

## **Digital Enhanced Cordless Telecommunications (DECT); Fixed network Multimedia Message Service (F-MMS) Interworking Profile**

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Reference

DTS/DECT-000235

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Keywords

DECT, MMS, multimedia

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## Foreword

This Technical Specification (TS) has been produced by ETSI Project Digital Enhanced Cordless Telecommunications (DECT).

The present document is based on DECT Common Interface (CI) specification EN 300 175, parts 1 [1] to 7 [7], to enable DECT terminals to interwork in the public and private environment.

In addition, for the purpose of interoperability and wherever it is found appropriate, the present document takes into consideration the requirements of:

- the DECT Generic Access Profile (GAP), EN 300 444 [10] to enable the same DECT portable part (PT) to interwork with a DECT fixed part (FP) complying to the GAP mainly signalling requirements, irrespective of whether this FP provides residential, business or public access services.

General attachment requirements are based on EN 301 406 [11].

Further details on the DECT system may be found in TR 101 178 [9].

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# 1 Scope

The present document specifies that set of technical requirements for Digital Enhanced Cordless Telecommunications (DECT) Fixed Part (FP) and DECT Portable Part (PP) necessary for the support and provision to the user of Multimedia Messaging Services (MMS) when provided over a fixed line access network.

From architectural point of view the present document specifies an End System (ES) configuration, which assumes termination of many of the protocols required by the Fixed line Multimedia Messaging Service (F-MMS) as defined in ES 202 314-4 [17] in the DECT Fixed Termination (FT) and transport of as minimum as possible however sufficient for the service operation data over the DECT air interface to the DECT Portable Termination (PT).

NOTE: The specified requirements can be applied also for the provision of MMS services in a business system, e.g. IP based PBX, that has fully implemented the requirements of the F-MMS services as defined in ES 202 314-4 [17].

The specification aims at ensuring interoperability between FTs and PTs from different vendors and minimum cost load on the DECT portable side.

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# 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 EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".
- [2] ETSI EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL)".
- [3] ETSI EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer".
- [4] ETSI EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer".
- [5] ETSI EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer".
- [6] ETSI EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing".
- [7] ETSI EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features".
- [8] ETSI EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech coding and transmission".
- [9] ETSI TR 101 178: "Digital Enhanced Cordless Telecommunications (DECT); A High Level Guide to the DECT Standardization".

- [10] ETSI EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [11] ETSI EN 301 406: "Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced Cordless Telecommunications (DECT) covering essential requirements under article 3.2 of the R&TTE Directive; Generic radio".
- [12] ETSI EN 301 649: "Digital Enhanced Cordless Telecommunications (DECT); DECT Packet Radio Service (DPRS)".
- [13] ETSI EN 30 757: "Digital Enhanced Cordless Telecommunications (DECT); ); Low Rate Messaging Service (LRMS) including Short Messaging Service (SMS)".
- [14] ETSI TS 102 342: "Digital Enhanced Cordless Telecommunications (DECT); Cordless Multimedia Communication System; Open Data Access Profile (ODAP)".
- [15] ETSI TS 102 314-1: "Access and Terminals (AT); Fixed network Multimedia Messaging Service (F-MMS); PSTN/ISDN; Part 1: Overview".
- [16] ETSI ES 202 314-2: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Fixed network Multimedia Messaging Service (F-MMS); PSTN/ISDN; Part 2: Service description".
- [17] ETSI ES 202 314-4: "Access and Terminals (AT); Fixed network Multimedia Messaging Service (F-MMS); PSTN/ISDN; Part 4: Multimedia Message communication between a fixed network Multimedia Messaging Terminal Equipment and a Multimedia Messaging Service Centre".
- [18] ETSI TR 102 314-6: "Access and Terminals (AT); Fixed network Multimedia Messaging Service (F-MMS); PSTN/ISDN; Part 6: Control strings (service codes) for MMS functions and MMS supplementary services".
- [19] IETF RFC 2616: "Hypertext Transfer Protocol - HTTP/1.1".
- [20] ETSI TS 123 140: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Multimedia Messaging Service (MMS); Functional description; Stage 2 (3GPP TS 23.140 version 5.9.0 Release 5)".
- [21] ETSI TS 126 140: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Multimedia Messaging Service (MMS); Media formats and codes (3GPP TS 26.140 Release 5)".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 175-1 [1] and the following apply:

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

**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:** a Terminal Equipment containing an MMS User Agent and an appropriate MMS user interface

## 3.2 Abbreviations

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

3GPP	3rd Generation Partnership Project
AT	Access and Terminals
CI	Common Interface
DECT	Digital Enhanced Cordless Telecommunications
DLC	Data Link Control
DPRS	DECT Packet Radio Service
DSL	Digital Subscriber Line
EN	European Norm
ES	End System
ETSI	European Telecommunications Standards Institute
F-MMS	Fixed line-Multimedia Messaging Service
F-SMS	Fixed line-Short Messaging Service
FT	Fixed Termination
FP	Fixed Part
GAP	Generic Access Profile
GSM	Global System for Mobile communications
HDR	High Data Rate
HLR	Home Location Record
HTTP	HyperText Transport Protocol
ICMP	IP Control Management Protocol
ID	IDentifier
IETF	Internet Engineering Task Force
IP	Internet Protocol
IS	Intermediate System
ISDN	Integrated Services Digital Network
LDR	Low Data Rate
LRMS	Low Rate Messaging Service
MAC	Medium Access Control
MM	Multimedia Message
MMH	Multimedia Message Handler
MMS	Multimedia Messaging Service
MMSE	Multimedia Messaging Service Environment
MMS-HDR	MMS High Data Rate
MMS-LDR	MMS Low Data Rate
MMUA	Multimedia Messaging service User Agent
MMUA-D	Multimedia Messaging service User Agent-Destination
MMUA-O	Multimedia Messaging service User Agent-Originator
NBS	Network Based Solution
NWK	NetWorK
ODAP	Open Data Access Profile
OMA	Open Mobile Alliance
PAP	Push Access Protocol
PDU	Protocol Data Unit
PHL	PHysical Layer
PP	Portable Part
PPG	Push Proxy Gateway
PPP	Point to Point Protocol
PSTN	Public Switched Telephone Network
PT	Portable Termination
REQ	REQuest
RES	RESponse
RFC	Request For Comment
R&TTE	Radio communications and Telecommunications Terminal Equipment
SM	Short Message
SMPP	Short Message Peer to Peer protocol
SMS	Short Message Service
SMSC	Short Message Service Centre

SMS-C	SMS-C-plane
SMS-U	SMS-U-plane
SM-TL	Short Message-Transport Layer
TCP	Transmission Control Protocol
TISPAN	Telecommunications and Internet converged Services and Protocols for Advanced Networking
TR	Technical Report
TS	Technical Specification
UA	User Agent
UCP	Universal Computer Protocol
UDP	User Datagram Protocol
URI	Uniform Resource Identifier
UMTS	Universal Mobile Telecommunications System
VAS	Value Added Services

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## 4 General

The present document is a part of the extensive set of DECT standards produced by EP DECT and covering various aspects and needs of communications markets and end users with services ranging from voice to data and multimedia.

The main focus of the present document is on provision of a F-MMS capable DECT End System (ES) that allows distributing the burden of the data applications and transport protocols implementation between the DECT Portable Part (PP) and the DECT Fixed Part (FP) targeting of putting the complexity into the FP and reducing the complexity, and hence reducing the cost, of the Portable Parts (PPs).

The present document defines the roles and requirements in regard to the different members of the DECT ES, namely the PT and the FT, in the provision of the F-MMS between the access network and the user and is organized in three basic groups:

- Overview to the basic concept and system architecture (clauses 5 and 6);
- Features definitions (clause 7);
- Requirements description (clauses 8 and 9).

Wherever it is possible reference to external standards is used instead of detail description.

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## 5 Overview

The Multimedia Messaging Service (MMS) is a non-real-time delivery service providing a store-and-forward mechanism for the provision of messages with a wide range of contents, e.g. text, images, audio and video clips, etc.

The Fixed line Multimedia Messaging Service (F-MMS) is a service provided via a PSTN or an ISDN fixed network (see note). The F-MMS is closely based on the MMS existing in the mobile networks aiming at facilitating the interworking with the existing mobile networks MMS, offering the same user experience for both fixed and mobile network users and reducing the F-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.

**NOTE:** An upgrade of the F-MMS in the future may include DSL or other access networks.

An overview of the relevant standards documents can be found in TS 102 314-1 [15]. The F-MMS service description can be found in ES 202 314-2 [16]. The protocol requirements relevant to a F-MMS capable terminal can be found in ES 202 314-4 [17] and TR 102 314-6 [18]. Ongoing and future standardisation development may add new documents to this brief list.

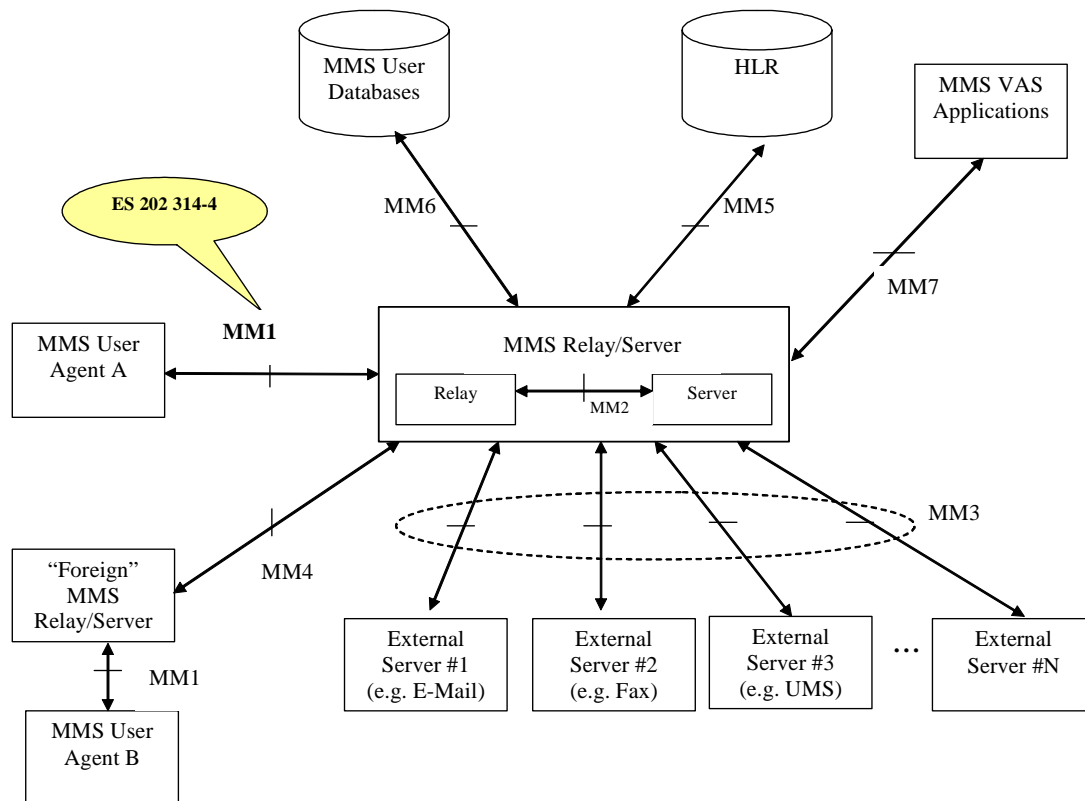


DECT, as specified in the DECT Common Interface (CI) standards set EN 300 175 parts 1 [1] to 8 [8], is a cordless access technology that provides means for cordless delivery of various access networks' services to the end users. To satisfy the specific requirements for each access network or/and service and provide basis for interoperable terminal implementations the DECT standardisation concept is based on a "base standard - profile relations" resulting in the specification of a number DECT profiles standards targeting dedicated access network or/and services. The current document is such a profile aimed at specifying interoperable requirements for cordless delivery of F-MMS to the end user over a DECT FT- PT pair.

