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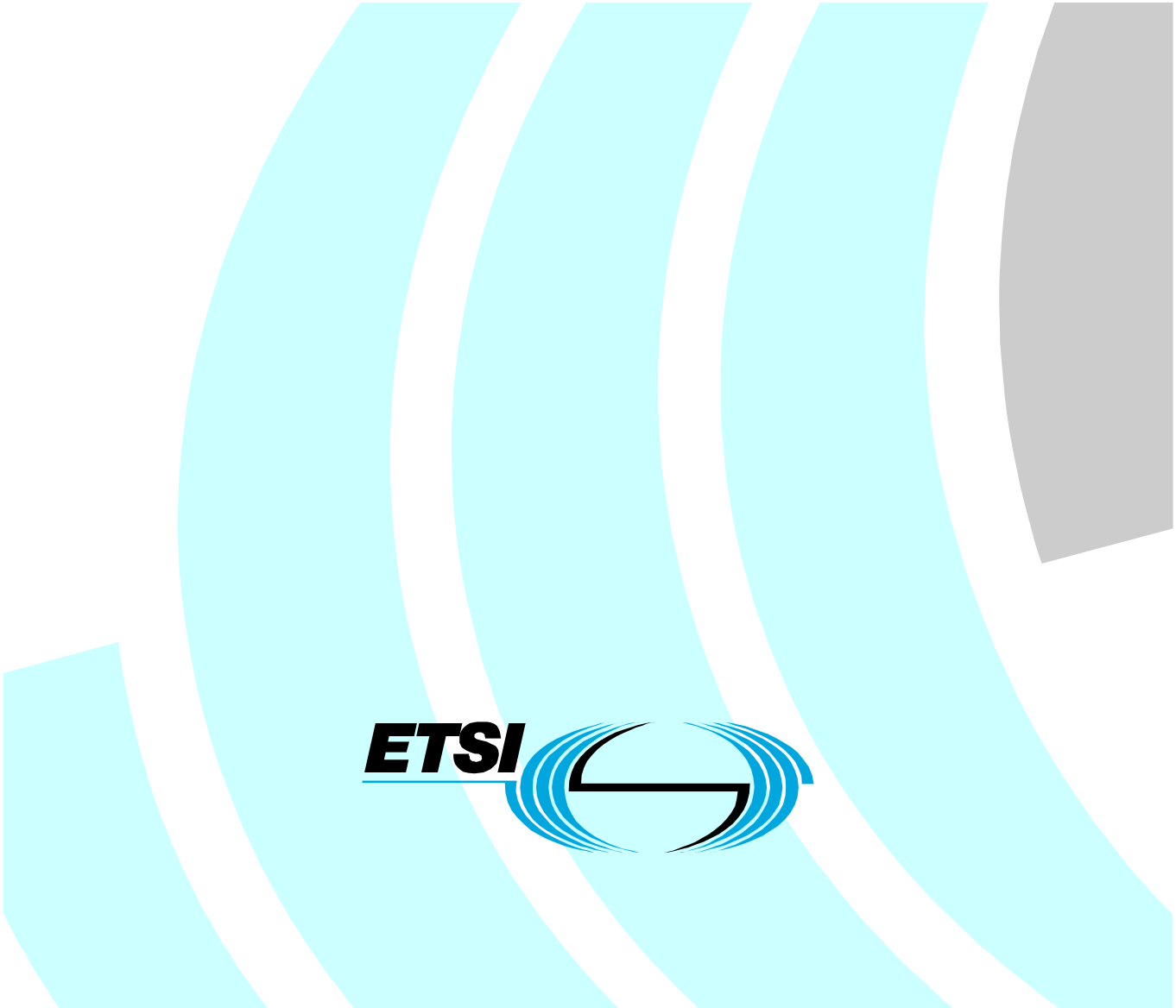
ETSI Standard

Fixed network Multimedia Messaging Service (F-MMS);
Part 4: PSTN/ISDN;
Multimedia Message communication between a fixed network Multimedia Messaging Terminal Equipment and a Multimedia Messaging Service Centre



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Contents

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Access and Terminals (AT).

The present document is part 4 of a multi-part deliverable covering the Fixed network Multimedia Messaging Service (F-MMS); as identified below:

TS 102 314-1: "Overview";

ES 202 314-2: "PSTN/ISDN; Service description";

TR 102 314-3: "Network architecture and interconnection";

ES 202 314-4: "PSTN/ISDN; Multimedia Message communication between a fixed network Multimedia Messaging Terminal Equipment and a Multimedia Messaging Service Centre";

ES 202 314-5: "ISDN; Digital Subscriber Signalling System No. One (DSS1) protocol, Signalling System No. 7 (SS7) - ISDN User Part (ISUP), and interworking between DSS1 and ISUP";

TR 102 314-6: "Control strings (service codes) for MMS functions and MMS supplementary services".

TS 102 314-7: "Over-The-Line configuration of F-MMS terminal settings";

ES 202 314-8: "Combined PSTN/ISDN and broadband access and broadband access only; Service description";

ES 202 314-9: "Combined PSTN/ISDN & broadband access and broadband access only; Multimedia Message communication between a fixed network Multimedia Messaging Terminal Equipment and a Multimedia Messaging Service Centre".

NOTE: The parts above refer to the active work items and published standards within ETSI. These work items do not include MMS over NGN.

Introduction

The Short Message Service (SMS) has paved the way for a new approach to personal communication. Following the success in mobile telecommunication networks, SMS has also become in fixed line telecommunication networks a well-known feature. Based on ETSI standards, a continuously growing number of fixed line SMS capable terminals are installed and several SMS providers offer the possibility of exchanging Short Messages within and between fixed line and mobile telecommunication networks.

The Multimedia Messaging Service (MMS) in the mobile networks was created to provide a sophisticated kind of messaging which combines the advantages of both SMS and Email messaging. With MMS, the user is able to send and receive messages with a wide range of contents, e.g. text, images, audio and video clips and even streaming contents. Similar to the Short Message Service (SMS), the Multimedia Messaging Service (MMS) is a non-real-time delivery system providing a store-and-forward mechanism. A good overview about the Multimedia Messaging Service can be found in TS 122 140 [6] and OMA-WAP-MMS-ARCH-v1-1-20021101-C [12].

The Multimedia Messaging Service for PSTN/ISDN follows the philosophy of adopting the existing Multimedia Messaging Service of the mobile networks as widely as possible to:

- simplify the interworking with the existing mobile net MMS;
- offer the same user experience for both fixed and mobile net users;
- reduce the fixed net MMS implementation efforts.

Following this philosophy, only the mobile network-specific transport mechanisms are replaced by transport mechanisms applicable to the fixed networks (PSTN/ISDN). The higher, not mobile network-specific MMS protocol layers are used similar to their respective use in mobile networks. Also the existing fixed net infrastructure can be used without modification.

1 Scope

The present document describes the MMS communication between a fixed net Multimedia Messaging Service Terminal Equipment and a Multimedia Messaging Service Centre using in-band signalling.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1] ETSI ES 202 314-2: "Fixed network Multimedia Messaging Service (F-MMS); PSTN/ISDN; Part 2: Service description"

[2] ETSI ES 201 986: "Services and Protocols for Advanced Networks (SPAN); Short Message Service (SMS) for PSTN/ISDN; Service description".

[3] ETSI ES 201 912: "Access and Terminals (AT); Short Message Service (SMS) for PSTN/ISDN; Short Message Communication between a fixed network Short Message Terminal Equipment and a Short Message Service Centre".

[4] ETSI TS 103 912: "Access and Terminals (AT); Short Message Service (SMS) for PSTN/ISDN; Short Message Communication between a fixed network Short Message Terminal Equipment and a Short Message Service Centre (Corrections to ES 201 912 V1.1.1)".

[5] ETSI ES 202 060-1: "Short Message Service (SMS) for fixed networks; Network Based Solution (NBS); Part 1: Overview".

[6] ETSI TS 122 140: "Universal Mobile Telecommunications System (UMTS); Service aspects; Stage 1; Multimedia Messaging Service (3GPP TS 22.140 Release 4)".

[7] ETSI TS 123 140: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Multimedia Messaging Service (MMS); Functional description; Stage 2 (3GPP TS 23.140 Release 4)".

[8] ETSI TR 123 039: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Interface protocols for the connection of Short Message Service Centres (SMSCs) to Short Message Entities (SMEs) (3GPP TR 23.039 Release 4)".

[9] WAP-205-MMSArchOverview-20010425-a: "Wireless Application Protocol; Multimedia Messaging Service; Architecture Overview Specification".

[10] WAP-206-MMSCTR-20020115-a: "Wireless Application Protocol; Multimedia Messaging Service; Client Transactions Specification".

[11] WAP-209-MMSEncapsulation-20020105-a: "Wireless Application Protocol; MMS Encapsulation Protocol".

[12] OMA-WAP-MMS-ARCH-v1-1-20021101-C: "Multimedia Messaging Service; Architecture Overview; Version 1.1".

[13] OMA-WAP-MMS-CTR-v1-1-20021031-C: "Multimedia Messaging Service; Client Transactions; Version 1.1".

[14] OMA-WAP-MMS-ENC-v1-1-20021030-C: "Multimedia Messaging Service; Encapsulation Protocol; Version 1.1".

[15] OMA-IOP-MMSCONF-2-0-0-20020206C: "MMS Conformance Document, Version 2.0.0".

[16] OMA-WAP-UAProf-v1-1-20021212-C: "User Agent Profile 1.1".

[17] WAP-229-HTTP-20010329-a: "Wireless Profiled HTTP Specification".

[18] IETF RFC 791: "Internet Protocol".

[19] IETF RFC 768: "User Datagram Protocol".

[20] IETF RFC 792: "Internet Control Message Protocol".

[21] IETF RFC 793: "Transmission Control Protocol".

[22] IETF RFC 1332: "The PPP Internet Protocol Control Protocol (IPCP)".

[23] IETF RFC 1334: "PPP Authentication Protocols".

[24] IETF RFC 1661: "The Point-to-Point Protocol (PPP)".

[25] IETF RFC 1662: "PPP in HDLC-like Framing".

[26] IETF RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies".

[27] IETF RFC 2616: "Hypertext Transfer Protocol -- HTTP/1.1".

[28] IETF RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

[29] IETF RFC 1034: "Domain names - concepts and facilities".

[30] IETF RFC 2821: "Simple Mail Transfer Protocol".

[31] ETSI EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[32] ETSI ES 202 314-5: "Fixed network Multimedia Messaging Service (F-MMS); PSTN/ISDN; Part 5: ISDN; Digital Subscriber Signalling System No. One (DSS1) protocol, Signalling System No. 7 (SS7) - ISDN User Part (ISUP), and interworking between DSS1 and ISUP".

[33] ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[34] ITU-T Recommendation V.32bis: "A duplex modem operating at data signalling rates of up to 14 400 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits".

