Relay/Server

8.7.4.1 Normal Operation

The MMS Relay/Server shall create the MM7_delivery_report.REQ and send it to the VASP when the appropriate information is available.

Support for MM7_delivery_report.REQ and MM7_delivery_report.RES is mandatory for a MMS Relay/Server that supports MM7.

8.7.4.2 Abnormal Operation

In case the VASP cannot identify the MMS Relay/Server or the Message ID is not recognized, then the VASP shall respond with a MM7_delivery_report.RES including a status which indicates the reason the delivery report was not accepted.

8.7.4.3 Features

Addressing: Both the address of the VAS (which is the original MM originator) and the address of the recipient of the original MM shall be provided in the addressing-relevant information fields of MM7_delivery_report.REQ.

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message Type: The type of message used on reference point MM7 indicating MM7_delivery_report.REQ and MM7_delivery_report.RES as such.

Transaction Identification: The VASP shall provide an unambiguous transaction identification within a request. The response shall unambiguously refer to the corresponding request using the same transaction identification.

Time stamping: The MM7_delivery_report.REQ shall carry the time and date of handling of the MM (e.g. retrieval, expiry, rejection).

Message identification: In the MM7_delivery_report.REQ the MMS Relay/Server shall always provide the original message identification of the MM that the delivery report corresponds to as generated in response to the associated MM7_submit.REQ.

MM Status: The MM7_delivery_report.REQ shall carry the status of the MM delivery, e.g. retrieved, rejected, expired or indeterminate. The MM Status Extension may be used to provide more granularity. The status code may be supported with an explanatory text to further qualify the status of the MM delivery (e.g. recipient does not support MMS, recipient address unresolved, MM is too big, if/what content adaptation took place, address where the MM was forwarded). If there is no match between delivery condition and user status, delivery condition not met shall be returned.

Request Status: The VASP shall indicate the status of the MM7_delivery_report.REQ in the associated MM7_delivery_report.RES. The reason code given in the status information element of the response may be supported with an explanatory text further qualifying the status.

MMS User Agent Capabilities: The MMS Relay/Server may provide information about the MMS User Agent 's capabilities of the recipient of the original MM. This information should be provided by the MMS Relay/Server either from information received from the MMS User Agent or other MMS Relay/Server-based proprietary means.

NOTE: This information is time stamped. As time goes on, it may not accurately reflect the current MMS User Agent capabilities.

Applic-ID: This information element indicates the identification of the application that the delivery report is intended for. If a Reply-Applic-ID was indicated in the corresponding original MM, the recipient MMS Relay/Server shall set its value to that Reply-Applic-ID value. Otherwise, the recipient MMS Relay/Server shall set its value to the Applic-ID value that was indicated in the corresponding original MM.

Reply-Applic-ID: If present, this information element indicates a “reply path”, i.e. the identification of an application to which reply-MMs are addressed. The recipient MMS Relay/Server shall insert it into the MM7_delivery_report.REQ if the values of Applic-ID and Reply-Applic-ID in the corresponding original MM differ, in which case its value shall equal the Applic-ID value that was indicated in the corresponding original MM.

Aux-Applic-Info: If present, this information element indicates additional application/implementation specific control information (cf. 7.1.18.1). The recipient MMS Relay/Server shall insert it if Aux-Applic-Info was indicated in the corresponding original MM, in which case its value shall equal that Aux-Applic-Info value.

8.7.4.4 Information Elements

Table 70: Information elements in the MM7_delivery_report.REQ.

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_delivery_report.REQ/ MM7_delivery_report.RES pair.
Message Type	Mandatory	The type of message used on reference point MM7 " MM7_delivery_report.REQ".
MM7 Version	Mandatory	The version of MM7 supported by the MMS Relay/Server
MMS Relay/Server ID	Optional	Identifier of the MMS Relay/Server
Message ID	Mandatory	The identification of the original MM.
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Recipient address	Mandatory	The address of the recipient of the original MM.
Sender address	Mandatory	The address of the VAS that submitted the original MM.
Date and time	Mandatory	Date and time the MM was handled (retrieved, expired, rejected, etc.) (time stamp)
MM Status	Mandatory	Status of the MM, e.g. retrieved, expired, rejected
MM Status Extension	Optional	Extension of the MM Status, to provide more granularity.
MM Status text	Optional	Text description of the status for display purposes, should qualify the MM Status
MMS User Agent Capabilities	Optional	Information about the MMS User Agent's capabilities of the recipient of the original MM. As part of this information, a timestamp should be conveyed indicating the time when the recipient MMS User Agent provided its capabilities.
Applic-ID	Optional	The identification of the originating application of the original MM.
Reply-Applic-ID	Optional	Identification of an application to which the originating application of the original MM shall address reply-MMs if any.
Aux-Applic-Info	Optional	Auxiliary application addressing information.

Table 71: Information elements in the MM7_delivery_report.RES.

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_delivery_report.REQ/ MM7_delivery_report.RES pair.
Message Type	Mandatory	The type of message used on reference point MM7: "MM7_delivery_report.RES".
MM7 Version	Mandatory	The version of MM7 supported by the VASP
Request Status	Mandatory	The status of the associated MM7_delivery_report.REQ.
Request Status text	Optional	Text description of the status for display purposes, should qualify the Request Status

8.7.5 Read-Reply Report for VASP

This part of MMS service covers the delivery of a read-reply report from the MMS Relay/Server to the VASP. The involved abstract messages are outlined in the table below from type and direction points of view.

Table 72: Abstract messages for sending and receiving read-reply reports in MM7

Abstract messages	Type	Direction
MM7_read_reply.REQ	Request	MMS Relay/Server -> VASP
MM7_read_reply.RES	Response	VASP -> MMS Relay/Server

8.7.5.1 Normal Operation

If the VASP requested a read-reply report then the recipient MMS User Agent may create and send a read-reply to the MMS Relay/Server. The MMS Relay/Server must identify that this read-reply report is associated with a MM originating from the MM7 reference point and must create the MM7_read_reply.REQ and send it to the VASP. The VASP shall return a MM7_read_reply.RES that reflects the successful reception of the read-reply report.

Support for MM7_read_reply_report.REQ and MM7_read_reply_report.RES is optional for a MMS Relay/Server that supports MM7.

8.7.5.2 Abnormal Operation

In case the VASP cannot identify the MMS Relay/Server or the Message ID is not recognized, then the VASP shall respond with a MM7_read_reply.RES including a status which indicates the reason the read reply report was not accepted.

8.7.5.3 Features

Addressing: Both, the address of the VASP (which is the MM originator), and the address of the originator (which is the MM recipient) of a read-reply report shall be provided in the addressing-relevant information fields of MM7_read_reply_report.REQ.

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message Type: The type of message used on reference point MM7 indicating MM7_read_reply.REQ and MM7_read_reply.RES as such.

Transaction Identification: The VASP shall provide an unambiguous transaction identification within a request. The response shall unambiguously refer to the corresponding request using the same transaction identification.

Message identification: In the MM7_read_reply_report.REQ the MMS Relay/Server shall always provide the original message identification of the MM that the read-reply report corresponds to as generated for the MM7_submit.RES.

Time Stamping: The MM7_read_reply_report.REQ shall carry the time-stamp associated with the read-reply report.

Read Status: The MM7_read_reply_report.REQ shall carry the status of the MM retrieval, e.g. read or deleted without being read.

Request Status: The VASP shall indicate the status of the MM7_read_reply.REQ in the associated MM7_read_reply.RES. The reason code given in the status information element of the response may be supported with an explanatory text further qualifying the status.

Applic-ID: In case of application addressing, this information element indicates the identification of the application that the read-reply report is intended for. The recipient MMS Relay/Server shall set its value to the Applic-ID value indicated in the corresponding MM1_read_reply.REQ or MM4_read_reply_recipient.REQ.

Reply-Applic-ID: If present, this information element indicates a "reply path", i.e. the identifier of the application to which reply-MMs to this read-reply report are addressed if any. The recipient MMS Relay/Server shall set its value to the Reply-Applic-ID value indicated in the corresponding MM1_read_reply.REQ or MM4_read_reply_recipient.REQ.

Aux-Applic-Info: If present, this information element indicates additional application/implementation specific control information (cf. 7.1.18.1). The recipient MMS Relay/Server shall set its value to the Aux-Applic-Info value indicated in the corresponding MM1_read_reply.REQ or MM4_read_reply_recipient.REQ.

8.7.5.4 Information Elements

Table 73: Information elements in the MM7_read_reply_report.REQ.

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_read_reply_report.REQ/ MM7_read_reply_report.RES pair.
Message Type	Mandatory	Identifies this message as a MM7_read_reply_report request.
MM7 Version	Mandatory	The version of MM7 supported by the MMS Relay/Server.
MMS Relay/Server ID	Optional	Identifier of the MMS Relay/Server
Recipient address	Mandatory	The address of the MM recipient of the original MM, i.e. the originator of the read-reply report.
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Sender address	Mandatory	The address of the VASP (originator of the original MM) i.e. the recipient of the read-reply report.
Message ID	Mandatory	The message ID of the original MM.
Date and time	Mandatory	Date and time the MM was handled (read, deleted without being read, etc.) (time stamp)
Read Status	Mandatory	Status of the MM, e.g. Read, Deleted without being read
Read Status text	Optional	Text description of the status for display purposes, should qualify the Read Status
Applic-ID	Optional	The identification of the originating application of the original MM.
Reply-Applic-ID	Optional	Identification of an application to which the originating application of the original MM shall address reply-MMs if any.
Aux-Applic-Info	Optional	Auxiliary application addressing information.

Table 74: Information elements in the MM7_read_reply_report.RES.

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_read_reply_report.REQ/ MM7_read_reply_report.RES pair.
Message Type	Mandatory	Identifies this message as a MM7_read_reply_report response.
MM7 Version	Mandatory	The version of MM7 supported by the VASP.
Request Status	Mandatory	The status of the associated MM7_read_reply_report.REQ.
Request Status text	Optional	Text description of the status for display purposes, should qualify the Request Status.

8.7.5A Extended Cancel and Extended Replace of MM

This section details the requests that should be supported in MM7 to allow a VASP to control or change the distribution of a MM, down to the MMS User Agent. These operations will allow the VASP to cancel a submitted MM or replace a submitted MM with a new MM.

The involved abstract messages are outlined in Table 75 from type and direction points of view.

Table 75: Abstract messages for controlling Distribution MM

Abstract messages	Type	Direction
MM7_extended_cancel.REQ	Request	VASP -> MMS Relay/Server
MM7_extended_cancel.RES	Response	MMS Relay/Server -> VASP
MM7_extended_replace.REQ	Request	VASP -> MMS Relay/Server
MM7_extended_replace.RES	Response	MMS Relay/Server -> VASP

The following figure illustrates the interaction between the different MMS entities in cancelling a VASP message.

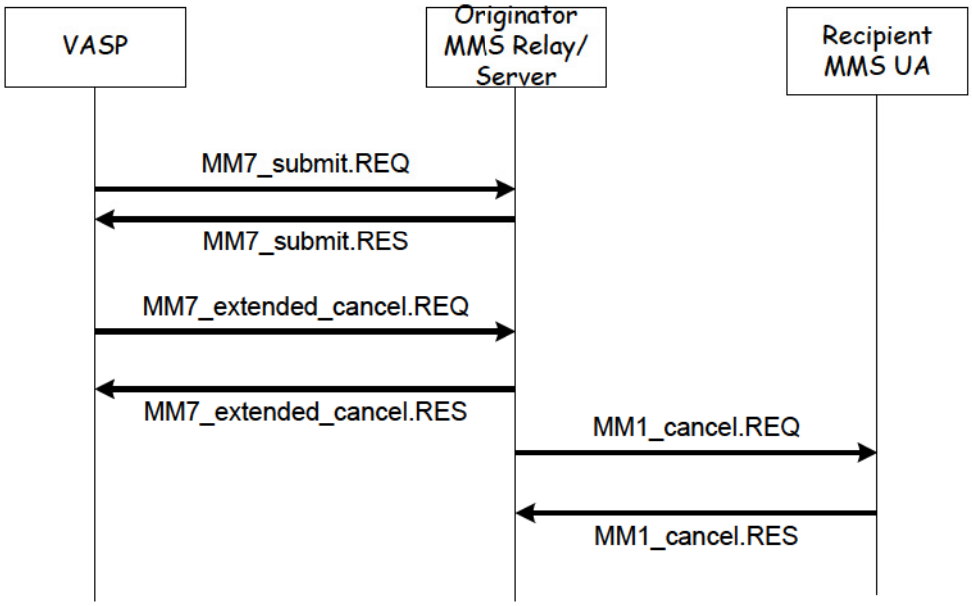


Figure 11: Data flow of VASP cancelling a submitted message down to the MMS User Agent

8.7.5A.1 Normal Operation

If the VASP has decided to cancel the delivery of a MM that it has already submitted, and wants to extend the cancellation to be effective also on an MM already downloaded by the terminal, then the VASP should indicate this by sending the MM7_extended_cancel.REQ message to the MMS Relay/Server. The MMS Relay/Server should check the status of the message indicated by the Cancel ID and:

1) locally cancel delivery, at the MMS Relay/Server level, to all destinations for which the MMS Relay/Server has not sent out a notification;

2) locally cancel the MM at the MMS Relay/Server level and indicate appropriate error code in MM1_retrieve.RES as "Request Status" and "Request Status", to all destinations for which the MMS Relay/Server has sent out a notification but the MM has not yet been retrieved, and

3) extend that cancellation down to the MMS User Agent using MM1_cancel.REQ, to all destinations for which the MM has already been retrieved. The MMS Relay/Server should use the destination list from the original MM7_submit.REQ in MM1_cancel.REQ.

The MMS Relay/Server should respond to the request with a MM7_extended_cancel.RES indicating that the request was processed.

If the VASP has new content that it wishes to submit in place of the content that was originally submitted, and wants to extend the replacement to be effective also on an MM already downloaded by the MMS User Agent, it should submit the new replacement content using the MM7_extended_replace.REQ message. The MMS Relay/Server should:

1) check the status of the message indicated by the Replace ID and replace the message content for all destinations that have not retrieved or forwarded the message as yet; and

2) extend that replacement down to the MMS User Agent, to all destinations that have retrieved but not forwarded the message; via sending an additional notification to the MMS User Agent. The MMS Relay/Server should redistribute the new content to the destination list from the original MM7_submit.REQ. Optional information elements that appear in the MM7_extended_replace.REQ message shall replace the corresponding information elements of the original submission (the VASP should not replace any information elements that were already provided in the previously sent notification), information elements that do not appear in the MM7_extended_replace.REQ message shall retain the original submission values.

The MMS Relay/Server should respond to the request with a MM7_extended_replace.RES indicating if the request was processed.

Support for MM7_extended_cancel.REQ, MM7_extended_cancel.RES, MM7_extended_replace.REQ, and MM7_extended_replace.RES is optional for all MMS Relay/Server that support MM7.

8.7.5A.2 Abnormal Operation

The MMS Relay/Server should reject a request to cancel or replace a message if it is unable to authorise the VAS to cancel or replace MMs, or find the ID of the previous message (i.e. Cancel ID and Replace ID respectively) indicated in the request.

8.7.5A.3 Features

Authorisation: The VASP must supply its own identifier or the VAS identifier as part of the request.

Addressing: The replacement and cancellation shall be addressed to the same recipients as the original MM being replaced and cancelled respectively.

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message type: The type of message used on reference point MM7 indicating MM7_extended_cancel.REQ, MM7_extended_cancel.RES, MM7_extended_replace.REQ, and MM7_extended_replace.RES as such.

Transaction identification: The VASP shall provide an unambiguous transaction identification within a request. The response shall unambiguously refer to the corresponding request using the same transaction identification.

Service code: When replacing a previously sent MM, the VASP may mark the content of the message with a service code that may be transferred by the MMS Relay/Server in the form of charging information for use by the billing system to properly bill the user for the service being supplied.

Time stamping: When replacing a previously sent MM, the VASP may time stamp the MM.

Time constraints: When replacing a previously sent MM, the VASP may also request the earliest desired time of delivery and time of expiry of the MM to be changed.

Delivery reporting: When replacing a previously sent MM, the VASP may request a delivery report for the updated (replacing) MM.

Read reporting: When replacing a previously sent message, the VASP may request a read-reply report when the user has viewed the updated (replacing) MM.

Content adaptation restriction: The VASP may request that the content of the MM will not be subjected to content adaptation.

NOTE: In case of misalignment, DRM-protection rules shall prevail on the Content Adaptation Restriction feature.

Content type: The MIME type of the multimedia content shall always be identified in the MM7_extended_replace.REQ if content is replaced.

Content: The content of the multimedia message if provided by the VASP may be conveyed in the MM7_extended_replace.REQ.

Replace ID: When replacing a previously sent MM, the VASP shall supply the identifier of the previous MM to be replaced.

Cancel ID: When cancelling a previously sent MM, the VASP shall supply the identifier of the previous MM to be cancelled.

Message identification: When replacing an MM that was retrieved or forwarded, the updated (replacing) MM has a different identification from the original (replaced) message. In this case, the MMS Relay/Server shall provide the new identification for the updated (replacing) MM in the MM7_extended_replace.RES. When replacing a MM that was neither retrieved nor forwarded, the updated MM retains the identification of the original (replaced) MM.

Request status: The MMS Relay/Server shall indicate the status of the request in the associated response.

8.7.5A.4 Information Elements

Table 76: Information elements in the MM7_extended_cancel.REQ .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_extended_cancel.REQ/ MM7_extended_cancel.RES pair.
Message type	Mandatory	Identifies this message as a MM7 extended cancel request.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Sender address	Optional	The address of the MM originator.
Cancel ID	Mandatory	Identifier of the message to cancel.

Table 77: Information elements in the MM7_extended_cancel.RES .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_extended_cancel.REQ/ MM7_extended_cancel.RES pair.
Message type	Mandatory	Identifies this message as a MM7 extended_cancel response.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
Request Status	Mandatory	Status of the completion of the request.

Table 78: Information elements in the MM7_extended_replace.REQ .

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_extended_replace .REQ/ MM7_extended_replace.RES pair.
Message type	Mandatory	Identifies this message as a MM7_extended replace request.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
VASP ID	Optional	Identifier of the VASP for this MMS Relay/Server.
VAS ID	Optional	Identifier of the originating application.
Service code	Optional	Information supplied by the VASP which may be included in charging information. The syntax and semantics of the content of this information are out of the scope of this specification.
Replace_ID	Mandatory	This identifies the previously sent VAS/VASP MM that need to be replaced by this MM.
Date and time	Optional	The time and date of the submission of the MM (time stamp).
Earliest delivery time	Optional	The earliest desired time of delivery of the MM to the recipient (time stamp).
Time of Expiry	Optional	The desired time of expiry for the MM (time stamp).
Delivery report	Optional	A request for delivery report.
Read reply	Optional	A request for confirmation via a read report to be delivered as described in section 8.1
Adaptations	Optional	Indicates if VASP allows adaptation of the content (default True) (NOTE 1)
Content type	Conditional	The content type of the MM's content. If the Content IE appears, then the Content type IE must appear.
Content	Optional	The content of the multimedia message
NOTE 1: In case of misalignment between the value assigned to Adaptations and DRM-protection rules, the latter shall prevail.		

Table 79: Information elements in the MM7_extended_replace.RES.

Information element	Presence	Description
Transaction ID	Mandatory	The identification of the MM7_extended_replace.REQ/ MM7_ extended_replace.RES pair.
Message type	Mandatory	Identifies this message as a MM7_extended_replace.RES.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
Message ID	Conditional	The MMS Relay/Server generated identification of the updated (replacing) MM (applicable only if the replaced Mm is retrieved or forwarded).
Request Status	Mandatory	Status of the completion of the request.

8.7.6 Generic Error Handling

When the MMS Relay/Server or VASP receives a MM7 abstract message that cannot be replied to with the specific response it shall reply using a generic error message as described here. To get a correlation between the original send REQ and the error response, every abstract message on the MM7 reference point shall include a Transaction ID.

The involved abstract messages are outlined in the table below from type and direction points of view.

Table 80: Abstract message for generic error notification

Abstract message	Type	Direction
MM7_RS_error.RES	Response	MMS Relay/Server -> VASP
MM7_VASP_error.RES	Response	VASP->MMS Relay/Server

8.7.6.1 Normal Operation

If the MMS Relay/Server has received a message over the MM7 interface and does not recognize the Message Type, or the requested feature is not supported and the normal response message is not supported, then the MMS Relay/Server must generate a MM7_RS_error.RES message to reply to the VASP.

If the VASP has received a message over the MM7 interface and does not recognize the Message Type, or the requested feature is not supported and the normal response message is not supported, then the VASP must generate a MM7_VASP_error.RES message to reply to the MMS Relay/Server.

Support for the MM7_RS_error.RES and MM7_VASP_error.RES is Mandatory for a MMS Relay/Server that supports MM7

8.7.6.2 Features

Version: The MM7 protocol shall provide unique means to identify the version supported by both the MMS Relay/Server and VASP.

Message Type: The type of message used on reference point MM7 indicating MM7_RS_error.RES or MM7_VASP_error.RES as such.

Transaction Identification: The response shall unambiguously refer to the corresponding request using the same transaction identification.

Error Status: The MMS Relay/Server or VASP shall indicate the error condition that caused the generation of the error response. The reason code given in the status information element of the response may be supported with an explanatory text further qualifying the status.

8.7.6.3 Information Elements

Table 81: Information elements in the MM7_RS_error.RES .

Information element	Presence	Description
Transaction ID	Mandatory	Identifier that corresponds to the Transaction ID of the incoming message.
Message type	Mandatory	Identifies this message as a MM7_RS_error response.
MM7 version	Mandatory	Identifies the version of the interface supported by the MMS Relay/Server
Error Status	Mandatory	Error code (e.g. Message type not-supported, MM7 version not supported).
Error Status text	Optional	Text description of the status for display purposes, should qualify the Error Status.

Table 82: Information elements in the MM7_VASP_error.RES .

Information element	Presence	Description
Transaction ID	Mandatory	Identifier that corresponds to the Transaction ID of the incoming message.
Message type	Mandatory	Identifies this message as a MM7_VASP_error response.
MM7 version	Mandatory	Identifies the version of the interface supported by the VASP
Error Status	Mandatory	Error code (e.g. Message type not-supported, MM7 version not supported).
Error Status text	Optional	Text description of the status for display purposes, should qualify the Error Status.

8.7.7 Administrating the Distribution List

After a Value Added Service becomes available users may subscribe to the service using direct contact to the VASP (e.g. by sending a MM via MM1_submit.REQ to the service provider including registration information). The distribution list may be maintained by the MMS Relay/Server. The full definition of the administration of the distribution list may be specified in future releases of this specification.

8.7.8 Implementation of the MM7 Abstract Messages

The interface between a VASP and the MMS Relay/Server, over the MM7 reference point, shall be realised using SOAP 1.1 [68] as the formatting language. The VASP and the MMS Relay/Server shall be able to play dual roles of sender and receiver of SOAP messages. HTTP [48] shall be used as the transport protocol of the SOAP messages. The SOAP message shall bind to the HTTP request/response model by providing SOAP request parameters in the body of the HTTP POST request and the SOAP response in the body of the corresponding HTTP response.

8.7.8.1 SOAP Message Format and Encoding Principles

The following principles shall be used in the design of the SOAP implementation of the MM7 interface:

- The schema shall be based on the W3C SOAP 1.1 schema . The schema shall include an indication of the version of the MM7 specification that is supported.

  NOTE: The W3C SOAP 1.1 schema will be published by the 3GPP. The URI shall be http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-1.

- The MM7 SOAP messages shall consist of a SOAP envelope, SOAP Header element and SOAP Body element, as described in [68].

- The SOAP EncodingStyle [68] should not be used.

- Transaction management shall be handled in the SOAP Header element. The TransactionID shall be included as a SOAP Header entry. The SOAP *actor* [68] attribute should not be specified in the SOAP Header entry. The SOAP *mustUnderstand* [68] attribute should be specified with value "1".

- All MM7 information elements, except for the TransactionID, shall be included in the SOAP Body element.
- XML element names shall use Upper Camel Case convention, where words are concatenated to form an element name with the first letter of each word in upper case (e.g. EarliestDeliveryTime). The only exception to this rule is where an acronym (e.g. VASP) is used - in such cases all of the letters of the acronym shall be in upper case (e.g. VASPHeader).

8.7.8.1.1 Binding to HTTP

MM7 request messages shall be transferred in an HTTP POST request. MM7 responses shall be transferred in an HTTP Response message. The media type "text/xml" [70] shall be used for messages containing only the SOAP envelope.

MM7 requests that carry a SOAP attachment shall have a "multipart/related" [71] Content-Type. The SOAP envelope shall be the first part of the MIME message and shall be indicated by the Start parameter of the multipart/related Content-Type. If a SOAP attachment is included it shall be encoded as a MIME part and shall be the second part of the HTTP Post message. The MIME part should have the appropriate content type(s) to identify the payload. Figures 12 and 13 provide few examples of the message structure.This MIME part shall have two MIME headers - Content-Type and Content-ID [72] fields. The Content-ID shall be referenced by the MM7 request <Content> element using the format specified in [69].