## 6 Reference configuration

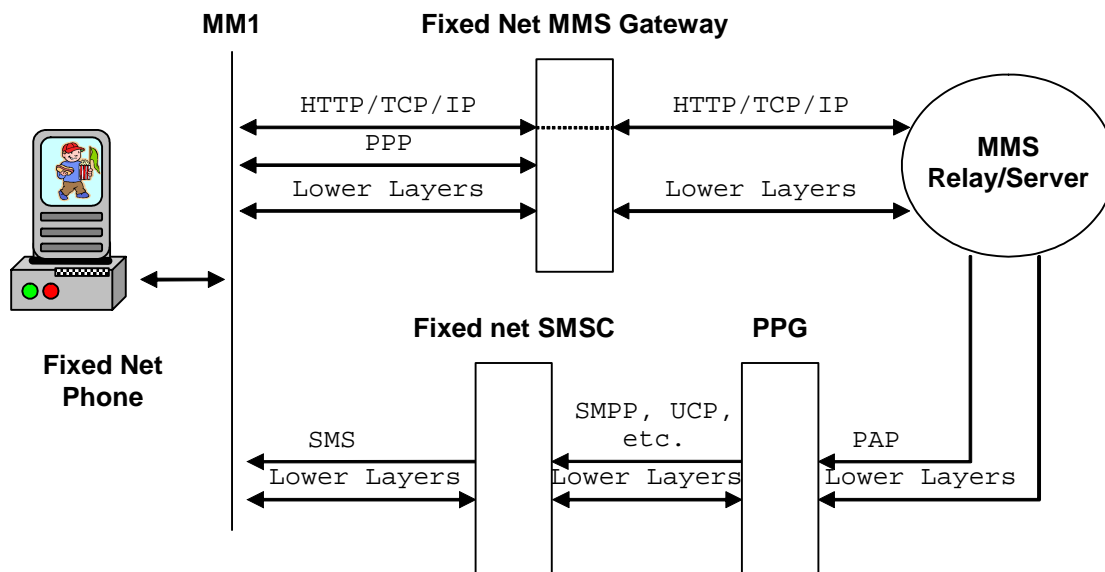
### 6.1 General F-MMS

The fixed net MMS architecture as defined in ES 202 314-4 [17] is depicted on figure 1. The architecture is similar to the MMS architecture in cellular networks, e.g. GSM. The ES 202 314-4 [17] focuses on the definition of the realisation of F-MMS on the MM1 interface used in a fixed network.



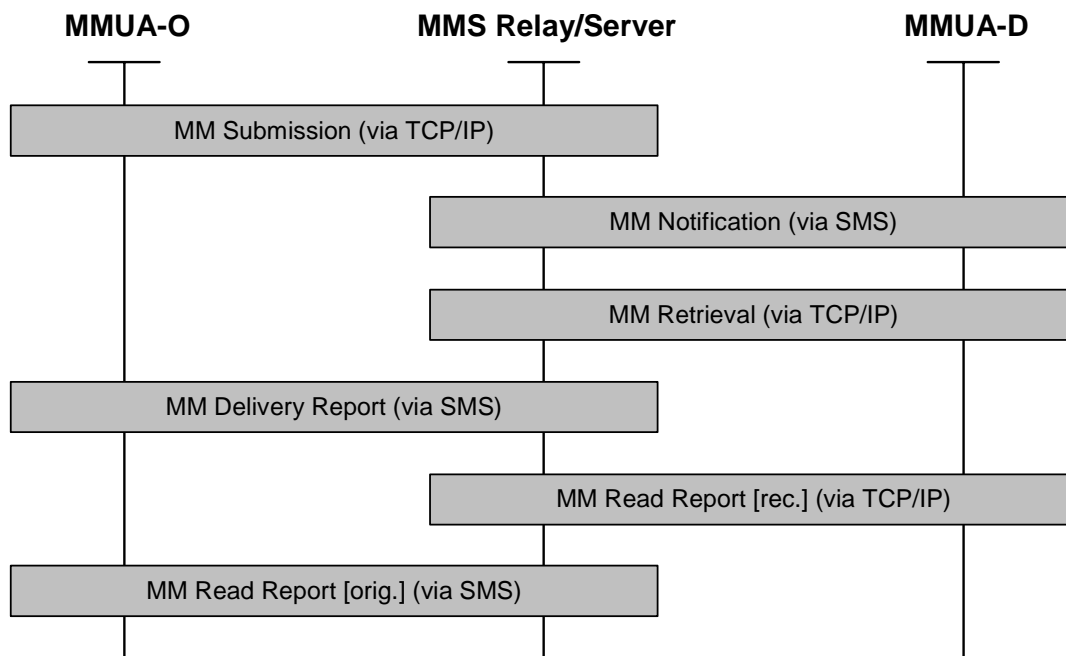
**Figure 1: MMS reference architecture**

The F-MMS MM1 interface can be seen as a gateway and its general structure from protocol point of view is depicted in figure 2.



**Figure 2: General F-MMS MM1 transport protocol structure**

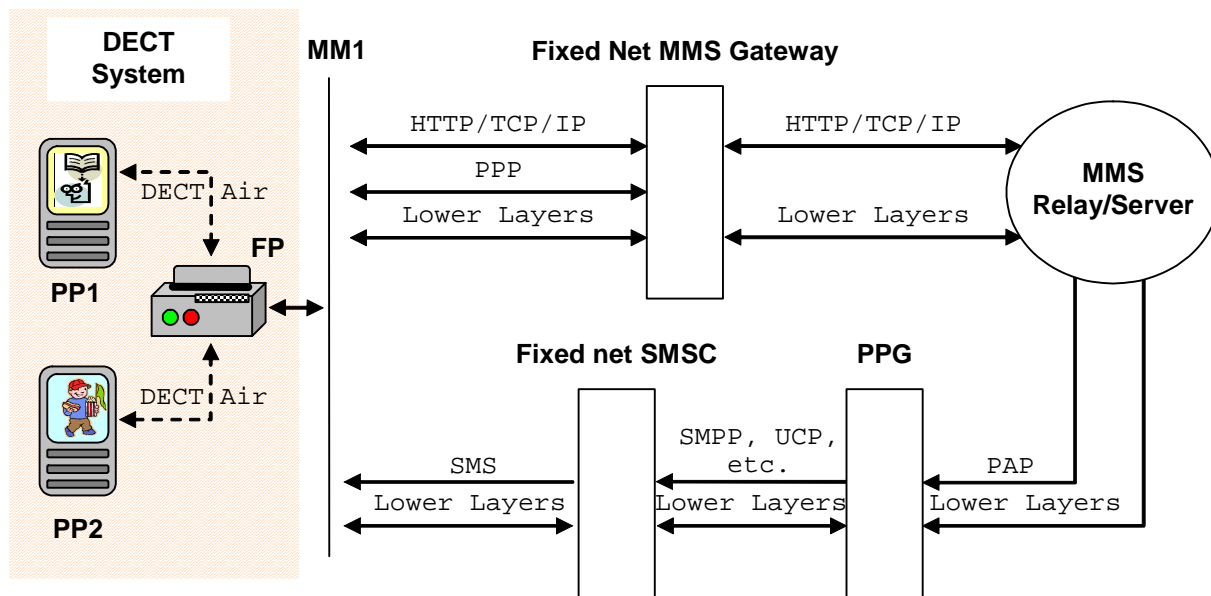
As specified in ES 202 314-4 [17] the interaction between a MMS User Agent (UA) Originator (MMUA-O), a MMS Relay/Server and a MMS UA Destination (MMUA-D) is carried out through a number of transactions and exchange of messages that, depending on the procedure, use for underlying transport carrier the Hypertext Transfer Protocol (HTTP) or the F-SMS protocols. A generalized transaction sequence of the procedures that may be involved in a MM delivery is provided on the figure 3.



**Figure 3: Generalized F-MMS transaction sequence**

## 6.2 DECT F-MMS reference architecture

In the case of a DECT phone capable of MMS the notion of a single fixed net phone is substituted for a system comprising a DECT FP and one or more DECT PPs where the FP is connected to the MM1 interface. This configuration is depicted into the figure 4.



**Figure 4: General DECT F-MMS MM1 interface reference model and transport protocol structure**

A DECT system is a distributed system in the sense that the provision of a particular service to the user, in most of the cases, involves two separate terminals. Consequently a DECT system can be designed in two basic configurations:

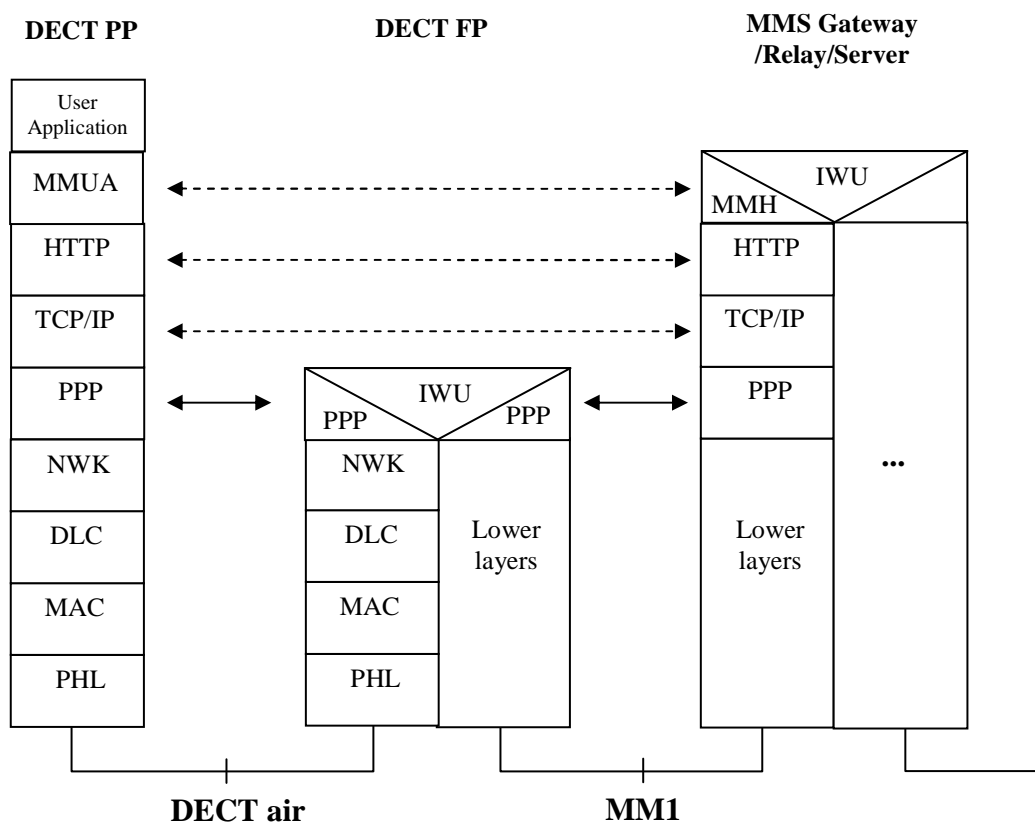
- Intermediate System (IS) configuration; where, all or part of the protocols on the MM1 interface are handled by the PT with the FT acting as a transparent transport.
- End System (ES) configuration; where, most of the protocols on the MM1 interface are handled by the FT and only one or very few higher layer protocols, or even extracted data from such protocols, is transported to the PT, i.e. need to be understood by the PT.