[35] ITU-T Recommendation V.34: "A modem operating at data signalling rates of up to 33 600 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits".

[36] ITU-T Recommendation V.90: "A digital modem and analogue modem pair for use on the Public Switched Telephone Network (PSTN) at data signalling rates of up to 56 000 bit/s downstream and up to 33 600 bit/s upstream".

[37] ITU-T Recommendation V.92: "Enhancements to Recommendation V.90".

[38] ITU-T Recommendation V.14: "Transmission of start-stop characters over synchronous bearer channels".

[39] ITU-T Recommendation V.42: "Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion".

[40] ITU-T Recommendation V.42bis: "Data compression procedures for data circuit-terminating equipment (DCE) using error correction procedures".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

MM1 reference point: reference point between MMS Relay/Server and MMS User Agent

MM2 reference point: reference point between MMS Relay and MMS Server

MM3 reference point: reference point between MMS Relay/Server and External Servers / Messaging Systems

MM4 reference point: reference point between MMS Relay/Server and Different MMSEs

MM5 reference point: reference point between MMS Relay/Server and HLR

MM6 reference point: reference point between MMS Relay/Server and MMS User Databases

MM7 reference point: reference point between MMS Relay/Server and MMS VAS Applications

MM Service Environment: collection of MMS-specific infrastructure elements under the control of a single administration

MMS Relay/Server: MMS-specific network entity/application that is under the control of an MMS service provider

NOTE: An MMS Relay/Server transfers messages, provides operations of the MMS that are specific to or required by the network environment and provides (temporary and/or persistent) storage services to the MMS.

MMS User Agent: application residing on a fixed net or mobile net terminal or an external device that performs MMS-specific operations on a user's behalf

NOTE: An MMS User Agent is not considered part of an MMSE.

MM Terminal Equipment: terminal equipment containing an MMS User Agent and an appropriate MMS user interface

MM Terminal: See MM Terminal Equipment

Legacy Terminal: a terminal which has no MMS User Agent and is therefore not able to send or receive multimedia messages

Multimedia Message Entity (MME): MM endpoint which may send or receive Multimedia Messages

NOTE: An MMTE may contain one or more Multimedia Message Entities. Each entity may be assigned to a particular user and as a terminal option, for privacy reasons, the access to each entity may be protected e.g. by a PIN.

MME subaddress: address used for the addressing of a Multimedia Message to a specific Multimedia Message Entity (MME) connected to one fixed net subscriber line

NOTE: The addressed MME may be one of the Multimedia Message Terminals connected in parallel to one subscriber line, as well as one of the Multimedia Message Entities contained in a Multimedia Message Terminal. The MME subaddress length is one digit in the range 0 to 9.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3GPP	3rd Generation Partnership Project
APP	APPlication
CHAP	Challenge Handshake Authentication Protocol
CLI	Calling Line Identity
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CW	Call Waiting
DNS	Domain Name System
DSS1	Digital Subscriber Signalling No 1
F-MMS	Fixed network MMS
F-MMSE	Fixed network MMSE
F-SMS	Fixed network SMS
F-SMSC	Fixed network SMSC
GSM	Global System for Mobile communication
HLR	Home Location Register
HTTP	HyperText Transfer Protocol
IANA	Internet Assigned Numbers Authority
ICMP	Internet Control Message Protocol
IP	Internet Protocol
IPCP	Internet Protocol Control Protocol
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
ITU	International Telecommunication Union
LCP	Link Control Protocol
MM	Multimedia Message
MME	Multimedia Message Entity
MMS	Multimedia Messaging Service
MMSE	Multimedia Messaging Service Environment
MMTE	Multimedia Messaging Terminal Equipment
MMTE-D	Multimedia Messaging Terminal Equipment, Destination
MMTE-O	Multimedia Messaging Terminal Equipment, Originator
OMA	Open Mobile Alliance
PAP	Password Authentication Protocol
PAP	Push Access Protocol
PIN	Personal Identification Number
PLMN	Public Land Mobile Network
PPG	Push Proxy Gateway
PPP	Point to Point Protocol
PSTN	Public Switched Telephone Network
RAS	Remote Access Service
REQ	REQuest
RES	RESult
SM	Short Message(s)
SME	Short Message Entity
SMS	Short Message Service
SMSC	Short Message Service Centre
SMTP	Simple Mail Transfer Protocol
SS7	Signalling System No. 7
TCP	Transmission Control Protocol
UBS1	User Based Solution, protocol 1
UDH	User Data Header
UDP	User Datagram Protocol
URL	Uniform Resource Locator
VAS	Value Added Service
WAP	Wireless Application Protocol
WP TCP	Wireless Profiled TCP
WSP	Wireless Session Protocol

4 Overview

4.1 Fixed net MMS architecture

The fixed net MMS architecture is equal to the mobile net MMS architecture. Figure 1, taken from TS 123 140 [7], gives an overview about the general MMS architecture applicable to both the mobile net MMS and the fixed net MMS.

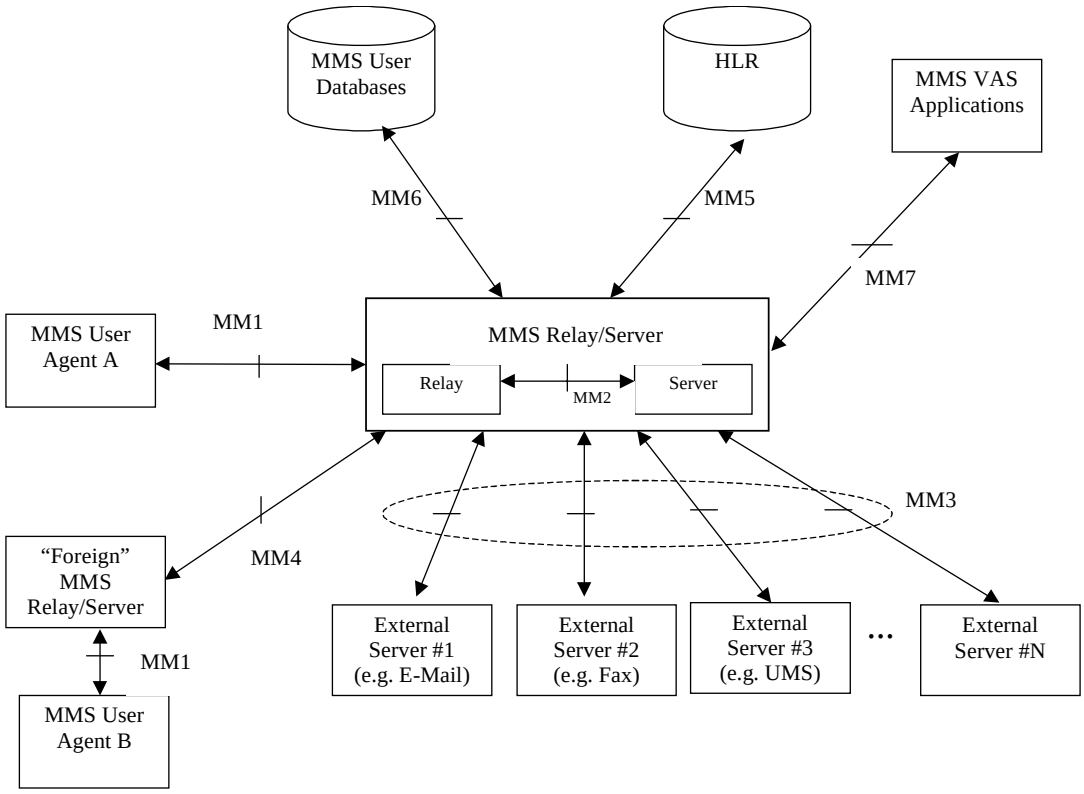

Figure 1: MMS reference architecture

A description of the reference points MM1 to MM7 can be found in TS 123 140 [7].

The present document focuses on the definition of the realisation of the MM1 interface used in fixed networks (PSTN/ISDN).

4.2 Interworking of fixed net MMSEs with other MMSEs

Figure 2, based on the respective figure in TS 123 140 [7], gives an overview about the interworking between fixed net and mobile net MMSEs. As defined in TS 123 140 [7], the interworking between the MMS Relay/Servers of the different MMSEs shall be based on SMTP according to RFC 2821 (STD 0010) [30].

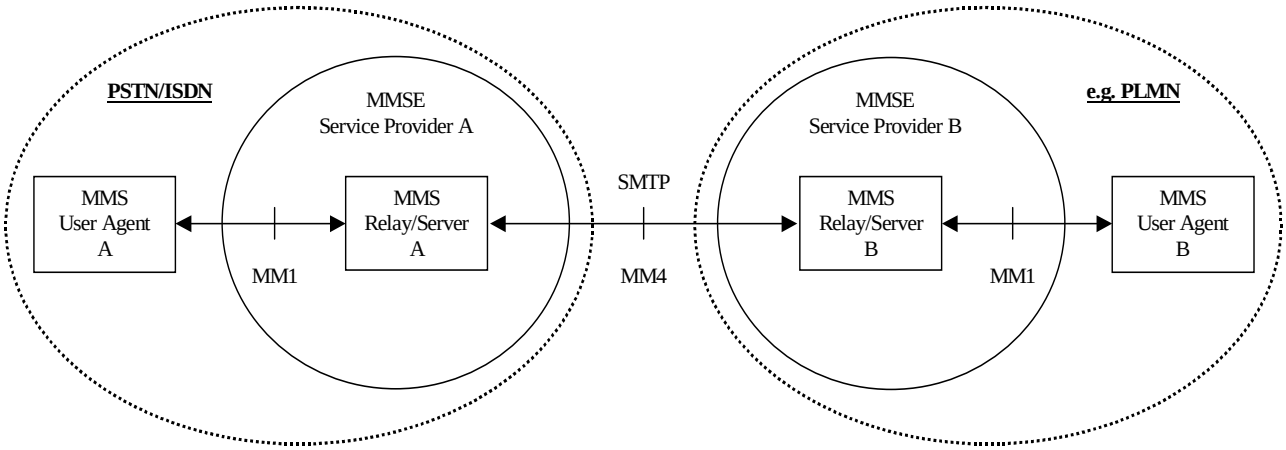

Figure 2: Interworking of fixed net MMSEs with other MMSEs

4.3 MM transportation mechanism within fixed networks

The relevant reference point for the provision of MMS in the fixed net (PSTN/ISDN) is the MM1, which is the reference point between the MMS Relay/Server and the MMS User Agent.

4.3.1 MM1 gateway structure

The general MM1 gateway structure for fixed networks is depicted in figure 3. It is similar to the respective MM1 gateway structure used in mobile networks (see also figure A.1 in clause A.1). The main difference between the fixed net MM1 gateway structure and the mobile net gateway structure is the use of two different communication paths between the fixed net MM Relay/Server and the fixed net MMS terminal.