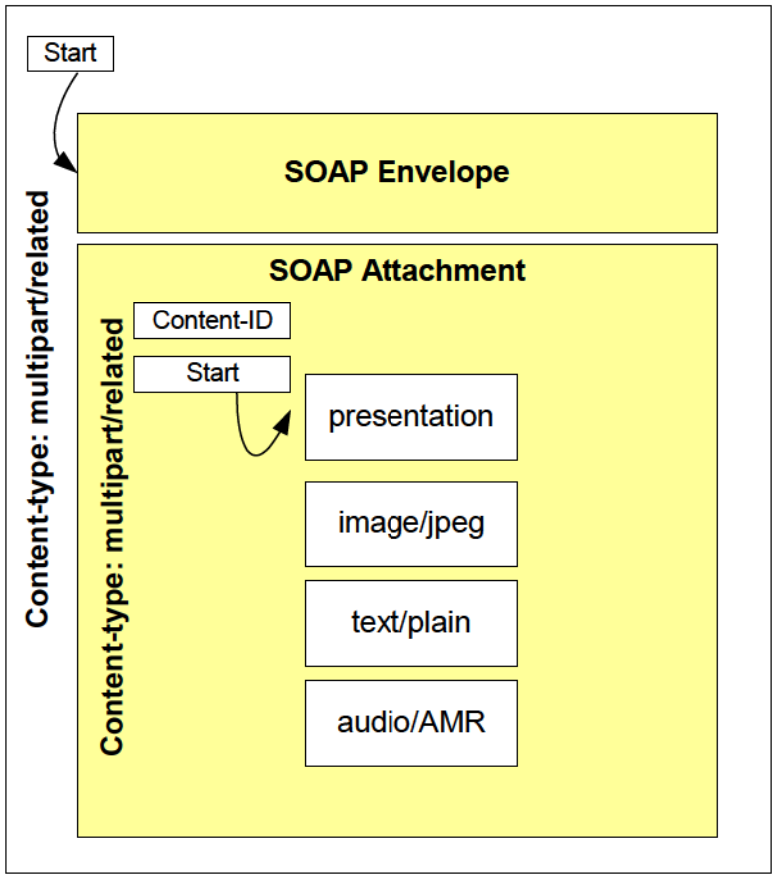


Figure 12: Message structure for a message with a SOAP Attachment (multipart/related payload)

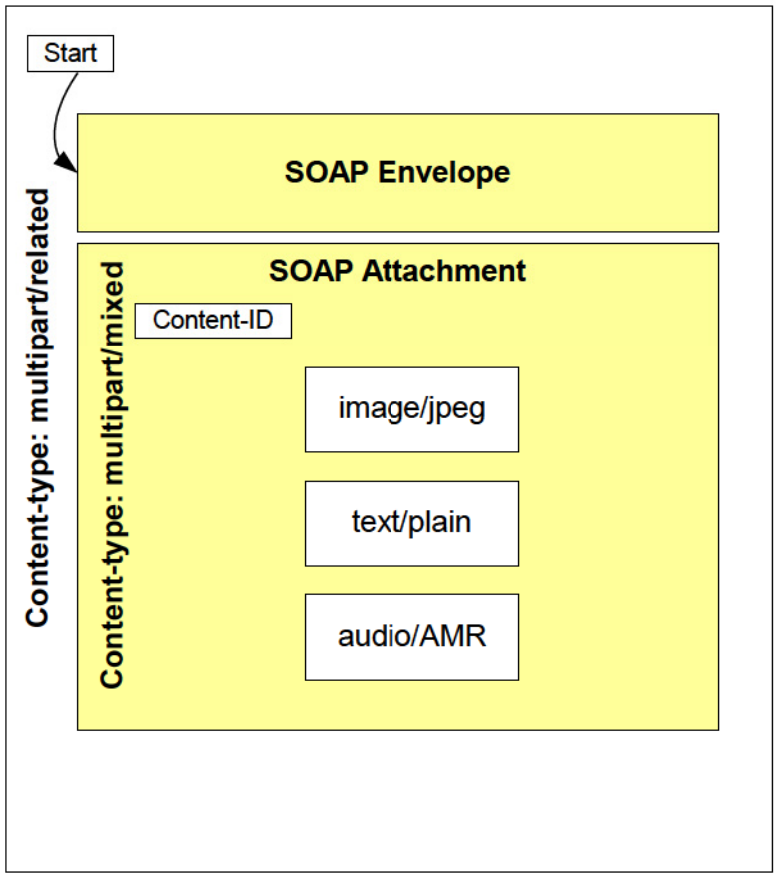


Figure 13: Message structure for a message with a SOAP Attachment (multipart/mixed payload)

For specific examples see the section describing SOAP HTTP examples.

8.7.8.1.2 SOAPAction Header Field

The SOAPAction HTTP request header field [68] should be set to the NULL string (i.e. "").

8.7.8.1.3 DRM-related media types in SOAP messages

In case MM elements are DRM-protected these MM elements shall be of media types as defined in [76] and [78].

8.7.8.2 MM7 Addressing Considerations

In order to bind properly to HTTP, the MMS Relay/Server and the VASP shall be addressable by a unique URI type address [48]. This address shall be placed in the host header field in the HTTP POST method.

In the SOAP body, when the recipient MMS User Agent is addressed, the address-encoding scheme for MM1 shall be used. For these purposes the VASP shall be identified by a MM1 addressable address.

8.7.8.3 Status Reporting

The MM7 response messages shall be carried within a HTTP Response. The response may carry status at three levels:

– network errors shall be indicated by the HTTP level, e.g. as an HTTP 403 "Server not found" and shall be carried in the HTTP response back to the originating application.

– request processing errors (status codes in the range 2xxx-9xxx) shall be reported as a SOAP Fault as defined in [68]. The SOAP fault shall include the *faultcode* [68], *faultstring*[68], and *detail*[68] elements. The *detail* element shall include the status elements described below and in Table 70. The SOAP detail element shall include VASPErrorRsp or RSErrorRsp element as direct child elements. VASPErrorRsp element shall be included if the SOAP Fault is generated by the VASP and RSErrorRsp element shall be sent if the SOAP Fault is generated by the MMS Relay/Server. Errors relating to the TransactionID shall be reported as a SOAP Fault. The *faultcode* shall be "Client.TransactionID" and the *faultstring* shall be used to indicate the human-readable description of the error. No *detail* element shall appear.

– success or partial success (status codes from the Success class, i.e. with format 1xxx) shall be reported in a MM7 response message that will include the following status elements, contained in the Status element of the response messages.

All status responses shall be reported with three XML elements in the response, i.e. the details of the SOAP Fault and the status of the MM7 response message –

- StatusCode shall indicate a numerical code that identifies different classes of error or successful completion of the operation. The StatusCode is a four-digit number of which the two high-order digits are defined in section 8.7.8.3.1, the two low-order digits are implementation specific.
- StatusText shall contain a predefined human readable description of the numerical code that indicates the general type of the error.
- Details, optionally, gives particular details of the error or partial success, e.g. indicates the address that cannot be resolved or message-id that is not recognized. The format of the details element is implementation specific.

8.7.8.3.1 Request and Error Status Codes

The StatusText element (for application-level situations) shall be used to carry a human readable explanation of the error or success situation, e.g. partial success. In Table 70 below the status text should be used by the VASP or MMS Relay/Server when indicating status information to the originator. In addition to this there will be status codes consisting of a four digit numeric value. The first digit of the status code indicates the class of the code. There are 4 classes:

- 1xxx: Success in the operation,
- 2xxx: Client errors,
- 3xxx: Server errors,
- 4xxx: Service errors.

Status codes are extensible. The VASP and the MMS Relay/Server must understand the class of a status code. Unrecognised codes shall be treated as the x000 code for that class. Codes outside the 4 defined class ranges shall be treated as 3000. For implementation specific codes, the numbers in the range x500-x999 shall be used.

The following Table 67 shows the StatusCodes and StatusTexts that are currently defined.

Table 83: StatusCode and StatusText

StatusCode	StatusText	Meaning
1000	Success	This code indicates that the request was executed completely
1100	Partial success	This code indicates that the request was executed partially but some parts of the request could not be completed. Lower order digits and the optional Details element may indicate what parts of the request were not completed.
2000	Client error	Client made an invalid request
2001	Operation restricted	The request was refused due to lack of permission to execute the command.
2002	Address Error	The address supplied in the request was not in a recognized format or the MMS Relay/Server ascertained that the address was not valid for the network because it was determined not to be serviced by this MMS Relay/Server. When used in response-result, and multiple recipients were specified in the corresponding push submission, this status code indicates that at least one address is incorrect.
2003	Address Not Found	The address supplied in the request could not be located by the MMS Relay/Server. This code is returned when an operation is requested on a previously submitted message and the MMS Relay/Server cannot find the message for the address specified.
2004	Multimedia content refused	The server could not parse the MIME content that was attached to the SOAP message and indicated by the Content element or the content size or media type was unacceptable.
2005	Message ID Not found	This code is returned when an operation is requested on a previously submitted message and the MMS Relay/Server cannot find the message for the message ID specified or when the VASP receives a report concerning a previously submitted message and the message ID is not recognized.
2006	LinkedID not found	This code is returned when a LinkedID was supplied and the MMS Relay/Server could not find the related message.
2007	Message format corrupt	An element value format is inappropriate or incorrect.
2008	Application ID not found	This code is returned when an operation is requested on a previously submitted message and the MMS Relay/Server cannot find the destination application for the application ID specified or when the VASP receives a report concerning a previously submitted message and the application ID is not recognized.
2009	Reply Application ID not found	This code is returned when a Reply Application ID was supplied and the MMS Relay/Server could not find the originating application.
3000	Server Error	The server failed to fulfill an apparently valid request.
3001	Not Possible	The request could not be carried out because it is not possible. This code is normally used as a result of a cancel or status query on a message that is no longer available for cancel or status query. The MMS Relay/Server has recognized the message in question, but it cannot fulfill the request because the message is already complete or status is no longer available.
3002	Message rejected	Server could not complete the service requested.
3003	Multiple addresses not supported	The MMS Relay/Server does not support this operation on multiple recipients. The operation MAY be resubmitted as multiple single recipient operations.

3004	Application Addressing not supported	Recipient MMS User Agent does not support the transport of application data.
4000	General service error	The requested service cannot be fulfilled.
4001	Improper identification	Identification header of the request does not uniquely identify the client (either the VASP or MMS Relay/Server).
4002	Unsupported version	The version indicated by the MM7 Version element is not supported.
4003	Unsupported operation	The server does not support the request indicated by the MessageType element in the header of the message.
4004	Validation error	The SOAP and XML structures could not be parsed, mandatory fields are missing, or the message-format is not compatible to the format specified. Details field may specify the parsing error that caused this status.
4005	Service error	The operation caused a server (either MMS Relay/Server or VASP) failure and should not be resent.
4006	Service unavailable	This indication may be sent by the server when service is temporarily unavailable, e.g. when server is busy
4007	Service denied	The client does not have permission or funds to perform the requested operation.
4008	Application denied	The application does not have permission or funds to perform the requested operation.

8.7.8.4 Delivery Conditions

The Delivery Condition element shall be used to carry the conditions that are carried by the VASP/VAS to the MMS Relay/Server.

Delivery Conditions are extensible. Unrecognised Delivery Condition and values reserved by this specification for future definitions shall be ignored. The numbers in the range 1000-1999 shall be used for bilateral agreements.

The table below shows the Delivery Conditions that are currently defined.

Table 84: Delivery Conditions

Delivery condition value	Delivery condition value	Comment
1	MMS capable only	VASP/VAS intend the MM to be sent to a recipient's terminal that has MMS capabilities.
2	HPLMN only	VASP/VAS intend the MM to be sent to a recipient's terminal that is within the PLMN (i.e., not roaming).
3 … 999	Reserved for future definition by this specification	Reserved for future definition by this specification. Ignore if received by an MMS Relay/Server that can't interpret the value.
1000 … 1999	Reserved for bilateral agreement usage.	Reserved for bilateral agreement usage and will not be used by this specification in the future. Ignore if received by an MMS Relay/Server that can't interpret the value.

8.7.9 Mapping of Information Elements to SOAP Elements

The following subsections detail the mapping of the information elements of the abstract messages to SOAP elements. The full XML Schema definition of the MM7 reference point appears in Annex L of this document. Specification of the format of SOAP element values appear in the schema.

8.7.9.1 MM7_submit.REQ mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Sender Address	SOAP Body	SenderAddress	
Recipient Address	SOAP Body	Recipients	Different address format will be specified as part of element value
Service code	SOAP Body	ServiceCode	Information supplied for billing purposes – exact format is implementation dependent
Linked ID	SOAP Body	LinkedID	Message-ID of linked message
Message class	SOAP Body	MessageClass	Enumeration – possible values: Informational, Advertisement, Auto
Date and time	SOAP Body	TimeStamp	
Time of Expiry	SOAP Body	ExpiryDate	
Earliest delivery time	SOAP Body	EarliestDeliveryTime	
Delivery report	SOAP Body	DeliveryReport	Boolean – true or false
Read reply	SOAP Body	ReadReply	Boolean – true or false
Reply-Charging	SOAP Body	ReplyCharging	No value – presence implies true!
Reply-Deadline	SOAP Body	replyDeadline	Attribute of *ReplyCharging* element Date format – absolute or relative
Reply-Charging-Size	SOAP Body	replyChargingSize	Attribute of *ReplyCharging* element
Priority	SOAP Body	Priority	Enumeration – possible values: High, Normal, Low
Subject	SOAP Body	Subject	
Content Class	SOAP Body	ContentClass	Enumeration – possible values: text, image-basic, image-rich, video-basic, video-rich, megapixel, content-basic, content-rich
DRM Content	SOAP Body	DRMContent	Boolean – true or false
Adaptations	SOAP Body	allowAdaptations	Attribute of *Content* element Boolean – true or false
Charged Party	SOAP Body	ChargedParty	Enumeration – possible values: Sender, Recipient, Both, Neither
Message Distribution Indicator	SOAP Body	DistributionIndicator	Boolean – true or false
Delivery Condition	SOAP Body	DeliveryCondition	Possible values include MMS capable only, HPLMN only
Applic-ID	SOAP Body	ApplicID	
Reply-Applic-ID	SOAP Body	ReplyApplicID	
Aux-Applic-Info	SOAP Body	AuxApplicInfo	
Content type	MIME header – Attachment	Content-Type	

Content	SOAP Body	Content	href:cid attribute links to attachment

8.7.9.2 MM7_submit.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Message ID	SOAP Body	MessageID	
Request Status	SOAP Body	StatusCode	See section 8.7.8.3
Request Status Text	SOAP Body	StatusText & Details	See section 8.7.8.3

Sample message submission

```
POST /mms-rs/mm7 HTTP/1.1
Host: mms.omms.com
Content-Type: multipart/related; boundary="NextPart_000_0028_01C19839.84698430"; type=text/xml;
    start="</tnn-200102/mm7-submit>"
Content-Length: nnnn
SOAPAction: ""

--NextPart_000_0028_01C19839.84698430
Content-Type:text/xml; charset="utf-8"
Content-ID: </tnn-200102/mm7-submit>

<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-3"
env:mustUnderstand="1">
            vas00001-sub
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <SubmitReq xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-
MM7-1-3">
            <MM7Version>5.6.0</MM7Version>
            <SenderIdentification>
                <VASPID>TNN</VASPID>
                <VASID>News</VASID>
            </SenderIdentification>
            <Recipients>
                <To>
                    <Number>7255441234</Number>
                    <RFC2822Address displayOnly="true">7255442222@OMMS.com</RFC2822Address>
                </To>
                <Cc>
                    <Number>7255443333</Number>
                </Cc>
                <Bcc>
                    <RFC2822Address>7255444444@OMMS.com</RFC2822Address>
                </Bcc>
            </Recipients>
            <ServiceCode>gold-sp33-im42</ServiceCode>
            <LinkedID>mms00016666</LinkedID>
            <MessageClass>Informational</MessageClass>
            <TimeStamp>2002-01-02T09:30:47-05:00</TimeStamp>
            <EarliestDeliveryTime>2002-01-02T09:30:47-05:00</EarliestDeliveryTime>
            <ExpiryDate>P90D</ExpiryDate>
            <DeliveryReport>true</DeliveryReport>
            <Priority>Normal</Priority>
            <Subject>News for today</Subject>
            <ContentClass>video-rich</ContentClass>
            <DRMContent>true</DRMContent>
```

```
            <ChargedParty>Sender</ChargedParty>
            <DistributionIndicator>true</DistributionIndicator>
            <Content href="cid:SaturnPics-01020930@news.tnn.com" allowAdaptations="true"/>
        </SubmitReq>
    </env:Body>
</env:Envelope>

--NextPart_000_0028_01C19839.84698430
Content-Type: multipart/mixed; boundary="StoryParts 74526 8432 2002-77645"
Content-ID:<SaturnPics-01020930@news.tnn.com>

--StoryParts 74526 8432 2002-77645
Content-Type: text/plain; charset="us-ascii"

Science news, new Saturn pictures...

--StoryParts 74526 8432 2002-77645
Content-Type: image/gif;
Content-ID:<saturn.gif>
Content-Transfer-Encoding: base64

R0lGODdhZAAwAOMAAAAAAIGJjGltcDE0OOfWo6Ochbi1n1pmcbGojpKbnP/lpW54fBMTE1RYXEFO
…

--StoryParts 74526 8432 2002-77645--
--NextPart_000_0028_01C19839.84698430--
```

NOTE: The different encoding mechanisms, as defined by RFC2045 [44], can be utilized for content encoding.

The response message is sent by the MMS Relay/Server back to the VASP for the VAS application in a HTTP Response message.

```
HTTP/1.1  200 OK
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn

<?xml  version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-3"
env:mustUnderstand="1">
            vas00001-sub
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <SubmitRsp xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-
MM7-1-3">
            <MM7Version>5.6.0</MM7Version>
            <Status>
                <StatusCode>1000</StatusCode>
                <StatusText>Success</StatusText>
            </Status>
            <MessageID>041502073667</MessageID>
        </SubmitRsp>
    </env:Body>
</env:Envelope>
```

Sample message submission with application addressing

```
POST /mms-rs/mm7 HTTP/1.1
Host: mms.omms.com
Content-Type: multipart/related; boundary="NextPart_000_0028_01C19839.84698430"; type=text/xml;
    start="</tnn-200102/mm7-submit>"
Content-Length: nnnn
SOAPAction: ""

--NextPart_000_0028_01C19839.84698430
Content-Type:text/xml; charset="utf-8"
Content-ID: </tnn-200102/mm7-submit>

<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-6-7"
env:mustUnderstand="1">
```

```
            vas00001-sub
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <SubmitReq xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-
MM7-6-7">
            <MM7Version>6.7.0</MM7Version>
            <SenderIdentification>
                <VASPID>TNN</VASPID>
                <VASID>News</VASID>
            </SenderIdentification>
            <Recipients>
                <To>
                    <Number>7255441234</Number>
                    <RFC2822Address displayOnly="true">7255442222@OMMS.com</RFC2822Address>
                </To>
                <Cc>
                    <Number>7255443333</Number>
                </Cc>
                <Bcc>
                    <RFC2822Address>7255444444@OMMS.com</RFC2822Address>
                </Bcc>
            </Recipients>
            <ServiceCode>gold-sp33-im42</ServiceCode>
            <LinkedID>mms00016666</LinkedID>
            <MessageClass>Informational</MessageClass>
            <TimeStamp>2002-01-02T09:30:47-05:00</TimeStamp>
            <EarliestDeliveryTime>2002-01-02T09:30:47-05:00</EarliestDeliveryTime>
            <ExpiryDate>P90D</ExpiryDate>
            <DeliveryReport>true</DeliveryReport>
            <Priority>Normal</Priority>
            <Subject>News for today</Subject>
            <ChargedParty>Sender</ChargedParty>
            <DistributionIndicator>true</DistributionIndicator>
    <ApplicID>ifx.com.neon.MyPackage.MAFIA</ApplicID>
            <ReplyApplicID>ifx.com.neon.downloadedPackage.MAFIA</ReplyApplicID>
            <AuxApplicID>MAFIA instance #04</AuxApplicID>
        <Content href="cid:SaturnPics-01020930@news.tnn.com" allowAdaptations="true"/>
        </SubmitReq>
    </env:Body>
</env:Envelope>

--NextPart_000_0028_01C19839.84698430
Content-Type: multipart/mixed; boundary="StoryParts 74526 8432 2002-77645"
Content-ID:<SaturnPics-01020930@news.tnn.com>

--StoryParts 74526 8432 2002-77645
Content-Type: text/plain; charset="us-ascii"

Science news, new Saturn pictures...

--StoryParts 74526 8432 2002-77645
Content-Type: image/gif;
Content-ID:<saturn.gif>
Content-Transfer-Encoding: base64

R0lGODdhZAAwAOMAAAAAAIGJjGltcDE0OOfWo6Ochbi1n1pmcbGojpKbnP/lpW54fBMTE1RYXEFO
…

--StoryParts 74526 8432 2002-77645--
--NextPart_000_0028_01C19839.84698430--
```

NOTE: The different encoding mechanisms, as defined by RFC2045 [44], can be utilized for content encoding.

Again, the response message is sent by the MMS Relay/Server back to the VASP for the VAS application in a HTTP Response message.

```
HTTP/1.1  200 OK
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn

<?xml  version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-6-7"
env:mustUnderstand="1">
```

```
            vas00001-sub
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <SubmitRsp xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-
MM7-6-7">
            <MM7Version>6.7.0</MM7Version>
            <Status>
                <StatusCode>1000</StatusCode>
                <StatusText>Success</StatusText>
            </Status>
            <MessageID>041502073667</MessageID>
            <ApplicID>ifx.com.neon.downloadedPackage.MAFIA</ApplicID>
            <ReplyApplicID>ifx.com.neon.MyPackage.MAFIA</ReplyApplicID>
            <AuxApplicID>session.ABC.DEF</AuxApplicID>
        </SubmitRsp>
    </env:Body>
</env:Envelope>
```

8.7.9.3 MM7_deliver.REQ Mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
MMS Relay/Server ID	SOAP Body	MMSRelayServerID	
Linked ID	SOAP Body	LinkedID	Message-ID of linked message
Sender address	SOAP Body	Sender	
Recipient address	SOAP Body	Recipients	If none appear then Sender Address is used
Date and time	SOAP Body	TimeStamp	
Reply-Charging-ID	SOAP Body	ReplyChargingID	Should correspond to an ID that appeared in previous MM7_submit.REQ
Priority	SOAP Body	Priority	Enumeration – possible values: High, Normal, Low
Subject	SOAP Body	Subject	
Content type	MIME header of attachment	Content-Type	
MMS User Agent capabilities	SOAP body	UACapabilities	
Applic-ID	SOAP Body	ApplicID	
Reply-Applic-ID	SOAP Body	ReplyApplicID	
Aux-Applic-Info	SOAP Body	AuxApplicInfo	
Content	SOAP Body	Content	href:cid attribute links to attachment

8.7.9.4 MM7_deliver.RES

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Service code	SOAP Body	ServiceCode	
Request status	SOAP Body	StatusCode	See section 8.7.8.3
Request status text	SOAP Body	StatusText & Details	See section 8.7.8.3

Sample Deliver request and response

```
POST /mms/weather.xml HTTP/1.1
Host: www.yahoo.com
Content-Type: multipart/related; boundary="NextPart_000_0125_01C19839.7237929064"; type=text/xml;
    start="</cmvt256/mm7-deliver>"
Content-Length: nnnn
SOAPAction: ""

--NextPart_000_0125_01C19839.7237929064
Content-Type:text/xml; charset="utf-8"
Content-ID: </cmvt256/mm7-deliver>

<?xml version="1.0"?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-1-4"
env:mustUnderstand="1">
            vas00324-dlvr
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <!-- Example of MM7_deliverReq -->
        <DeliverReq xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-
MM7-1-4">
            <MM7Version>6.7.0</MM7Version>
                <VASPID>TNN</VASPID>
                <VASID>Reminder</VASID>
            <MMSRelayServerID>240.110.75.34</MMSRelayServerID>
            <LinkedID>wthr8391</LinkedID>
            <Sender>
                <RFC2822Address>97254265781@OMMS.com</RFC2822Address>
            </Sender>
            <TimeStamp>2002-04-15T14:35:21-05:00</TimeStamp>
            <Priority>Normal</Priority>
            <Subject>Weather Forecast</Subject>
            <Content href="cid:forecast-location200102-86453"/>
        </DeliverReq>
    </env:Body>
</env:Envelope>

--NextPart_000_0125_01C19839.7237929064
Content-Type:text/plain;charset="utf-8"
Content-ID:<forecast-location2000102-86453>

Los Angeles, Calif, USA
--NextPart_000_0125_01C19839.7237929064--
```

The deliver response message might look like this (with an application error code):

```
HTTP/1.1  200 OK
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn
```

```
<?xml version="1.0"?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-1-4"
env:mustUnderstand="1">
            vas00324-dlvr
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
       <env:Fault>
            <faultcode>env:Client</faultcode>
            <faultstring>Client error</faultstring>
            <detail>
        <VASPErrorRsp xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-
MM7-1-4">
                    <MM7Version>6.7.0</MM7Version>
                    <Status>
                        <StatusCode>4006</StatusCode>
                        <StatusText>Service Unavailable</StatusText>
                        <Details>
                            <app:Reason xmlns:app="http://vendor.example.com/MM7Extension">Location
not covered in service</app:Reason>
                        </Details>
                    </Status>
                </ VASPErrorRsp>
            </detail>
        </env:Fault>
    </env:Body>
</env:Envelope>
```