**NOTE 1:** It is possible that a F-MMS DECT system is designed in which the FP alone provides the MMS, including user interface, e.g. means for showing and constructing MMs. Such implementations are out of the scope of the present document.

Various F-MMS DECT IS can be implemented utilising the IP, PPP or V.24 interworking protocols conventions defined in DECT Packet Radio Service (DPRS), EN 301 649 [12]. The present document aims at specifying a F-MMS DECT ES configuration system. The present document does not specify requirements in regard to provision of MMS over streaming - such requirements are left for further study.

**NOTE 2:** Streaming here should be understood as the possibility to terminate all protocols in the FT and render the MMs to the PT upon user request in real time.

Figure 5 provides an example of a DECT F-MMS IS protocol configuration.



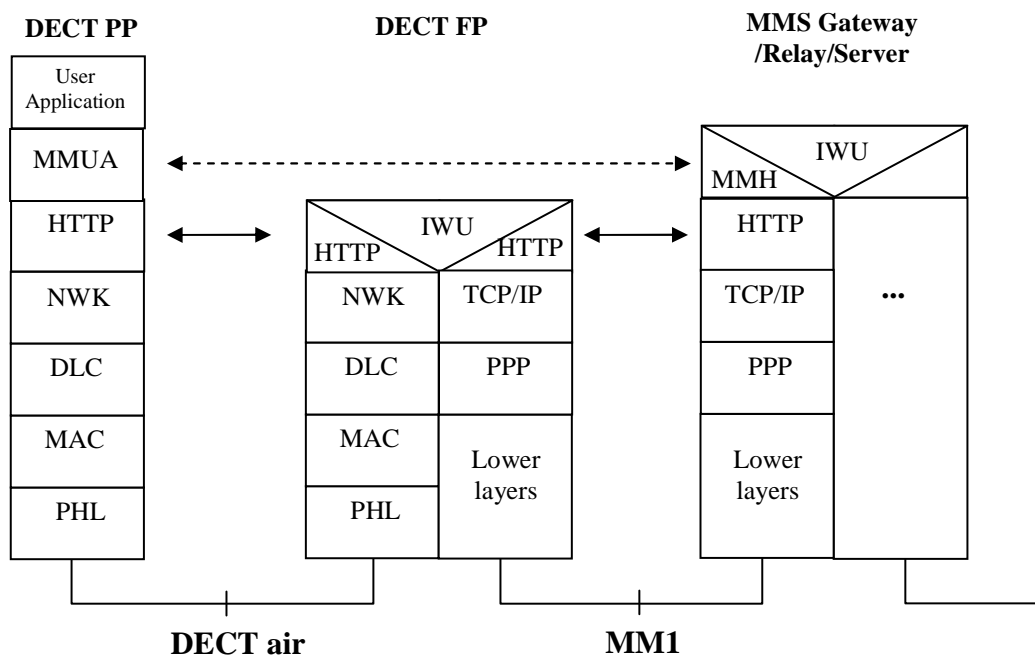
NOTE 1: For simplicity the protocol structure in regard to the F-SMSC (i.e. SMS handling on the MM1 interface) is not shown.

NOTE 2: The figure does not imply any assumptions on the protocol structure or the physical architecture in the accessed network. For simplicity the F-MMS Gateway and Relay/Server are shown as one entity and therefore the MMS protocol handling entity does not represent an actual entity and is simply called Multimedia Message Handler.

NOTE 3: The PP is shown as a single entity which comprises all protocols including the MMUA. Other implementations examples include a PP designed as a modem that can handle the PPP but all protocols above may be located in an external to the PP terminal, e.g. a PC or PDA.

**Figure 5: A DECT F-MMS IS protocol configuration (DPRS PPP Interworking)**

Figure 6 provides an example of a DECT F-MMS ES protocol configuration in which no MMS protocol knowledge is assumed in the FT.



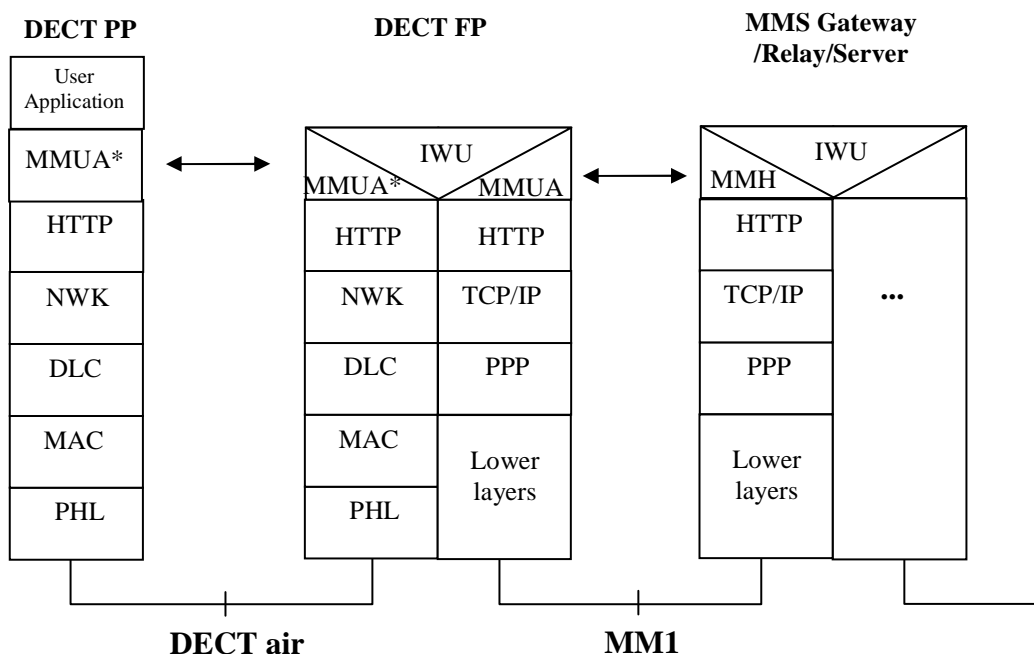
NOTE 1: For simplicity the protocol structure in regard to the F-SMSC (i.e. SMS handling on the MM1 interface) is not shown.

NOTE 2: The figure does not imply any assumptions on the protocol structure or the physical architecture in the accessed network. For simplicity the F-MMS Gateway and Relay/ Server are shown as one entity and therefore the MMS protocol handling entity does not represent an actual entity and is simply called Multimedia Message Handler.

**Figure 6: A DECT F-MMS ES protocol configuration**

Figure 7 provides an example of a Local Server DECT F-MMS ES protocol configuration in which the FT is designed as a MMS server (i.e. MMS protocol knowledge is assumed in the FT) where the MM can be stored and the PT can display them one by one. In such a configuration the construction of a MM can also be done remotely and the final result shown in the PT.

NOTE 3: Similar service is available today on some Internet sites where the user can choose from a number of pictures, sounds, text, video clips, etc. and construct an Internet greetings card, which can be reviewed before being sent out.



NOTE 1: For simplicity the protocol structure in regard to the F-SMSC (i.e. SMS handling on the MM1 interface) is not shown.

NOTE 2: The figure does not imply any assumptions on the protocol structure or the physical architecture in the accessed network. For simplicity the F-MMS Gateway and Relay/ Server are shown as one entity and therefore the MMS protocol handling entity does not represent an actual entity and is simply called Multimedia Message Handler.

NOTE 3: The MMUA\* depicts the implementation possibility the PT to provide a limited MMUA functionality.

**Figure 7: A local FT server DECT F-MMS ES protocol configuration**

The specification of Local Server DECT F-MMS ES is left for further study.

## 7 Feature definitions

For the purposes of the present document the following feature definitions apply. The procedures relevant to each feature are described in clauses 8 and 9.

**Submission of an MM:** DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT; transmit a MM from the PT to the FT utilising this bearer; and, submit the MM from the FT to a known F-MMS Gateway - Relay/Server together with sufficient addressing information for one or multiple called parties and optionally MM terminal equipment capabilities.

**MM notification:** DECT FT's ability to communicate with a fixed network SMSC, receive and understand a SMS message carrying notification from F-MMS Relay/Server referring to a MM received by the F-MMS Relay/Server and addressed to one of the FT users; DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT and transmit the notification from the FT to the PT utilising this bearer.

NOTE: A received MM notification should result in suitable indication provided to the User.

**MM retrieval:** DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT; request MM retrieval for a MM for which notification has been received from the PT to FT and from the FT to the F-MMS Gateway - Relay/Server; retrieve that referred message from the F-MMS Gateway - Relay/Server to the FT and transmit it over the DECT bearer to the PT together with information for the sender and optionally information regarding action the F-MMS Gateway - Relay/Server has taken in respect to MM terminal equipment capabilities.

NOTE: MM retrieval may be started explicitly upon user request or may be set by the user to be executed automatically upon receipt of MM notification.

**MM delivery report:** DECT FT's ability to communicate with a fixed network SMSC, receive and understand a SMS message carrying delivery report from F-MMS Relay/Server referring to a MM submitted by the FT and being delivered to its addressee; DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT and transmit the MM delivery report from the FT to the PT utilising this bearer.

NOTE: A received MM delivery report should result in suitable indication provided to the User.

**MM read report (MM receiving side):** DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT; DECT MM PT ability, after the user has read a received MM and, if the sender has requested a read report, to transmit a MM from the PT to the FT utilising this bearer; and, FT's ability to indicate the event to the F-MMS Relay/Server referring to the MM being read.

**MM read report (MM sending side):** DECT FT's ability to communicate with a fixed network SMSC, receive and understand a SMS message carrying MM read report from F-MMS Relay/Server referring to a MM submitted by the FT and being read by its addressee; DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT and transmit the MM delivery report from the FT to the PT utilising this bearer.

NOTE: A received MM read report should result in suitable indication provided to the User.

**MM forwarding:** DECT F-MMS system's ability to establish, maintain and release a suitable DECT bearer between a PT and a FT; request (from the PT to the FT and from the FT to the F-MMS Gateway - Relay/Server ) MM forwarding to a preferred address for a MM for which notification has been received.