One of these communication paths is the fixed net Short Message Service. This service provides the push-functionality required for the transmission of the MM protocol messages MM Notification, MM Delivery Report and MM Read Report (originator side).

The other communication path used for MMS in fixed networks is an HTTP/TCP/IP connection. Using this connection, the transactions MM Submission, MM Retrieval, MM Read Report (recipient side) and MM Forwarding are handled.

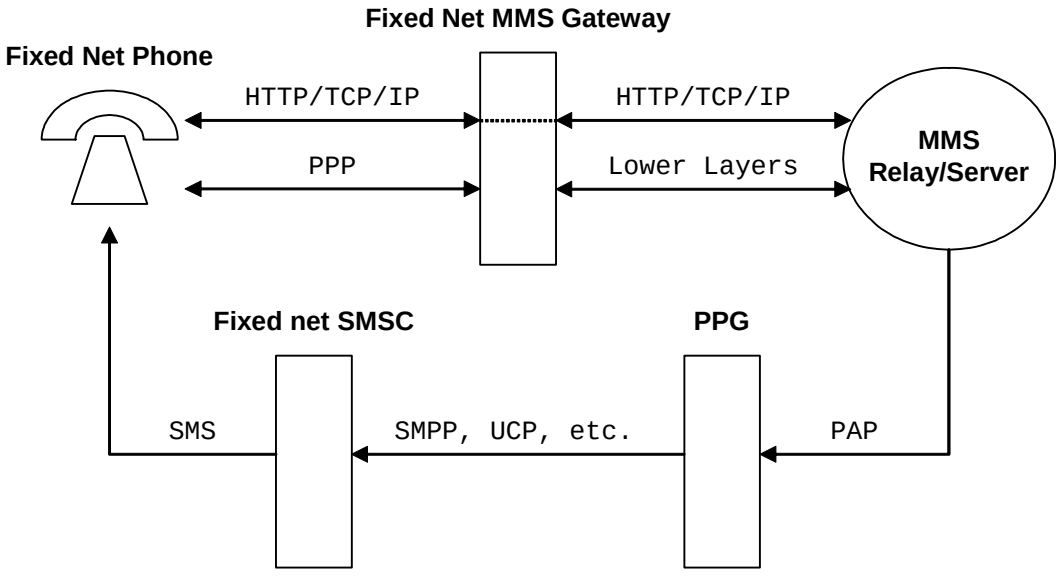

Figure 3: General MM1 gateway structure for fixed networks

The interface between Push Proxy Gateway (PPG) and fixed net SMSC can be based on several different SMSC access protocols as defined in TR 123 039 [8].

NOTE: The fixed net SMSC in figure 3 may be part of the fixed net MMS provider's infrastructure or be provided by a contracted third party fixed net SMS provider. This choice does not limit the subscriber's possible choice of different service providers for fixed net MMS and fixed net SMS.

4.3.2 General transaction sequence

Figure 4 describes the general sequence of transactions to send an MM from an originating fixed net MM terminal (MMTE-O) to a destination fixed net MM terminal (MMTE-D). There are five basic transactions:

1) "MM Submission" - the originating MM terminal submits an MM to the MMSE.

2) "MM Notification" - the destination MM terminal is notified of the presence of a new MM.

3) "MM Retrieval" - the destination MM terminal retrieves the new MM.

4) "MM Delivery Report" - the originating MM terminal is notified of the delivery of the submitted MM.

5) "MM Read Report" - the originating MM terminal is notified that the MM was read by the recipient.

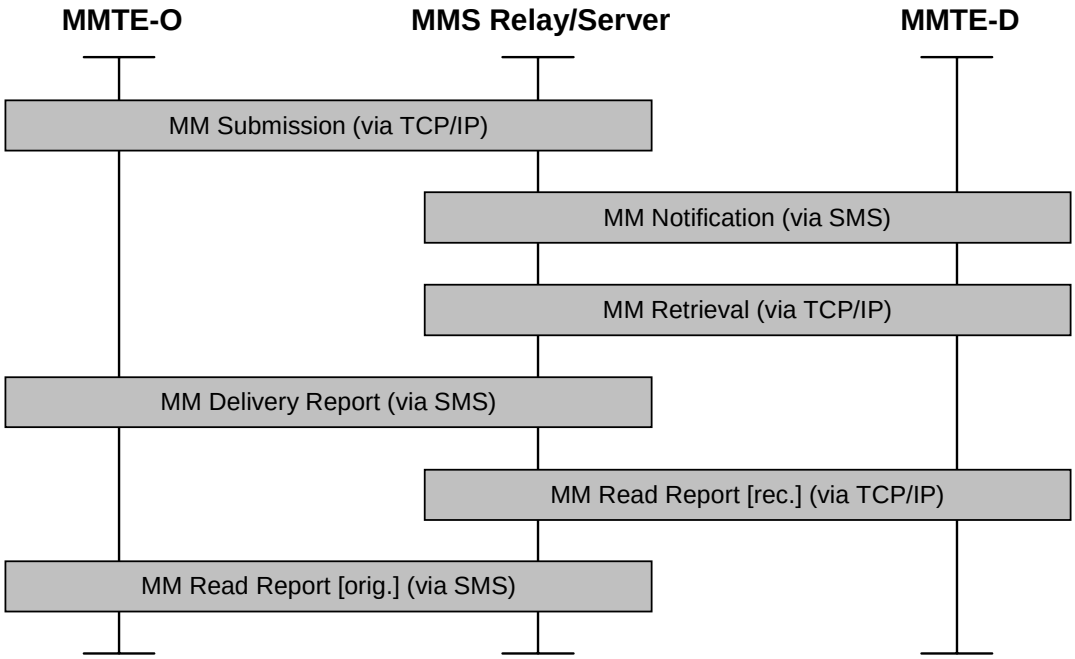

Figure 4: Generalized MMS transaction sequence in fixed networks

The transaction MM Retrieval is performed only if requested by the user (in case of manually initiated retrieval) or allowed by the user (in case of automatically initiated retrieval).

The push-based transactions MM Notification, MM Delivery Report and MM Read Report (originator side) are performed via F-SMS. The MM Notification is a mandatory transaction, while the MM Delivery Report and the MM Read Report are only performed if requested by the originator and permitted by the recipient.

The non push-based transactions MM Submission and MM Retrieval and MM Read Report (recipient side) are performed via HTTP/TCP/IP.

NOTE: Other possibilities for MM Retrieval, e.g. via Internet, are subject to the MM Service Providers.

5 Basic transactions

This clause gives an overview about the basic transactions for MM transfer. More detailed information about the transactions and the related message sequences can be found in the respective referenced documents.

5.1 Submission of an MM

To send an MM, the fixed net MMS terminal (MMTE-O) connects to the MMS Relay/Server using internet protocol mechanisms (HTTP/TCP/IP) to transmit the MM to the MMS Relay/Server. The connection between the fixed net MMS terminal (MMTE-O) and the MMS Relay/Server is handled via an F-MMS gateway as shown in figure 3. The F-MMS gateway provides the RAS dial-in functionality required by the terminal to establish the HTTP/TCP/IP connection. After the submission of the MM from the terminal to the Relay/Server has been finished, the connection is released.

Figure 5 describes the abstract message flow for the submission of an MM using 3GPP abstract message terminology. The abstract protocol message MM1_submit.REQ carries the content of the multimedia message as well as information like the recipient address, a transaction ID, etc. The abstract protocol message MM1_submit.RES carries the response of the MMSE to the respective MM1_submit.REQ. More information about these abstract protocol messages can be found in TS 123 140 [7] (MMS framework) and the related OMA documents [13] and [14] (MMS implementation).

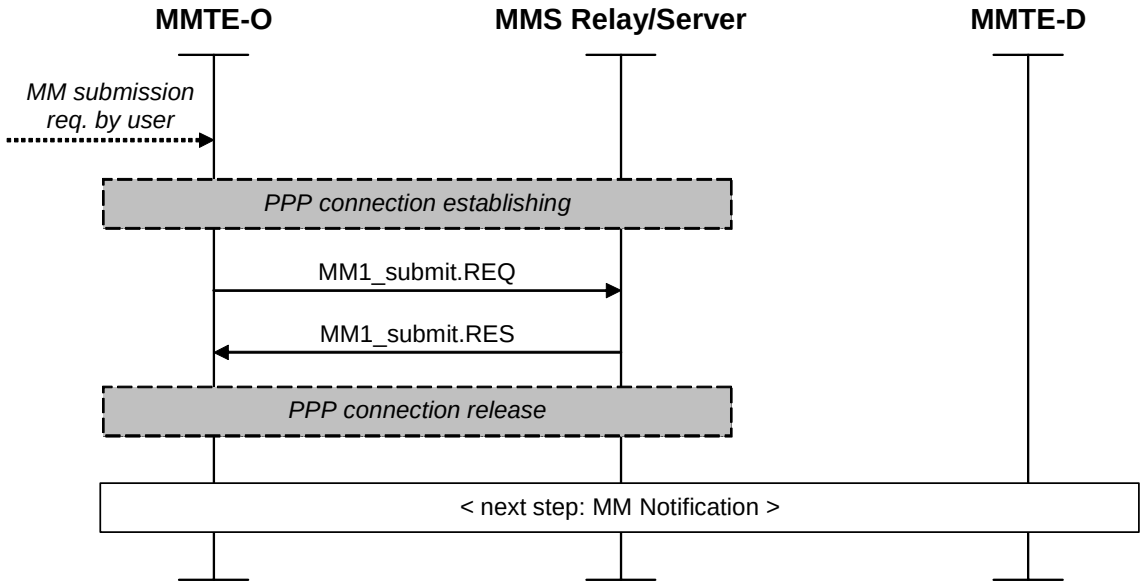

Figure 5: Example abstract message flow for MM submission

After the MM has been received by the MMS Relay/Server, the Relay/Server forwards the MM to the next entity involved in the delivery chain to the destination. The next involved entity may be another Relay/Server system or another messaging system. The final destination may be a fixed net MMS terminal (MMTE-D) or any other destination, e.g. a mobile net MMS terminal.

NOTE: The PPP connection established for MM Submission may also be used by the terminal for other MM transactions, e.g. further MM Submissions, MM Retrieval, MM Read Report (recipient side), MM Forwarding, etc.

5.2 Delivery of an MM

Different from the procedures known from SMS, the delivery of an MM is split up into two separate procedures, the MM Notification and the MM Retrieval.

In the first step, according to TS 122 140 [6], an MM Notification is sent to the recipient of an MM by the MMS Relay/Server, which notifies the recipient about a new MM being ready for retrieval. The MM Notification can contain various information about the stored MM, like the address of the sending user, subject of the message, message size, message expiry, content location, etc.

In the second step, after the MM Notification has been transmitted to the destination MMS terminal, the respective MM can be retrieved from the MMS Relay/Server.