8.7.9.5 MM7_cancel.REQ mapping

Information Element	Location	Element-name	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Sender Address	SOAP Body	SenderAddress	
Message ID	SOAP Body	MessageID	
Applic-ID	SOAP Body	ApplicID	
Reply-Applic-ID	SOAP Body	ReplyApplicID	
Aux-Applic-Info	SOAP Body	AuxApplicInfo	

8.7.9.6 MM7_cancel.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Request status	SOAP Body	StatusCode	See section 8.7.8.3
Request status text	SOAP Body	StatusText & Details	See section 8.7.8.3

The following shows an interchange of a MM7_cancel.REQ and MM7_cancel.RES to illustrate a SOAP message that does not include a multimedia content part.

```
POST /mms-rs/mm7 HTTP/1.1
Host: mms.omms.com
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn
SOAPAction: ""

<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-3"
env:mustUnderstand="1">
                vas0000—can
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <CancelReq xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-
3">
            <MM7Version>5.6.0</MM7Version>
            <SenderIdentification>
                <VASPID>TNN</VASPID>
                <VASID>Reminder</VASID>
            </SenderIdentification>
            <MessageID>mms000222222</MessageID>
        </CancelReq>
    </env:Body>
</env:Envelope>

HTTP/1.1  200 OK
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn

<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-3"
env:mustUnderstand="1">
                vas0000—can
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <CancelRsp xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-
3">
            <MM7Version>5.6.0</MM7Version>
            <Status>
                <StatusCode>1000</StatusCode>
                <StatusText>Success</StatusText>
            </Status>
        </CancelRsp>
    </env:Body>
</env:Envelope>
```

8.7.9.7 MM7_replace.REQ mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Sender address	SOAP Body	SenderAddress	
Message ID	SOAP Body	MessageID	
Service code	SOAP Body	ServiceCode	Information supplied for billing purposes – exact format is implementation dependent
Date and time	SOAP Body	TimeStamp	
Earliest delivery time	SOAP Body	EarliestDeliveryTime	Date format – absolute or relative
Read reply	SOAP Body	ReadReply	Boolean – true or false
Content Class	SOAP Body	ContentClass	Enumeration – possible values: text, image-basic, image-rich, video-basuc, video-rich, megapixel, content-basic, content-rich
DRM Content	SOAP Body	DRMContent	Boolean – true or false
Adaptations	SOAP Body	allowAdaptations	Attribute of *Content* element Boolean – true or false
Content type	MIME part Header	Content-Type	
Content	SOAP Body	Content	href:cid attribute links to attachment
Message Distribution Indicator	SOAP Body	DistributionIndicator	Boolean – true or false
Applic-ID	SOAP Body	ApplicID	
Reply-Applic-ID	SOAP Body	ReplyApplicID	
Aux-Applic-Info	SOAP Body	AuxApplicInfo	

8.7.9.8 MM7_replace.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	Transaction-ID	
Message-Type	SOAP Body	Message-Type	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7-Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Request status	SOAP Body	StatusCode	See section 8.7.8.3
Request status text	SOAP Body	StatusText & Details	See section 8.7.8.3

8.7.9.9 MM7_delivery_report.REQ mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
MMS Relay/Server ID	SOAP Body	MMSRelayServerID	
Message ID	SOAP Body	MessageID	
Recipient address	SOAP Body	Recipient	
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Sender address	SOAP Body	Sender	
Date and time	SOAP Body	Date	
MM Status	SOAP Body	MMStatus	Enumeration – possible values: Expired, Retrieved, Rejected, Indeterminate, Forwarded, Delivery Condition Not Met
Status text	SOAP Body	StatusText	
MMS User Agent Capabilities	SOAP Body	UACapabilities	
Applic-ID	SOAP Body	ApplicID	
Reply-Applic-ID	SOAP Body	ReplyApplicID	
Aux-Applic-Info	SOAP Body	AuxApplicInfo	

8.7.9.10 MM7_delivery_report.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Request Status	SOAP Body	StatusCode	See section 8.7.8.3
Request Status text	SOAP Body	StatusText & Details	See section 8.7.8.3

8.7.9.11 MM7_read_reply.REQ mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
MMS Relay/Server ID	SOAP Body	MMSRelayServerID	
Message ID	SOAP Body	MessageID	
Recipient address	SOAP Body	Recipient	
Sender address	SOAP Body	Sender	
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Date and time	SOAP Body	TimeStamp	
Read Status	SOAP Body	MMStatus	Enumeration – possible values: Indeterminate, Read, Deleted without Read
Status text	SOAP Body	StatusText	
Applic-ID	SOAP Body	ApplicID	
Reply-Applic-ID	SOAP Body	ReplyApplicID	
Aux-Applic-Info	SOAP Body	AuxApplicInfo	

8.7.9.12 MM7_read_reply.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Request status	SOAP Body	StatusCode	See section 8.7.8.3
Request status text	SOAP Body	StatusText & Details	See section 8.7.8.3

8.7.9.13 MM7_RS_error.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Error status	SOAP Body	StatusCode	See section 8.7.8.3
Error status text	SOAP Body	StatusText & Details	See section 8.7.8.3

8.7.9.14 MM7_VASP_error.RES mapping

Information Element	Location	Element-name	Comments
Transaction ID	SOAP Header	Transaction-ID	
Message-Type	SOAP Body	Message-Type	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7-Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Error status	SOAP Body	StatusCode	See section 8.7.8.3
Error status text	SOAP Body	StatusText & Details	See section 8.7.8.3

8.7.9.15 MM7_extended_cancel.REQ mapping

Information Element	Location	Element-name	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Sender Address	SOAP Body	SenderAddress	
Cancel_ID	SOAP Body	CancelID	

8.7.9.16 MM7_extended_cancel.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Request status	SOAP Body	StatusCode	See section 8.7.8.3

The following shows an interchange of a MM7_extended_cancel.REQ and MM7_extended_cancel.RES to illustrate a SOAP message that does not include a multimedia content part.

```
POST /mms-rs/mm7 HTTP/1.1
Host: mms.omms.com
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn
SOAPAction: ""

<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-3"
env:mustUnderstand="1">
                vas0000—can
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <extendedCancelReq xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-
5-MM7-1-3">
```

```
            <MM7Version>5.6.0</MM7Version>
            <SenderIdentification>
                <VASPID>TNN</VASPID>
                <VASID>Reminder</VASID>
            </SenderIdentification>
            <CancelID>mms000222222</CancelID>
        </extendedCancelReq>
    </env:Body>
</env:Envelope>

HTTP/1.1  200 OK
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn

<?xml version="1.0" ?>
<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
      <env:Header>
        <mm7:TransactionID
xmlns:mm7="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-5-MM7-1-3"
env:mustUnderstand="1">
                vas0000-can
        </mm7:TransactionID>
    </env:Header>
    <env:Body>
        <extendedCancelRsp xmlns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-
5-MM7-1-3">
            <MM7Version>5.6.0</MM7Version>
            <Status>
                <StatusCode>1000</StatusCode>
            </Status>
        </extendedCancelRsp>
    </env:Body>
</env:Envelope>
```

8.7.9.17 MM7_extended_replace.REQ mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	TransactionID	
Message-Type	SOAP Body	MessageType	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
VASP ID	SOAP Body	VASPID	
VAS ID	SOAP Body	VASID	
Service code	SOAP Body	ServiceCode	Information supplied for billing purposes – exact format is implementation dependent
Replace_ID	SOAP Body	ReplaceID	This identifies the previously sent VAS/VASP MM that need to be replaced by this MM
Date and time	SOAP Body	TimeStamp	
Earliest delivery time	SOAP Body	EarliestDeliveryTime	Date format – absolute or relative
Time of Expiry	SOAP Body	ExpiryDate	
Delivery Report	SOAP Body	DeliveryReport	Boolean – true or false
Read reply	SOAP Body	ReadReply	Boolean – true or false
Adaptations	SOAP Body	AllowAdaptations	Attribute of *Content* element Boolean – true or false
Content type	MIME part Header	Content-Type	
Content	SOAP Body	Content	href:cid attribute links to attachment

8.7.9.18 MM7_extended_replace.RES mapping

Information Element	Location	ElementName	Comments
Transaction ID	SOAP Header	Transaction-ID	
Message-Type	SOAP Body	Message-Type	Defined as Root element of SOAP Body
MM7 Version	SOAP Body	MM7-Version	Value is the number of the specification in which the schema has changed most recently, e.g. 5.2.0
Message ID	SOAP Body	MessageID	
Request status	SOAP Body	StatusCode	See section 8.7.8.3

8.8 Technical realisation of MMS on reference point MM8

This reference point is further specified in TS 32.240 [80] and TS 32.270 [81].

8.9 Technical realisation of MMS on reference point MM9

This reference point is further specified in TS 32.240 [80] and TS 32.270 [81].

8.10 Technical realisation of MMS on reference point MM10

The stage 3 description of this reference point can be found in TS 29.140 [86].

The MMSE may support the interrogation of an external MSCF. Section 7.1.17 specifies the applicability of the MM10 interrogation to certain MMS services. The MM10 message flow may be invoked during MM1 submission. The figures below describes the Message flows between the MMS Relay/Server and an external MSCF.

In the following example the submission of a MM through MM1 is shown.

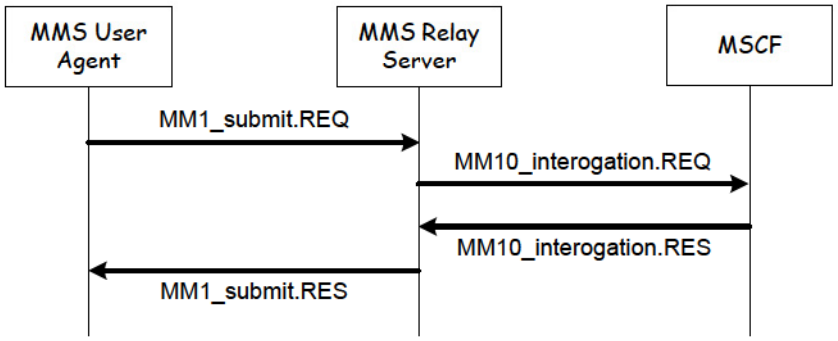


Figure 14: Message Flow Example for the MM1 submit traffic case

In the following example the MM1 delivery is shown.

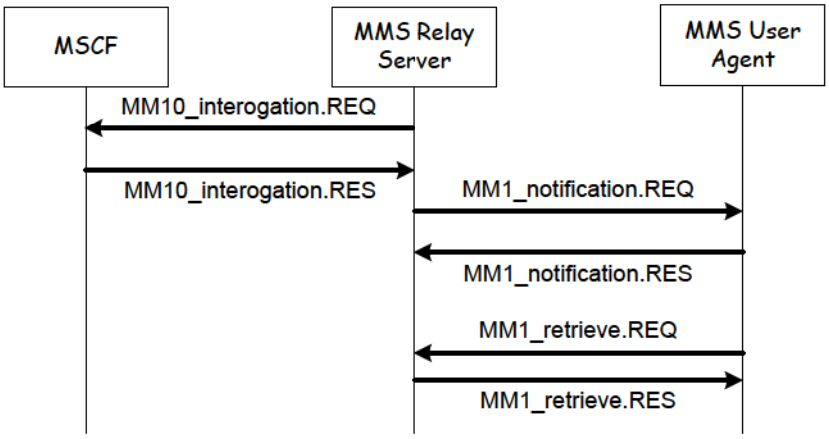


Figure 15: Message Flow Example for the MM1 notification traffic case

In the following example the submission of a MM through MM7 is shown.

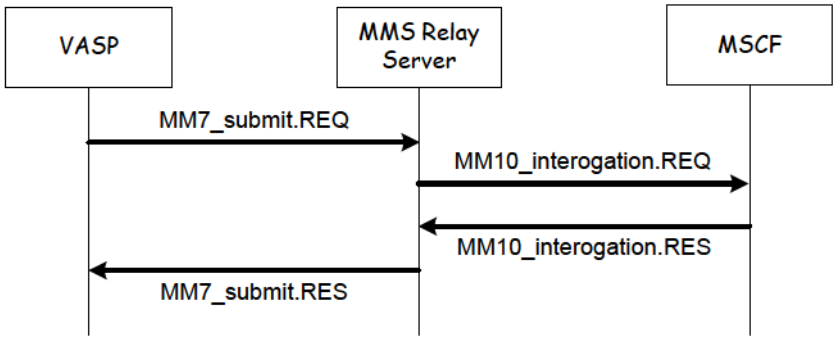


Figure 16: Message Flow Example for the MM7 submit traffic case

8.10.1 Interrogation of the Messaging Service Control Function (MSCF)

This section addresses the operations necessary for a MSCF to provide the service by sending a interrogation Message from the Relay/Server to the MSCF. The involved abstract messages are outlined in the table below from type and direction points of view.

Table 85: Abstract messages for interrogation of the Address resolution Node

Abstract messages	Type	Direction
MM10_Interrogation.REQ	Request	MMS Relay/Server -> MSCF
MM10_ Interrogation.RES	Response	MSCF -> MMS Relay/Server

8.10.2 Normal Operation

After reaching the specified trigger point the MMS Relay/Server sends a MM10_interrogation.REQ to the MSCF. This Message includes a information set received in the incoming MM. Furthermore the information of the reached trigger Point as well as the information of the incoming interface shall be included in the MM10_Interrogation.REQ Abstract Message. The MSCF reacts with a MM10_Interrogation.RES where relevant information fields are substituted or added if necessary. Furthermore, charging relevant information may included in the response. All this information needs to reflected in a appropriate CDR.

The received information shall be taken for the further handling of the MM.

8.10.3 Abnormal Operation

If no response on an MM10_interrogation.REQ is received in a appropriate timeframe the MMS Relay/Server shall process according the information given by the specific trigger information.

The further handling of potential Error scenarios (resulting from incorrect addresses) is subject of the associated Message handling process.

8.10.4 Features

Served User Identity: This field contains the public identity of served user. It shall be filled, depending of the traffic case. Possible values are: MM1 Submission: Sender, MM1 delivery: Recipient, MM7 submission: VASP ID

Server User IMSI: This field contains the IMSI of the served user.

Service Key: A operator configurable string which identifies the target application at the MSCF.

Addressing: In the MM10_interrogation.REQ the MMS Relay/Server shall provide the initial MM address information to the MSCF. In the MM10_interrogation.RES the MSCF may return the address information unmodified or modified according to the requirements of the operator specific service.

Trigger Event: The Trigger point, which initiated the sending of the MM10_Interrogation.REQ.

Originating Interface: Indicator of the interface from which the MM was originated.

Event Time Stamp: The originator MMS User Agent may time stamp the MM.

Reporting: The originator MMS User Agent may request a delivery report for the MM. In addition, the originator MMS User Agent may request a read-reply report when the user has viewed the MM. This feature allows the MSCF to override the request provided by the MMS User Agent. This feature shall only be invoked if there is an appropriate mutual agreement between the subscriber and the network opertor.

Sender Visibility: A request to show or hide the sender's identity when the message is delivered to the recipient. This feature allows the MSCF to override the request provided by the MMS User Agent. This feature shall only be invoked if there is an appropriate mutual agreement between the subscriber and the network opertor.

Result Code: The Result Code determines whether the request have been accepted or rejected by the MSCF or whether an error occurred during processing.

CDR Information: Billing information, which are introduced by the MSCF. This information will be transparently copied to the CDR for post-processing proposes, or transparently forwarded to the pre paid systems.

8.10.5 Information Elements

Table 86: Information elements in the MM10_Interrogation.REQ .

Information element	Presence	Description
Message Type	Mandatory	Identifies this message as MM10_interrogation.REQ
Trigger Event	Manadory	The Trigger point, which initiated the sending of the MM10_Interrogation.REQ
Served User Identity	Mandatory	The identity of the served user depending on the traffic case.
Served User IMSI	Optional	The IMSI of the served user
Initial Recipient address	Mandatory	The address of the recipient(s) of the MM. Multiple addresses are possible.
Originating Interface	Mandatory	Indicator of the interface from which the MM was originated
Service Key	Optional	A operator configurable string which identifies the target application at the MSCF
Sender address	Optional	The address of the MM originator.
Delivery report	Optional	A request for delivery report.
Read Reply	Optional	A request for read reply report.
Sender visibility	Optional	A request to show or hide the sender's identity when the message is delivered to the recipient.

Table 87: Information elements in the MM10_Interrogation.RES .

Information element	Presence	Description
Message Type	Mandatory	Identifies this message as MM10_interrogation.RES
Result Code	Mandatory	The Result Code determines whether the request have been accepted or rejected by the MSCF or whether an error occurred during processing.
Presentation address	Optional	Recipient address used for presentation 71
Routeing Address	Optional	Recipient Address used for routeing of the message
Sender Address	Optional	Sender Address used for presentation
Read reply	Optional	A request for read reply report.
CDR information	Optional	Billing information, which are introduced by the MSCF. This information will be transparently copied to the CDR for post-processing purposes, or transparently forwarded to the pre paid systems

Annex A (informative): Examples of MMS architectural implementations

A.1 Introduction

This informative annex is intended to provide architectural examples based on the general architecture as outlined in clause 4 to show implementations for different business models. The focus is upon the various MMS Relay - MMS Server and MMS Relay/Server – External Server scenarios, whereas the MMS Relay/Server - MMS User Agent interface is assumed to be as stated in clause 6.3. Each of the following subclauses provides only one possible scenario, however a combination could be feasible. Please note that each functional element should be understood as a logical entity and may be combined due to implementation reasons.

A.2 Example of combined MMS-Relay/Server

This scenario shows the case where the two logical entities, MMS Relay and MMS Server, are combined into a single physical entity.

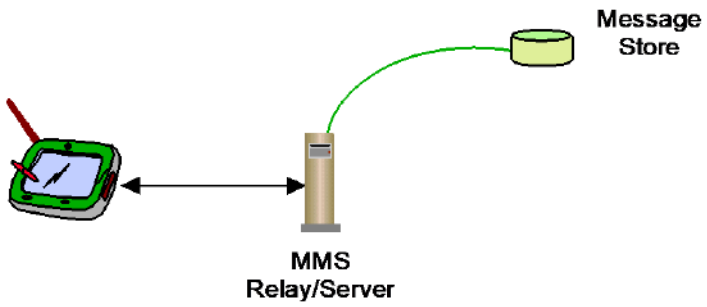


Figure A.1: Example of combined MMS-Relay/Server

A.3 Example of non-combined MMS-Relay and MMS-Server

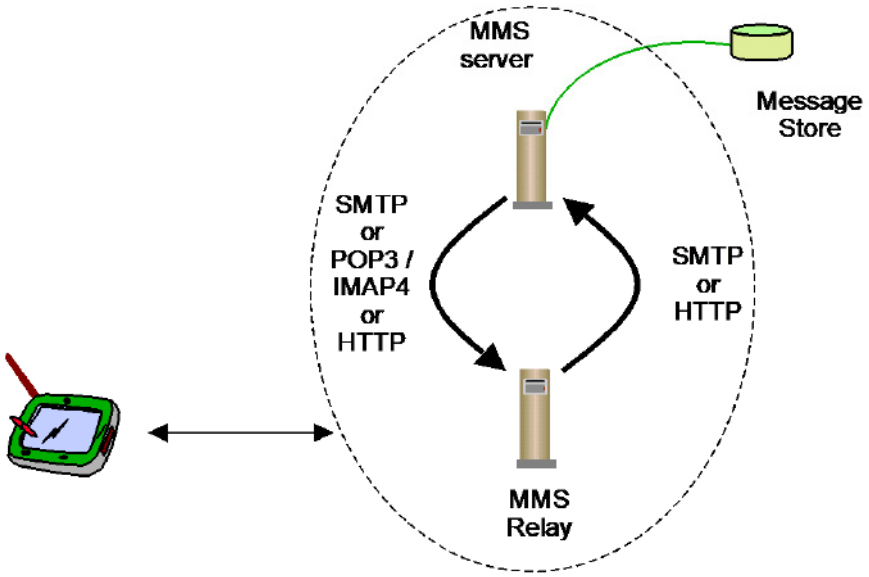


Figure A.2: Example of non-combined MMS-Relay and MMS-Server

For the transfer of messages between an MMS-Relay and an MMS-Server the use of SMTP and POP3[34]/IMAP4[35] or HTTP as illustrated in Figure A.2 is identified as appropriate.

If the protocol is SMTP for up- and download of messages to the server, then it may be identical to the one used between different MMS Relay/Servers as specified in the clause 6.6.

A.4 Example of MMS interaction with T.30 Facsimile Services

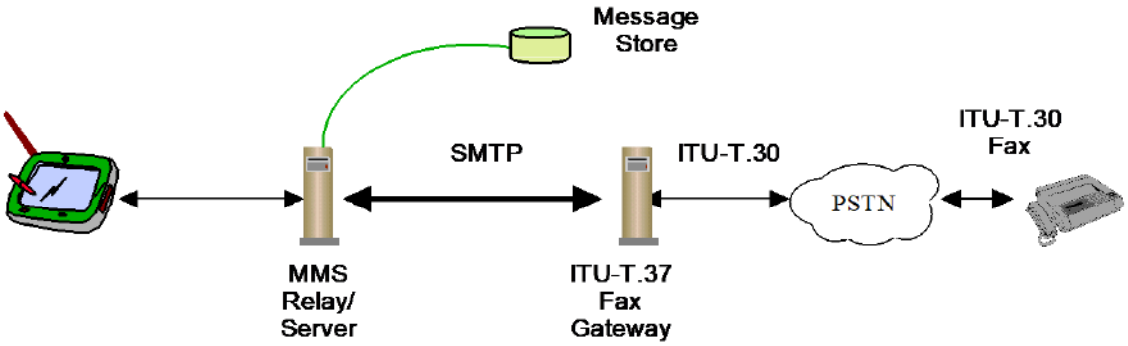


Figure A.3: Example of MMS interaction with Facsimile Services based on ITU-T.37

For the transfer of facsimile data via store-and-forward mechanisms ITU-T.37 [31] procedures have been standardised. These are identified as appropriate in the MMSE for the interworking with T.30 [32] facsimile services. What the relevant MMSE parts are supposed to look like for a T.37 approach is depicted in figure A.3. The MMS Relay/Server interfaces with a T.37 Fax Gateway. For the Gateway's communication with the MMS Relay/Server the appropriate protocol is SMTP. I.e., the protocol to be used on the interface between MMS-Relay/Server and the Fax GW is identical to the one used between different MMS Relay/Servers as specified in clause 6.6.

Towards the PSTN the Fax-GW terminates the T.30 facsimile protocol. Mobile terminated fax data will be converted into TIFF[36] image format and forwarded to the MMS Relay/Server as an attachment in an IETF internet email. In case of mobile originated fax messages the Fax-GW receives a written email provided with the receiver's fax number from the MMS Relay/Server. Depending on the functions of the Fax-GW this email may contain plain text only or additional attachments, too. Although T.37 requires only TIFF format support there are Fax-GWs out on the market that permit many different formats to be included.

A.5 Example of MMS interaction with 2G/3G Voice Mailboxes

MMS interaction with voice mailbox systems should be performed on a non-realtime basis. Figure A.4 illustrates an example architecture for the incorporation of voice mailboxes.

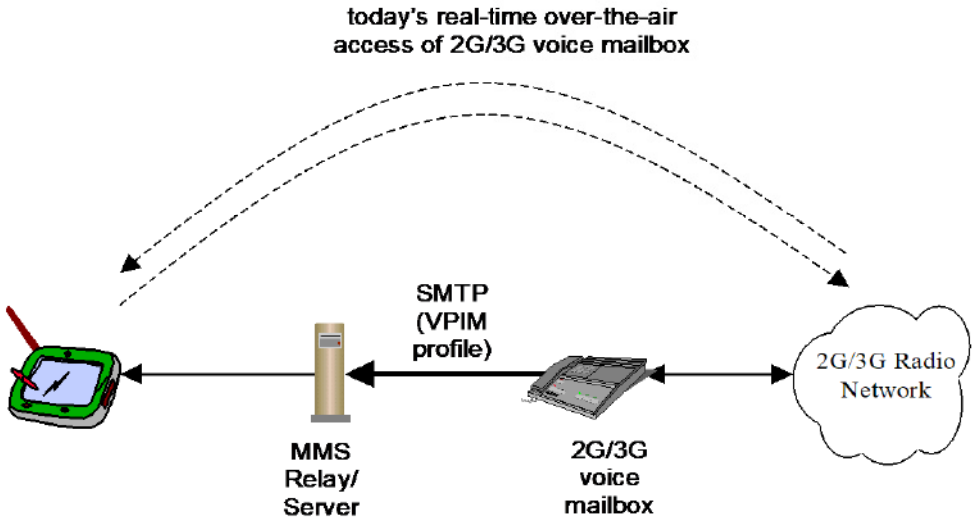


Figure A.4: First Example of MMS interaction with 2G/3G Voice Mailbox based on VPIM

The Voice Profile for Internet Mail Version 2, VPIMv2, provides format extensions for MIME supporting the transmission of voice messages over standard Internet E-Mail systems. The VPIM concept was developed by the Electronic Messaging Association (EMA). After VPIMv2 had been reviewed by the IETF it became RFC 2421 [33].

The VPIM specification allows voice records to be MIME encapsulated and sent as Internet mail attachments via ESMTP or retrieved as Internet mail attachments via POP3 [34] or IMAP4[35]. The MIME type used for voice messages is "multipart/voice-message" that includes an "audio/*" part and possibly additional parts for a voice signature or Vcard .