**Service operation setting:** DECT F-MMS system's ability to set and exchange MM service operation relevant information, e.g. PT and FT terminals capabilities, service provider/network operator service provision settings, sub-addressing, etc.

**Interconnection with access networks:** DECT FT ability to establish suitable communication channels with the relevant fixed line access network for the provisioning of F-MMS utilising various communication protocols, e.g. PPP, IP/TCP/UDP, V.90, F-SMS, etc.

## 8 DECT protocol elements of procedures

This clause specifies DECT protocol procedures, messages and information elements that should be used for the provision of F-MMS by a DECT set comprising of a FT and at least one PT.

This specification does not prevent any PT or FT from implementing requirements not specified in this document. A PT or FT receiving an unsupported message or information element which it does not recognize shall ignore it as specified in EN 300 175 parts 3 [3] to 5 [5].

NOTE: The MM1 messages mentioned in the present document are abstract protocol messages according to the terminology used in 3GPP. More information about these abstract protocol messages and the PDUs they may represent can be found in various OMA documents. For the relevant documents consult ES 202 314-4 [17].

### 8.1 General

#### 8.1.1 DECT Transport

The F-MMS service protocol requirements as specified in ES 202 314-4 [17] divide the F-MMS protocol in two basic sets of procedures depending on the transport used for the F-MMS PDUs:

- 1) procedures utilising HTTP as transport;
- 2) procedures utilising the F-SMS as transport.

To satisfy the requirements of procedures' set 1) the current document provides:

- a) a MMS High Data Rate (MMS-HDR) solution based on transport mechanism specified in the EN 301 649 [12];
- b) a MMS Low data rate (MMS-LDR) solution based on transport mechanism specified in TS 102 342 [14].

All DECT terminals that claim compliance with the current document shall support either MMS-HDR or MMS-LDR or both transport mechanism(s). The indication of MMS transport mechanism option supported is defined by clause 8.8.1 "DECT Terminal capabilities indication" of this document.

To satisfy the requirements of procedures' set 2) the current document provides:

- a) a SMS C-plane (SMS-C) solution based on transport mechanism specified in the EN 300 757 [13];
- b) a SMS U-plane (SMS-U) solution specified in the current document.

All DECT terminals that claim compliance with the current document shall support either SMS-C or SMS-U or both solution(s). The indication of SMS transport mechanism option supported is defined by clause 8.8.1 "DECT Terminal capabilities indication" of this document.

## 8.1.2 Applications

PPs that comply to the current document shall provide the user with the capability to assemble a MM. The means for collecting different MM components, e.g. retrieval or direct drawing of a picture, retrieval or recording of audio or video, etc., and their presentation to the user are out of the scope of this document.

PPs that comply to the current document shall provide the user with the capability to view a MM.

To be able to assemble or/and view a MM, the PPs shall comply to the requirements as specified in TS 123 140 [20] and TS 126 140 [21].

## 8.2 MM submission

All FTs that comply to the requirements of the present document for the provision of F-MMS shall comply to the requirements specified in ES 202 314-4 [17] clauses 5.1 and 7.3 and the requirements specified in the current clause. All PTs shall comply to subset of ES 202 314-4 [17] as specified in the current clause.

### 8.2.1 MMS-HDR (MM submission)

If a PP wants to send a MM using the MMS-HDR option, it shall start a DPRS call as specified in EN 301 649 [12]. The PP shall use the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP and shall conform to all relevant requirements as specified in EN 301 649 [12].

Both PT and FT shall support the HTTP RFC 2616 [19] and HTTP messages shall be transported over the thus provided DPRS bearer. That is, the DPRS call shall provide transport mechanism between the two HTTP entities, one residing in the PT and the other in the FT.

The PT shall construct a MM1\_submit.REQ message and shall send it to the FT using the HTTP as defined in ES 202 314-4 [17]. The HTTP entity in FT is responsible to recognize the MM1\_submit.REQ message and submit it to the FT MMS-UA. When the FT MMS-UA receives the MM1\_submit.REQ it shall act as this message was constructed by the FT MMS-UA itself, shall establish a connection to the MMS Relay/Server as specified in ES 202 314-4 [17] and transmit the message to the MMS Relay/Server. The response from the MMS Relay/Server, i.e. the MM1\_submit.RES message shall be relayed by the FT to the PT and the DECT call should be released. Information that the message was successfully transmitted should be delivered to the User.



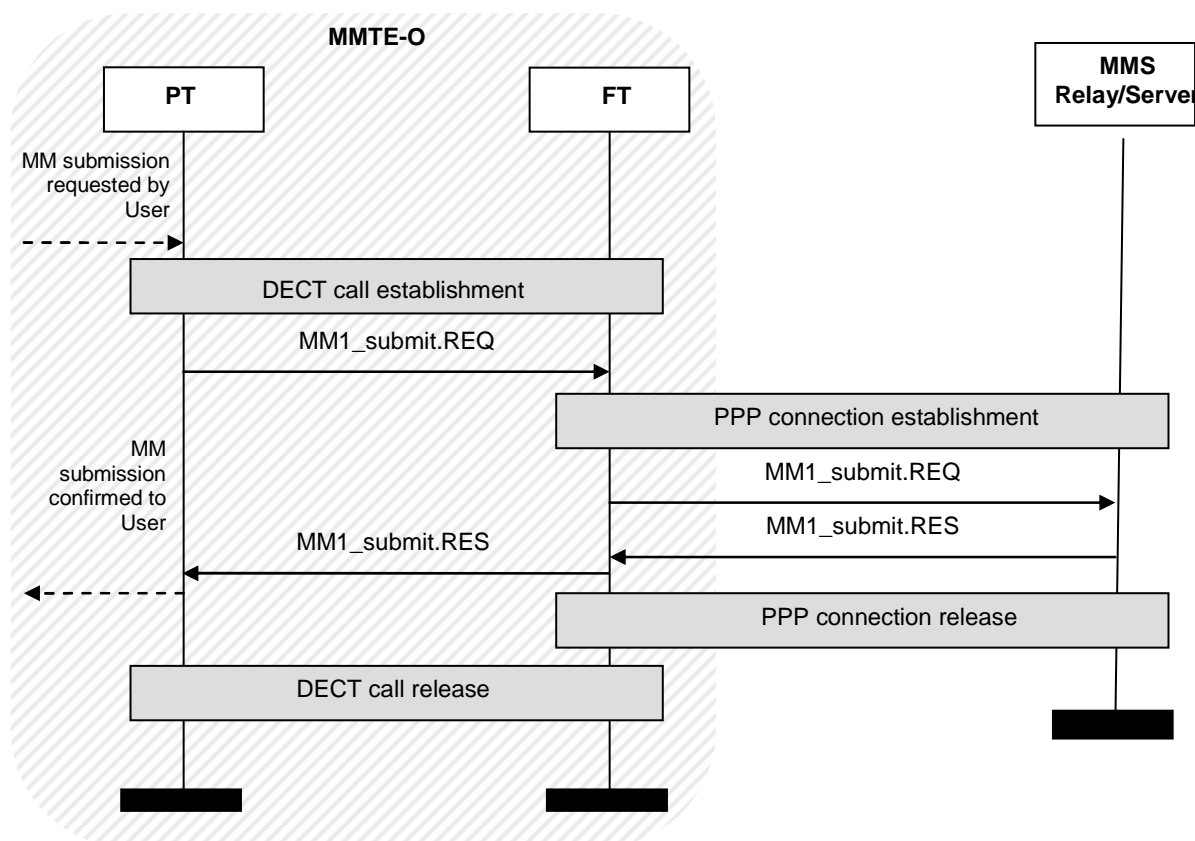


Figure 8: An example abstract message flow for successful MM submission

## 8.2.2 MMS-LDR (MM submission)

For the low data rate implementations all requirements relevant for the high data rate implementations shall apply with the exception that when the PP wants to send a MM it shall establish an ODAP call as specified in TS 102 342 [14].

## 8.3 MM notification

All FTs that comply to the requirements of the present document for the provision of F-MMS shall comply to the requirements specified in ES 202 314-4 [17] clauses 5.2.1 and 7.2 and the requirements specified in the current clause. All PTs shall comply to subset of ES 202 314-4 [17] as specified in the current clause.

### 8.3.1 SMS-C (MM notification)

Upon receipt of an SMS message that can be identified as carrying a MM1\_notification.REQ message the FT, which supports SMS-C option and if the PT supports the SMS-C option too, shall establish a DECT call and transmit the SMS message to the PT as specified in clause 7, Short Message Service (SMS), of EN 300 757 [13]. The PT shall inform the user about the received notification.

**NOTE:** The means for informing the user about the received notification and the presentation of the information to the user are out of the scope of the present document.

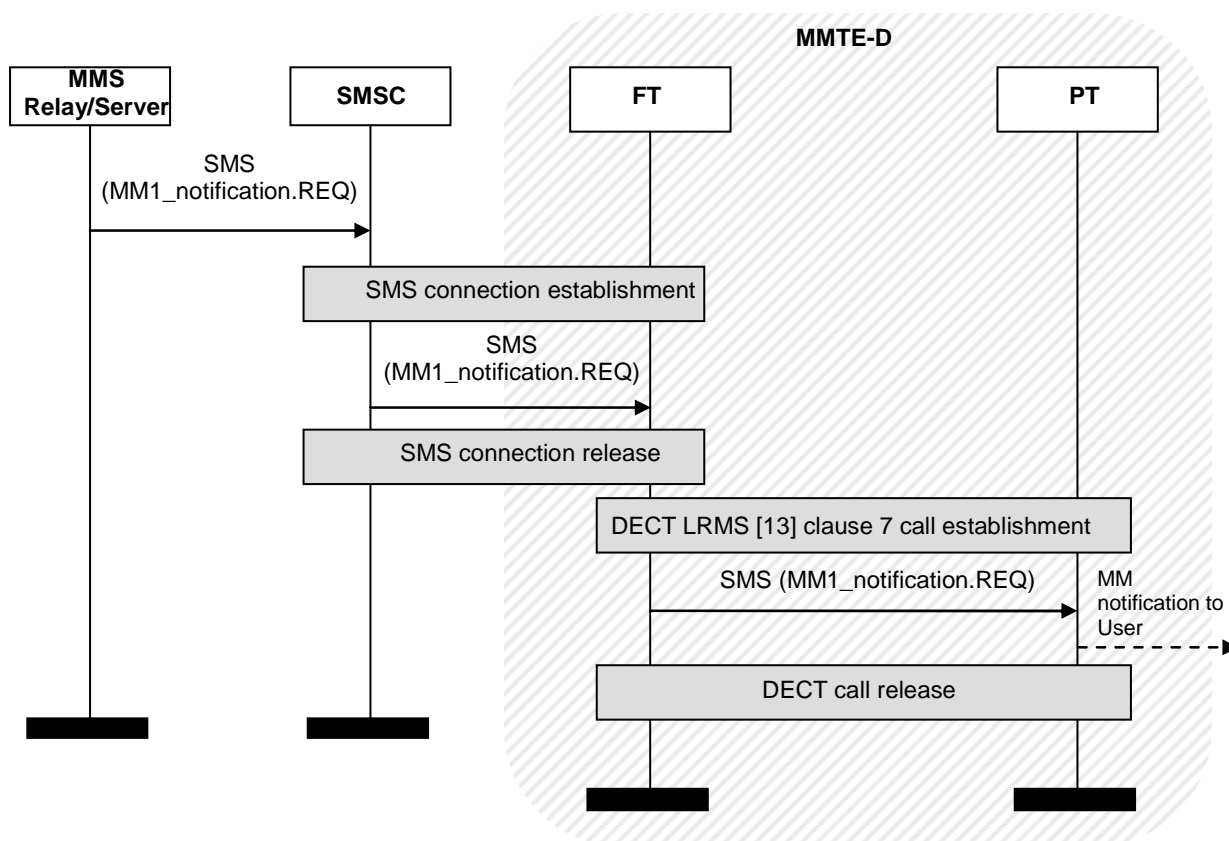


Figure 9: An example abstract message flow for MM notification C-Plane

### 8.3.2 SMS-U (MM notification)

Upon receipt of an SMS message that can be identified as carrying a MM1\_notification.REQ message the FT, which supports SMS-U option and if the PT supports the SMS-U option too, shall extract the MM-notification.REQ message and depending on the supported transport shall continue in one of the following ways:

- The FT shall establish a DPRS call as specified in EN 301 649 [12] utilising the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP. The MM1\_notification.REQ shall be attached to a HTTP PDU and transported to the PT. All relevant requirements as specified in EN 301 649 [12] shall be obeyed; for the HTTP utilisation the same requirements as in the case of the MM submission shall apply.
- The FT shall establish a ODAP call as specified in TS 102 342 [14]. The MM1\_notification.REQ shall be attached to a HTTP PDU and transported to the PT. All relevant requirements as specified in TS 102 342 [14]; for the HTTP utilisation the same requirements as in the case of the MM submission shall apply.

The PT shall inform the user about the received notification.

NOTE: The means for informing the user about the received notification and the presentation of the information to the user are out of the scope of the present document.

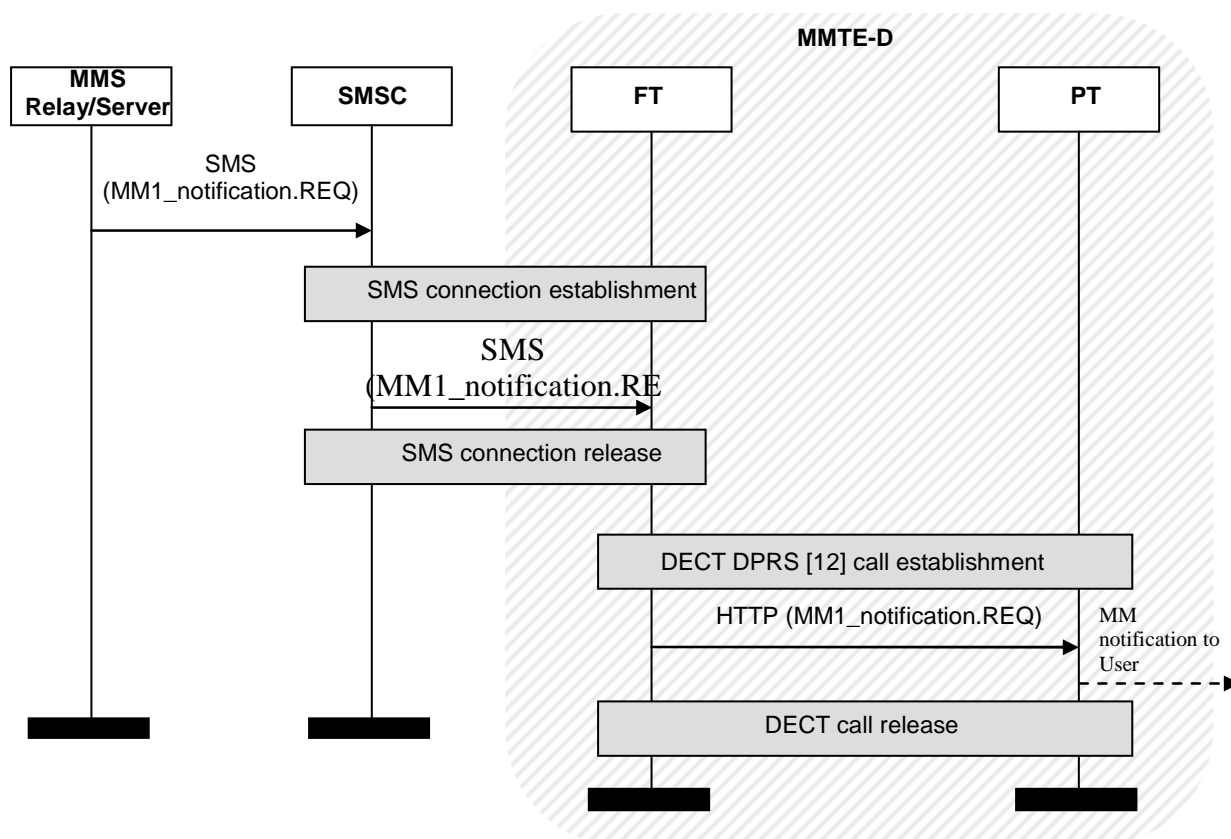


Figure 10: An example abstract message flow for MM notification U-plane

## 8.4 MM retrieval

All FTs that comply to the requirements of the present document for the provision of F-MMS shall comply to the requirements specified in ES 202 314-4 [17] clauses 5.2.2 and 7.3 and the requirements specified in the current clause. All PTs shall comply to subset of ES 202 314-4 [17] as specified in the current clause.

The MM retrieval procedure can be started by the PT without user intervention immediately after the MM1\_notification.REQ has been received (automatic retrieval, i.e. immediate retrieval); alternatively, the PT may await explicit request from the user to initiate the MM retrieval procedure (manual retrieval, i.e. deferred retrieval).

**NOTE:** An FT may be designed to act as a local server and start the MM retrieval procedure without awaiting request from the PT. On this case the PT initiated procedure will be local and will not have significance for the accessed network. Such FTs should implement message handling/storage policies similar to a MM Server especially in regard to delivery/read reports.

### 8.4.1 MMS-HDR (MM retrieval)

If a PP wants to retrieve a MM using the MMS-HDR option, it shall start a DPRS call as specified in EN 301 649 [12]. The PP shall use the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP and shall conform to all relevant requirements as specified in EN 301 649 [12].

Both PT and FT shall support the HTTP RFC 2616 [19] and HTTP messages shall be transported over the thus provided DPRS bearer. That is, the DPRS call shall provide transport mechanism between the two HTTP entities, one residing in the PT and the other in the FT.

The PT shall construct a MM1\_retrieve.REQ message and shall send it to the FT using the HTTP as defined in ES 202 314-4 [17]. The HTTP entity in FT is responsible to recognize the MM1\_retrieve.REQ message and submit it to the FT MMS-UA. When the FT MMS-UA receives the MM1\_retrieve.REQ it shall act as this message was constructed by the FT MMS-UA itself, shall establish a connection to the MMS Relay/Server as specified in ES 202 314-4 [17] and transmit the message to the MMS Relay/Server. The response from the MMS Relay/Server, i.e. the MM1\_retrieve.RES message shall be relayed by the FT to the PT and the DECT call should be released. Information that the message was successfully transmitted should be delivered to the User.

Depending on the type of retrieval used, e.g. deferred retrieval or immediate retrieval, prior to constructing and transmitting the MM1\_retrieve.REQ message the PT may have to construct and submit a MM1\_notification.RES message and after the MM has been retrieved the PT may have to construct and submit a MM1\_acknowledgement.REQ message.

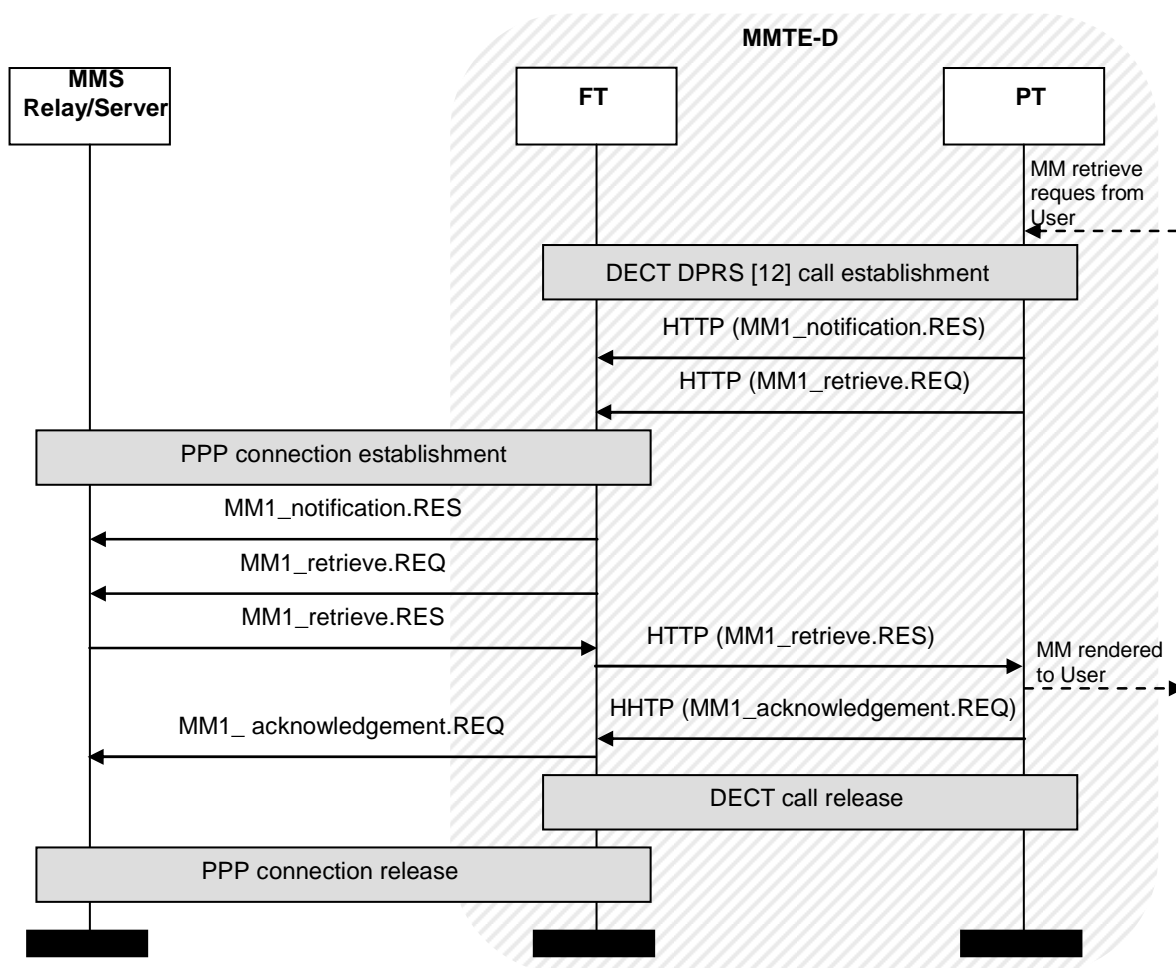


Figure 11: An example abstract message flow for MM retrieval U-plane

#### 8.4.2 MMS-LDR (MM retrieval)

For the low data rate implementations all requirements relevant for the high data rate implementations shall apply with the exception that when the PP wants to retrieve a MM it shall establish an ODAP call as specified in TS 102 342 [14].