5.2.1 MM notification

The MM Notification is transmitted to the destination terminal using the fixed net Short Message Service defined in ES 201 986 [2], ES 201 912 [3] (UBS1) and ES 202 060-1 [5] (NBS using UBS1 coding). The purpose of the notification is to allow the destination terminal to automatically retrieve an MM from the location indicated in the notification.

Figure 6 describes the abstract message flow for the transmission of an MM Notification from the MMSE to the destination terminal (MMTE-D) using 3GPP abstract message terminology. The abstract protocol message MM1_notification.REQ carries a message reference, i.e. an indication of the location of the content of the respective new MM being ready for retrieval, as well as information about this MM like message size, time of expiry, etc. More information about this abstract protocol message can be found in TS 123 140 [7] (MMS framework) and the related OMA documents [13] and [14] (MMS implementation).

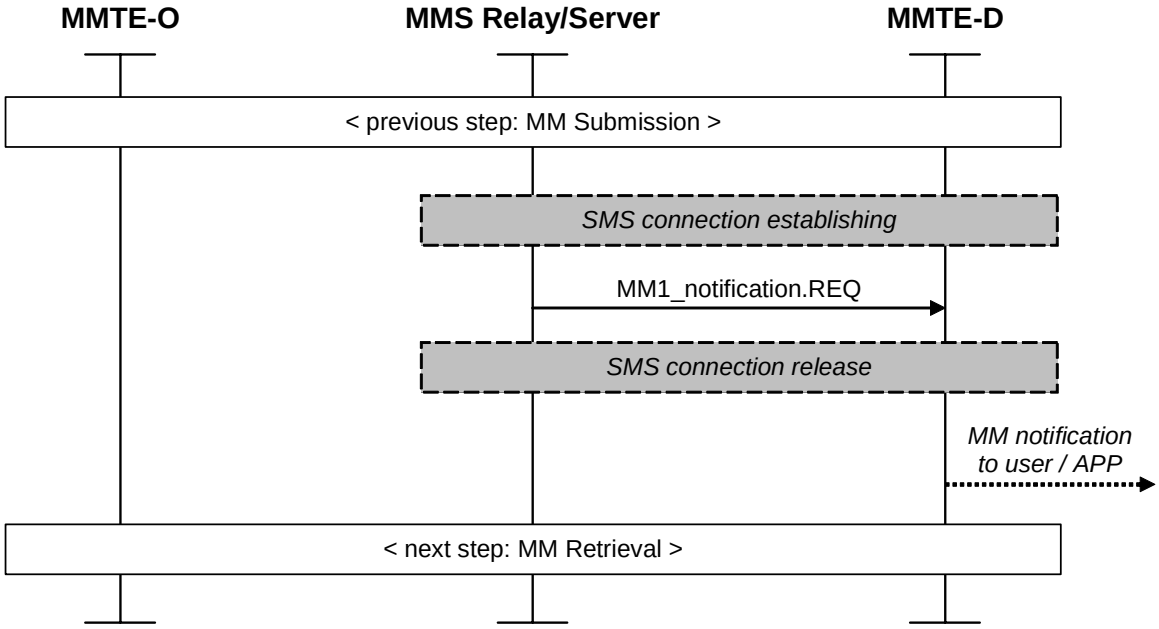

Figure 6: Example abstract message flow for MM notification

5.2.2 MM retrieval

After the MM Notification has been received by the MMS terminal (MMTE-D), the terminal may connect to the MMS Relay/Server to download the respective MM. This transaction is handled using internet protocol mechanisms (HTTP/TCP/IP). See also clause 7.3. The MM Retrieve procedure may be either initiated automatically by the terminal or manually by the user.

Figure 7 describes the abstract message flow for the retrieval of an MM initiated by the destination terminal using 3GPP abstract message terminology.

The abstract protocol message MM1_notification.RES carries the response from the destination MMS terminal (MMTE-D) to the respective MM1_notification.REQ (see clause 5.2.1).

The abstract protocol message MM1_retrieve.REQ carries the message reference, i.e. an indication of the location of the content of the MM to be retrieved. As a response to the MM1_retrieve.REQ, the abstract protocol message MM1_retrieve.RES carries the content of the multimedia message as well as information like date and time, content type, a message ID, etc.

Finally, the abstract protocol message MM1_acknowledgement.REQ carries a request of the receiver to allow or disallow the sending of an MM Delivery Report to the MM originator. More information about these abstract protocol messages can be found in TS 123 140 [7] (MMS framework) and the related OMA documents [13] and [14] (MMS implementation).

NOTE 1: The OMA documents [13] and [14] referred to above describe two different message flows called "deferred retrieval" and "immediate retrieval". Both message flows may be used by the MMTE. See [13] and [14] for details about these message flows.

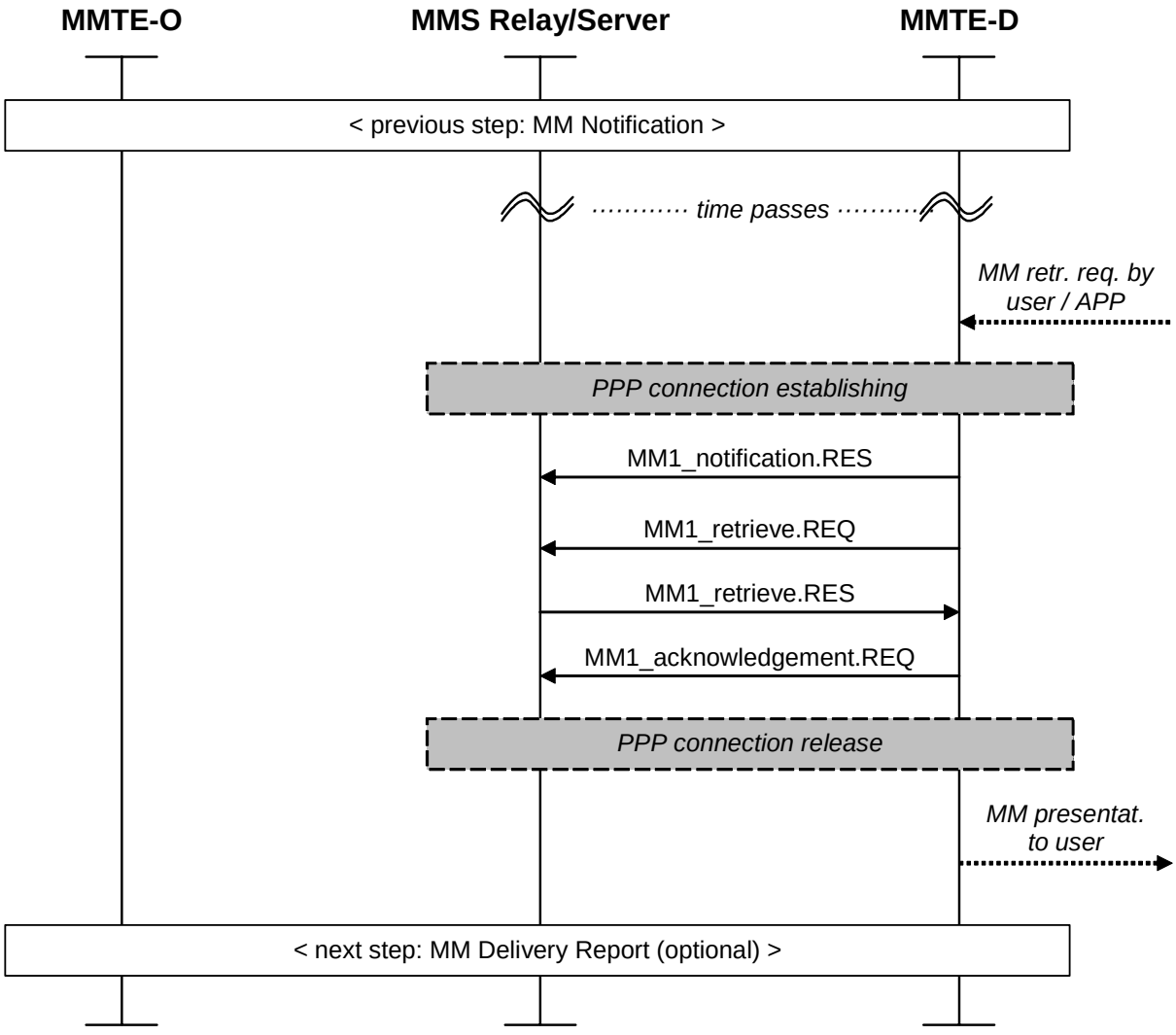

Figure 7: Example abstract message flow for MM Retrieval

NOTE 2: The PPP connection established for MM Retrieval may also be used by the terminal for other MM transactions, e.g. MM Submission, MM Read Report (recipient side), MM Forwarding, etc.

5.3 MM reporting

5.3.1 MM delivery report

If requested by the originator and permitted by the recipient, an MM Delivery Report according to TS 123 140 [7] may be sent back to the originator of the MM after the MM has been transferred to the destination.

The MM Delivery Report is transmitted to the originating terminal using the fixed net Short Message Service defined in ES 201 986 [2], ES 201 912 [3], TS 103 912 [4] (UBS1) and ES 202 060-1 [5] (NBS using UBS1 coding).

Figure 8 describes the abstract message flow for the transmission of an MM Delivery Report to the originating terminal (MMTE-O) using 3GPP abstract message terminology. The abstract protocol message MM1_delivery_report.REQ carries information about the status of a previously submitted MM (e.g. retrieved, forwarded, expired, rejected) as well as information like date and time, a message ID, etc. More information about this abstract protocol message can be found in TS 123 140 [7] (MMS framework) and the related OMA documents [13] and [14] (MMS implementation).