For the interaction of MMS with voice mailboxes, the voice mailbox may forward received voice records as VPIM messages via SMTP to the MMS Relay/Server. This implies that voice messages' download is always done via the MMS service. In this case the protocol to be used on the interface between MMS-Relay/Server and the voice mailbox is ESMTP and thus identical to the one used between different MMS Relay/Servers as specified in clause 6.6. The message conversion that is necessary for this transfer is specified in Annex D1.

Alternatively, the MMS Relay/Server may poll the voice mailbox via POP3 or IMAP4 for new messages received. Messages the user wants to retrieve via the MMS service can then be downloaded via POP3/IMAP4 from the voice mailbox to the MMS Relay/Server from where they are delivered to the MMS User Agent. This enables the user to do both, retrieve voice messages via today's realtime voice mail services or as an MM. In any case it is expected that the voice mailbox is still the owner of the message and as a consequence responsible for the storage.

As an alternative the MMS interworking with a 2G/3G Voice Mailbox System could be envisaged via an HTTP interface as depicted in figure A.5.

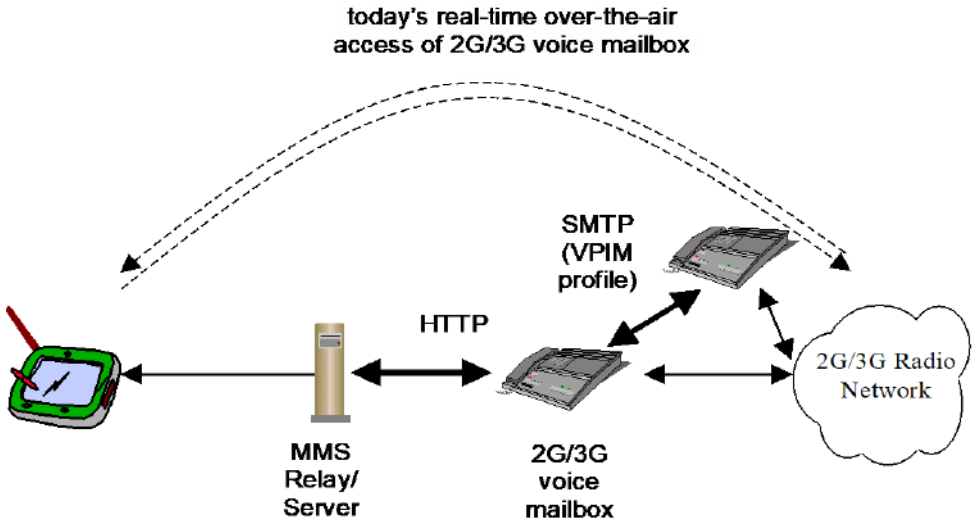


Figure A.5: Second example of MMS interaction with 2G/3G Voice Mailbox based on HTTP

A.6 Example of interaction with Internet E-Mail Messaging

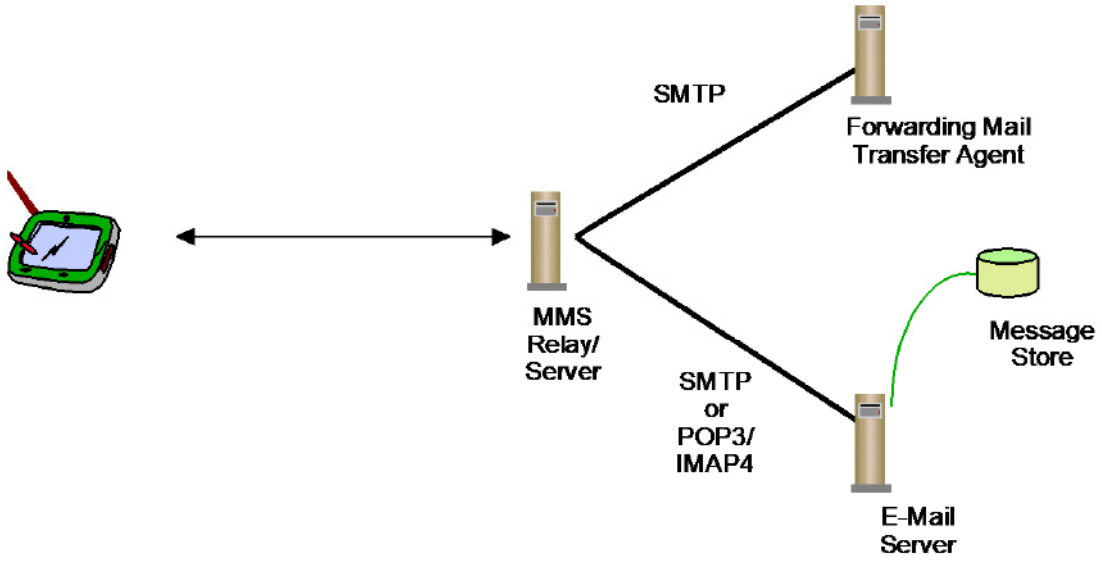


Figure A.6 Example of interaction with Internet E-Mail messaging

In this architecture the server will be an E-Mail server providing post office services which are accessible e.g. via POP3 [34] or IMAP[35] for Internet E-Mail retrieval in the MMSE or are accessible to the MMS Relay/Server using SMTP. The MMS Relay/Server will send messages that are to be transmitted as Internet E-Mail via SMTP.

In the case of retrieval and sending of MMs from and to the Internet Email service is done via SMTP, the protocol to be used on the interface between MMS Relay/Server and the Mail Transfer Agent, MTA/Email Server is identical to the one used between different MMS-Relays as specified in clause 6.6.

A.7 Example of interaction with Short Message Service, SMS

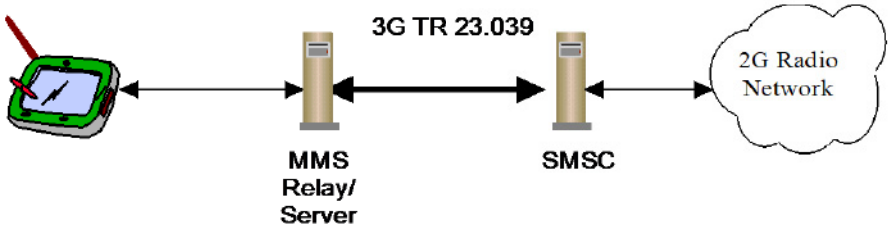


Figure A.7: Example of MMS interaction with SMSC

Depending on the SMSC manufacturer the MMS Relay/Server either can be directly connected to the SMSC (as shown in figure A.7) or an additional SMS-Gateway has to be added. In the latter case the SMS-GW has to be located between the MMS Relay/Server and the SMSC and provides the mapping of one or several SMSC access protocol (mapping between MMS Relay/Server SMSC access protocol and operator's existing SMSC access protocol). Currently several different SMSC access protocols are defined in 3GPP TR 23.039 [37].

A.8 Example of Integration with Unified Messaging System (UMS)

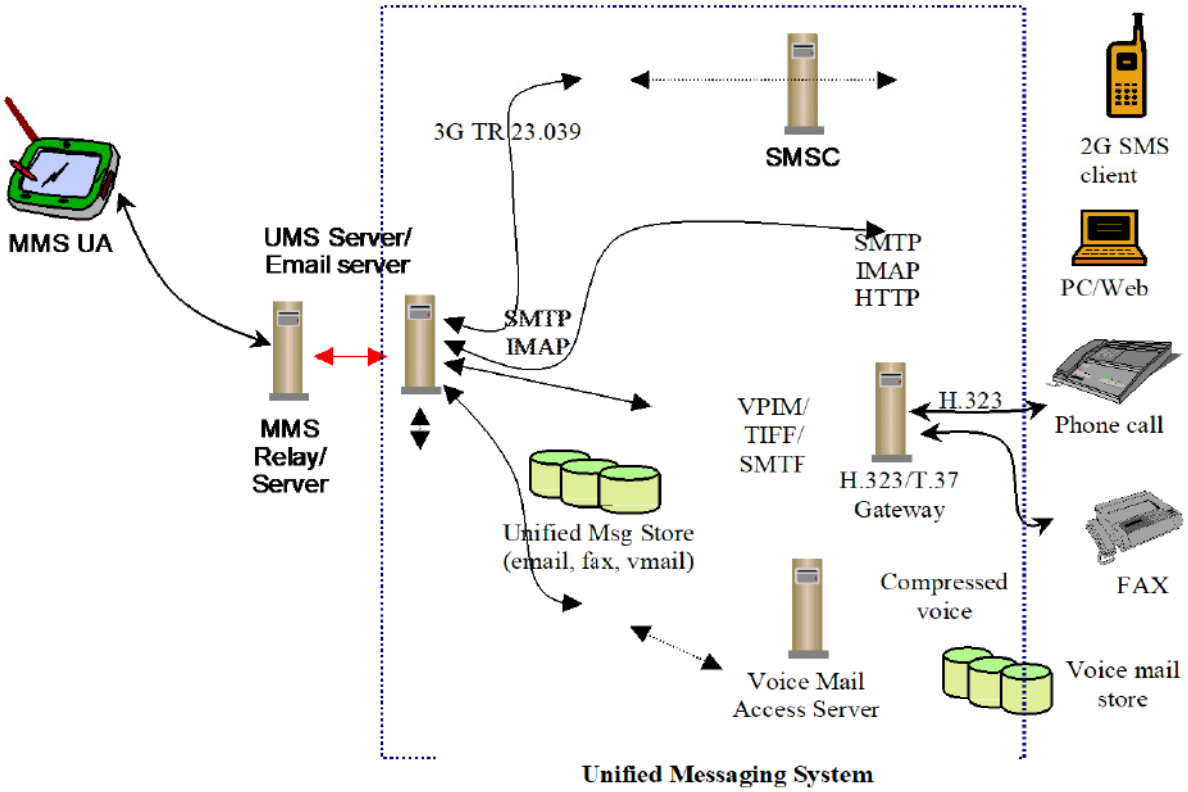


Figure A.8: Example of MMS integration with UMS

Many carriers are operating or planning to operate Unified Messaging System (UMS) platforms, as well as conform to 3GPP specifications. Ideally, newly deployed UMS platforms will use MMS as their wireless access User Agents. However, newly deployed MMS systems will likely co-exist and integrate with Unified Messaging systems, (UMS), voice mail systems (VMS), and email systems. UMS will involve other access methods, such as PC mail access, Web browser access, PSTN voice phone access, etc., all of which are outside the scope of 3GPP standardization efforts.

Some operators may choose to integrate their MMS and UMS services. Even with a complete migration strategy, large email systems and VMS systems may require lengthy migration periods during which an integrated operation between the 3GPP and legacy systems must occur. Also, some installations will require permanent integrations, where 3GPP systems continuously interoperate with a legacy UMS or a legacy VMS.

The above diagram depicts a possible integrated architecture, building on the previous use cases, where a 3GPP MMS Relay/Server interoperates with a UMS that connects to VMS, SMS, fax, and email.

Access from MMS UA occurs through the MMS Relay/Server. The MMS Relay/Server obtains email, voice, and/or fax messages from the UMS. PC clients access through the UM servers which may be integrated with the MMS servers by some operators. In this case a unified mailbox will be presented to both MMS users and others who access the system via other devices.

In addition, the UMS Server could possibly stream compressed voice from the VMS, assuming that streaming support is available in the servers as well as the clients. It could also establish a CS connection (using for example WTA methods to the wireless terminal.)

Voice mail and faxes can also originate from a voice/fax gateway server, which exists in both the legacy VMS as well as a UMS. Faxes can be sent out to remote fax numbers via the fax gateway. In that case the gateway would convert the VM or Fax to VPIM based email messages.

Access to the VMS and UMS should occur via open standard protocols, such as POP3, IMAP4, WebDAV, T.30, H.323, etc.

Annex B (informative): MMS Stage 3 Implementation

WAP/OMA implementation (stage 3) for the MM1 reference point of MMS, as defined in this specification, is available in [82].

Annex C (informative): Charging Data Records

This annex describes information of MMs/abstract messages which may be required for inclusion into Charging Data Records (CDR's) for MMS for the purpose of Billing and Traceability in the operators post-processing system. Further details on the CDR content and transport for MMS are described in the 3GPP TS 32.270 [81].

This list may include:

- Message –ID of Multimedia Message
- Recipient address(es)
- Sender address
- Message size
- Time stamp for submission time, earliest delivery time and time of expiry
- Duration of transmission (for streaming purposes)
- Duration of storage (in the MMS Relay/Server)
- Type of message: (e.g. notification, message MM, delivery report, read-reply)
- Bearer type used
- Content information (e.g. audio, picture, video, text,)
- Message class (e.g. advertisement/informational)
- Delivery Report Request
- Read Reply Request
- Charging Indicator (e.g. Pre paid charging, Reply charging, Charged Party)
- MM7 service code
- MM Status (e.g. delivered, rejected, expired, delivery pending).
- Indication of forwarding
- Conversion of type and media
- Priority of the MM
- Linked ID
- VASP ID
- VAS ID
- Reply-Charging
- Content type
- Reply-Charging-ID
- Charged Party, Charged Party ID
- MCC + MNC
- MSCF CDR information

- Sender address provided by MSCF
- Recipient address(es) provided by MSCF
- MSCF service Key
- MSCF host and realm information
- Applic-ID
- Reply-Applic-ID
- Aux-Applic-Info
- Replace ID
- Cancel ID

The following information elements at least will be considered for the future.

- Identification if a message has been sent to a pre-defined group

NOTE: Some of the above fields may not be available in the MMS Relay/Server e.g. due to network implementation options. Also some fields may not be directly available from MMS Relay/Server CDRs but defined in the Charging and Billing system.

Annex D (informative): MM3 principles

D.1 Sending of MMs

On sending an MM to an external server the MMS Relay/Server:

- should map as many fields as possible to corresponding fields of the message format or protocol of the external server while suppressing MMS-only relevant fields (e.g. MMS-version) or sensitive fields (e.g. originator Address when address hiding is requested) and fields that cannot be mapped (e.g. Content-type in case fax gateway).
- In the case the external server uses RFC 2822 formatted messages the mapping should be according to the mapping on MM4 under consideration of the above mentioned constraints.
- May add relevant fields that cannot be mapped to fields of the message format or protocol of the external server to the content body of the message if suitable (e.g. Print Content-Type, Priority, etc. on fax).
- should convert the content itself into the appropriate format used by the external server (e.g. WAV(G.723) attachment to AMR attachment for voice mail system).

D.2 Receiving of messages

On receiving a message from an external server the MMS Relay/Server should be able to handle the following on MM3:

- The external server may send a message with RFC 2822 formatted header and a body with encapsulated message type of the external server (e.g. e-mail with attachment application/sms). In that case the MMS Relay/Server should map as many fields of the RFC 2822 header to the corresponding header fields of an MM. Additionally the MMS Relay/Server may be able to copy MMS relevant information from the MIME encapsulated body and map them to the corresponding header fields and body of an MM. The attachment itself should be forwarded unaltered as attachment of the generated MM to the recipient.
- The MMS Relay/Server should be able to interpret MMS specific fields in the RFC 2822 header of a message from an external server (e.g. voice mail can specify expiry date).
- The external server may send a message with regular RFC 2822 formatted header and MIME encapsulated attachments which may comprise content and/or profile information (e.g. VPIM multipart/voice-message). The MMS Relay/Server should be able to map as many fields of the RFC 2822 header to the corresponding header fields of an MM. Additionally in the case the attachments contain some message profile information the MMS Relay/Server should be able to map those to the corresponding header fields of an MM. The attachments/parts of the attachments with message content may be converted to another media type or format subject to the capabilities of the MMS User Agent. In most cases the attachments might be forwarded unaltered to the recipient.
- The external server may send a message with a format different from RFC 2822. In this case the MMS Relay/Server should be able to extract as many information from the external message format and protocol and map them to corresponding fields of the MM header. The content of the message from the external server should be mapped to an appropriate MIME type/subtype and attached to the MM. (e.g. SMS via 3GPP TR 23.039 -> MM with text/plain).

Annex D1 (informative): Mapping of IE to MM3 protocols

This annex maps the information elements found on MM1 and MM4 to the relevant fields to transfer over MM3 to Internet Email (based on ESMTP and MIME) or voicemail systems (based on VPIMv2).

D1.1 Transforming MM

The tables below are provided to give an end-to-end description of the interface between MMS and external messaging services. The first table indicates how to transform a MM, that originates from either MM1_submit.REQ or from MM4_forward.REQ, to a corresponding Internet Email message to be transferred to an email address. The second table indicates how to transform a MM, that originates from either MM1_submit.REQ or from MM4_forward.REQ, to a corresponding VPIM message to be transferred to a voicemail server. In each table the MMS information elements appear in the left column, the middle column indicates the corresponding standard header field, the right column gives special explanations for the transformation.

As indicated in Annex D – many of the MMS Information Elements should not be transferred to external messaging systems and should be suppressed. This will be indicated in the tables by the word "suppressed"

Table D1.1 Mapping of Submitted MM to Internet Email

MMS Information Element	Internet Email Header	Notes
Message Type	*suppressed*	
MMS Version	*suppressed*	
Transaction ID	*suppressed*	
Recipient address	**SMTP -** RCPT TO **MIME -** To:, Cc:	Bcc recipients should only appear in the SMTP RCPT TO part of the transfer and not part of the MIME content.
Content type	**MIME -** Content-Type:	
Sender address	**SMTP -** MAIL FROM **MIME -** From:	(NOTE 1)
Message class	*suppressed*	If Message class is "auto" this should affect the MAIL FROM field (NOTE 1).
Date and time	**MIME -** Date:	
Time of Expiry	**SMTP** – DELIVER-BY parameter of RCPT TO	As defined in RFC 2852
Earliest Delivery Time	*suppressed*	There is currently an IETF draft that suggests use of the SMTP AFTER parameter
Delivery report	**SMTP** – DSN	As defined in RFC 3461, dependent on ENVID, see below.
Reply-Charging	*suppressed*	
Reply-Deadline	*suppressed*	
Reply-Charging-Size	*suppressed*	
Priority	**MIME -** X-Priority:	
Sender visibility	*suppressed*	
Store	*suppressed*	
MM State	*suppressed*	
MM Flags	*suppressed*	
Read reply	**MIME** – Disposition-Notification-To:	As defined in RFC 2298
Subject	**MIME -** Subject:	
Reply-Charging-ID	*suppressed*	
Content	*<message body>*	
Message ID	**SMTP** – ENVID **MIME** – Message-ID:	As defined in RFC 3461, used to return DSN, this Message ID should be generated by the MMS Relay for MM that come from MM1_submit.REQ and should use the X-Mms-Message-ID from the MM4_forward.REQ

Table D1.2 Mapping of Submitted MM to Voicemail via VPIM

MMS Information Element	Internet VPIM Header	Notes
Message Type	*suppressed*	
MMS Version	*suppressed*	
Transaction ID	*suppressed*	
Recipient address	**SMTP -** RCPT TO **MIME -** To:, Cc:	Bcc recipients should only appear in the SMTP RCPT TO part of the transfer and not part of the MIME content.
Content type	**MIME -** Content-Type:	(NOTE 2)
Sender address	**SMTP -** MAIL FROM **MIME -** From:	(NOTE 1)
Message class	*suppressed*	If Message class is "auto" this should affect the MAIL FROM field (NOTE 1).
Date and time	**MIME -** Date:	
Time of Expiry	**SMTP** – DELIVER-BY parameter of RCPT TO	As defined in RFC 2852
Earliest Delivery Time	*suppressed*	There is currently an IETF draft that suggests use of the SMTP AFTER parameter
Delivery report	**SMTP** – DSN	As defined in RFC 3461, dependent on ENVID, see below.
Reply-Charging	*suppressed*	
Reply-Deadline	*suppressed*	
Reply-Charging-Size	*suppressed*	
Priority	**MIME -** Importance:	
Sender visibility	*suppressed*	
Store	*suppressed*	
MM State	*suppressed*	
MM Flags	*suppressed*	
Read reply	**MIME** – Disposition-Notification-To:	As defined in RFC 2298
Subject	**MIME -** Subject:	
Reply-Charging-ID	*suppressed*	
Content	*<message body>*	(NOTE 3)
Message ID	**SMTP** – ENVID **MIME** – Message-ID:	As defined in RFC 3461, used to return DSN, this Message ID should be generated by the MMS Relay for MM that come from MM1_submit.REQ and should use the X-Mms-Message-ID from the MM4_forward.REQ
	MIME – MIME Version: 1.0 (Voice 2.0)	This field should be added to all MM transferred to VPIM

NOTE 1:	When Address Hiding was requested then the MIME From: field shall not contain the originator's address, but some string, e.g. "Anonymous", that indicates that the address is being suppressed. If the Message-class of the MM is "auto", i.e. this MM was automatically generated by the MMS Relay then the SMTP MAIL FROM field should be set to null ("<>") to prevent attempts to respond to the message.
NOTE 2:	RFC 2421 (VPIMv2) requires that the content of the voice message be packaged in a "multipart/voice-message" content-type that may contain the actual message within a "audio/*" part of the multipart.
NOTE 3:	The actual content must be filtered to transfer only a voice part of the message with possibly a vCard or voice signature. In addition, the content should be encoded in binary if supported by the SMTP servers and if not shall be encoded in Base64 encoding. The transfer encoding must be indicated for each part of the multipart using the Content-Transfer-Encoding: header field.

When receiving a message from an external messaging service, the MMS Relay/Server should use the available information in the transport and message headers to generate appropriate MMS information elements. The following tables indicate what header information should be used when receiving messages from either Internet Email or Voicemail via VPIM.

Table D1.3 Mapping of Internet Email / Voicemail via VPIM to MM notification / retrieved MM

MM1 Notification or Retrieve Information Element	Internet Email/VPIM Header	Notes
Message Type		Created by MMS Relay/Server
MMS Version		Created by MMS Relay/Server
Transaction ID		Created by MMS Relay/Server
Recipient address	**MIME -** To:, Cc:	
Content type	**MIME -** Content-Type:	
Sender address	**MIME -** From:	
Message class		Should be set to "personal"
Date and time	**MIME -** Date:	
Time of Expiry	**SMTP** – DELIVER-BY parameter of RCPT TO	Note that the DELIVER-BY is always a relative time
Delivery report	**SMTP** – DSN	
Reply-Charging fields		These will not appear – as they are Optional and are not supported in originating messaging system.
Priority	**MIME -** Importance: or X-Priority:	
Read reply	**MIME** – Disposition-Notification-To:	As defined in RFC 2298
Subject	**MIME -** Subject:	
Content	*<message body>*	
Message ID	**SMTP** – ENVID **MIME** – Message-ID:	As defined in RFC 3461, used to return DSN, this Message ID should be generated by the MMS Relay for MM that come from MM1_submit.REQ and should use the X-Mms-Message-ID from the MM4_forward.REQ
Stored MM State MM Flags Request Status Request Status Text		All of these fields are dependent on MMS Relay/Server settings

D1.2 Delivery Reports

The MMS Relay/Server should be prepared to receive delivery reports from external messaging services that such reports were requested from. In addition the MMS Relay/Server should support generation of Delivery Status Notification messages (as specified in RFC3461) when requested from external messaging services. The following table indicates the transformation of a received Delivery Report as defined in RFC 3461 and RFC 1892 to the corresponding MM1-deliveryReport.req PDU.

Note that the DSN as defined in the relevant RFC consists of three content parts in addition to the set of MIME headers. Each of the three parts may contain information necessary for the transformation from DSN to MM1-deliveryReport.

Table D1.4 Mapping of Delivery Status Notification to MMS Delivery Report

MM1 DeliveryReport Information Element	RFC3461 DSN report message	Notes
Message Type	DSN top-level : multipart/report, report-type=delivery-status second-part : message/delivery-status	Created by MMS Relay/Server
MMS Version		Created by MMS Relay/Server
Transaction ID		Created by MMS Relay/Server
Message-ID	Original-Envelope-ID field of per-message fields	This is an optional field in the DSN but "should" appear if ENVID was supplied as specified in tables above.
Recipient address	Final-Recipient field	This is a mandatory field in the DSN per-message section of the second-part
Sender address	top-level: To: header field value	In addition, this may be available from the SMTP RCPT TO: field.
Date and Time	top-level: Date: header field value	
MM Status	Action and Status fields of the per-message section of second-part	The DSN Action field may have one of the following values: ▪ delivered (should correspond to the *retrieved*). ▪ failed (may correspond to the expired status – depending on the Status field value. ▪ delayed (should not be transferred to user) ▪ relayed (should correspond to the *indeterminate* status of MMS) ▪ expanded (should not be transferred to user)
MM Status Text	Text from first part of DSN content	
NOTE: When the DSN Action field indicates that the action taken by the external messaging service was either "delayed" or "expanded" then the MMS Relay/Server should not forward a delivery-report to the MM originator.		

When an external messaging service requests, via DSN request in SMTP envelope, a delivery report the MMS Relay/Server should generate a DSN with the following information:

- MIME message of content-type: multipart/report with parameter "report-type=delivery-status";
- MIME field To: should be originator of the message that is being delivered according to the address format that appeared in the From; field as it was received at the MMS Relay/Server;
- MIME field From: should be the address of the recipient that the delivery-report is relating to;
- The content of the DSN should be a two-part multipart/report in which the first part is a plain/text part that includes the MM Status Text field that would have been generated for a MM1 delivery-report;
- The second-part of the content should be a message/delivery-status content that should include the following information:

- Original-Envelope-ID field with the Message-ID that appeared in the ENVID field of the SMTP envelope that was conveyed to the MMS Relay/Server by the external service;
- Final-Recipient field whose value should be the MMS address of the recipien;
- Action field should indicate if the message was delivered;
- For failed delivery an appropriate Status value should be included.