### 8.5 MM delivery report

All FTs that comply to the requirements of the present document for the provision of F-MMS shall comply to the requirements specified in ES 202 314-4 [17] clauses 5.3.1 and 7.2 and the requirements specified in the current clause. All PTs shall comply to subset of ES 202 314-4 [17] as specified in the current clause.

### 8.5.1 SMS-C (MM delivery report)

Upon receipt of an SMS message that can be identified as carrying a MM1\_delivery\_report.REQ message the FT, which supports SMS-C option and if the PT supports the SMS-C option too, shall establish a DECT call and transmit the SMS message to the PT as specified in clause 7, Short Message Service (SMS), of EN 300 757 [13]. The PT shall inform the user about the received report.

NOTE: The means for informing the user about the received report and the presentation of the information to the user are out of the scope of the present document.

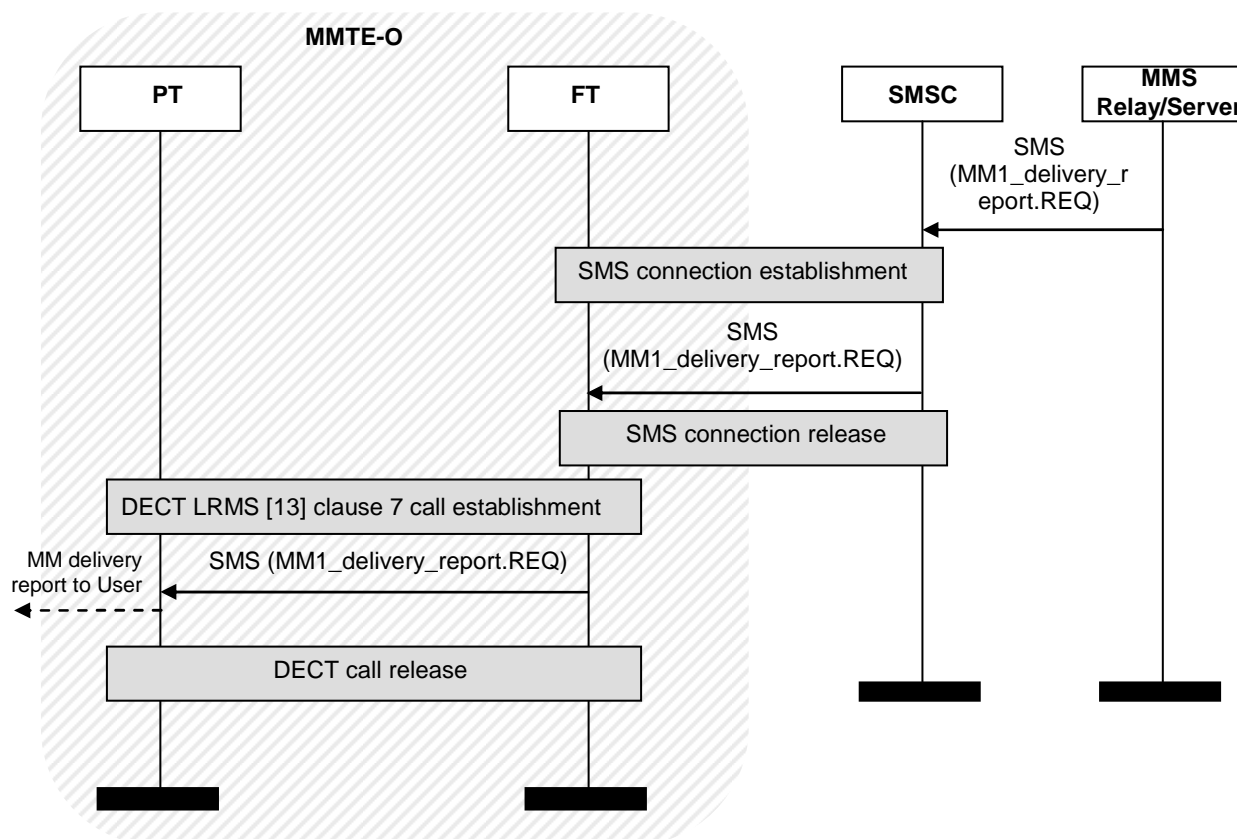


Figure 12: An example abstract message flow for MM delivery report C-Plane

### 8.5.2 SMS-U (MM delivery report)

Upon receipt of an SMS message that can be identified as carrying a MM1\_delivery\_report.REQ message the FT, which supports SMS-U option and if the PT supports the SMS-U option too, shall extract the MM-notification.REQ message and depending on the supported transport shall continue in one of the following ways:

- c) The FT shall establish a DPRS call as specified in EN 301 649 [12] utilising the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP. The MM1\_notification.REQ shall be attached to a HTTP PDU and transported to the PT. All relevant requirements as specified in EN 301 649 [12] shall be obeyed; for the HTTP utilisation the same requirements as in the case of the MM submission shall apply.
- d) The FT shall establish a ODAP call as specified in TS 102 342 [14]. The MM1\_notification.REQ shall be attached to a HTTP PDU and transported to the PT. All relevant requirements as specified in TS 102 342 [14]; for the HTTP utilisation the same requirements as in the case of the MM submission shall apply.

The PT shall inform the user about the received report.

NOTE: The means for informing the user about the received report and the presentation of the information to the user are out of the scope of the present document.

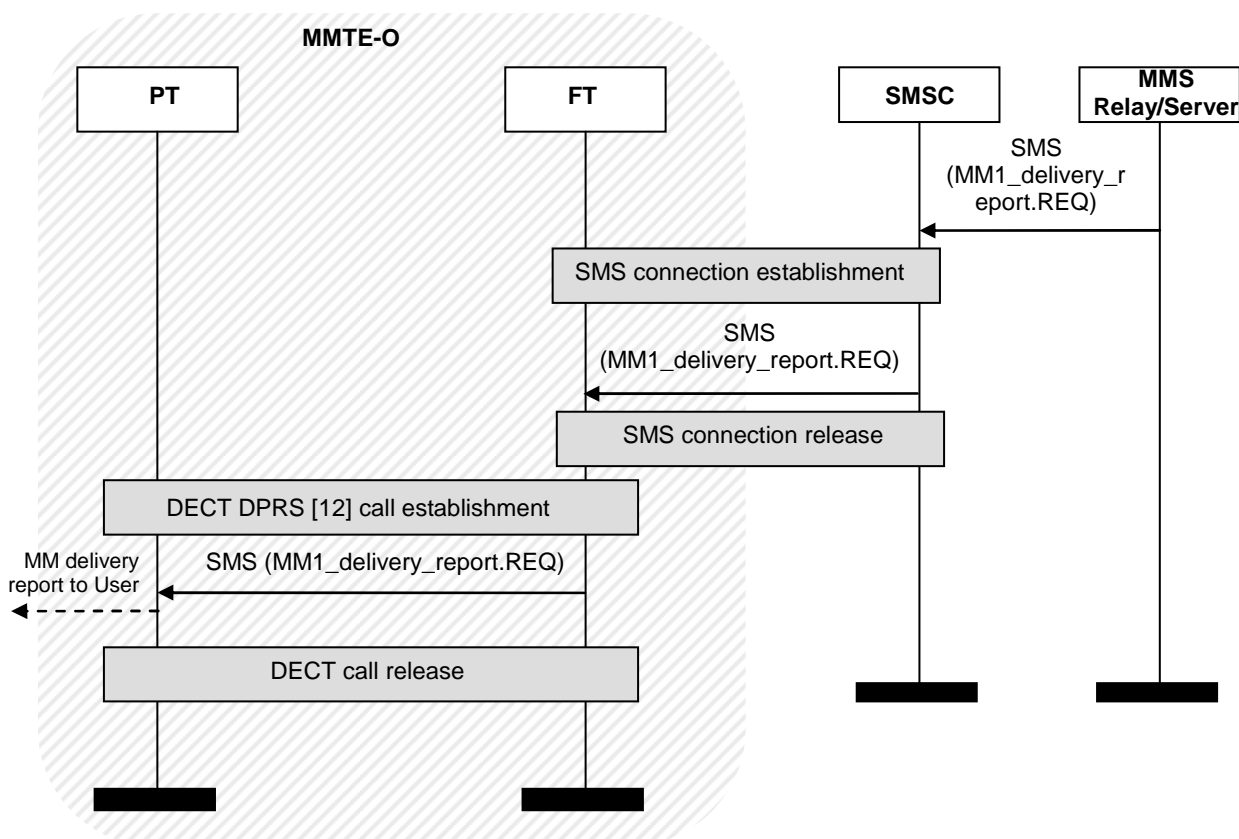


Figure 13: An example abstract message flow for MM delivery report U-Plane

## 8.6 MM read report

All FTs that comply to the requirements of the present document for the provision of F-MMS shall comply to the requirements specified in ES 202 314-4 [17] clauses 5.3.2 and 7.2 or 7.3 (whichever relevant) and the requirements specified in the current clause. All PTs shall comply to subset of ES 202 314-4 [17] as specified in the current clause.

The MM read report procedure consists of two transactions executed at different places and at different times. The first transaction (MM read report from MM destination) takes place at the MM destination site after the recipient of an MM reads the MM. As a consequence a report is sent from the MM destination to the MMS Relay Server. The second transaction (MM read report to MM originator) takes place at the MM originator site when the MMS Relay Server sends a report to the Originator of the MM via a SMSC that its MM was read.

**NOTE:** The procedure activation depends on events out of the procedure itself, e.g. if originator has requested a read report and if the destination has allowed a read report to be sent. Each of these actions may be determined by the terminals' capabilities, the service features or the users wish.

### 8.6.1 MM read report from MM destination

#### 8.6.1.1 MMS-HDR (MM read report from MM destination)

If a MM read report has been requested, and if it is supported by the recipient terminal and permitted by the user, after the recipient user reads the MM, the PP, which supports the MMS-HDR option, shall start a DPRS call as specified in EN 301 649 [12]. The PP shall use the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP and shall conform to all relevant requirements as specified in EN 301 649 [12].

Both PT and FT shall support the HTTP RFC 2616 [19] and HTTP messages shall be transported over the thus provided DPRS bearer. That is, the DPRS call shall provide transport mechanism between the two HTTP entities, one residing in the PT and the other in the FT.

The PT shall construct a MM1\_read\_reply\_recipient.REQ message and shall send it to the FT using the HTTP as defined in ES 202 314-4 [17]. The HTTP entity in FT is responsible to recognize the MM1\_read\_reply\_recipient.REQ message and submit it to the FT MMS-UA. When the FT MMS-UA receives the MM1\_read\_reply\_recipient.REQ it shall act as this message was constructed by the FT MMS-UA itself, shall establish a connection to the MMS Relay/Server as specified in ES 202 314-4 [17] and transmit the message to the MMS Relay/Server.