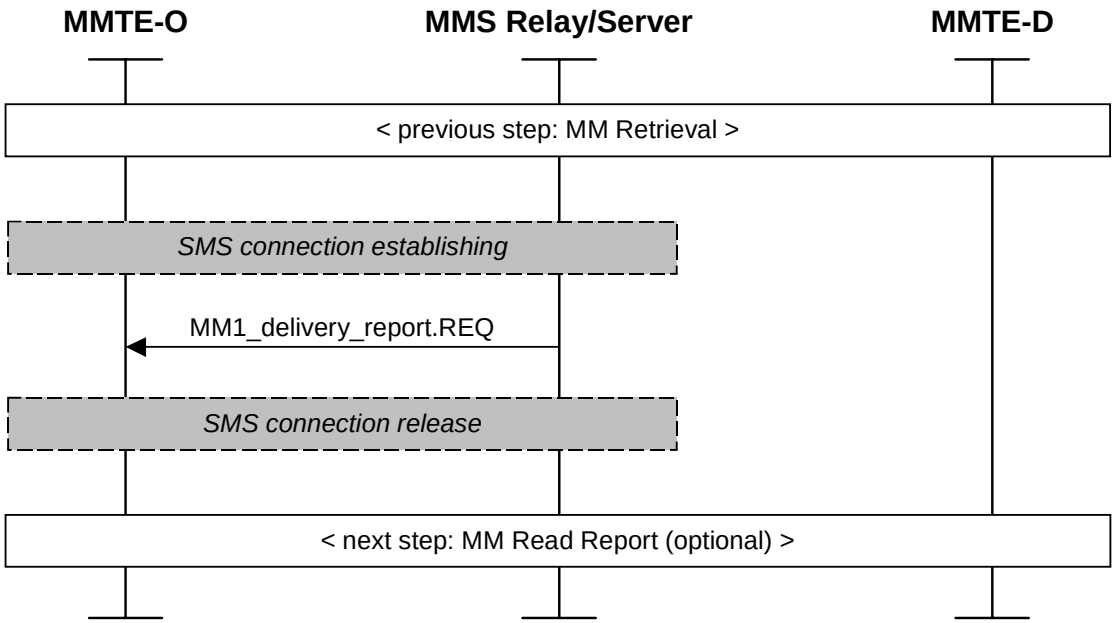

Figure 8: Example abstract message flow for MM delivery report

5.3.2 MM read report

If requested by the originator and permitted by the recipient, also an MM Read Report according to TS 123 140 [7] may be sent back to the originator of the MM after the MM has been read by the recipient.

The MM Read Report (recipient side) is transmitted to the MMS Relay/Server using internet protocol mechanisms (HTTP/TCP/IP). See also clause 7.3.

The MM Read Report (originator side) is transmitted to the originating terminal (MMTE-O) using the fixed net Short Message Service defined in ES 201 986 [2], ES 201 912 [3], TS 103 912 [4] (UBS1) and ES 202 060-1 [5] (NBS using UBS1 coding).

Figure 9 describes the abstract message flow for the transmission of an MM Read Report from the destination terminal (MMTE-D) via the MMSE to the originating terminal (MMTE-O) using 3GPP abstract message terminology. The abstract protocol message MM1_read_reply_recipient. REQ carries information about the read status of the respective MM (e.g. read, deleted without being read) as well as information like date and time, a message ID, etc. from the destination terminal (MMTE-D) to the MMSE. The abstract protocol message MM1_read_reply_originator. REQ carries that information from the MMSE to the originating terminal (MMTE-O). More information about these abstract protocol messages can be found in TS 123 140 [7] (MMS framework) and the related OMA documents [13] and [14] (MMS implementation).

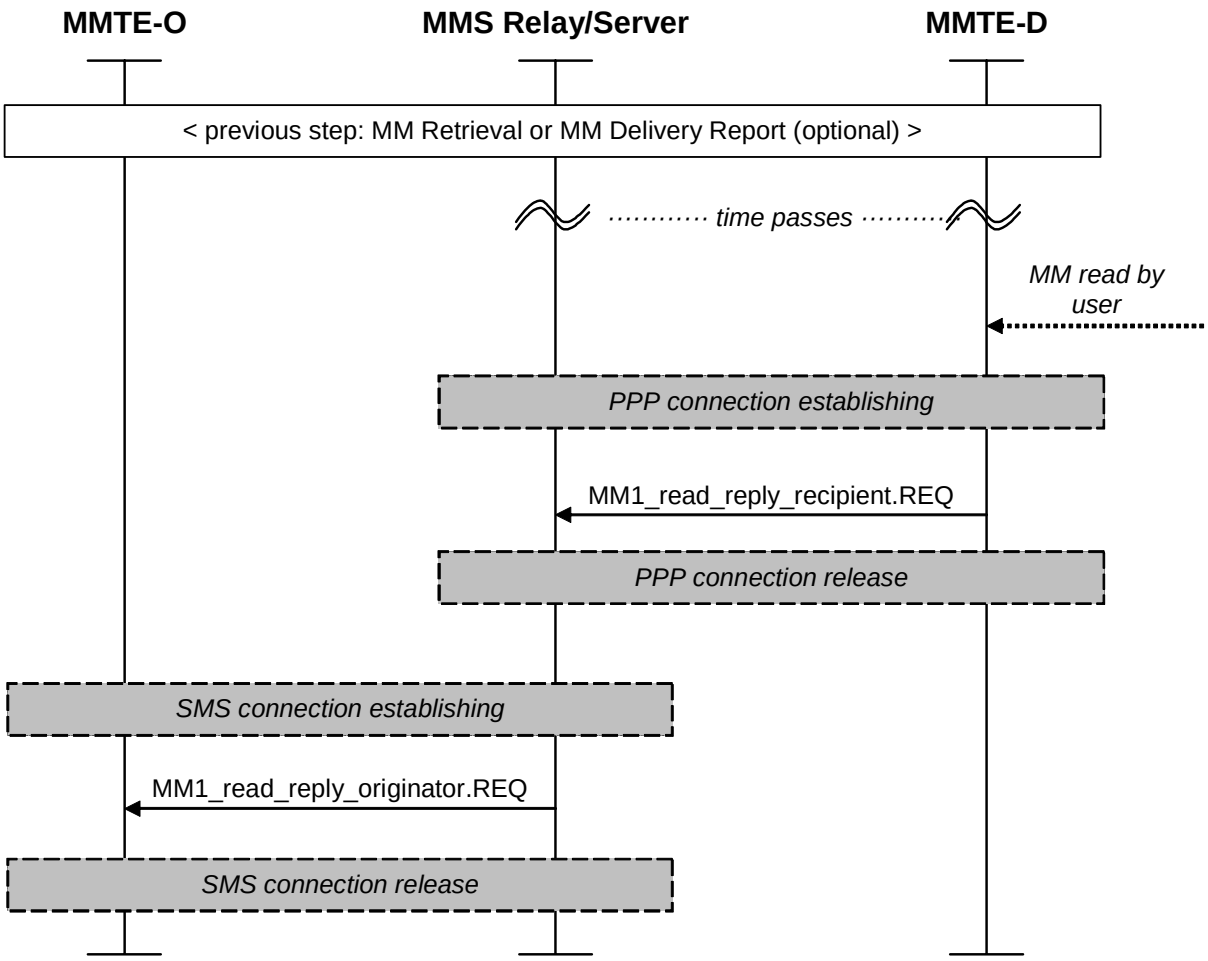

Figure 9: Example abstract message flow for MM read report

NOTE: The PPP connection established for MM Read Report (recipient side) may also be used by the terminal for other MM transactions, e.g. MM Submission, MM Retrieval, MM Forwarding, etc.

5.4 MM forwarding

After having received an MM Notification, the recipient of an MM can request the MMSE to forward the respective MM to other addressees without having first to retrieve the MM by using the MM Forwarding mechanism according to TS 123 140 [7].

Figure 10 describes the abstract message flow for the forwarding of an MM initiated by the destination terminal using 3GPP abstract message terminology.

The abstract protocol message MM1_forward.REQ carries the request to forward the respective MM. This protocol message contains the control information necessary to perform the forwarding, e.g. the addressees to which the MM is requested to be forwarded to. As a response to the MM1_forward.REQ, the abstract protocol message MM1_forward.RES carries the status of the forward request.

More information about these abstract protocol messages can be found in TS 123 140 [7] (MMS framework) and the related OMA documents [13] and [14] (MMS implementation).

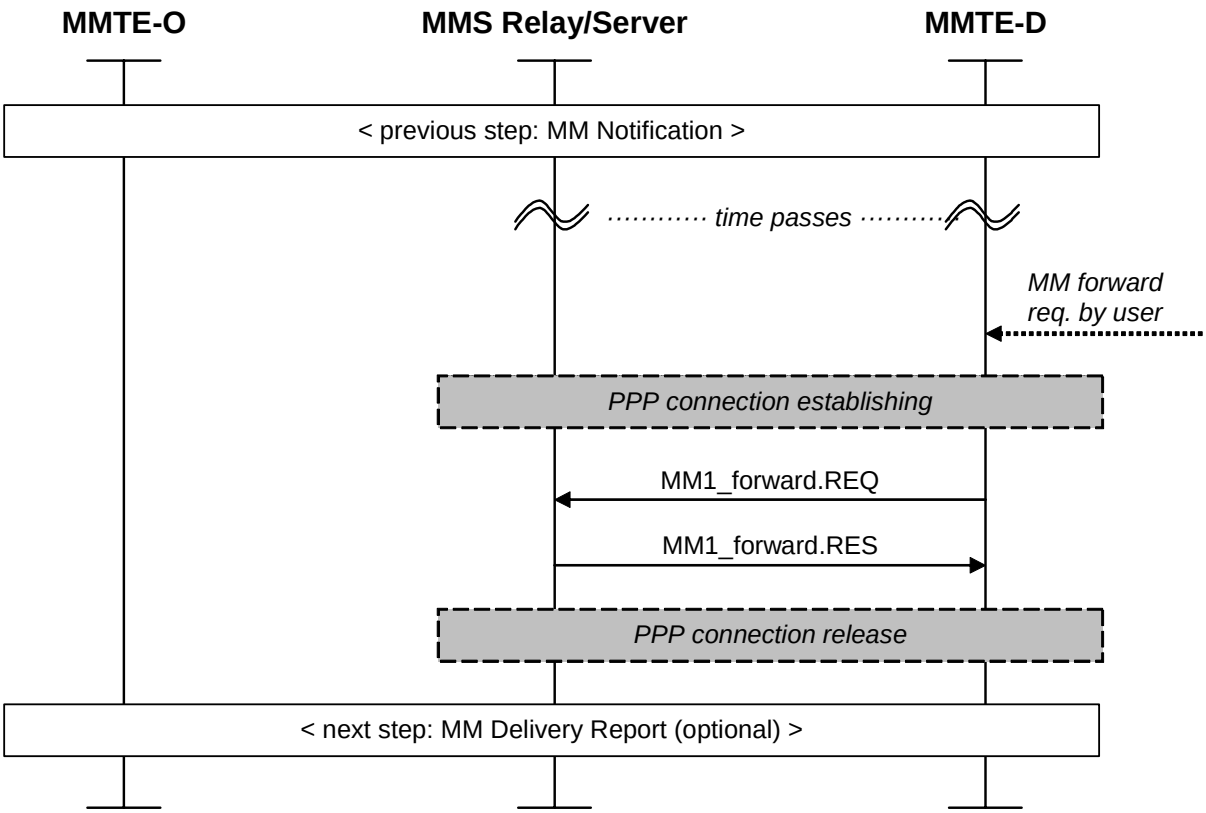

Figure 10: Example abstract message flow for MM forwarding

NOTE: The PPP connection established for MM Forwarding may also be used by the terminal for other MM transactions, e.g. MM Submission, MM Retrieval, etc.