Annex E (informative): Use cases for Reply-Charging

The following detailed example use case of reply-charging describes the case when MMS User Agent A and MMS User Agent B belong to the same MMSE. MMS User Agent A is the sender of the reply-charged MM and MMS User Agent B is the recipient of the reply-charged MM.

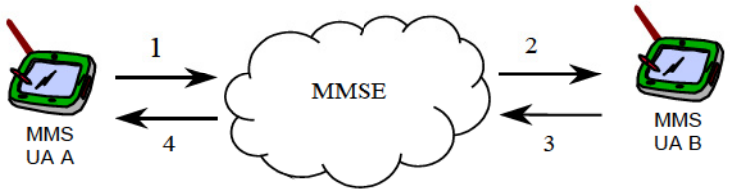


Figure E.1: Message flow in case of reply-charging

1. User A produces an MM and marks it "reply-charged" before it is submitted to the MMS Relay/Server. The MMS Relay/Server notes that user A is willing to pay for a reply-MM to this particular MM and notes the message identification of the original MM and the originator's limitations.

2. The MM is retrieved by user B in accordance to the user profile of user B. This might imply charges for user B when retrieving the MM. User B retrieves the original MM and discovers that the first reply to this message (that is accepted by the Service Provider) will be paid by user A.

3. User B creates an answer, the MMS User Agent B marks it as a reply-MM and submits it on to the MMS Relay/Server. The MMS Relay/Server identifies this MM as a reply to the original MM and checks the originator's limitations. If the MMS Relay/Server accepts the reply the reference set before (as described in transaction 1) is deleted. User A is billed for transaction 3.

4. User A retrieves the reply-MM and eventually is billed for transaction 4.

The other use case of reply-charging where MMS User Agent A and MMS User Agent B belong to different MMS Service Providers is for future elaboration.

The use case of reply-charging where the originator MMS User Agent is actually the MMS VAS Application (using MM7 reference point) behaves in the same way as the use case of two MMS User Agents in the same MMSE.

Annex F (normative): Configuration of MMS-capable UEs

An MMS-capable UE may be configured with information about MMS connectivity and user preferences. A configured MMS-capable UE requires minimum user interaction for different MMS-specific purposes, e.g. accessing network infrastructure, composing mobile-originated MMs. MMS connectivity information and user preferences are described below.

F.1 MMS Connectivity Information

MMS connectivity information consists of a set of information elements needed to access network infrastructure for the MMS purpose. This includes bearer, protocols, and addresses of related access points. Two possible ways to provision an MMS-capable UE with MMS connectivity information, which are not mutually exclusive, are:

- via the (U)SIM, cf. clause 7.1.14, and
- via over the air provisioning according to [55].

A list of information elements concerning MMS connectivity information is outlined below. Some of the connectivity information elements can also be used for purposes other than MMS. An MMS-capable UE can be configured with all or a subset of the listed elements depending on the provided service in terms of e.g. bearer, security, implementation protocol. Moreover, an MMS-capable UE can be configured with more than one sets of connectivity information for multiple access mechanisms, e.g. bearer, access type. Further information about the listed information elements for WAP/OMA MMS implementation (cf. Annex B) can be found in [55] and [56].

MMS Relay/Server

- address: the address of the associated MMS Relay/Server as defined in [56]

WAP Gateway for WAP/OMA implementation of MMS (the terminology of the information elements as defined in chapter 5.6 in [55] is given in parenthesis)

- address: the address of the associated WAP Gateway. The address can be of different types, as indicated by the "type of address" (PXADDR)
- type of address: indicates the type (e.g. IPv4, IPv6) of the "address" of the WAP Gateway (PXADDRTYPE)
- port: indicates the port number specific to the address of the WAP Gateway (PORTNBR)
- service: specifies available service, e.g. connection-less, secured (SERVICE)
- authentication type: indicates the authentication method used by the WAP Gateway (PXAUTH-TYPE)
- authentication id: indicates the authentication identifier used for authentication by the WAP Gateway (PXAUTH-ID)
- authentication pw: indicates the authentication secret used for authentication by the WAP Gateway (PXAUTH-PW)

Interface to core network including access point for the core network (e.g. GGSN) and required bearer (the terminology of the information elements as defined in chapter 5.6 in [55] is given in parenthesis)

- bearer: indicates the type of network (e.g. CSD, GPRS) (BEARER)
- address: the address of the associated access point. The address could be of different types depending on the bearer, as indicated by the "type of address" (NAP-ADDRESS)
- type of address: indicates the type (e.g. MSISDN for CSD, APN for GPRS) of the "address" of the access point (NAP-ADDRTYPE)
- speed: indicates the speed of the connection for circuit switched bearers (LINKSPEED)

- call type: indicates type of call for specific bearer (e.g. analogue for CSD) (CALLTYPE)
- authentication type: indicates the authentication protocol used by the access point (AUTHTYPE)
- authentication id: indicates the authentication id used for authentication by the access point (AUTHNAME)
- authentication pw: indicates the authentication secret used for authentication by the access point (AUTHSECRET)

For the storage of WAP Gateway Information and Interface to Core Network and Bearer Information on the (U)SIM only the binary encoding of information elements as defined in chapter 8 of [55] shall be taken into account, i.e. for each information element ("attribute name" according to [55]) and for each predefined attribute value according to [55] the equivalent tokens shall be used. Non-predefined attribute values shall be represented by ASCII string encoding with NULL character termination in order to indicate the end of the attribute value. The "connectivity document" structure as defined in previous chapters of [55] shall not be used for the storage of WAP Gateway Information and Interface to Core Network and Bearer Information on the (U)SIM.

F.2 User Preferences

User preferences consist of a set of information elements with user-defined values. The set is a subset of information elements required for composing an MM. User preferences include following information elements.

For the WAP/OMA implementation of MMS (cf. Annex B) the corresponding header field names and their equivalent binary tokens as defined in [56] are given in parenthesis. For the storage of MMS User Preferences on the (U)SIM only these binary tokens shall be taken into account. The header field encoding according to [23] shall not be used for that purpose.

- Delivery report (Delivery-Report, encoded as 0x06)
- Read reply (Read-Reply, encoded as 0x10)
- Sender visibility (Sender-Visibility, encoded as 0x14)
- Priority (Priority, encoded as 0x0F)
- Time of expiry (Expiry, encoded as 0x08)
- Earliest delivery time (Delivery-Time, encoded as 0x07)

Further information about the information elements, listed here, can be found in section 8.1.3 (Submission of Multimedia Message) of this specification.

Annex G (normative): DNS-ENUM recipient MSISDN address resolution.

For those recipients MSISDN addresses that appear in an MM and belong to an external MMSE, the originator MMS Relay/Server shall translate (resolve) them to a routable RFC 2822 [5] address that shall be used in the "RCPT TO" SMTP subsequent commands.

DNS-ENUM recipient MSISDN address resolution procedure:

1. The originator MMS Relay/Server shall ensure that the recipient address (MSISDN) complies with the E.164 address format and includes the '+' character. In the case of national or local addressing scheme (e.g. only operator code followed by a number), the MMS Relay/Server shall convert the national or local number to an E.164 address format.

   EXAMPLE 1: +30-697-123-4567

   EXAMPLE 2: In case of number conversion 6971234567 is converted to +306971234567

2. The originator MMS Relay/Server shall remove all non-digit characters with the exception of the leading '+'.

   EXAMPLE: +306971234567

3. The originator MMS Relay/Server shall remove all characters with the exception of digits.

   EXAMPLE: 306971234567

4. The originator MMS Relay/Server shall put dots (".") between each digit.

   EXAMPLE: 3.0.6.9.7.1.2.3.4.5.6.7

5. The originator MMS Relay/Server shall reverse the order of the digits.

   EXAMPLE: 7.6.5.4.3.2.1.7.9.6.0.3

6. The resulting subdomain (result of step 5) shall be converted to a FQDN by appending an appropriate string. The specific string depends on the administrative control of the ENUM implementation.

   EXAMPLES: 7.6.5.4.3.2.1.7.9.6.0.3.e164.arpa (public top level domain), 7.6.5.4.3.2.1.7.9.6.0.3.e164.gsm (private top level domain), 7.6.5.4.3.2.1.7.9.6.0.3.e164.gprs (private top level domain), etc.

7. The resulting FQDN together with the string (E.164 number) in the form as specified in step 2 above, shall be used as the input to the NAPTR algorithm [60] by the originator MMS Relay/Server.

8. The output may result in one of the following cases:

   a. E.164 number not in the numbering plan. The originating MMS Relay/Server shall invoke an appropriate address resolution exception handling procedure (e.g. send a message to the originating MMS User Agent reporting the error condition).

   b. E.164 number in the numbering plan, but no URIs exist for that number. The originating MMS Relay/Server shall invoke an appropriate address resolution exception handling procedure (e.g. send a message to the originating MMS User Agent reporting the error condition, perform the necessary conversion and route forward the message to the recipient via MM3, etc.).

   c. E.164 number in the numbering plan, but no MMS URIs (MMS URIs are of the form "mms:mailbox" and they are defined in the MMS Resource Record section) exist for that number. The originating MMS Relay/Server shall invoke an appropriate address resolution exception handling procedure (e.g. send a message to the originating MMS User Agent reporting the error condition, perform the necessary conversion and route forward the message to the recipient via MM3 using the appropriate URI based on the Service field, etc.).

d. DNS ENUM service unavailable. The originating MMS Relay/Server shall invoke an appropriate address resolution exception handling procedure (e.g. send a message to the originating MMS User Agent reporting the error condition, store the message in the queue and retry at a later time, etc.).

e. E.164 number in the numbering plan and MMS URIs exist for that number.

EXAMPLE: The following is an example of NAPTR Resource Records associated with the FQDN derived from the recipient MSISDN address (+306971234567)

IN NAPTR 100 10 "u" "sip+E2U" "!^.*$!sip:Mary.Smith@sip.cosmote.gr!" .

IN NAPTR 100 11 "u" "mms+E2U"
"!^.*$!mms:+306971234567/TYPE=PLMN@mms.cosmote.gr!" .

IN NAPTR 101 10 "u" "mailto+E2U" "!^.*$!mailto:Mary.Smith@mycosmos.gr!" .

IN NAPTR 102 10 "u" "mailto+E2U" "!^.*$!mailto:MaryS@otenet.gr!" .

The +306971234567 is converted to the following URIs:

sip:Mary.Smith@sip.cosmote.gr

mms:+306971234567/TYPE=PLMN@mms.cosmote.gr

mailto:Mary.Smith@mycosmos.gr

mailto:MaryS@otenet.gr

9. In case that the ENUM-DNS returns more than one MMS URI, the originator MMS Relay/Server shall sort the MMS URIs according to the Order and Preference fields as it is described in [60] and [61].

10. The originator MMS Relay/Server shall resolve the domain part of the "mailbox" of the highest precedence MMS URI to an IP address using standard DNS according to [22] section 5 "Address Resolution and Mail Handling". Specifically, MX records shall be checked for and, if present, shall be used..

EXAMPLE: The highest precedence MMS URI is mms:+306971234567/TYPE=PLMN@mms.cosmote.gr

The domain part of the "mailbox" is mms.cosmote.gr and is resolved (e.g. DNS) to 10.10.0.1

11. The resulting IP address together with the recipient RFC 2822 address ("mailbox") shall be used by the originator MMS Relay/Server for routing forward the MM using the protocol described in clause 6.8 to the recipient MMS Relay/Server.

MMS Resource Record (RR)

The key fields in the NAPTR RR are the Domain, TTL, Class, Type, Order, Preference, Flags, Service, Regexp and Replacement and they are described in [60] and [61]. In particular, for this release the following fields are further specified as follows:

Service = "mms+E2U"

Regexp = "!^.*$!mms:mailbox!" where "mailbox" token and its associated formatting rules are specified in [5].

The MMS URI is of the form "mms:mailbox"

Annex H (normative): Recipient MSISDN address resolution based on IMSI.

Only if recipient addressing resolution mechanism based on a MAP query is used, the procedures defined in this annex shall be followed.

For those recipients MSISDN addresses that appear in an MM and belong to an external MMSE, the originator MMS Relay/Server shall translate (resolve) them to a routable RFC 2822 [5] address that shall be used in the "RCPT TO" SMTP subsequent commands.

Recipient MSISDN address resolution procedure:

1. The originator MMS Relay/Server determines that the recipient MSISDN address belongs to an external MMSE.

2. The originator MMS Relay/Server shall interrogate the recipient HLR for the associated IMSI by invoking the standard GSM-MAP operation SRI_for_SM as described in [62] and [64]. This operation should be invoked with the SM-RP-PRI parameter set to 'true'. As an optional feature, to complement the mandatory SRI_for_SM operation, the Relay/Server may also support the Send_IMSI MAP operation as described in [62] and [64].

3. Incase of a successful interrogation the originator MMS Relay/Server shall determine the MCC and MNC and look up for a matching entry in an IMSI table. The IMSI table shall maintain the associations of MCC + MNC → MMSE FQDN. Subsequently the originator MMS Relay/Server shall be able to resolve (e.g. using standard DNS) the MMSE FQDN to an IP address for establishing the SMTP (MM4) session.

4. If the recipient MSISDN is not known to belong to any MMSE (No entry in the IMSI table, GSM-MAP error, etc.), the MMS Relay/Server shall invoke an appropriate address resolution exception handling procedure. These procedures are not standardized.

NOTE: Although the mandatory GSM-MAP operation SRI_for_SM is a standardized operation, in some cases HLR is unable to return the correct recipient's IMSI number (GSM MAP error received) due to e.g. recipient's settings or recipient network's settings. In that case MMS Relay/Server shall invoke an appropriate exception handling procedure. These procedures are not standardized.

The above procedure complies with the Mobile Number Portability (MNP) requirements and technical realization as they are specified in [63] and [64] respectively. In addition, this procedure complies with the Non-call related signalling MNP procedures for direct and indirect routeing as it is described in [64], Annex B.

Figure H.1 provides an example message flow diagram:

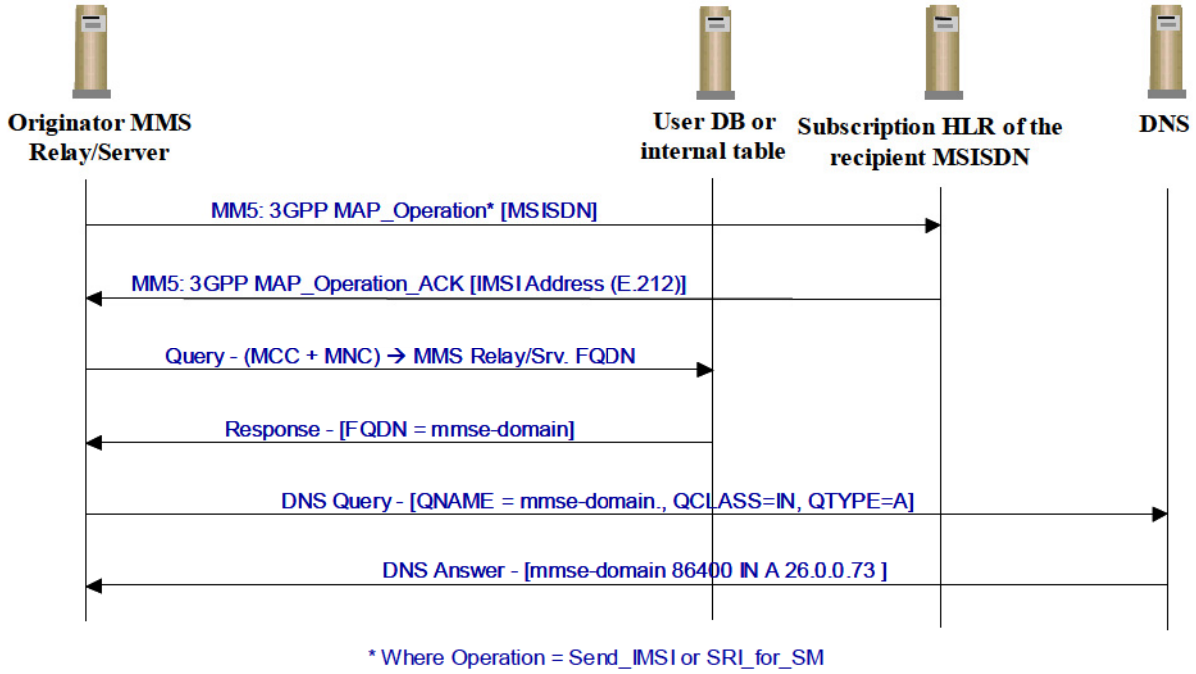


Figure H.1: Message flow of the recipient MSISDN address resolution based on IMSI.

Annex I (normative): MM1 <-> MM4 header mapping

This annex maps the information elements found on MM1 onto the STD 11 [5] header fields of MM4.

The tables below are provided to give a normative end-to-end description of MMS. It provides mapping of MM1 with respect to MM4/STD11.

In many cases there is no mapping between MM1 information elements and MM4 STD 11 header fields, this is according to specifications. These information elements are included in the tables below in order to give a complete picture of how the MM1 information elements are handled.

Table I.1: Mapping MM1_submit.REQ -> MM4_forward.REQ

Information elements in MM1_submit.REQ	STD11 Header fields in Egress MM4_forward.REQ
Message Type	-
MMS Version	-
Transaction ID	-
Recipient address	To:, Cc:, Bcc: (NOTE 1, NOTE 2)
Content type	Content-Type:
Sender address	From:
Message class	X-Mms-Message-Class:
Date and time	Date:
Time of Expiry	X-Mms-Expiry:
Earliest Delivery Time	-
Delivery report	X-Mms-Delivery-Report:
-	X-Mms-Originator-R/S-Delivery-Report
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Priority	X-Mms-Priority:
Sender visibility	X-Mms-Sender-Visibility:
Store	-
MM State	-
MM Flags	-
Read reply	X-Mms-Read-Reply:
Subject	Subject:
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info
Reply-Charging-ID	-
Content Class	X-Mms-Content-Class:
DRM Content	X-Mms-Drm-Content:
Adaptations	X-Mms-Adaptation-Allowed:
Content	*<message body>*
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Message-Id
-	X-Mms-Acq-Request
-	X-Mms-Forward-Counter
-	X-Mms-Previously-sent-by
-	X-Mms-Previously-sent-date-and-time
NOTE 1: A "Bcc:" field is created on MM4 only when the original MM on MM1 contains only blind-carbon-copy recipient(s). In this case the "Bcc:" field is left blank, see clause 8.4.4.2. NOTE 2: Recipient addresses for blind-carbon-copy recipient(s) on MM1 are mapped onto <RCPT TO:> commands on SMTP level on MM4.	

Table I.2: Mapping MM1_submit.RES -> MM4_forward.REQ

Information elements in MM1_submit.RES	STD11 Header fields in Egress MM4_forward.REQ
Message Type	-
MMS Version	-
Transaction ID	-
Request Status	-
Request Status Text	-
Message ID	X-Mms-Message-ID:
Store Status	-
Store Status Text	-
Stored Message Reference	-
-	X-Mms-Applic-ID
-	X-Mms-Reply-Applic-ID
-	X-Mms-Aux-Applic-Info
-	To:, Cc:, Bcc: (NOTE 1, NOTE 2)
-	Content-Type:
-	From:
-	X-Mms-Message-Class:
-	Date:
-	X-Mms-Expiry:
-	X-Mms-Delivery-Report:
-	X-Mms-Originator-R/S-Delivery-Report
-	X-Mms-Priority:
-	X-Mms-Sender-Visibility:
-	X-Mms-Read-Reply:
-	Subject:
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Acq-Request
-	X-Mms-Forward-Counter
-	X-Mms-Previously-sent-by
-	X-Mms-Previously-sent-date-and-time

NOTE 1: A "Bcc:" field is created on MM4 only when the original MM on MM1 contains only blind-carbon-copy recipient(s). In this case the "Bcc:" field is left blank, see clause 8.4.4.2.

NOTE 2: Recipient addresses for blind-carbon-copy recipient(s) on MM1 are mapped onto <RCPT TO:> commands on SMTP level on MM4.

Table I.3: Mapping MM1_notification.REQ <- MM4_forward.REQ

Information elements in MM1_notification.REQ	STD11 Header fields in Ingress MM4_forward.REQ
Message Type	-
MMS Version	-
Transaction ID	-
Message class	X-Mms-Message-Class:
Message size	-
Time of expiry	X-Mms-Expiry:
Message Reference	-
Subject	Subject:
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info
Priority	X-Mms-Priority:
Sender address	From:
Stored	-
Delivery report	X-Mms-Delivery-Report:
-	X-Mms-Originator-R/S-Delivery-Report
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Reply-Charging-ID	-
Element-Descriptor	-
Message Distribution Indicator	-
-	To:, Cc:, Bcc: (NOTE 1, NOTE 2)
-	Content-Type:
-	Date:
-	X-Mms-Sender-Visibility:
-	X-Mms-Read-Reply:
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Acq-Request
-	X-Mms-Forward-Counter
-	X-Mms-Previously-sent-by
-	X-Mms-Previously-sent-date-and-time
Content Class	X-Mms-Content-Class:
DRM Content	X-Mms-Drm-Content:
NOTE 1: A "Bcc:" field is created on MM4 only when the original MM on MM1 contains only blind-carbon-copy recipient(s). In this case the "Bcc:" field is left blank, see clause 8.4.4.2. NOTE 2: Recipient addresses for blind-carbon-copy recipient(s) on MM1 are mapped onto <RCPT TO:> commands on SMTP level on MM4.	

Table I.4: Information elements in the MM1_notification.RES.

Information elements in MM1_notification.RES	MM4 STD 11 Header fields
Message Type	-
MMS Version	-
Transaction ID	-
MM Status	-
Report allowed	-

Table I.5: Information elements in the MM1_retrieve.REQ

Information elements in MM1_retrieve.REQ	MM4 STD 11 Header fields
Message Reference	-

Table I.6: Mapping MM1_retrieve.RES <- MM4_forward.REQ

Information elements in MM1_retrieve.RES	STD11 Header fields in Ingress MM4_Forward.REQ
Message Type	-
MMS Version	-
Transaction ID	-
Message ID	X-Mms-Message-ID:
Sender address	From:
Content type	Content-type:
Recipient address	To:
Message class	X-Mms-Message-Class:
Date and time	Date:
Delivery report	X-Mms-Delivery-Report:
-	X-Mms-Originator-R/S-Delivery-Report
Priority	X-Mms-Priority:
Read reply	X-Mms-Read-Reply:
Subject	Subject:
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info
Request Status	-
MM State	-
MM Flags	-
Request Status Text	-
Reply-Charging	-
Reply-Charging-ID	-
Reply-Deadline	-
Reply-Charging-Size	-
Previously-Sent-By	X-Mms-Previously-Sent-By
Previously-Sent-Date	X-Mms-Previously-Sent-Date
Content	*<message body>*
Message Distribution Indicator	-
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Expiry
-	X-Mms-Sender-Visibility:
-	X-Mms-Read-Reply:
-	X-Mms-Acq-Request
-	X-Mms-Forward-Counter
Content Class	X-Mms-Content-Class:
DRM Content	X-Mms-Drm-Content:

Table I.7: Information elements in the MM1_acknowledgement.REQ

Information elements in MM1_acknowledgement.REQ	MM4 STD 11 Header fields
Message Type	-
MMS Version	-
Transaction ID	-
Report allowed	-

Table I.8: Mapping MM1_forward.REQ -> MM4_forward.REQ

Information elements in MM1_forward.REQ	STD11 Header fields in Egress MM4_Forward.REQ
Message Type	-
MMS Version	-
Transaction ID	-
Recipient address	To:, Cc:, Bcc: (NOTE 1, NOTE 2)
Forwarding address	From:
Date and time	Date:
Time of Expiry	X-Mms-Expiry:
Earliest delivery time	-
Store	-
MM State	-
MM Flags	-
Delivery report	X-Mms-Delivery-Report:
-	X-Mms-Originator-R/S-Delivery-Report
Read reply	X-Mms-Read-Reply:
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Message Reference	-
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Message-ID:
-	Content-Type:
-	X-Mms-Message-Class:
-	X-Mms-Priority:
-	X-Mms-Sender-Visibility:
-	Subject:
-	X-Mms-Acq-Request
-	X-Mms-Forward-Counter
-	X-Mms-Previously-Sent-By
-	X-Mms-Previously-Sent-Date
-	Content
-	X-Mms-Applic-ID
-	X-Mms-Reply-Applic-ID
-	X-Mms-Aux-Applic-Info
NOTE 1: A "Bcc:" field is created on MM4 only when the original MM on MM1 contains only blind-carbon-copy recipient(s). In this case the "Bcc:" field is left blank, see clause 8.4.4.2. NOTE 2: Recipient addresses for blind-carbon-copy recipient(s) on MM1 are mapped onto <RCPT TO:> commands on SMTP level on MM4.	

Table I.9: Information elements in the MM1_forward.RES.