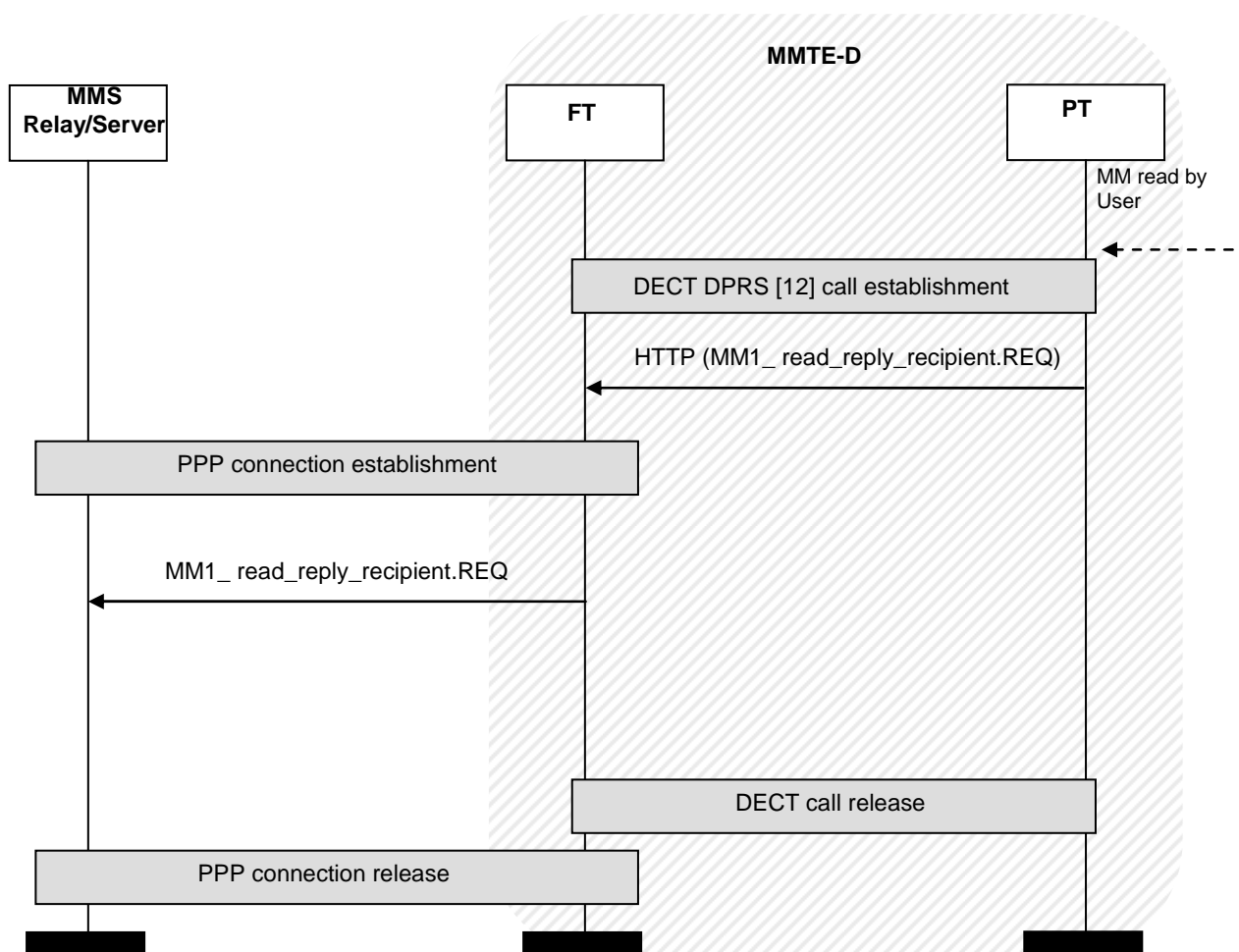


Figure 14: An example abstract message flow for MM read indication recipient side

### 8.6.1.2 MMS-LDR (MM read report from MM destination)

For the low data rate implementations all requirements relevant for the high data rate implementations shall apply with the exception that when the PP wants to send indication that a MM was read it shall establish an ODAP call as specified in TS 102 342 [14].

## 8.6.2 MM read report to MM originator

### 8.6.2.1 SMS-C (MM read report to MM originator)

Upon receipt of an SMS message that can be identified as carrying a MM1\_read\_reply\_originator.REQ message the FT, which supports SMS-C option and if the PT supports the SMS-C option too, shall establish a DECT call and transmit the SMS message to the PT as specified in clause 7, Short Message Service (SMS), of EN 300 757 [13]. The PT shall inform the user about the received report.

NOTE: The means for informing the user about the received report and the presentation of the information to the user are out of the scope of the present document.

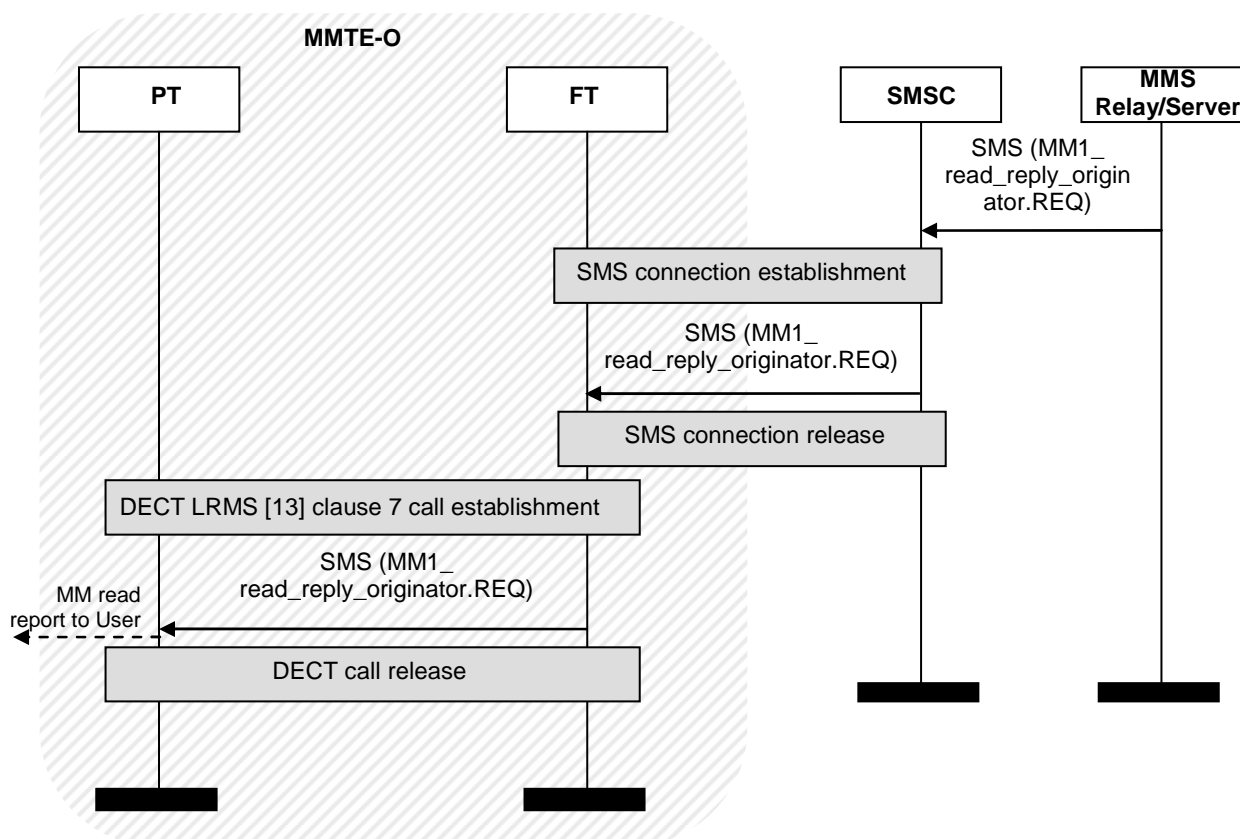


Figure 15: An example abstract message flow for MM delivery report C-Plane

### 8.6.2.2 SMS-U (MM read report to MM originator)

Upon receipt of an SMS message that can be identified as carrying a MM1\_read\_reply\_originator.REQ message the FT, which supports SMS-U option and if the PT supports the SMS-U option too, shall extract the MM1\_read\_reply\_originator.REQ message and depending on the supported transport shall continue in one of the following ways:

- e) The FT shall establish a DPRS call as specified in EN 301 649 [12] utilising the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP. The MM1\_read\_reply\_originator.REQ shall be attached to a HTTP PDU and transported to the PT. All relevant requirements as specified in EN 301 649 [12] shall be obeyed; for the HTTP utilisation the same requirements as in the case of the MM submission shall apply.
- f) The FT shall establish a ODAP call as specified in TS 102 342 [14]. The MM1\_read\_reply\_originator.REQ shall be attached to a HTTP PDU and transported to the PT. All relevant requirements as specified in TS 102 342 [14]; for the HTTP utilisation the same requirements as in the case of the MM submission shall apply.

The PT shall inform the user about the received report.

NOTE: The means for informing the user about the received report and the presentation of the information to the user are out of the scope of the present document.

## 8.7 MM forwarding

All FTs that comply to the requirements of the present document for the provision of F-MMS shall comply to the requirements specified in ES 202 314-4 [17] clauses 5.4 and 7.3 and the requirements specified in the current clause. All PTs shall comply to subset of ES 202 314-4 [17] as specified in the current clause.



The MM forwarding procedure consists of one transaction. After having received an MM Notification, the recipient (the user or the PP if it has been set by the user automatically to do so) can request that the MM is forwarded to other addressees without having first to retrieve the MM.

### 8.7.1 MMS-HDR (MM forwarding)

If a PP, which supports the MMS-HDR option, wants to forward a message to another address, after notification has been received and before the message has been retrieved, it shall start a DPRS call as specified in EN 301 649 [12]. The PP shall use the DPRS Frame Relay Service with the profile subtype DECT Generic Media Encapsulation and Application Communication Port HTTP and shall conform to all relevant requirements as specified in EN 301 649 [12].

Both PT and FT shall support the HTTP RFC 2616 [19] and HTTP messages shall be transported over the thus provided DPRS bearer. That is, the DPRS call shall provide transport mechanism between the two HTTP entities, one residing in the PT and the other in the FT.

The PT shall construct a MM1\_forward.REQ message and shall send it to the FT using the HTTP as defined in ES 202 314-4 [17]. The HTTP entity in FT is responsible to recognize the MM1\_forward.REQ message and submit it to the FT MMS-UA. When the FT MMS-UA receives the MM1\_forward.REQ it shall act as this message was constructed by the FT MMS-UA itself, shall establish a connection to the MMS Relay/Server as specified in ES 202 314-4 [17] and transmit the message to the MMS Relay/Server. The response from the to the MMS Relay/Server, i.e. the MM1\_forward.RES message shall be relayed by the FT to the PT and the DECT call should be released. Information that the procedure was successfully accomplished should be delivered to the User.