5.5 Other procedures

It is up to the F-MMS provider to define procedures for registration, activation, deactivation, etc. These procedures may be based on SMS (e.g. using service codes), MMS (e.g. using service codes), Internet or other communication systems. See also ES 202 314-2 [1].

6 Terminal capability negotiation

According to the framework defined by TS 123 140 [7] and the respective implementation defined by OMA documents [13] and [14], MMTEs should provide their capabilities when requesting an MM Retrieval. However, in order to enable the MMSE to serve MMTEs in an appropriate manner, it is strictly recommended for terminals to support Terminal Capability Negotiation.

6.1 Terminals not supporting capability negotiation

MMTEs not supporting Capability Negotiation should be served by the MMSE as described in the OMA document [16], particularly clause 11.1.1"Client Devices Not Supporting User Agent Profiles".

NOTE: The serving of the MMTE by the MMSE may be based on the capabilities described in the OMA document [15].

6.2 Terminals supporting capability negotiation

MMTEs supporting Capability Negotiation shall insert the HTTP header field "x-wap-profile" containing the respective capability information into the HTTP request message carrying the retrieve request according to the OMA document [16], particularly clauses 11.1.2 "Client Devices Supporting User Agent Profiles" and 9.1.1.1 "X-WAP-PROFILE".

Furthermore, the MMTE may insert the additional HTTP header field "x-wap-profile-diff" containing differences to the respective capability information given in the HTTP header field "x-wap-profile" according to the OMA document [16], particularly clauses 11.1.2. "Client Devices Supporting User Agent Profiles" and 9.1.1.2 "X-WAP-PROFILE-DIFF".

The MMSE may insert the HTTP header field "x-wap-profile-warning" containing the response to the respective capability information into the HTTP result message carrying the retrieve result (i.e. the MM) according to the OMA document [16], particularly clauses 11.1.2 "Client Devices Supporting User Agent Profiles" and 9.1.1.3 "X-WAP-PROFILE-WARNING".

7 Fixed net MMS protocol architecture

7.1 Transaction coding

The abstract messages used for the basic transactions as described in clause 5 shall be handled and coded as defined in the OMA documents [12], [13] and [14].

7.2 Transport protocol used for push-based transactions

The push-based transactions MM Notification, MM Delivery Report and MM Read Report (originator side) are handled using the fixed net Short Message Service defined in ES 201 986 [2], ES 201 912 [3], TS 103 912 [4] (UBS1) and ES 202 060-1 [5] (NBS using UBS1 coding).

Following the implementations in mobile networks, the MM Notification shall be transmitted using the SMS, where the MM Notification (i.e. the abstract message "MM1_notification.REQ" described in TS 123 140 [7]) is implemented by the respective message "M-notification.ind" defined in the OMA documents [13] and [14]. This "M-notification.ind" message is transported within a WAP PUSH message carried by SMS.

To transport this WAP PUSH message containing the "M-notification.ind" using SMS, the basic SMS transfer mechanism is used. To indicate the presence of the WAP PUSH message, the PDU values contained in the SMS Transfer Layer message SMS_DELIVER transmitted to the MMTE shall be used as defined below:

- TP-DCS shall be set to "8 bit, uncompressed" (e.g. 04hex).
- TP-UDHI shall be set to "UDH present" (1bin).
- TP-UD shall contain a User Data Header (UDH) as well as the WAP PUSH message.
- The User Data Header (UDH) shall contain the information element "Application port addressing scheme, 16 bit address" (05hex). The Source Port within this information element should be set to "WAP connectionless session service" (9 200dec), while the Destination Port shall be set to "WAP PUSH" (2 948dec). Both given port numbers are defined by IANA (see http://www.iana.org/assignments/port-numbers).
- Depending on the size of the WAP PUSH message, the use of Short Message Concatenation may be necessary. Both information elements "Concatenated short messages, 8-bit reference number" (00hex) or "Concatenated short message, 16-bit reference number" (08hex) may be used in this case.

The same mechanism shall be used to transmit the MM Delivery Report and MM Read Report (i.e. the abstract message "MM1_delivery_report.REQ" implemented by "M-delivery.ind" [13], [14] and "MM1_read_reply_originator.REQ" implemented by "M-ReadOrig.ind" [13], [14] respectively) via SMS.

As UBS1 uses the existing GSM SMS Transfer Layer messages, this mechanism is directly applicable to F-SMS implementations using UBS1.

7.3 Transport protocol used for non push-based transactions

The non push-based transactions MM Submission, MM Retrieval, MM Read Report (recipient side) and MM Forwarding are only applicable to MMS-capable terminals. These transactions are performed using HTTP/TCP/IP.

7.3.1 Protocol stack

The MM1 protocol stack for MM Submission, MM Retrieval, MM Read Report (recipient side) and MM Forwarding in the fixed net is described in figure 11. The structure of this protocol stack is very similar to the MM1 protocol stack used in mobile networks today (compare figure A.2 in clause A.2). However, unlike current mobile network implementations which are based on WSP, an HTTP/TCP/IP based protocol stack (compare OMA-WAP-MMS-CTR [13], clause 8.2) is used for the communication between the fixed net MMS User Agent and the fixed net MMS gateway. Therefore, the use of a WAP gateway is not necessary in the fixed network.

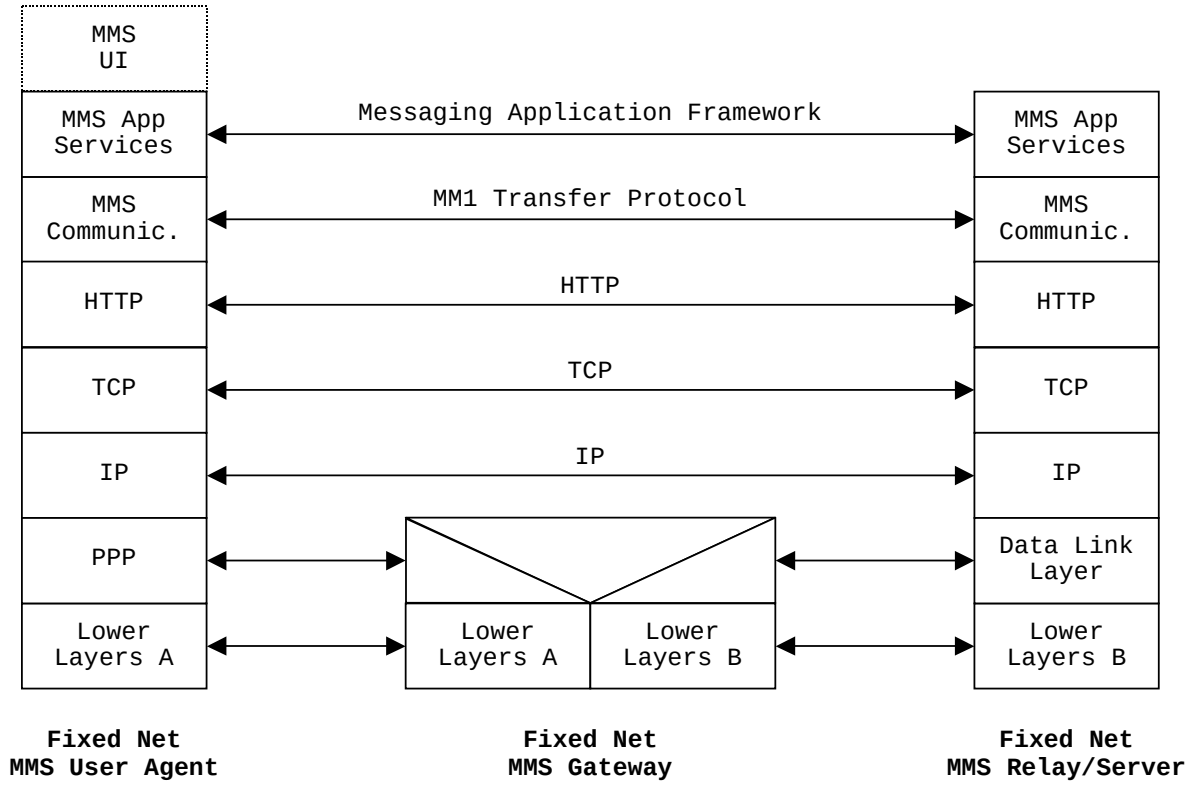

Figure 11: MM1 protocol layers in fixed networks for MM submission, MM retrieval, MM read report (recipient side) and MM forwarding

The functionality as it is provided by a WAP gateway in mobile networks is in the fixed network performed by an even simpler fixed net MMS gateway. This fixed net MMS gateway just provides low-level transport mechanisms and RAS functionalities for the fixed net MMS User Agent and lower layer communication services for the MMS Relay/Server. The interface between fixed net MMS gateway and MMS Relay/Server remains the same as between the WAP gateway and the MMS Relay/Server in mobile networks.

7.3.2 Authentication

Authentication should be performed implicitly by the RAS (F-MMS gateway) based on the received Calling Line Identity. The RAS (F-MMS gateway) may optionally require an authentication on PPP layer via username and password. See also clauses 8.2 and 8.3. The F-MMSE may also optionally require an authentication on HTTP layer via username and password. This will permit MMTEs which have already established a connection to the IP network to communicate with the MMSE using the already established IP connection. See also clauses 8.2 and 8.3.

7.3.3 Description of the protocol layers

7.3.3.1 Lower layers

The protocol layers described as "lower layers" in figure 11 are dependent on the MMTE's network access (PSTN/ISDN).

7.3.3.1.1 PSTN terminals

MMTEs connected to the network via analogue access (PSTN) shall establish a connection to the RAS (F-MMS gateway) using basic call procedures and using the RAS (F-MMS gateway) number stored in the configuration profile of the terminal. Once the connection is established, the terminal shall use one of the modem protocols V.32, V.32bis, V.34, V.90 or V.92 according to [33], [34], [35], [36] and [37] to communicate with the RAS (F-MMS gateway). If permitted by the respective modem protocol, the MMTE may use the options asynchronous transfer mode, error control and compression according to V.14, V.42, V.42bis [38], [39] and [40].

7.3.3.1.2 ISDN terminals

MMTEs connected to the network via ISDN access shall establish an ISDN "unrestricted digital information" bearer connection to the RAS (F-MMS gateway) by using basic call procedures according to [31] and using the RAS (F-MMS gateway) number stored in the configuration profile of the terminal. If supported by both the network and the RAS (F-MMS gateway), the MMTE may establish a connection to the RAS (F-MMS gateway) using two or more b-channels according to [31]. See [32] for details.

7.3.3.2 PPP

General Information:

The Point-to-Point Protocol (PPP) provides a standard method for transporting multi-protocol datagrams over point-to-point links. PPP provides a Link Control Protocol (LCP) for establishing, configuring, and testing the data-link connection, which provides full-duplex simultaneous bi-directional operation, and is assumed to deliver packets in order.