Information elements in MM1_forward.RES	MM4 STD 11 Header fields
Message Type	-
MMS Version	-
Transaction ID	-
Request Status	-
Request Status Text	-
Message ID	-
Store Status	-
Store Status Text	-
Stored Message Reference	-

Table I.10: Mapping MM1_delivery_report.REQ <- MM4_delivery_report.REQ

Information elements in MM1_delivery_report.REQ	STD11 Header fields in Ingress MM4_delivery_report.REQ
Message Type	-
MMS Version	-
Message ID	X-Mms-Message-ID
Recipient address	From:
Date and Time	Date:
MM Status	X-Mms-MM-Status-Code
-	X-Mms-MM-Status-Extension
MM Status text	X-Mms-Status-text:
-	X-Mms-Forward-To-Originator-UA
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info

Table I.11: Mapping MM1_read_reply_recipient.REQ -> MM4_read_reply_report.REQ

Information elements in MM1_read_reply_recipient.REQ	STD11 Header fields in Egress MM4_read_reply_report.REQ
Message Type	-
MMS Version	-
Recipient address	From:
Originator address	To:
Message ID	X-Mms-Message-ID:
Date and Time	Date:
Read Status	X-Mms-Read-Status:
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Acq-Request
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info

Table I.12: Mapping MM1_ read_reply_originator.REQ <- MM4_ read_reply_report.REQ

Information elements in MM1_read_reply_originator.REQ	Ingress STD11 Header fields in MM4_read_reply_report.REQ
Message Type	-
MMS Version	-
Recipient address	From:
Originator address	To:
Message ID	X-Mms-Message-ID:
Date and Time	Date:
Read Status	X-Mms-Read-Status:
-	X-Mms-3GPP-MMS-Version
-	X-Mms-Message-Type
-	X-Mms-Transaction-Id
-	X-Mms-Acq-Request
Applic-ID	X-Mms-Applic-ID
Reply-Applic-ID	X-Mms-Reply-Applic-ID
Aux-Applic-Info	X-Mms-Aux-Applic-Info

Annex J (informative): Support for Streaming in MMS

Figure J.1 shows an example of the transaction flow for using streaming in MMS for retrieval of streamable MM elements. The MMS Relay/Server sends a modified MM as MM1_retrieve.RES in response to a retrieve request (MM1_retrieve.REQ). The rest of the transactions and the acronyms are as described in [40].

NOTE: The interface between MMS Relay/Server and Media Server is not specified in this release.

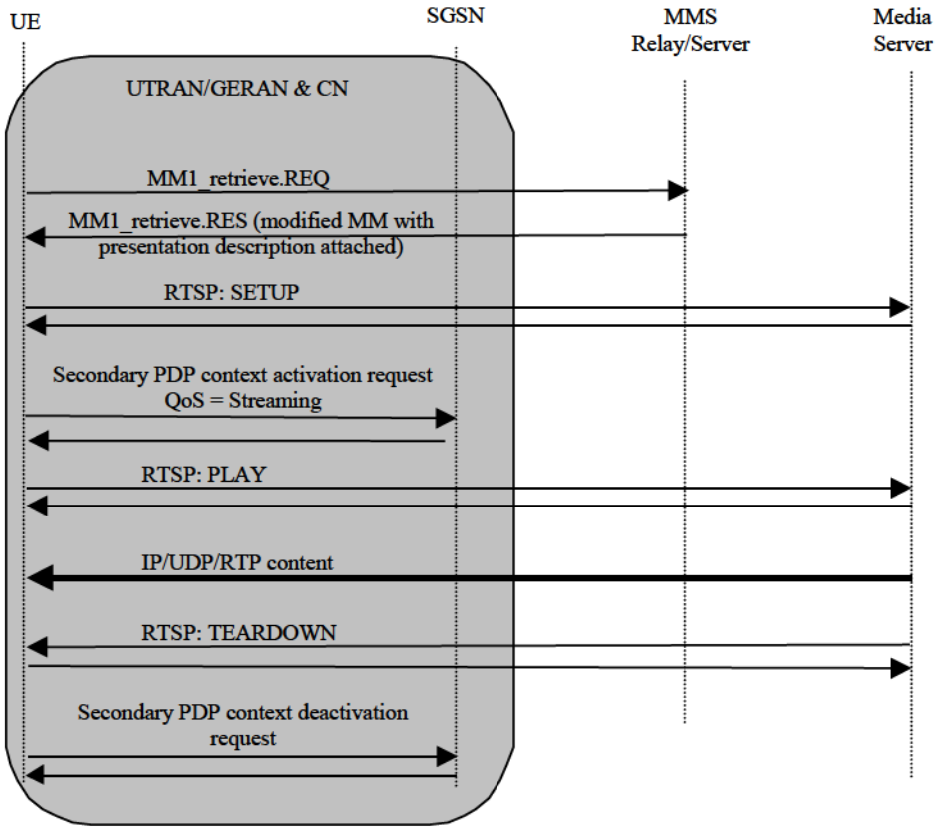


Figure J.1: Schematic view of the support for streaming in MMS

SDP is used as the format of the presentation description, as defined in [41]. MIME type for an SDP file is also according to [41]. The attribute line ('a=') with "control" type in the SDP header indicates the need to open an RTSP session. Use of RTSP to set-up and control a streaming session is according to [41].

Following is an example of a presentation description in SDP format. The example describes streaming of a video sequence.

```
v=0
o=ghost 2890844526 2890842807 IN IP4 192.168.10.10
s=MMS Example
i=Example of SDP file for streaming in MMS
u=http://www.infoserver.com/ae600
e=ghost@mailserver.com
c=IN IP4 0.0.0.0
b=AS:128
t=0 0
```

a=range:npt=0-45.678
m=video 1024 RTP/AVP 96
b=AS:128
a=rtpmap:96 H263-2000/90000
a=fmtp:96 profile=3;level=10
a=control:rtsp://mediaserver.com/movie
a=recvonly

Annex K (informative): MM1, MM4 <-> MM7 header mapping

This annex maps the abstract messages from MM1 and MM4 to MM7.

The abstract messages mapped between MM1 and MM7 are:

- MM1_Submit.REQ to the MM7_Deliver.REQ
- MM7_Submit.REQ to the MM1_Notification.REQ and the MM1_Retrieve.RES
- MM1_Read_Reply_Recipient.REQ to the MM7_Read_Reply_Report.REQ
- MM1_Forward.REQ to the MM7_Deliver.REQ
- MM7_extended_cancel.REQ to the MM1_cancel.REQ
- MM7_extended_replace.REQ to the MM1_notification.REQ, and MM1_Retrieve.RES

The abstract messages mapped between MM4 and MM7 are:

- MM4_Forward.REQ to the MM7_Deliver.REQ
- MM4_Delivery_Report.REQ to the MM7_Delivery_Report.REQ
- MM4_Read_Reply_Report.REQ to the MM7_Read_Reply.REQ

The tables below show the mapping and are provided to give an end-to-end description of MMS. There is a table for each MM1, MM4 abstract message that maps to a MM7 abstract message. In many cases there is no mapping between MM1, MM4 and MM7 information elements, this is according to specifications. These information elements are included in the tables below in order to give a complete picture of how the information elements are handled.

There are also several abstract messages over MM1, MM4 that have no relevant mapping to MM7 and vice versa. These abstract messages are omitted from this annex.

Table K.1: Mapping MM1_submit.REQ -> MM7_deliver.REQ

Information elements in MM1_submit.REQ	Information elements in MM7_deliver.REQ
Message Type	-
Transaction ID	-
MMSVersion	-
Recipient address, -	Recipient address, - (NOTE 1)
Content type	Content type
Sender address	Sender address, - (NOTE 2)
Message class	-
Date and time	Date and time
Time of Expiry	-
Earliest delivery time	-
Delivery report	-
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Priority	Priority
Sender visibility	-
Store	-
MM State	-
MM Flags	-
Read reply	-
Subject	Subject
Reply-Charging-ID	Reply-Charging-ID
Applic-ID	Applic-ID
Reply-Applic-ID	Reply-Applic-ID
Aux-Applic-Info	Aux-Applic-Info
Content Class	-
DRM Content	-
Adaptations	-
Content	Content
-	Transaction ID
-	Message type
-	MM7 version
-	MMS Relay/Server ID
-	Linked ID
-	Sender SPI
-	Recipient SPI
NOTE 1: The recipient address over MM1 may or may not be mapped to recipient address over MM7. The recipient address over MM7 may also be independent of the recipient address over MM1. NOTE 2: If the Sender Visibility flag is set over MM1, the Sender address from MM1 is not mapped onto MM7.	

Table K.2: Mapping MM7_submit.REQ -> MM1_notification.REQ, MM1_Retrieve.RES

Information elements in MM7_submit.REQ	Information elements in MM1_notification.REQ	Information elements in MM1_retrieve.RES
-	Message Type	-
-	Transaction ID	-
-	MMS Version	-
Message class	Message class	Message class
Time of Expiry	Time of expiry	-
Subject	Subject	Subject
Priority	Priority	Priority
Sender address	Sender address	Sender address
Reply-Charging	Reply-Charging	Reply-Charging
-	-	Reply-Charging-ID
Reply-Deadline	Reply-Deadline	Reply-Deadline
Reply-Charging-Size	Reply-Charging-Size	Reply-Charging-Size
Transaction ID	-	-
Message type	-	-
MM7 version	-	-
VASP ID	-	-
VAS ID	-	-
Recipient address	-	Recipient address
Service code	-	-
Linked ID	-	-
Date and time	-	Date and time
Earliest delivery time	-	-
Delivery report	-	-
Read reply	-	Read reply
Content Class	Content Class	Content Class
DRM Content	DRM Content	DRM Content
Adaptations	-	-
Content type	-	Content type
Content	-	Content
Message Distribution Indicator	Message Distribution Indicator	Message Distribution Indicator
Charged Party	-	-
Charged Party ID	-	-
DeliveryCondition	-	-
-	Message size	-
-	Message Reference	-
-	Stored	-
-	Delivery report	Delivery report
-	Reply-Charging-ID	-
-	Element-Descriptor	-
-	-	Message ID
-	-	MM State
-	-	MM Flags
-	-	Request Status
-	-	Request Status Text
-	-	Previously-sent-by
-	-	Previously-sent-date-and-time
-	-	Message Type
-	-	Transaction ID
-	-	MMS Version
Applic-ID	Applic-ID	Applic-ID
Reply-Applic-ID	Reply-Applic-ID	Reply-Applic-ID
Aux-Applic-Info	Aux-Applic-Info	Aux-Applic-Info

Table K.3: Mapping MM1_read_reply_recipient.REQ -> MM7_read_reply_report.REQ

Information elements in MM1_read_reply_recipient.REQ	Information elements in MM7_read_reply_report.REQ
Message Type	-
MMS Version	-
Recipient address	Recipient address
Originator address	Sender address
-	VASP ID
-	VAS ID
Message-ID	Message-ID
Date and Time	Date and Time
Read Status	Read Status
-	Transaction ID
-	Message Type
-	MM7 Version
-	MMS Relay/Server ID
-	Status text
Applic-ID	Applic-ID
Reply-Applic-ID	Reply-Applic-ID
Aux-Applic-Info	Aux-Applic-Info

Table K.4: Mapping MM1_Forward.REQ -> MM7_Deliver.REQ

Information elements in MM1_Forward.REQ	Information elements in MM7_Deliver.REQ
Message Type	-
Transaction ID	-
MMS Version	-
Recipient address	Recipient address
Forwarding address	Sender address
Date and time	Date and time
Time of Expiry	-
Earliest delivery time	-
Store	-
MM State	-
MM Flags	-
Delivery report	-
Read reply	-
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Message Reference	<Content>, Content Type, Subject, Priority (NOTE)
-	Transaction ID
-	Message type
-	MM7 version
-	VASP ID
-	VAS ID
-	MMS Relay/Server ID
-	Linked ID
	Reply Charging ID
-	Sender SPI
-	Recipient SPI
-	Applic-ID
-	Reply-Applic-ID
-	Aux-Applic-Info
NOTE: The message reference is used to map fields and content from the original MM. The mapping of these fields is identical to the MM1_Submit.REQ/MM7_Deliver.REQ mapping in table K.1.	

Table K.5: Mapping MM4_Forward.REQ -> MM7_Deliver.REQ

Information elements in MM4_Forward.REQ	Information elements in MM7_Deliver.REQ
3GPP MMS Version	-
Message Type	-
Transaction ID	-
Message ID, -	Linked ID, - (NOTE 1)
Recipient(s) address	Recipient address
Sender address	Sender address (NOTE 2)
Content type	Content type
Message class	-
Date and time	Date and time
Time of Expiry	-
Delivery report	-
Priority	Priority
Sender visibility	-
Read reply	-
Subject	Subject
Acknowledgement Request	-
Forward counter	-
Previously-sent-by	Previously-sent-by
Previously-sent-date and-time	Previously-sent-date-and-time
Content Class	-
DRM Content	-
Adaptations	-
Content	Content
-	Transaction ID
-	Message type
-	MM7 version
-	VASP ID
-	VAS ID
-	MMS Relay/Server ID
-	Recipient address
-	Reply-Charging-ID
-	Sender SPI
-	Recipient SPI
Applic-ID	Applic-ID
Reply-Applic-ID	Reply-Applic-ID
Aux-Applic-Info	Aux-Applic-Info
NOTE 1: The Message ID over MM1 may or may not be mapped to the Linked ID over MM7. The Linked ID over MM7 may also be independent of the Message ID over MM1. NOTE 2: If the Sender Visibility flag is set over MM4, the Sender address from MM4 is not mapped onto MM7.	

Table K.6: void

Table K.7: MM4_delivery_report.REQ -> MM7_delivery_report.REQ

Information elements in MM4_delivery_report.REQ	Information elements in MM7_delivery_report.REQ
3GPP MMS Version	-
Message Type	-
Transaction ID	-
Message ID	Message ID
Recipient address	Sender address
-	VASP ID
-	VAS ID
Sender address	Recipient address
Date and time	Date and time
Acknowledgement Request	-
MM Status	MM Status
MM Status Extension	MM Status Extension
MM Status Text	Status text
-	Transaction ID
-	Message Type
-	MM7 Version
-	MMS Relay/Server ID
Applic-ID	Applic-ID
Reply-Applic-ID	Reply-Applic-ID
Aux-Applic-Info	Aux-Applic-Info

Table K.8: MM4_Read_reply_report.REQ -> MM7_read_reply_report.REQ

Information elements in MM4_Read_reply_report.REQ	Information elements in MM7_read_reply.REQ
3GPP MMS Version	-
Message Type	-
Transaction ID	-
Recipient address	Recipient address
Sender address	Sender address
-	VASP ID
-	VAS ID
Message-ID	Message-ID
Date and time	Date and time
Acknowledgement Request	-
Read Status	Read Status
Status text	Status text
-	Transaction ID
-	Message Type
-	MM7 Version
-	MMS Relay/Server ID
Applic-ID	Applic-ID
Reply-Applic-ID	Reply-Applic-ID
Aux-Applic-Info	Aux-Applic-Info

Table K.9: Mapping MM7_extended_replace.REQ -> MM1_notification.REQ, MM1_Retrieve.RES

Information elements in MM7_ extended_replace.REQ	Information elements in MM1_notification.REQ	Information elements in MM1_retrieve.RES
-	Message Type	-
-	Transaction ID	-
-	MMS Version	-
Transaction ID	-	-
Message type	-	-
MM7 version	-	-
VASP ID	-	-
VAS ID	-	-
Replace ID	Replace-ID	Replace-ID
Service code	-	-
Date and time	-	Date and time
Earliest delivery time	-	-
Delivery report	-Delivery report	-Delivery report
Read reply	-	Read reply
Adaptations	-	-
Content type	-	Content type
Content	-	Content
-	Message Distribution Indicator	Message Distribution Indicator
-	Applic-ID	Applic-ID
-	Reply-Applic-ID	Reply-Applic-ID
-	Aux-Applic-Info	Aux-Applic-Info
-	Message size	-
Time of expiry-	Time of expiry	
-	Message Reference	-
-	Subject	Subject
-	Priority	Priority
-	Sender address	Sender address
-	Stored	-
-	Reply-Charging	Reply-Charging
-	Reply-Deadline	Reply-Deadline
-	Reply-Charging-Size	Reply-Charging-Size
-	Reply-Charging-ID	Reply-Charging-ID-
-	Element-Descriptor	-
-	MM recommended retrieval mode	-
-	Text explaining MM recommended retrieval mode	-
-	-	Recipient address
-	Message class-	Message class
-	-	Message ID
-	-	MM State
-	-	MM Flags
-	-	Request Status
-	-	Request Status Text
-	-	Previously-sent-by
-	-	Previously-sent-date-and-time
-	-	Message Type
-	-	Transaction ID
-	-	MMS Version

Table K.10: Mapping MM7_extended_cancel.REQ -> MM1_cancel.REQ

Information elements in MM1_cancel.REQ	Information elements in MM7_extended_cancel.REQ
-	Transaction ID
-	Message type
-	MM7 version
-	VASP ID
-	VAS ID
-	Sender address
Cancel ID	Cancel ID
Message Type	-
Transaction ID	-
MMS Version	-

Annex L (normative): MM7 XML Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-
1-4" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-1-4"
elementFormDefault="qualified" attributeFormDefault="unqualified">

<xs:import namespace="http://schemas.xmlsoap.org/soap/envelope/"
schemaLocation="http://schemas.xmlsoap.org/soap/envelope/"/>

    <xs:element name="TransactionID">
        <xs:annotation>
            <xs:documentation>The transaction ID that shall be included in the SOAP
Header</xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute ref="soap:mustUnderstand"/>
                    <xs:attribute ref="soap:encodingStyle"/>
                    <xs:attribute ref="soap:actor"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="SubmitReq" type="tns:submitReqType">
        <xs:annotation>
            <xs:documentation>VASP to MMS : Sending MM from the VASP to one or more
recipients</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="SubmitRsp" type="tns:submitRspType">
        <xs:annotation>
            <xs:documentation>MMS  to VASP: Response to a VASP after MM submission
request</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="DeliverReq" type="tns:deliverReqType">
        <xs:annotation>
            <xs:documentation>MMS to VASP : Delivery of MM from the MMS Relay/Server to the VASP
</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="DeliverRsp" type="tns:deliverRspType">
        <xs:annotation>
            <xs:documentation>VASP to MMS : Response to a message delivered to the VASP from the MMS
Relay/Server</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="CancelReq" type="tns:cancelReqType">
        <xs:annotation>
            <xs:documentation>VASP  to MMS: Request to cancel a message submission
</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="CancelRsp" type="tns:genericResponseType">
        <xs:annotation>
            <xs:documentation>MMS  to VASP: Response to a VASP after MM cancellation request
</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="ReplaceReq" type="tns:replaceReqType">
        <xs:annotation>
            <xs:documentation>VASP  to MMS: Request to replace a message which was submitted
</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="ReplaceRsp" type="tns:genericResponseType">
        <xs:annotation>
            <xs:documentation>MMS  to VASP: Response to a VASP after MM replace request
</xs:documentation>
```

```
        </xs:annotation>
    </xs:element>
<xs:element name="extendedCancelReq" type="tns:extendedcancelReqType">
        <xs:annotation>
            <xs:documentation>VASP  to MMS: Extended Request to cancel a message submission
</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="extendedCancelRsp" type="tns:extendedcancelRspType">
        <xs:annotation>
            <xs:documentation>MMS  to VASP: Response to a VASP after extended MM cancellation
request </xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="extendedReplaceReq" type="tns:extendedreplaceReqType">
        <xs:annotation>
            <xs:documentation>VASP  to MMS: extended Request to replace a message which was
submitted </xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="extendedReplaceRsp" type="tns:extendedreplaceRspType">
        <xs:annotation>
            <xs:documentation>MMS  to VASP: Response to a VASP after extended MM cancellation
request </xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="DeliveryReportReq" type="tns:deliveryReportReqType">
        <xs:annotation>
            <xs:documentation>MMS to VASP : Delivery Report from one of the MM
recipients</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="DeliveryReportRsp" type="tns:genericResponseType">
        <xs:annotation>
            <xs:documentation>VASP to MMS: Response to a delivery report delivered to the
VASP</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="ReadReplyReq" type="tns:readReplyReqType">
        <xs:annotation>
            <xs:documentation>MMS to VASP : Delivery Report from one of the MM
recipients</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="ReadReplyRsp" type="tns:genericResponseType">
        <xs:annotation>
            <xs:documentation>VASP to MMS: Response to a read reply delivered to the
VASP</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="RSErrorRsp" type="tns:genericResponseType">
        <xs:annotation>
            <xs:documentation>MMS to VASP: Error response to a any bad request sent to the MMS
Relay/Server</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="VASPErrorRsp" type="tns:genericResponseType">
        <xs:annotation>
            <xs:documentation>VASP to MMS: Error response to a any bad request sent to the
VASP</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:complexType name="senderIDType">
        <xs:sequence>
            <xs:element name="VASPID" type="tns:entityIDType" minOccurs="0"/>
            <xs:element name="VASID" type="tns:entityIDType" minOccurs="0"/>
            <xs:element name="SenderAddress" type="tns:addressType" minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="submitReqType">
        <xs:complexContent>
            <xs:extension base="tns:genericVASPRequestType">
                <xs:sequence>
                    <xs:element name="Recipients" type="tns:recipientsType"/>
                    <xs:element name="ServiceCode" type="tns:serviceCodeType" minOccurs="0"/>
                    <xs:element name="LinkedID" type="tns:messageIDType" minOccurs="0"/>
                    <xs:element name="MessageClass" type="tns:messageClassType"
default="Informational" minOccurs="0"/>
```

```
                    <xs:element name="TimeStamp" type="xs:dateTime" minOccurs="0"/>
                    <xs:element name="ReplyCharging" minOccurs="0">
                        <xs:complexType>
                            <xs:attribute name="replyChargingSize" type="xs:positiveInteger"
use="optional"/>
                            <xs:attribute name="replyDeadline" type="tns:relativeOrAbsoluteDateType"
use="optional"/>
                        </xs:complexType>
                    </xs:element>
                    <xs:element name="EarliestDeliveryTime" type="tns:relativeOrAbsoluteDateType"
minOccurs="0"/>
                    <xs:element name="ExpiryDate" type="tns:relativeOrAbsoluteDateType"
minOccurs="0"/>
                    <xs:element name="DeliveryReport" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="ReadReply" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="Priority" type="tns:priorityType" minOccurs="0"/>
                    <xs:element name="Subject" type="xs:string" minOccurs="0"/>
                    <xs:element name="ChargedParty" type="tns:chargedPartyType" minOccurs="0"/>
                    <xs:element name="ChargedPartyID" type="tns:chargedPartyIDType" minOccurs="0"/>
                    <xs:element name="DistributionIndicator" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="DeliveryCondition" type="tns:deliveryConditionType"
minOccurs="0"/>
                    <xs:element name="ApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="ReplyApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="AuxApplicInfo" type="xs:string" minOccurs="0"/>
                    <xs:element name="ContentClass" type="tns:contentClassType" minOccurs="0"/>
                    <xs:element name="DRMContent" type="xs:boolean" minOccurs="0"/>
    <xs:element name="Content" type="tns:contentReferenceType" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="submitRspType">
        <xs:complexContent>
            <xs:extension base="tns:genericResponseType">
                <xs:sequence>
                    <xs:element name="MessageID" type="tns:messageIDType"/>
                </xs:sequence>
            </xs:extension>     </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="deliverReqType">
        <xs:complexContent>
            <xs:extension base="tns:genericRSReqType">
                <xs:sequence>
                    <xs:element name="VASPID" type="tns:entityIDType" minOccurs="0"/>
                    <xs:element name="VASID" type="tns:entityIDType" minOccurs="0"/>
                    <xs:element name="LinkedID" type="tns:messageIDType" minOccurs="0"/>
                    <xs:element name="Sender" type="tns:addressType"/>
                    <xs:element name="Recipients" type="tns:recipientsType" minOccurs="0"/>
                    <xs:element name="Previouslysentby" type="tns:previouslySentByType"
minOccurs="0"/>
                    <xs:element name="Previouslysentdateandtime" type="tns:previouslySentByDateTime"
minOccurs="0"/>
                    <xs:element name="SenderSPI" type="tns:serviceProviderIDType" minOccurs="0"/>
                    <xs:element name="RecipientSPI" type="tns:serviceProviderIDType" minOccurs="0"/>
                    <xs:element name="TimeStamp" type="xs:dateTime" minOccurs="0"/>
                    <xs:element name="ReplyChargingID" type="tns:messageIDType" minOccurs="0"/>
                    <xs:element name="Priority" type="tns:priorityType" minOccurs="0"/>
                    <xs:element name="Subject" type="xs:string" minOccurs="0"/>
                    <xs:element name="ApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="ReplyApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="AuxApplicInfo" type="xs:string" minOccurs="0"/>
                    <xs:element name="UACapabilities" type="tns:capabilitiesType" minOccurs="0"/>
                    <xs:element name="Content" type="tns:contentReferenceType" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="deliverRspType">
        <xs:complexContent>
            <xs:extension base="tns:genericResponseType">
                <xs:sequence>
                    <xs:element name="ServiceCode" type="tns:serviceCodeType" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="cancelReqType">
```