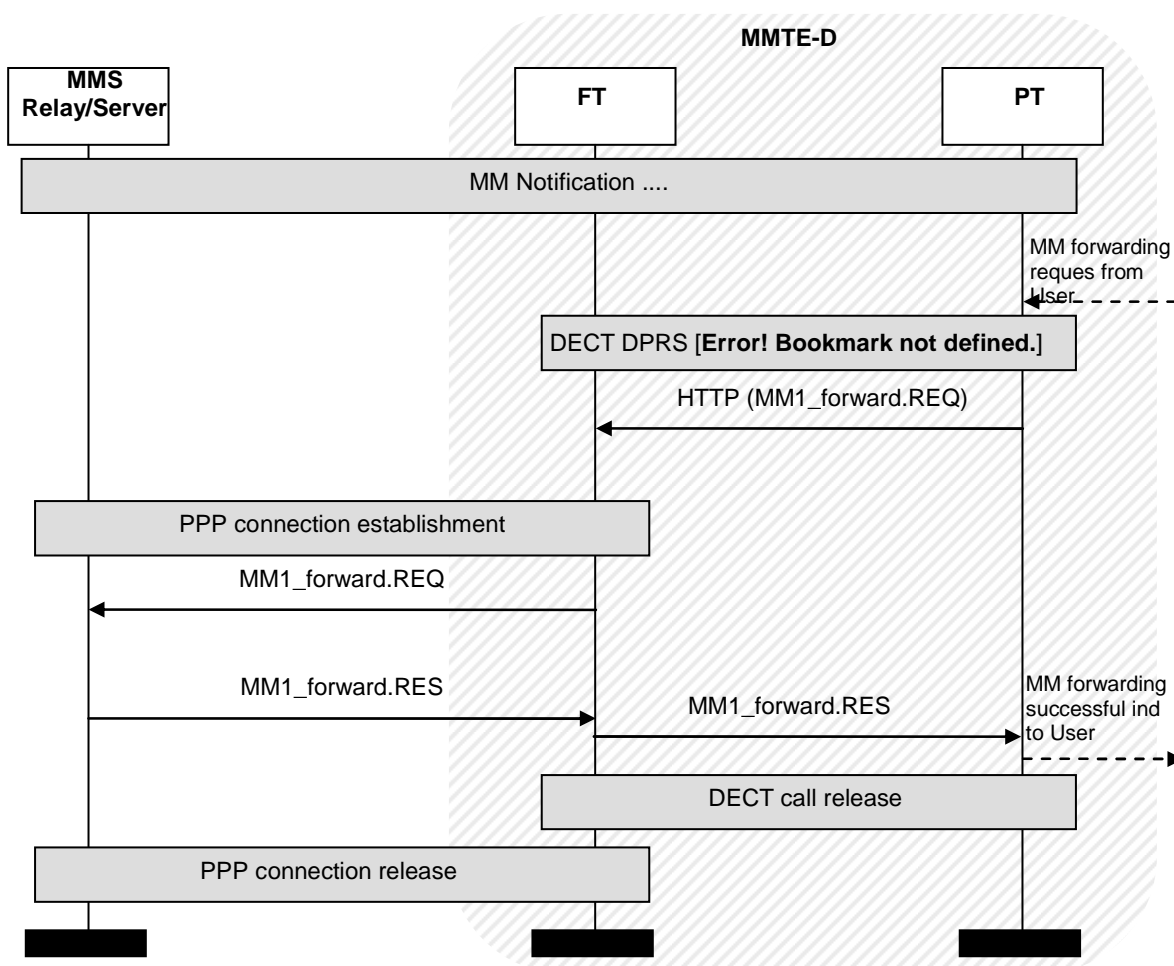


Figure 16: An example abstract message flow for successful MM forwarding

## 8.7.2 MMS-LDR (MM forwarding)

For the low data rate implementations all requirements relevant for the high data rate implementations shall apply with the exception that when the PP wants to request MM forwarding it shall establish an ODAP call as specified in TS 102 342 [14].

## 8.8 Service operation settings

### 8.8.1 DECT Terminal capabilities indication

The support of the F-MMS interworking profile described in this document shall be indicated by the FT by setting on the "F-MMS interworking profile supported" bit in the FT's Extended fixed part capabilities Qt message and by the PT by setting on the "F-MMS interworking profile supported" bit in the <<Profile/Application Indicator\_6>> field of the <<Terminal-capability>> information element during obtaining access rights and location registration procedures as specified in EN 300 444 [10].

In addition FTs and PTs shall indicate the exact mechanism used for transporting the F-MMS information on the DECT air interface, i.e. High Data Rate (HDR) or Low Data Rate (LDR), and, SMS C-plane (SMS-C) or SMS U-plane (SMS-U) respectively.

**Table 1: Values used in Extended FP capabilities (QH=4)**

Bit Nr.	Attribute	Value	Note
a25	F-MMS Interworking profile supported	1	Implies that F-MMS service is supported the exact mode of transport is indicated additionally.
a26	ODAP supported	All	a25 and a26 set imply that F-MMS service will be using the LDR option.
a27	Generic Media Encapsulation transport (DPRS) supported	All	a25 and a27 set imply that F-MMS service will be using the HDR option.
a43	LRMS	All	a25 and a43 set implies that F-MMS service will be using the SMS-C. If a43 is not set, the setting of bits a26 and a27 in conjunction with a25 being set will determine which of the SMS-U options will be used.

**Table 2: Values used within the <<TERMINAL CAPABILITY>> information element**

Information element	Field within the information element	Standard values within the field/information element	Normative action/comment
<<Terminal capability>>			Octets 1 and 2 set in accordance with in EN 300 175-5 [5] clause 7.7.41
	<ext 3>	1	No other octets from Octet group 3 included (see note 1)
	<Tone capability>	001	No tone capability
	<Display capability>	0001	No display
	<ext 4>	0	
	<Profile indicator_1>	xx1xxxx	Implies that F-MMS service is supported using the SMS-C. If this bit is not set, the setting of the relevant bits in <Profile indicator_5> and <Profile indicator_6> will determine which of the SMS-U options will be used. (see notes 2 and 4)
	<ext 4a>	0	
	<Profile indicator_2>	xxxxxxx	(See note 2)
	<ext 4b>	0	
	<Profile indicator_3>	xxxxxxx	(See note 2)
	<ext 4c>	0	
	<Profile indicator_4>	1xxxxxx	Generic Media Encapsulation transport (DPRS) supported. Implies that F-MMS service is supported using the HDR option. (see notes 2 and 4)

Information element	Field within the information element	Standard values within the field/information element	Normative action/comment
	<ext 4d>	0	
	<Profile indicator_5>	xxxxxxx	(See note 2)
	<ext 4e>	1	No other octets from Octet group 4 included
	<Profile indicator_6>	xxx11xx	Implies that F-MMS service is supported using the LDR option. (see notes 2 and 4)
		xxx1xxx	F-MMS Interworking profile supported (see notes 2 and 3)
	<ext 5>	1	
	<Control codes>	000	Not specified
	<ext 6>	0/1	
	<Blind Slot Indication>	All	As appropriate
	<SPx>	All	As appropriate
	<ext 6a>	1	Present if <ext 6> = 0
	<SPx>	All	As appropriate
NOTE 1: Implies that <Slot type capability> = Full slot.			
NOTE 2: Bits indicated with "x" shall be sent in accordance to the support provided by the terminal - these bits are not relevant to the F-MMS provision.			
NOTE 3: Implies that F-MMS service is supported the exact mode of transport is indicated additionally.			
NOTE 4: The setting of this bit has implication on the F-MMS service only if the <Profile indicator_6> has been set to indicate "F-MMS interworking profile supported".			

## 8.8.2 MMS Terminal capability negotiation

DECT FTs and PTs supporting F-MMS should support the MMS terminal capability negotiation procedure as specified in ES 202 314-4 [17], clauses 6 and 6.2.

DECT PTs should provide their terminal capabilities at least once and the DECT FT should store the information for future use. If PT does not provide its MMS terminal capability the FT should retrieve any stored locally information and use it in its communication with the MMSE. If information is not available the FT shall act as a MMTE which does not support terminal capability negotiation as specified in ES 202 314-4 [17], clauses 6.1.

NOTE: For PTs sold together with a FT manufacturers may choose to have the PT's MMS terminal capabilities pre-stored in the FT. The PT should still be able to send its MMS terminal capabilities or otherwise such PTs may not be able to support MMS terminal capability negotiation when used with FTs from other vendors.

If the MMSE provides back information on the MMS terminal capability, FT shall provide this information to the PT.

## 8.8.3 Configuration profile setting

For successful operation of the F-MMS a number of, per user, parameters need to be configured or values need to be provided.

The values may be made available to the FT via one specially designated PT, via any PT that supports the F-MMS or, through any suitable proprietary interface, e.g. over a wired connection to a PC. The former and the latter are left to manufacture of the FT to choose any suitable solution. It is assumed that DECT solutions are sold as a set that includes one FP and at least one PP from the same manufacturer.

For the provision of the possibility parameters to be provided via PPs from different vendors than those supplying the FP the DECT keypad protocol as defined in EN 300 175-5 [5], clause 10.2 should be supported. The FT should request a particular parameter by sending a <<Multi-display>> information element containing the parameter name and the value provided by the user in response shall be included in single <<Multi-keypad>> information element.

All DECT terminals that claim compliance with the current document shall support the parameters defined in ES 202 314-4 [17] clauses 8.2.3 and 8.2.4.

## 8.8.4 Service administration

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.

If SMS or MMS are used, DECT PT and FT should use the normal transport mechanism they use for the provision of SMS or MMS in regard to the standard F-MMS service procedures described in clause 9 of the current document.

## 8.8.5 Sub-addressing

The DECT multi-handset per base station capability allows for the provision of more than one MMTE connected in parallel to the same subscriber line. If this is to be supported the mechanism of MMS sub-addressing shall be provided. The sub-addressing may be used also to allow the use of personal MM mailboxes within the MMTEs. DECT terminals that provide sub-addressing shall comply with the requirements specified in ES 202 314-4 [17], clauses 8.1.

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# 9 Interconnection with access networks

This clause provides information and requirements in regard to the interconnection of the DECT system with the access network.

The ES 202 314-4 [17] provides requirements for interconnection to PSTN and ISDN networks. Future extensions to the F-MMS service may provide interconnection requirements to other networks, e.g. DSL.

## 9.1 General

DECT FTs that claim compliance with the current document shall comply with the requirements specified in ES 202 314-4 [17] clauses 7.3.3 and support PPP, IP, ICMP, TCP, UDP and HTTP protocols for the provision of transport mechanism for the F-MMS procedures using these protocols.

In addition, all FTs shall comply with the requirements specified in ES 202 314-4 [17] clauses 7.2 and support the fixed network Short Message Service protocol(s) for the provision of transport mechanism for the F-MMS procedures using these protocols.

## 9.2 PSTN access

DECT FTs that claim compliance with the current document and connected to the network via PSTN shall comply with the requirements specified in ES 202 314-4 [17], clause 8.2.2.1 and support at least one of the modem protocols V.32, V.32bis, V.34, V.90, V.92.

## 9.3 ISDN access

DECT FTs that claim compliance with the current document and connected to the network via ISDN shall comply with the requirements specified in ES 202 314-4 [17], clause 8.2.2.2 and support shall support the ISDN "unrestricted digital information" bearer.

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## History

<b>Document history</b>		
V1.1.1	February 2005	Publication