Application in fixed net MMS:

After the basic call connection between the MMTE and the RAS (F-MMS gateway) has been established, a PPP link between the MMTE and the RAS (F-MMS gateway) is established. The PPP shall be used according to RFC 1661 [24] and RFC 1662 [25].

If an authentication via username and password on PPP layer is required by the MMSE, the authentication should be performed using PAP (Password Authentication Protocol) according to RFC 1334 [23] or optionally using CHAP (Challenge Handshake Authentication Protocol) according to RFC 1334 [23].

For establishing and configuring an Internet Protocol (IP) link over PPP, the Internet Protocol Control Protocol (IPCP) according to RFC 1332 [22] is used as network control protocol.

7.3.3.3 IP

General Information:

The Internet Protocol (IP) as defined by RFC 791 [18] is specifically limited in scope to provide the functions necessary to deliver a package of bits (an internet datagram) from a source to a destination over an interconnected system of networks. There are no mechanisms to augment end-to-end data reliability, flow control, sequencing, or other services commonly found in host-to-host protocols. The internet protocol can capitalize on the services of its supporting networks to provide various types and qualities of service.

Application in fixed net MMS:

For all parameters, the default values as specified by RFC 791 [18] shall be used (e.g. Type-Of-Service = 0; Time-To-Live = 64). Options are not needed and should therefore not be used. IP Header Fragmentation shall not be used.

After the IP over PPP connection has been established, the MMTE requests for resolution of the MM Relay/Server URL (stored in the configuration profile of the MMTE) using the Domain Name System (DNS) according to RFC 1034 (STD 0013) [29] via User Datagram Protocol (UDP) (see clause 7.3.3.6). Based on the resolved address, the MMTE then establishes a Transmission Control Protocol (TCP) connection to the MMS Relay/Server (see clause 7.3.3.5).

7.3.3.4 ICMP

General Information:

Being an integral part of IP, the purpose of the Internet Control Message Protocol (ICMP) according to RFC 792 [20] is to provide feedback about problems in the communication environment. ICMP messages typically report errors in the processing of datagrams. To avoid the infinite regress of messages about messages, etc., no ICMP messages are sent about ICMP messages.

Application in fixed net MMS:

The ICMP shall be used as defined by RFC 792 [20].

7.3.3.5 TCP

General Information:

The Transmission Control Protocol (TCP) as defined by RFC 793 [21] is intended to provide a reliable process-to-process communication service in a multi-network environment and to be a host-to-host protocol in common use in multiple networks. The primary purpose of the TCP is to provide reliable, securable logical circuit or connection service between pairs of processes.

Application in fixed net MMS:

The TCP is used for basic data transmission and flow control as defined by RFC 793 [21].

NOTE 1: For address resolution, the User Datagram Protocol (UDP) is used (see clause 7.3.3.6).

NOTE 2: General information on ports can be obtained from IANA (see bibliography).

7.3.3.6 UDP

General Information:

The User Datagram Protocol (UDP) as defined by RFC 768 [19] is defined to make available a datagram mode of packet-switched computer communication in the environment of an interconnected set of computer networks. This protocol assumes that the Internet Protocol (IP) is used as the underlying protocol.

This protocol provides a procedure for application programs to send messages to other programs with a minimum of protocol mechanism. The protocol is transaction oriented, and delivery and duplicate protection are not guaranteed. Applications requiring ordered reliable delivery of streams of data should use the Transmission Control Protocol (TCP).

Application in fixed net MMS:

Located on the same layer as TCP, the User Datagram Protocol (UDP) according to RFC 768 [19] is used for address resolution via a Domain Name Server (Internet Name Server) to request the IP address corresponding to the MMS Relay/Server URL stored in the terminal configuration profile (see clause 8.2.4). Using this information, the MMTE afterwards establishes a HTTP link to the MMS Relay/Server.

NOTE: General information on ports can be obtained from IANA (see bibliography).

7.3.3.7 HTTP

General Information about HTTP:

The HyperText Transfer Protocol (HTTP) as defined by RFC 2616 [27] is an application-level protocol for distributed, collaborative, hypermedia information systems. It is a generic, stateless, protocol which can be used for many tasks beyond its use for hypertext, such as name servers and distributed object management systems, through extension of its request methods, error codes and headers. A feature of HTTP is the typing and negotiation of data representation, allowing systems to be built independently of the data being transferred.

General Information about Wireless Profiled HTTP:

The core of the Wireless Profiled HTTP specification "Wireless Profiled HTTP" [17] is the HTTP specification RFC 2616 [27]. Elements and descriptions have been taken from RFC 2616 [27] and declared as mandatory or optional. The basic model of interaction between the WAP Terminal and WAP Proxy/WAP Server is a HTTP request/response.

Application in fixed net MMS:

The HTTP shall be used as defined by RFC 2616 [27] and WAP "Wireless Profiled HTTP" [17].

7.3.3.8 MMS communication

The MMTE may communicate with the MMSE according to the OMA documents [12], [13] and [14] or the respective WAP documents [9], [10] and [11].

7.3.3.9 MMS application services

The MMTE may handle the Application Services according to the OMA documents [12], [13] and [14] or the respective WAP documents [9], [10] and [11].

8 Fixed net specific MMTE and MMSE requirements

8.1 Subaddressing

8.1.1 General aspects

In order to allow the use of more than one MMTE connected in parallel to the same subscriber line as well as in order to allow the use of personal MM mailboxes within the MMTEs, the mechanism of MMS subaddressing may be provided. The support of the MMS subaddressing function is optional for both Service Provider (MMSE) and the Terminal (MMTE).

NOTE: In case that the MMTE or the MMSE do not support subaddressing, a default subaddress digit is used. See also the following clauses.

The philosophy of this MMS subaddressing mechanism follows the SMS subaddressing mechanism defined by F-SMS protocol 1 (UBS1) ES 201 912 [3], TS 103 912 [4]. Therefore, similar to a fixed net SMS terminal which, according to ES 201 912 [3], TS 103 912 [4] may contain one or more Short Message Entities (SMEs), also a fixed net MMS terminal may contain one or more Multimedia Message Entities (MMEs).

Moreover, because the push-based MMS transactions (e.g. MM Notification) are handled via F-SMS, there is a direct relation between MMS subaddressing and SMS subaddressing. Therefore, in order to avoid unnecessary confusion for the user, the subaddresses for SMS and MMS should not differ from each other. This may be achieved within the terminal by associating the SMS- and MMS mailboxes with each other. Furthermore, in case that the user connects more than one MMTE/SMTE to the same subscriber line, it is under the user's responsibility to avoid using the same subaddress digit value in more than one terminal.

Due to the direct relation between MMS subaddressing and SMS subaddressing, depending on the F-MMSE architecture, the destination MME subaddress may be completely transparent for the MMS Relay/Server. In this case, the subaddressing is completely handled by the RAS (F-MMS gateway) and the F-SMSC.

The MME subaddress length is one digit. It is up to the F-MMSE to define the default subaddress value which is used if no destination subaddress is specified by the sending user. For interoperability reasons, it is recommended to use "0" as default value.

The mechanism of subaddressing is applicable to all MM transactions, i.e. push-based transactions like MM Notification, MM Delivery Report, MM Read Report (originator side) as well as non push-based MM transactions like MM Submission, MM Read Report (recipient side), etc. In the following, only the MM Submission, MM Notification and MM Retrieval are exemplary described in detail.

8.1.2 Connecting to the F-MMSE

Every time the MMTE (MME) connects to the F-MMSE (e.g. to send or retrieve an MM, to send a Read Report (recipient side), etc.), it indicates its subaddress by dialling-in to the RAS (F-MMS gateway) using the RAS (F-MMS gateway) dial-in number including the respective subaddress digit as last digit. In case that the MMTE does not support the MMS subaddressing function, it shall use the default subaddress value (e.g. "0").

In case that the F-MMSE supports MMS subaddressing, it may require different username/password combinations for each subaddress when authenticating on PPP or HTTP layer.

8.1.3 Sending an MM

When sending an MM, the sender can address the destined fixed net MMTE (MME) by simply adding the respective destination MME subaddress (i.e. one digit ranging from "0" to "9") at the end of the destination phone number (i.e. in the "To", "Cc" and/or "Bcc" field within the M-Send.req {MM1_submit.REQ} PDU).

NOTE: This possibility is not limited to originating fixed net MMTEs supporting MMS subaddressing. Also other MM originators (e.g. fixed net MMTEs not supporting MMS subaddressing, mobile net MMS users, Service Providers, etc.) can address the desired fixed net MMTE (MME) by simply adding the respective destination MME subaddress at the end of the destination phone number.

In case that an MM is sent from a fixed net MMTE (MME), the originating MME subaddress is indicated by the fixed net MMTE (MME) to the MMSE when connecting to the MMSE (see clause 8.1.2). If this subaddress is not equal to the default value, the MMSE shall attach the originating subaddress digit at the end of the originating address (i.e. within the "From" field) when sending the MM to the destination or to another MMSE respectively. If this subaddress is equal to the default value, the MMSE should not attach the originating subaddress digit at the end of the originating address (i.e. within the "From" field) when sending the MM to the destination or to another MMSE in order to allow the presentation of the "normal" originator's subscriber line number to the final destination user in the default case.

8.1.4 Receiving an MM

8.1.4.1 MM notification

When there is an MM to be delivered from the MMSE to a particular fixed net MME, the MMSE shall notify this destination MME by sending an SM according to ES 201 912 [3], TS 103 912 [4] (see clause 7.2) containing the MM Notification to the addressed MME via the associated F-SMSC using the full given destination address (i.e. including the destination subaddress). If the delivery of the MM Notification to the addressed MME fails, the F-SMSC should notify the MMS Relay/Server about this. In this case, the MMS Relay/Server should handle the message by taking appropriate measures (e.g. by informing the originator that the destination is not existing/available or by trying to deliver the MM to the default subaddress, etc.). These measures are up to the Service Provider.

NOTE: Note that according to ES 201 912 [3] and TS 103 912 [4], the calling party number of the F-SMSC when delivering an SM consists of the basic SMSC number extended by the destination subaddress and the deliver mode identifier. See ES 201 912 [3] and TS 103 912 [4] for details and an explanation of the deliver mode identifier.

8.1.4.2 MM retrieval

When the fixed net MMTE, after having received the MM notification, connects to the MMS Relay/Server to retrieve the respective MM (see also clause 5.2.2), it indicates its own MME subaddress by dialling-in to the RAS (F-MMS gateway) using the RAS (F-MMS gateway) dial-in number as described in clause 8.1.2.

8.2 MMTE requirements

8.2.1 Network access

The MMTE can be connected to the PSTN or ISDN. In order to be able to receive notifications via SMS, the CLIP supplementary service shall be activated on the subscriber line at least for calls from the F-SMSC to the MMTE. See ES 201 986 [2] and ES 201 912 [3] for details.