```
        <xs:complexContent>
            <xs:extension base="tns:genericVASPRequestType">
                <xs:sequence>
                    <xs:element name="MessageID" type="tns:messageIDType"/>
                    <xs:element name="ApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="ReplyApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="AuxApplicInfo" type="xs:string" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="extendedcancelReqType">
        <xs:complexContent>
            <xs:extension base="tns:genericVASPRequestType">
                <xs:sequence>
                    <xs:element name="CancelID" type="tns:messageIDType"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="extendedcancelRspType">
        <xs:annotation>
            <xs:documentation>Extended Cancel Response</xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="MM7Version" type="tns:versionType"/>
            <xs:element name="Status" type="tns:extendedcancelresponseStatusType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="replaceReqType">
        <xs:complexContent>
            <xs:extension base="tns:genericVASPRequestType">
                <xs:sequence>
                    <xs:element name="MessageID" type="tns:messageIDType"/>
                    <xs:element name="ServiceCode" type="tns:serviceCodeType" minOccurs="0"/>
                    <xs:element name="TimeStamp" type="xs:dateTime" minOccurs="0"/>
                    <xs:element name="ReadReply" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="EarliestDeliveryTime" type="tns:relativeOrAbsoluteDateType"
minOccurs="0"/>
                    <xs:element name="DistributionIndicator" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="ContentClass" type="tns:contentClassType" minOccurs="0"/>
                    <xs:element name="DRMContent" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="ApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="ReplyApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="AuxApplicInfo" type="xs:string" minOccurs="0"/>
                    <xs:element name="Content" type="tns:contentReferenceType" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="extendedreplaceReqType">
                <xs:sequence>
                    <xs:element name="MM7Version" type="tns:versionType"/>
                    <xs:element name="VASPID" type="tns:entityIDType" minOccurs="0"/>
                    <xs:element name="VASID" type="tns:entityIDType" minOccurs="0"/>
                    <xs:element name="ServiceCode" type="tns:serviceCodeType" minOccurs="0"/>
                    <xs:element name="ReplaceID" type="tns:messageIDType" minOccurs="0"/>
                    <xs:element name="TimeStamp" type="xs:dateTime" minOccurs="0"/>
                    <xs:element name="EarliestDeliveryTime" type="tns:relativeOrAbsoluteDateType"
minOccurs="0"/>
                    <xs:element name="ExpiryDate" type="tns:relativeOrAbsoluteDateType"
minOccurs="0"/>
                    <xs:element name="ReadReply" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="DeliveryReport" type="xs:boolean" minOccurs="0"/>
                    <xs:element name="Content" type="tns:contentReferenceType" minOccurs="0"/>
                </xs:sequence>
    </xs:complexType>
    <xs:complexType name="extendedreplaceRspType">
        <xs:annotation>
            <xs:documentation>Extended Replace Response</xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="MM7Version" type="tns:versionType"/>
            <xs:element name="MessageID" type="tns:messageIDType"/>
            <xs:element name="Status" type="tns:extendedcancelresponseStatusType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="deliveryReportReqType">
```

```
        <xs:complexContent>
            <xs:extension base="tns:genericRSReqType">
                <xs:sequence>
                    <xs:element name="MessageID" type="tns:messageIDType"/>
                    <xs:element name="Recipient" type="tns:addressType"/>
                    <xs:element name="Sender" type="tns:addressType"/>
                    <xs:element name="Date" type="xs:dateTime"/>
                    <xs:element name="MMStatus" type="tns:mmDeliveryStatusType"/>
                    <xs:element name="MMStatusExtension" type="tns:MMStatusExtensionType"
minOccurs="0"/>
                    <xs:element name="StatusText" type="xs:string" minOccurs="0"/>
                    <xs:element name="ApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="ReplyApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="AuxApplicInfo" type="xs:string" minOccurs="0"/>
                    <xs:element name="UACapabilities" type="tns:capabilitiesType" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="readReplyReqType">
        <xs:complexContent>
            <xs:extension base="tns:genericRSReqType">
                <xs:sequence>
                    <xs:element name="MessageID" type="tns:messageIDType"/>
                    <xs:element name="Recipient" type="tns:addressType"/>
                    <xs:element name="Sender" type="tns:addressType"/>
                    <xs:element name="TimeStamp" type="xs:dateTime"/>
                    <xs:element name="MMStatus" type="tns:mmReadStatusType"/>
                    <xs:element name="StatusText" type="xs:string" minOccurs="0"/>
                    <xs:element name="ApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="ReplyApplicID" type="xs:string" minOccurs="0"/>
                    <xs:element name="AuxApplicInfo" type="xs:string" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="genericRSReqType">
        <xs:annotation>
            <xs:documentation>base for all request messages from R/S to VASP</xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="MM7Version" type="tns:versionType"/>
            <xs:element name="MMSRelayServerID" type="tns:entityIDType" minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="genericVASPRequestType">
        <xs:annotation>
            <xs:documentation>Base type for all requests from VASP to R/S</xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="MM7Version" type="tns:versionType"/>
            <xs:element name="SenderIdentification" type="tns:senderIDType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="genericResponseType">
        <xs:annotation>
            <xs:documentation>Any simple response sent </xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="MM7Version" type="tns:versionType"/>
            <xs:element name="Status" type="tns:responseStatusType"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="responseStatusType">
        <xs:annotation>
            <xs:documentation>Status information conveyed in responses</xs:documentation>
        </xs:annotation>
        <xs:all>
            <xs:element name="StatusCode">
                <xs:simpleType>
                    <xs:restriction base="tns:statusCodeType"/>
                </xs:simpleType>
            </xs:element>
            <xs:element name="StatusText" type="tns:statusTextType"/>
            <xs:element name="Details" type="tns:anyDataType" minOccurs="0"/>
        </xs:all>
    </xs:complexType>
    <xs:complexType name="extendedcancelresponseStatusType">
```

```
        <xs:annotation>
            <xs:documentation>Status information conveyed in responses</xs:documentation>
        </xs:annotation>
        <xs:all>
            <xs:element name="StatusCode">
                <xs:simpleType>
                    <xs:restriction base="tns:statusCodeType"/>
                </xs:simpleType>
            </xs:element>
        </xs:all>
    </xs:complexType>
    <xs:simpleType name="mmDeliveryStatusType">
        <xs:annotation>
            <xs:documentation>Statuses for MM7_delivery_report</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="Expired"/>
            <xs:enumeration value="Retrieved"/>
            <xs:enumeration value="Rejected"/>
            <xs:enumeration value="Indeterminate"/>
            <xs:enumeration value="Forwarded"/>
            <xs:enumeration value="Unrecognised"/>
            <xs:enumeration value="Deferred"/>
            <xs:enumeration value="DeliveryConditionNotMet"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="mmReadStatusType">
        <xs:annotation>
            <xs:documentation>Statuses for MM7_read_reply</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="Indeterminate"/>
            <xs:enumeration value="Read"/>
            <xs:enumeration value="Deleted"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="messageIDType">
        <xs:annotation>
            <xs:documentation>Message ID</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string"/>
    </xs:simpleType>
    <xs:group name="AddressGroup">
        <xs:choice>
            <xs:element name="RFC2822Address">
                <xs:complexType>
                    <xs:simpleContent>
                        <xs:extension base="xs:string">
                            <xs:attribute name="displayOnly" type="xs:boolean" use="optional"
default="false"/>
                            <xs:attributeGroup ref="tns:addressSecurity"/>
                        </xs:extension>
                    </xs:simpleContent>
                </xs:complexType>
            </xs:element>
            <xs:element name="Number">
                <xs:complexType>
                    <xs:simpleContent>
                        <xs:extension base="xs:string">
                            <xs:attribute name="displayOnly" type="xs:boolean" use="optional"
default="false"/>
                            <xs:attributeGroup ref="tns:addressSecurity"/>
                        </xs:extension>
                    </xs:simpleContent>
                </xs:complexType>
            </xs:element>
            <xs:element name="ShortCode">
                <xs:complexType>
                    <xs:simpleContent>
                        <xs:extension base="xs:string">
                            <xs:attribute name="displayOnly" type="xs:boolean" use="optional"
default="false"/>
                            <xs:attributeGroup ref="tns:addressSecurity"/>
                        </xs:extension>
                    </xs:simpleContent>
                </xs:complexType>
            </xs:element>
        </xs:choice>
```

```
    </xs:group>
    <xs:complexType name="multiAddressType">
        <xs:sequence maxOccurs="unbounded">
            <xs:group ref="tns:AddressGroup"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="addressType">
        <xs:group ref="tns:AddressGroup"/>
    </xs:complexType>
    <xs:attributeGroup name="addressSecurity">
        <xs:attribute name="addressCoding" type="tns:addressCodingType" use="optional"/>
        <xs:attribute name="id" type="xs:ID" use="optional"/>
    </xs:attributeGroup>
    <xs:simpleType name="addressCodingType">
        <xs:annotation>
            <xs:documentation>obfuscated or encrypted address type</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="encrypted"/>
            <xs:enumeration value="obfuscated"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="previouslySentByType">
        <xs:sequence>
            <xs:element name="UserAgent" type="tns:userAgentInfoType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="previouslySentByDateTime">
        <xs:sequence>
            <xs:element name="DateTime" type="tns:userAgentDateTimeType" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="userAgentInfoType">
        <xs:complexContent>
            <xs:extension base="tns:addressType">
                <xs:attribute name="sequence" type="xs:positiveInteger" use="optional"/>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
    <xs:complexType name="userAgentDateTimeType">
        <xs:simpleContent>
            <xs:extension base="tns:relativeOrAbsoluteDateType">
                <xs:attribute name="sequence" type="xs:positiveInteger" use="optional"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
    <xs:simpleType name="serviceProviderIDType">
        <xs:annotation>
            <xs:documentation>Service Provider Identification</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string"/>
    </xs:simpleType>
    <xs:simpleType name="chargedPartyIDType">
        <xs:annotation>
            <xs:documentation>The address of the third party which is expected to pay for the
MM</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string"/>
    </xs:simpleType>
    <xs:simpleType name="MMStatusExtensionType">
        <xs:restriction base="xs:string">
            <xs:enumeration value="RejectionByMMSRecipient"/>
            <xs:enumeration value="RejectionByOtherRS"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:complexType name="serviceCodeType">
        <xs:annotation>
            <xs:documentation>Used to identify the specific service given for billing
purposes</xs:documentation>
        </xs:annotation>
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:anyAttribute namespace="##other" processContents="lax"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
```

```
    <xs:simpleType name="entityIDType">
        <xs:annotation>
            <xs:documentation>String used to identify the VAS, VASP and MMSC</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string"/>
    </xs:simpleType>
    <xs:complexType name="recipientsType">
        <xs:annotation>
            <xs:documentation>At least one of To,CC,Bcc</xs:documentation>
        </xs:annotation>
        <xs:sequence maxOccurs="unbounded">
            <xs:choice>
                <xs:element name="To" type="tns:multiAddressType"/>
                <xs:element name="Cc" type="tns:multiAddressType"/>
                <xs:element name="Bcc" type="tns:multiAddressType"/>
            </xs:choice>
        </xs:sequence>
    </xs:complexType>
    <xs:simpleType name="messageClassType">
        <xs:annotation>
            <xs:documentation>Message class</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="Personal"/>
            <xs:enumeration value="Informational"/>
            <xs:enumeration value="Advertisement"/>
            <xs:enumeration value="Auto"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="priorityType">
        <xs:annotation>
            <xs:documentation>Priority of MM</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="Normal"/>
            <xs:enumeration value="High"/>
            <xs:enumeration value="Low"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="relativeOrAbsoluteDateType">
        <xs:annotation>
            <xs:documentation>Date which can be relative or absolute</xs:documentation>
        </xs:annotation>
        <xs:union memberTypes="xs:dateTime xs:duration"/>
    </xs:simpleType>
    <xs:complexType name="deliveryConditionType">
        <xs:annotation>
            <xs:documentation>DeliveryConditions provided in MM7SubmitReq, that all need to be
respected for the MM to be delivered </xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="DC" type="xs:positiveInteger" minOccurs="0" maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>
    <xs:simpleType name="chargedPartyType">
        <xs:annotation>
            <xs:documentation>Allows specification of which party - Sender or Reciever pays for
transmission</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="Sender"/>
            <xs:enumeration value="Recipient"/>
            <xs:enumeration value="Both"/>
            <xs:enumeration value="Neither"/>
            <xs:enumeration value="ThirdParty"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="contentClassType">
        <xs:annotation>
            <xs:documentation>Content Class Type used in MM7_Submit and MM7_Replace
</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="text"/>
            <xs:enumeration value="image-basic"/>
            <xs:enumeration value="image-rich"/>
            <xs:enumeration value="video-basic"/>
            <xs:enumeration value="video-rich"/>
```

```
            <xs:enumeration value="megapixel"/>
            <xs:enumeration value="content-basic"/>
            <xs:enumeration value="content-rich"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="versionType">
        <xs:annotation>
            <xs:documentation>Version number in the format of x.y.z </xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:enumeration value="6.8.0"/>
            <xs:enumeration value="6.6.0"/>
            <xs:enumeration value="6.5.0"/>
            <xs:enumeration value="6.4.0"/>
            <xs:enumeration value="6.3.0"/>
            <xs:enumeration value="5.10.0"/>
            <xs:enumeration value="5.8.0"/>
            <xs:enumeration value="5.6.0"/>
            <xs:enumeration value="5.5.0"/>
            <xs:enumeration value="5.3.0"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="statusCodeType">
        <xs:annotation>
            <xs:documentation>request status resonse codes in RES </xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:positiveInteger"/>
    </xs:simpleType>
    <xs:complexType name="contentReferenceType">
        <xs:annotation>
            <xs:documentation>content element including only href</xs:documentation>
        </xs:annotation>
        <xs:attribute name="href" type="xs:anyURI" use="required"/>
        <xs:attribute name="allowAdaptations" type="xs:boolean" default="true" use="optional"/>
    </xs:complexType>
<xs:complexType name="capabilitiesType">
        <xs:annotation>
            <xs:documentation>Base attributes for transfering user agent capabilities from R/S to
VASP, UAProf is e.g UserAgent Name, or URL to the UAProfile RDF. The TimeStamp is used to convey the
last known update by the MMS R/S to the UACapabilities</xs:documentation>
        </xs:annotation>
        <xs:attribute name="UAProf" type="xs:string" use="optional"/>
        <xs:attribute name="TimeStamp" type="tns:relativeOrAbsoluteDateType" use="optional"/>
    </xs:complexType>
    <xs:complexType name="anyDataType">
        <xs:annotation>
            <xs:documentation>Any element and attribute </xs:documentation>
        </xs:annotation>
        <xs:complexContent>
            <xs:restriction base="xs:anyType">
                <xs:sequence>
                    <xs:any processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
                </xs:sequence>
            </xs:restriction>
        </xs:complexContent>
    </xs:complexType>
    <xs:simpleType name="statusTextType">
        <xs:annotation>
            <xs:documentation>list of standard human-readable status descriptions</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string"/>
    </xs:simpleType>
</xs:schema>
```

Annex L1 (informative): Schema Version Handling

This annex defines the version numbers present in the MM7 Schema / Stage 3. (Annex L)

The schema target and default namespace versions are independent of the specification version.

MM7 versionType defines a list of specification values. The top element holds the current specification value for which the stage 3 was created against.

In the event of a stage two specification version X.Y.Z (cf. clause "Foreword") change without a stage three change, the schema version present in the target namespace URL or MM7 version type definition remain unchanged.

If a change is made to the schema, a new targetNamespace is used together with a new entry to the versionType enumerated table to indicate the latest specification.

Example 1:

REL-6-MM7-1-2 changes to REL-6-MM7-1-3 and the latest specification version e.g. 6.6.0 is added to the versionType definition.

Schema version present in the target namespace URL shown in bold text:

```
<xs:schema targetNamespace="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-1-32"
xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-1-32"
```

MM7 VersionType definition

```
<xs:simpleType name="versionType">
    <xs:annotation>
        <xs:documentation>Version number in the format of x.y.z </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:enumeration value="6.6.0"/>
        <xs:enumeration value="6.5.0"/>
    </xs:restriction>
</xs:simpleType>
```

Example 2:

if changes done in version 6.Y.Z do impact MM7-1-A, then a version 6.Y+1.0 will be created:

- With adding <xs:enumeration value="X.Y+1.0"/> to the "versionType"