Furthermore, depending on the network access of the RAS (F-MMS gateway), the CLIR supplementary service may have to be deactivated on the subscriber line at least for calls from the MMTE to the RAS (F-MMS gateway). Additionally, to avoid a possible disturbance of the communication between MMTE and RAS (F-MMS gateway), the CW supplementary service should be deactivated on the subscriber line at least during calls from the MMTE to the RAS (F-MMS gateway). See ES 202 314-2 [1] for details.

8.2.2 Bearer for IP-based transactions

8.2.2.1 PSTN terminals

MMTEs connected to the network via analogue access (PSTN) shall support at least one of the modem protocols V.32, V.32bis, V.34, V.90, V.92 according to ITU-T Recommendations [33], [34], [35], [36] and [37] to be able to communicate with the RAS (F-MMS gateway). If permitted by the respective modem protocol, the MMTE may use the options asynchronous transfer mode, error control and compression according to ITU-T Recommendations V.14 [38], V.42 [39] and V.42bis [40].

8.2.2.2 ISDN terminals

MMTEs connected to the network via ISDN access shall support the ISDN "unrestricted digital information" bearer according to EN 300 403-1 [31] to be able to communicate with the RAS (F-MMS gateway). If supported by both the network and the RAS (F-MMS gateway), the MMTE may establish a connection to the RAS (F-MMS gateway) using two or more
b-channels according to EN 300 403-1 [31]. See ES 202 314-5 [32] for details.

8.2.3 Authentication

For MMTEs connected to the network via analogue access (PSTN) or via ISDN, the following requirements apply:

- Authentication via username and password on PPP layer using PAP (Password Authentication Protocol) according to RFC 1334 [23] shall be supported by the MMTE.
- Authentication via username and password on PPP layer using CHAP (Challenge Handshake Authentication Protocol) according to RFC 1334 [23] should be supported by the MMTE.
- Authentication via username and password on HTTP layer using HTTP Basic Access Authentication according to RFC 2617 [28] (which concerning the used Base64 Content-Transfer-Encoding refers to RFC 2045 [26]) shall be supported by the MMTE.
- Authentication via username and password on HTTP layer using HTTP Digest Access Authentication according to RFC 2617 [28] should be supported by the MMTE.

8.2.4 Configuration profile

The terminal shall be able to handle at least one configuration profile containing the parameters listed in table 1.

Table 1: MMTE configuration profile

Item	Size (recommended)	Status	Remark
F-SMSC number	up to 16 digits	mandatory	Required for MM Notification reception via SMS.
RAS (F-MMS gateway) dial-in number (send)	up to 16 digits	mandatory	Used for MM Submission.
RAS (F-MMS gateway) dial-in number (receive)	up to 16 digits	mandatory	Used for MM Retrieval and MM Read Report (recipient side).
Username	up to 10 chars	mandatory	Used for: • Authentication on PPP layer (e.g. in case that authentication is not based on CLI). • Authentication on HTTP layer (e.g. in case that there is an already established connection to the IP network).
Password	up to 10 chars	mandatory	See above row.
MM Relay/Server URL	up to 50 chars	mandatory	Required for HTTP connection establishing. For URL syntax see RFC 2616 [27].
NOTE: The RAS (F-MMS gateway) dial-in number (send) and the RAS (F-MMS gateway) dial-in number (receive) are not necessarily different numbers.			

8.3 MMSE requirements

8.3.1 Authentication

For PSTN and ISDN terminals, the following requirements to the MMSE (RAS / F-MMS gateway) apply:

- Authentication should be performed implicitly by the RAS (F-MMS gateway) based on the received Calling Line Identity. The RAS (F-MMS gateway) should therefore be able to determine the Calling Party number of the MMTE which is dialling in.
- Also an authentication via username and password on PPP layer using PAP (Password Authentication Protocol) according to RFC 1334 [23] is recommended. Optionally, instead of using PAP, also CHAP (Challenge Handshake Authentication Protocol) according to RFC 1334 [23] may be used.
- Also authentication via username and password on HTTP layer may be applied. In this case, HTTP Basic Access Authentication according to RFC 2617 [28] (which concerning the used Base64 Content-Transfer-Encoding refers to RFC 2045 [26]) is recommended. Optionally, instead of using HTTP Basic Access Authentication, also HTTP Digest Access Authentication according to RFC 2617 [28] may be used.
- The MMSE may also use any combination of authentication based on the received Calling Line Identity, authentication via username and password on PPP layer and authentication via username and password on HTTP layer.

8.3.2 Bearer for IP-based transactions

The RAS (F-MMS gateway) shall serve both ISDN and PSTN terminals.

To serve MMTEs connected to the network via analogue access (PSTN), the RAS (F-MMS gateway) shall support all of the modem protocols ITU-T Recommendations V.32 [33], V.32bis [34], V.34 [35], V.90 [36] and V.92 [37] Furthermore, if permitted by the respective modem protocol, the RAS (F-MMS Gateway) shall support asynchronous transfer mode, error control and compression according to ITU-T Recommendations V.14 [38], V.42 [39] and V.42bis [40].

To serve analogue MMTEs connected via a PBX or terminal adapter to the network via an ISDN access, the RAS (F-MMS gateway) shall support all of the modem protocols V.32, V.32bis, V.34, V.90, V.92 [33], [34], [35], [36],[37].

Furthermore, if permitted by the respective modem protocol, the RAS (F-MMS Gateway) shall support asynchronous transfer mode, error control and compression according to ITU-T Recommendations V.14 [38], V.42 [39] and V.42bis [40].

To serve MMTEs connected to the network via ISDN access, the RAS (F-MMS gateway) shall support the ISDN "unrestricted digital information" bearer according to EN 300 403-1 [31]. The RAS (F-MMS gateway) may provide the possibility to use two or more b-channels according to EN 300 403-1 [31]. See ES 202 314-5 [32] for details.

Annex A (informative): MM1 in mobile networks

A.1 MM1 gateway structure in mobile networks

Figure A.1 gives a rough overview about the MM1 gateway structure in mobile networks today. The communication, between mobile net MMS Relay/Server and mobile net MMS User Agent is handled via a WAP gateway. For details, see clause A.2.

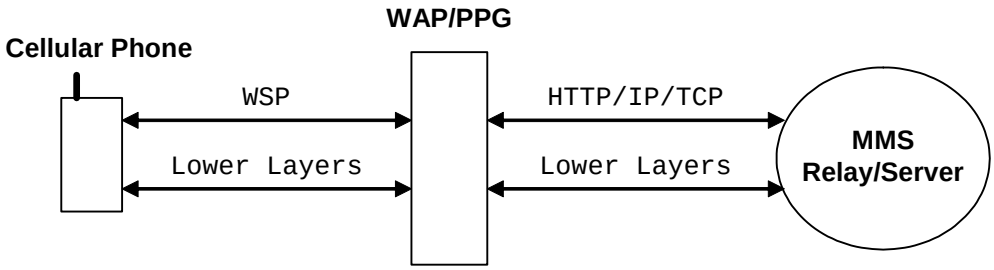

Figure A.1: MM1 gateway structure in mobile networks

A.2 MM1 protocol stack used in mobile networks today

Figure A.2 describes the protocol stack used in mobile networks today. The communication between mobile net MMS Relay/Server and mobile net MMS User Agent is handled via a WAP gateway. The WAP gateway is connected to the MMS Relay/Server using HTTP/TCP/IP and to the mobile net MMS User Agent using the appropriate WAP protocols (WAP WSP, etc.).

The WAP gateway provides a conversion between the transport mechanisms used on the MMS Relay/Server side (HTTP/TCP/IP) and the transport mechanisms used on the mobile net MMS User Agent side (WAP, WSP, etc.). The payload, i.e. the MMS specific content of the communication, remains unchanged.

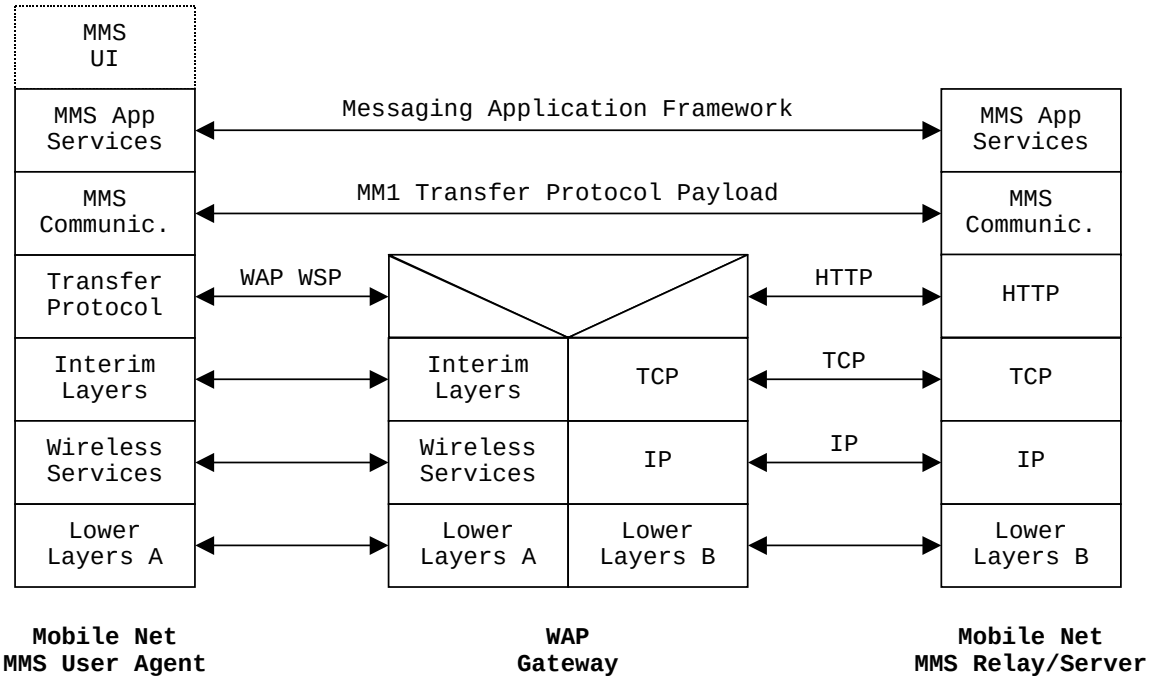

Figure A.2: MM1 protocol layers used in mobile networks today

Annex B (informative): Error- and rejection

B.1 Error- and rejection cases

Error- and rejection cases are described in the respective referenced documents of ETSI, 3GPP, WAP/OMA, IETF, etc. For a list of all referenced documents see clause 2.

Annex C (informative): Bibliography

ETSI TS 102 314-1: "Fixed Network Multimedia Messaging Service; Overview".

IANA: Internet Assigned Numbers Authority, http://www.iana.org.

History

Document history		
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