```
<xs:simpleType name="versionType">
    <xs:annotation>
        <xs:documentation>Version number in the format of x.y.z </xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:enumeration value="6.Y+1.0"/>
        <xs:enumeration value="6.Y.0"/>
    </xs:restriction>
  </xs:simpleType>
```

- With changing the NameSpace <xs:schema targetNamespace="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/REL-6-MM7-1-A+1"

- With changing the XMLschema xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:tns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/**REL-6-MM7-1-A+1**"

if changes made to version 6.Y.Z do not impact MM7-1-A, then a version 6.Y+1.0 will be created:

- Without adding <xs:enumeration value="6.Y.Z"/> to the "versionType"
- Without changing the NameSpace <xs:schema
  targetNamespace="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/**REL-6-MM7-1-A**"
- Without changing the XMLschema xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
- xmlns:tns="http://www.3gpp.org/ftp/Specs/archive/23_series/23.140/schema/**REL-6-MM7-1-A**"

Annex M (informative): Recipient MMS Relay/Server Delivery Report generation and presentation to the originator MMS User Agent.

Table M.1: Recipient MMS R/S Delivery Report generation and presentation to the originator MMS UA

		Originator MMS UA	
		Request a Delivery Report	Does not request a Delivery Report
Originator MMS R/S	Request a Delivery Report	Recipient permits sending Delivery Report, then recipient R/S: Sends Delivery Report Forward to Orig UA = Yes	Recipient permits sending Delivery Report, then recipient R/S: Sends Delivery Report Forward to Orig UA = No
		Recipient does not permit sending Delivery Report, then recipient R/S: Sends Delivery Report Forward to Orig UA = No	Recipient does not permit sending Delivery Report, then recipient R/S: Sends Delivery Report Forward to Orig UA = No
	Does not request a Delivery Report	Recipient permits sending Delivery Report, then recipient R/S: Sends Delivery Report Forward to Orig UA = Yes	Recipient permits sending Delivery Report, then recipient R/S: Does not send Delivery Report
		Recipient does not permit sending Delivery Report, then recipient R/S: Does not send Delivery Report	Recipient does not permit sending Delivery Report, then recipient R/S: Does not send Delivery Report

Annex N (normative): Information Element mapping for the support of MSCF

This annex defines the mapping of MM1, MM4, MM7 abstract message information elements to and from MM10 message information elements.

Table N.1: Mapping MM1_submit.REQ -> MM10_Interrogation.REQ

Information elements in MM1_submit.REQ	Information elements in MM10_interrogation.REQ
Message Type	-
Transaction ID	-
MMSVersion	-
Recipient address	Initial Recipient Address
Content type	-
Sender address	Sender Address
Message class	-
Date and time	-
Time of Expiry	-
Earliest delivery time	-
Delivery report	Delivery Report
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Priority	-
Sender visibility	Sender Visibility
Store	-
MM State	-
MM Flags	-
Read reply	Read Reply
Subject	
Reply-Charging-ID	
Content	
-	Message type
-	Trigger Event
-	Served User Identity (Note 1)
	Served User IMSI (Note 2)
-	Originating Interface (MM1)
-	Service Key
Note 1: The Served User Identity contains the authentic subscriber identification as derived from the MM1 authentication mechanism	
Note 2: The Served User IMSI shall be present if made available to the MMS Relay/Server as part of the MM1 authentication process.	

Table N.2: Mapping MM4_forward.REQ -> MM10_Interrogation.REQ

Information elements in MM7_submit.REQ	Information elements in MM10_interrogation.REQ
3GPP MMS Version	-
Message Type	-
Transaction ID	-
Message ID	-
Recipient(s) address	Initial Recipient Address
Sender address	Sender Address
Content type	
Message class	-
Date and time	-
Time of Expiry	-
Delivery report	Delivery Report
Originator R/S delivery report	-
Priority	-
Sender visibility	Sender Visibility
Read reply	Read Reply
Subject	-
Acknowledgement Request	-
Forward_counter	-
Previously-sent-by	-
Previously-sent-date-and-time	-
Content	-
-	Message type
-	Trigger Event
-	Originating Interface (MM4)
-	Service Key
-	Served User Identity

Table N.3: Mapping MM7_submit.REQ -> MM10_Interrogation.REQ

Information elements in MM7_submit.REQ	Information elements in MM10_interrogation.REQ
Transaction ID	-
Message type	-
MM7 version	-
VASP ID	Served User Identity
VAS ID	Served User Identity
Sender address	Sender Address
Recipient address	Initial Recipient Address
Service code	-
Linked ID	-
Message class	-
Date and time	-
Time of Expiry	-
Earliest delivery time	-
Delivery report	Delivery Report
Read Reply	Read Reply
Reply-Charging	-
Reply-Deadline	-
Reply-Charging-Size	-
Priority	-
Subject	-
Adaptations	-
Charged Party	-
Content type	-
Content	-
Message Distribution Indicator	-
Charged Party ID	-
Delivery Condition	-
Transaction ID	-
Message type	-
	Message type
	Trigger Event
	Originating Interface (MM7)
	Service Key

Table N.4: Mapping MM10_interrogation.RES -> MM1_Notification.REQ and MM1_retrieve.RES

Information elements in MM10_Interrogation.RES	Information elements in MM1_notification.REQ	Information elements in MM1_retrieve.RES
Message Type	-	-
Result Code	-	-
Delivery report	Delivery report	Delivery report
Sender visibility	-	-
Read reply	-	Read reply
Presentation-address	-	Recipient address
Routeing-Address	-	-
Sender-Address	Sender address	Sender address
CDR information	-	-
-	Message Type	Message Type
-	Transaction ID	Transaction ID
-	MMS Version	MMS Version
-	Message class	Message class
-	Message size	-
-	Time of expiry	-
-	Message Reference	-
-	Subject	Subject
-	Priority	Priority
-	Stored	-
-	Reply-Charging	Reply-Charging
-	Reply-Deadline	Reply-Deadline
-	Reply-Charging-Size	Reply-Charging-Size
-	Reply-Charging-ID	Reply-Charging-ID
-	Element-Descriptor	-
-	MM recommended retrieval mode	-
-	Text explaining MM recommended retrieval mode	-
-	Message Distribution Indicator	-
-	-	Message ID
-	-	Content type
-	-	Date and time
-	-	MM State
-	-	MM Flags
-	-	Request Status
-	-	Request Status Text
-	-	Previously-sent-by
-	-	Previously-sent-date-and-time
-	-	Message Distribution Indicator
-	-	Content

Table N.5: Mapping MM10_interrogation.RES -> MM4_Forward.REQ

Information elements in MM10_interrogation.RES	Information elements in MM4_forward.REQ
Message Type	-
Result Code	-
Delivery report	Delivery report
Sender visibility	Sender visibility
Read reply	Read reply
Presentation-address	Recipient(s) address
Routeing Address	(Note 1)
Sender Address	Sender address
CDR information	-
-	3GPP MMS Version
-	Message Type
-	Transaction ID
-	Message ID
-	Content type
-	Message class
-	Date and time
-	Time of Expiry
-	Originator R/S delivery report
-	Priority
-	Subject
-	Acknowledgement Request
-	Forward_counter
-	Previously-sent-by
-	Previously-sent-date-and-time
-	Content
Note 1: The Routeing address is used by the MMS relay server to determine the MM4 routeing address used on SMTP level	

Table N.6: Mapping MM10_interrogation.RES -> MM7_Deliver.REQ

Information elements in MM10_interrogation.RES	Information elements in MM4_forward.REQ
Message Type	-
Result Code	-
Delivery report	Delivery Report
Sender visibility	-
Read reply	Read Reply
Presentation-address	Recipient address
Routeing Address	-
Sender Address	Sender address
CDR information	-
-	Transaction ID
-	Message type
-	MM7 version
-	MMS Relay/Server ID
-	Linked ID
-	Previously-sent-by
-	Previously-sent-date-and-time
-	Sender SPI
-	Recipient SPI
-	Date and time
-	Reply-Charging-ID
-	Priority
-	Subject
-	Content type
-	Content

Annex O (informative): Change history

TSG#	TSG Doc	CR	Rev	Rel	Subject	Cat	Vers-Curr	Vers-New	T2 Doc	Workitem
TP-07	TP-000028				New		2.0.0	3.0.0		
					Editorial change by MCC		3.0.0	3.0.1		
TP-09	TP-000144	001	-	Rel-4	Set of mandatory media formats for MMS	B	3.0.1	4.0.0	T2-000555	MMS
TP-10	TP-000195	002	-	Rel-4	High-level description of MMS	B	4.0.0	4.1.0	T2-000791	MMS
TP-11	TP-010029	003	-	Rel-4	High-level description of MMS - part II	B	4.1.0	4.2.0	T2-010264	MMS
TP-12	TP-010128	004	-	Rel-4	Corrections on MM4 example	F	4.2.0	4.3.0	T2-010537	MMS
TP-12	TP-010128	005	-	Rel-4	MMS Media Codec/Format – Corrections, Clarifications and Updates	F	4.2.0	4.3.0	T2-010539	MMS
TP-12	TP-010128	006	-	Rel-4	Address Hiding and Read-Reply Report	F	4.2.0	4.3.0	T2-010559	MMS
TP-12	TP-010128	007	-	Rel-4	Correction of MMSE definition	F	4.2.0	4.3.0	T2-010535	MMS
TP-13	TP-010194	008	-	Rel-4	Clarification of REL-4 MMS authentication	F	4.3.0	4.4.0	T2-010736	MMS
TP-13	TP-010194	009	-	Rel-4	MMS address hiding	F	4.3.0	4.4.0	T2-010737	MMS
TP-13	TP-010194	010	-	Rel-5	New Figure 5: Interworking with different MMSEs	D	4.3.0	5.0.0	T2-010741	MESS5-MMS
TP-13	TP-010194	011	-	Rel-5	Priority field in notification message	B	4.3.0	5.0.0	T2-010748	MESS5-MMS
TP-13	TP-010194	012	-	Rel-5	Detailed Notification	B	4.3.0	5.0.0	T2-010803	MESS5-MMS
TP-13	TP-010194	013	-	Rel-4	Correction to MMS MM4 interface	F	4.3.0	4.4.0	T2-010807	MMS
TP-13	TP-010194	014	-	Rel-5	Editorial changes	D	4.3.0	5.0.0	T2-010816	MESS5-MMS
TP-13	TP-010194	015	-	Rel-4	Refinement of the reply-charging service behaviour description.	F	4.3.0	4.4.0	T2-010848	MMS
TP-13	TP-010194	016	-	Rel-4	Correction to MMS MM4 interface, delivery report	F	4.3.0	4.4.0	T2-010849	MMS
TP-13	TP-010194	017	-	Rel-5	Clarifications and Editorial Changes	F	4.3.0	5.0.0	T2-010850	MESS5-MMS
TP-14	TP-010280	019	-	Rel-5	Reference to TS 29.061 specification on RADIUS usage	A	5.0.0	5.1.0	T2-011020	MESS5-MMS
TP-14	TP-010280	020	-	Rel-5	Clarification of the reply-charging service behaviour description	F	5.0.0	5.1.0	T2-011043	MESS5-MMS
TP-14	TP-010280	023	-	Rel-5	Clarification of Forwarding in MM1 message retrieval	A	5.0.0	5.1.0	T2-011113	MESS5-MMS
TP-14	TP-010280	025	-	Rel-5	Removing inconsistency of mandated functionality	A	5.0.0	5.1.0	T2-011116	MESS5-MMS
TP-14	TP-010280	026	-	Rel-5	Correction of MM Status Code	A	5.0.0	5.1.0	T2-011119	MESS5-MMS
TP-14	TP-010280	028	-	Rel-5	Correction on MM1 and MM4 abstract messages	A	5.0.0	5.1.0	T2-011127	MESS5-MMS
TP-14	TP-010280	030	-	Rel-5	clarification of status codes in MM4_read_reply_report.REQ	A	5.0.0	5.1.0	T2-011201	MESS5-MMS
TP-14	TP-010280	031	-	Rel-5	Configuration of MMS-capable Ues	B	5.0.0	5.1.0	T2-011211	MESS5-MMS
TP-14	TP-010280	032	-	Rel-5	MMS address hiding	F	5.0.0	5.1.0	T2-011233	MESS5-MMS
TP-14	TP-010280	033	-	Rel-5	reply-charging clarifications	F	5.0.0	5.1.0	T2-011234	MESS5-MMS
TP-15	TP-020016	037	-	Rel-5	Correction on the SMTP-address address encoding	A	5.1.0	5.2.0	T2-020140	MESS5-MMS
TP-15	TP-020016	038	-	Rel-5	Introduction of SMTP service extensions over MM4	B	5.1.0	5.2.0	T2-020144	MESS5-MMS
TP-15	TP-020016	039	-	Rel-5	MM4 forward routing failure	B	5.1.0	5.2.0	T2-020145	MESS5-MMS
TP-15	TP-020016	040	-	Rel-5	Clarification of existing request status codes over MM4	B	5.1.0	5.2.0	T2-020146	MESS5-MMS
TP-15	TP-020016	041	-	Rel-5	Delivery report definition correction	F	5.1.0	5.2.0	T2-020148	MESS5-MMS
TP-15	TP-020016	042	-	Rel-5	VASP abbreviation	F	5.1.0	5.2.0	T2-020149	MESS5-MMS
TP-15	TP-020016	043	-	Rel-5	Correction on the MIME Content-Type Message format on MM4	A	5.1.0	5.2.0	T2-020151	MESS5-MMS
TP-15	TP-020016	044	-	Rel-5	Correction of addressing on MM1_Submit.REQ	F	5.1.0	5.2.0	T2-020155	MESS5-MMS
TP-15	TP-020016	045	-	Rel-5	Correction of the Forwarding Feature	A	5.1.0	5.2.0	T2-020156	MESS5-MMS
TP-15	TP-020016	046	-	Rel-5	Detection of duplicate MMs	F	5.1.0	5.2.0	T2-020157	MESS5-MMS
TP-15	TP-020016	047	-	Rel-5	Submission Description Enhancement regarding the IE “Date and Time”	F	5.1.0	5.2.0	T2-020158	MESS5-MMS
TP-15	TP-020016	048	-	Rel-5	Adding a reference to 3GPP TS 32.235	F	5.1.0	5.2.0	T2-020161	MESS5-MMS
TP-15	TP-020016	049	-	Rel-5	Terminal Capability Negotiation	B	5.1.0	5.2.0	T2-020162	MESS5-MMS
TP-15	TP-020016	050	-	Rel-5	Recipient MSISDN address resolution	B	5.1.0	5.2.0	T2-020211	MESS5-MMS
TP-15	TP-020016	051	-	Rel-5	Reply-charging bug fixes	F	5.1.0	5.2.0	T2-020215	MESS5-MMS
TP-15	TP-020016	052	-	Rel-5	Support of Reply-Charging in MM7	B	5.1.0	5.2.0	T2-020219	MESS5-MMS

TP-15	TP-020016	053	-	Rel-5	VASP-related CDR generation	B	5.1.0	5.2.0	T2-020261	MESS5-MMS
TP-15	TP-020016	054	-	Rel-5	Persistent Networked-Based Storage Functions	B	5.1.0	5.2.0	T2-020262	MESS5-MMS
TP-15	TP-020016	055	-	Rel-5	Functional Description and Abstract Messages for MM7 realization	B	5.1.0	5.2.0	T2-020263	MESS5-MMS
TP-15	TP-020016	056	-	Rel-5	MMS UA behaviour with respect to handling MMS parameters on the USIM	B	5.1.0	5.2.0	T2-020265	MESS5-MMS
TP-15	TP-020016	057	-	Rel-5	MM1 <-> MM4 header mapping	B	5.1.0	5.2.0	T2-020270	MESS5-MMS
TP-15	TP-020016	058	-	Rel-5	Editorial changes	D	5.1.0	5.2.0	T2-020271	MESS5-MMS
TP-15	TP-020016	059	-	Rel-5	Correction to Call Data Records definitions	F	5.1.0	5.2.0	T2-020272	MESS5-MMS
TP-15	TP-020016	060	-	Rel-5	MM1 addressing formats	C	5.1.0	5.2.0	T2-020297	MESS5-MMS
TP-15	TP-020016	061	-	Rel-5	Reference point MM8 to billing system	B	5.1.0	5.2.0	T2-020275	MESS5-MMS
TP-15	TP-020016	062	-	Rel-5	MM7 Addressing	B	5.1.0	5.2.0	T2-020277	MESS5-MMS
TP-15	TP-020016	063	-	Rel-5	Clarification about Streaming in MMS	F	5.1.0	5.2.0	T2-020278	MESS5-MMS
TP-15	TP-020016	064	-	Rel-5	Clarifications on responsibilities of MMS User Agent and MMS Relay/Server	F	5.1.0	5.2.0	T2-020279	MESS5-MMS
TP-16	TP-020105	065	-	Rel-5	Parameters for CDR creation related to VASP/VAS connectivity via MM7	F	5.2.0	5.3.0	T2-020511	MESS5-MMS
TP-16	TP-020105	066	-	Rel-5	Automatic Bearer Selection for MMS	B	5.2.0	5.3.0	T2-020586	MESS5-MMS
TP-16	TP-020105	067	-	Rel-5	Charged Party Indication on MM7	B	5.2.0	5.3.0	T2-020533	MESS5-MMS
TP-16	TP-020105	068	-	Rel-5	MM1 - MM7 and MM4 - MM7 header mapping	B	5.2.0	5.3.0	T2-020534	MESS5-MMS
TP-16	TP-020158	069	-	Rel-5	MM7 stage 3	B	5.2.0	5.3.0	T2-020587	MESS5-MMS
TP-16	TP-020105	070	-	Rel-5	Correction to MM7 Stage 2 on Address Visibility in Sender and Recipient IEs	F	5.2.0	5.3.0	T2-020536	MESS5-MMS
TP-16	TP-020105	073	-	Rel-5	Encapsulation of a short message (SMS) in a multimedia message (MMS)	A	5.2.0	5.3.0	T2-020550	MESS5-MMS
TP-16	TP-020105	074	-	Rel-5	MM1 and MM7 Interfaces: Message Distribution Indicator.	B	5.2.0	5.3.0	T2-020547	MESS5-MMS
TP-16	TP-020105	075	-	Rel-5	Consistent terminology	F	5.2.0	5.3.0	T2-020548	MESS5-MMS
TP-16	TP-020105	076	-	Rel-5	Clarification of Persistent Network-based Storage: Store Status and Store Status Text throughout MM1 Reference Point	F	5.2.0	5.3.0	T2-020549	MESS5-MMS
TP-16	TP-020105	077	-	Rel-5	Alignment of 3GPP TS 23.140 with 3GPP TS 26.140	F	5.2.0	5.3.0	T2-020551	MESS5-MMS
TP-16	TP-020105	078	-	Rel-5	Binary Encoding of MMS Connectivity Information for storage on the USIM	F	5.2.0	5.3.0	T2-020559	MESS5-MMS
TP-16	TP-020105	079	-	Rel-5	Additional information elements for the MM1 abstract messages.	F	5.2.0	5.3.0	T2-020560	MESS5-MMS
TP-16	TP-020105	080	-	Rel-5	Clarifications	F	5.2.0	5.3.0	T2-020563	MESS5-MMS
TP-16	TP-020105	081	-	Rel-5	Definition of Message Size in a CDR	F	5.2.0	5.3.0	T2-020564	MESS5-MMS
TP-16	TP-020105	082	-	Rel-5	Correction of incomplete/inconsistent MM4 interface responsibility allocation for delivery reports.	F	5.2.0	5.3.0	T2-020570	MESS5-MMS
TP-17	TP-020237	083	-	Rel-5	MMS UA behaviour with respect to handling MMS notification parameters stored on the USIM	F	5.3.0	5.4.0	T2-020773	MESS5-MMS
TP-17	TP-020237	085	-	Rel-5	Correction of MM7 Schema	F	5.3.0	5.4.0	T2-020724	MESS5-MMS
TP-17	TP-020237	086	-	Rel-5	Reference Update	F	5.3.0	5.4.0	T2-020734	MESS5-MMS
TP-17	TP-020237	087	-	Rel-5	MMS UA behaviour for handling number of MMS connectivity parameters sets on the USIM	F	5.3.0	5.4.0	T2-020735	MESS5-MMS
TP-17	TP-020237	088	-	Rel-5	Corrections for MM7 submit request/response examples	F	5.3.0	5.4.0	T2-020737	MESS5-MMS
TP-17	TP-020237	089	-	Rel-5	Binary Encoding of MMS User Preferences for Storage on the USIM	F	5.3.0	5.4.0	T2-020749	MESS5-MMS
TP-17	TP-020237	090	-	Rel-5	Corrections towards MM7 Stage 3 examples	F	5.3.0	5.4.0	T2-020766	MESS5-MMS
TP-17	TP-020237	091	-	Rel-5	Changes to the support of MAP operations for recipient MSISDN address resolution based on IMSI.	F	5.3.0	5.4.0	T2-020809	MESS5-MMS
TP-17	TP-020237	092	-	Rel-5	Acknowledgements for unconfirmed transactions	F	5.3.0	5.4.0	T2-020795	MESS5-MMS
TP-17	TP-020237	093	-	Rel-5	Time stamp definition and time clarification	F	5.3.0	5.4.0	T2-020797	MESS5-MMS
TP-18	TP-020273	094	-	Rel-5	MMS message size definition and its support on the MMS UA.	F	5.4.0	5.5.0	T2-020943	MESS5-MMS
TP-18	TP-020321	095	1	Rel-5	MMS UA behaviour regarding the MMS parameters on the (U)SIM	F	5.4.0	5.5.0	-	MESS5-MMS
TP-18	TP-020273	096	-	Rel-5	Further corrections towards the MM7 XML Schema and MM7 examples	F	5.4.0	5.5.0	T2-020952	MESS5-MMS
TP-18	TP-020273	097	-	Rel-6	Version Handling on MM4	C	5.4.0	6.0.0	T2-020955	MMS6
TP-18	TP-020273	098	-	Rel-6	Addition of support for “Bcc” field in the MM4 reference point	F	5.4.0	6.0.0	T2-020957	MMS6
TP-19	TP-030039	101	-	Rel-6	Transferring distribution indicator as part of message retrieval	A	6.0.0	6.1.0	T2-030186	MMS6

TP-19	TP-030039	104	-	Rel-6	Conditional Usage of the Message-ID in MM1_Retrieve.RES	A	6.0.0	6.1.0	T2-030122	MMS6
TP-19	TP-030039	105	-	Rel-6	Recipient Handling on MM4	C	6.0.0	6.1.0	T2-030068	MMS6
TP-19	TP-030039	109	-	Rel-6	MM1 MMBox View Clarifications	A	6.0.0	6.1.0	T2-030125	MMS6
TP-19	TP-030039	112	-	Rel-6	MM4_Read_reply_report processing refers to an incorrect message	A	6.0.0	6.1.0	T2-030131	MMS6
TP-19	TP-030039	114	-	Rel-6	Addition of missing field in table K6	A	6.0.0	6.1.0	T2-030133	MMS6
TP-19	TP-030039	116	-	Rel-6	Correcting definition of MM7 Version	A	6.0.0	6.1.0	T2-030194	MMS6
TP-20	TP-030115	119	-	Rel-6	Updating references	A	6.1.0	6.2.0	T2-030327	MMS6
TP-20	TP-030115	120	-	Rel-6	Support for DRM in MMS	B	6.1.0	6.2.0	T2-030357	MMS6
TP-20	TP-030115	121	-	Rel-6	Extension of the X-Mms-MM-Status-Code "reject", in the MM4_Delivery_report.REQ (CR)	B	6.1.0	6.2.0	T2-030337	MMS6
TP-20	TP-030115	122	-	Rel-6	Addition of IEs that currently exist in MM1/MM4 but not in MM7	B	6.1.0	6.2.0	T2-030338	MMS6
TP-20	TP-030115	123	-	Rel-6	Over the air provisioning in MMS	B	6.1.0	6.2.0	T2-030339	MMS6
TP-20	TP-030115	124	-	Rel-6	Addition of information regarding encrypted or obfuscated address in MM7	B	6.1.0	6.2.0	T2-030340	MMS6
TP-20	TP-030115	125	-	Rel-6	Addition of Service Provider Identification to the MM7 reference point	B	6.1.0	6.2.0	T2-030341	MMS6
TP-20	TP-030115	126	-	Rel-6	Charged Party ID (CR)	B	6.1.0	6.2.0	T2-030344	MMS
TP-20	TP-030115	127	-	Rel-6	Correction of RFC 2821 reference	A	6.1.0	6.2.0	T2-030347	MMS6
TP-21	TP-030174	130	-	Rel-6	Invalid MM7 references	F	6.2.0	6.3.0	T2-030451	MMS6
TP-21	TP-030174	131	-	Rel-6	Enhancements to DRM support in MMS	B	6.2.0	6.3.0	T2-030473	MMS6
TP-21	TP-030174	132	-	Rel-6	Clarity on USIM versus Over the air provisioning in MMS	C	6.2.0	6.3.0	T2-030474	MMS6
TP-21	TP-030174	133	-	Rel-6	Inaccuracies in Annexes I & K	F	6.2.0	6.3.0	T2-030532	MMS6
TP-21	TP-030174	134	-	Rel-6	Size in Retrieval request	C	6.2.0	6.3.0	T2-030490	MMS6
TP-21	TP-030174	135	-	Rel-6	Transfer over MM3	C	6.2.0	6.3.0	T2-030533	MMS6
TP-21	TP-030174	136	-	Rel-6	Extension of MM4 interface for delivery report	B	6.2.0	6.3.0	T2-030534	MMS6
TP-21	TP-030174	137	-	Rel-6	Reply charging in case of forwarding	B	6.2.0	6.3.0	T2-030499	MMS6
TP-21	TP-030174	138	-	Rel-6	Addition of Information elements to MM7	B	6.2.0	6.3.0	T2-030504	MMS6
TP-22	TP-030268	140	-	Rel-6	Correction in MM1-MM4/MM7 header mapping	F	6.3.0	6.4.0	T2-030587	MMS6
TP-22	TP-030268	141	-	Rel-6	Clarifying the Element of Information "Linked ID"	F	6.3.0	6.4.0	T2-030624	MMS6
TP-22	TP-030268	142	-	Rel-6	Cleaning up last references to RFC822, and deletion of non existing /TYPE=rfc822	F	6.3.0	6.4.0	T2-030625	MMS6
TP-22	TP-030268	143	-	Rel-6	Conditional delivery mechanism for MMS	B	6.3.0	6.4.0	T2-030629	MMS6
TP-22	TP-030268	144	-	Rel-6	Automatic and Manual Retrieval Modes	F	6.3.0	6.4.0	T2-030630	MMS6
TP-22	TP-030268	145	-	Rel-6	MM4 addressing	F	6.3.0	6.4.0	T2-030631	MMS6
TP-22	TP-030268	146	-	Rel-6	Addition of missing MM7 Delivery report status codes	F	6.3.0	6.4.0	T2-030635	MMS6
TP-22	TP-030268	147	-	Rel-6	MM7, Allow Adaptations default value	F	6.3.0	6.4.0	T2-030636	MMS6
TP-23	TP-040050	149	-	Rel-6	On the handling of MM7 messages composed with different XML schema	F	6.4.0	6.5.0	T2-040054	MMS6
TP-23	TP-040050	151	-	Rel-6	Correction of the MM7 Schema, change "TimeStamp" to "date"	F	6.4.0	6.5.0	T2-040141	MMS6
TP-23	TP-040050	152	-	Rel-6	MM7 – Charged party, third party value	F	6.4.0	6.5.0	T2-040142	MMS6
TP-23	TP-040050	153	-	Rel-6	MMS Online Charging	B	6.4.0	6.5.0	T2-040128	MMS6
TP-23	TP-040050	154	-	Rel-6	Updates to Annex M (Delivery Report Generation)	F	6.4.0	6.5.0	T2-040129	MMS6
TP-23	TP-040050	155	-	Rel-6	Content of RCPT in MM4	F	6.4.0	6.5.0	T2-040130	MMS6
TP-23	TP-040050	156	-	Rel-6	Management of Hyperlinks in MMS	B	6.4.0	6.5.0	T2-040132	MMS6
TP-24	TP-040095	158		Rel-6	Addition of recipient list to MM4_Forward.RES	B	6.5.0	6.6.0	T2-040258	MMS6
TP-24	TP-040095	159		Rel-6	Correcting "X-Mms-Read-Status" erroneous mapping on Annex I	F	6.5.0	6.6.0	T2-040257	MMS6
TP-24	TP-040095	161		Rel-6	Changing erroneous OMA references from MMS1.1 to MMS1.2	F	6.5.0	6.6.0	T2-040237	MMS6
TP-24	TP-040095	162		Rel-6	MM7 delivery conditions for MMS	B	6.5.0	6.6.0	T2-040260	MMS6
TP-24	TP-040095	163		Rel-6	Size indication by MMS UA	C	6.5.0	6.6.0	T2-040243	MMS6
TP-25	TP-040172	164		Rel-6	Deletion of annex K.6	F	6.6.0	6.7.0	T2-040359	MMS6
TP-25	TP-040172	165		Rel-6	Clarification about WAP-based and IP-based MM1 implementations	F	6.6.0	6.7.0	T2-040342	MMS6
TP-25	TP-040172	166		Rel-6	Introducing Application Addressing in MMS	B	6.6.0	6.7.0	T2-040347	MMS6
TP-25	TP-040172	167		Rel-6	Adding status text in the MM1 Delivery Report	C	6.6.0	6.7.0	T2-040355	MMS6

TP-25	TP-040172	168		Rel-6	Indication about Content Adaptation	C	6.6.0	6.7.0	T2-040356	MMS6
TP-25	TP-040172	169		Rel-6	Clarification of interpretation of value "No" in Information Element "Forward to Originator UA" in the MM4 Delivery Report Forwarding	C	6.6.0	6.7.0	T2-040358	MMS6
TP-25	TP-040172	170		Rel-6	Clarification of MM4 Forward.RES covering partial status information.	C	6.6.0	6.7.0	T2-040362	MMS6
TP-25	TP-040172	171		Rel-6	Support for multiple and single recipients on MM4	C	6.6.0	6.7.0	T2-040352	MMS6
TP-25	TP-040172	172		Rel-6	Adding the Information Elements VASID and VASPID to the MM7_Deliver.REQ	B	6.6.0	6.7.0	T2-040354	MMS6
TP-25	TP-040172	173		Rel-6	Support of Messaging Service Control Function (MSCF)	B	6.6.0	6.7.0	T2-040369	MMS6
TP-25	TP-040172	174		Rel-6	Additional DRM Requirements to the MMS Relay Server	B	6.6.0	6.7.0	T2-040357	MMS6
TP-26	TP-040226	175		Rel-6	Adding collision prevention mechanism to application addressing	C	6.7.0	6.8.0	T2-040455	MMS6
TP-26	TP-040226	176		Rel-6	Precision for the recipient entities' behaviour upon reception of an abstract message containing a destination application identifier	F	6.7.0	6.8.0	T2-040411	MMS6
TP-26	TP-040226	177		Rel-6	Replacing and Cancelling Multimedia Message in Recipient Terminal	B	6.7.0	6.8.0	T2-040447	MMS6
TP-26	TP-040226	178		Rel-6	Information about Content to Recipient Terminal	B	6.7.0	6.8.0	T2-040450	MMS6
TP-26	TP-040226	179		Rel-6	Truncating the "subject" element of an MM1_notification.REQ for adopting to carrier layer limitations and decreasing the response delay	F	6.7.0	6.8.0	T2-040463	MMS6
TP-26	TP-040226	180		Rel-6	Clarifying that the terminal hosting Application(s) identifies its capabilities in a binary way	F	6.7.0	6.8.0	T2-040460	MMS6
TP-26	TP-040226	181		Rel-6	Deletion of deferred MMs from the MMS Relay/Server	B	6.7.0	6.8.0	T2-040457	MMS6
TP-26	TP-040226	182		Rel-6	Resolving DNS to an IP address using procedures of RFC2821	B	6.7.0	6.8.0	T2-040449	MMS6
TP-26	TP-040226	183		Rel-6	MM4 _forward.REQ counter definition	F	6.7.0	6.8.0	T2-040459	MMS6
TP-26	TP-040226	184		Rel-6	Adding Recipient handset capabilities in the MM7 delivery report.REQ and MM7 deliver.REQ transactions	B	6.7.0	6.8.0	T2-040445	MMS6
TP-26	TP-040226	185		Rel-6	Additional Error situation in MM7_Deliver.RES	B	6.7.0	6.8.0	T2-040426	MMS6
TP-26	TP-040226	186		Rel-6	Allow more than one DeliveryCondition at a time	C	6.7.0	6.8.0	T2-040446	MMS6
TP-26	TP-040226	187		Rel-6	Clarification of schema versioning	F	6.7.0	6.8.0	T2-040441	MMS6
TP-26	TP-040226	188		Rel-6	Error Status Codes related to Application Addressing over MM7	B	6.7.0	6.8.0	T2-040442	MMS6
TP-26	TP-040226	189		Rel-6	Rapporteur's check of 23.140	F	6.7.0	6.8.0	T2-040391	MMS6
TP-26	TP-040226	190		Rel-6	Addition of roaming detection and MMS capability detection as part of functionalities of the MMS Relay/Server	F	6.7.0	6.8.0	T2-040419	MMS6
TP-26	TP-040226	191		Rel-6	Correct a typo, in Information Element Applic-ID (MM7_Deliver.REQ)	D	6.7.0	6.8.0	T2-040383	MMS6
TP-26	TP-040226	192		Rel-6	Editorial Modifications in section 7.2.3 Address Formats on MM7	D	6.7.0	6.8.0	T2-040462	MMS6
TP-26	TP-040226	193		Rel-6	Stage 3 MM7 Schema, addition of application, contentclass, drmcontent, vasp id, extended cancel/replace, deliverycondition and uacapabilities elements.	B	6.7.0	6.8.0	T2-040443	MMS6
TP-26	TP-040226	194		Rel-6	Collective Changes to improve the MM4 interface	C	6.7.0	6.8.0	T2-040470	MMS6
TP-26	TP-040226	195		Rel-6	Adding the Information Elements VAS-ID and VASP-ID in MM7_DeliveryReport and MM7_ReadReplyReport.	B	6.7.0	6.8.0	T2-040444	MMS6
TP-27	TP-050050	196		Rel-6	Definition of the notification procedure for MM addressed to the USIM	B	6.8.0	6.9.0	T2-050031	MMS6
TP-27	TP-050050	197		Rel-6	Correcting Extended Canceling and Replacing	F	6.8.0	6.9.0	T2-050037	MMS6