Presentation of Specification to TSG T

Presentation to:	**TSG T Meeting #25**
Document for presentation:	**TS 29.140, Version 1.0.0**
Presented for:	**Information**

Abstract of document:

This document contains a technical specification titled 'Multimedia Messaging Service (MMS); MM10 interface based on Diameter protocol; Stage 3' for the Release 6 Work Item "Support of private numbering schemes".

This document specifies the protocol implementation of the MM10 reference point based on Diameter.

Changes since last presentation to TSG T:

This is the first presentation of this document to TSG T

Outstanding Issues:

Further alignment with application requirements defined in 3G TS 23.140. Definition of application and protocol error handling.

The following namespace definitions are outstanding:

- Application ID by IANA

- Command Code and AVP values by 3GPP

Contentious Issues:

None.

References:

3GPP TS 29.140 V1.0.0 (2004-09)

Technical Specification

**3rd Generation Partnership Project;
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document defines the procedures and the transport protocol for use in the Multimedia Messaging Service (MMS) based on Diameter.

The present document is applicable to:

- The MM10 interface between an MMS Relay/Server and the MSCF.

Whenever it is possible this document specifies the requirements for this protocol by reference to specifications produced by the IETF within the scope of Diameter. Where this is not possible, extensions to Diameter are defined within this document.

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, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TS 23.140 "Multimedia Messaging Service (MMS); Functional description; Stage 2 (Release 6)"

[2]   3GPP TS 33.210 "3G Security; Network Domain Security; IP Network Layer Security (Release 6)"

[3]   IETF RFC 2960 "Stream Control Transmission Protocol"

[4]   IETF RFC 3588 "Diameter Base Protocol"

[5]   IETF RFC 2234 "Augmented BNF for syntax specifications"

[6]   Open Mobile Alliance; OMA-MMS-ENC-v1_2-20030915-C; Multimedia Messaging Service;
             Encapsulation Protocol, Version 1.2

[7]   3GPP TS 29.229 "Cx and Dx interfaces based on the Diameter protocol; Protocol details;
             (Release 6)"

[8]   3GPP TS 23.003 "Numbering, addressing and identification (Release 6)"

3   Definitions, symbols and abbreviations

3.1   Definitions

Refer to IETF RFC 3588 [4] for the definitions of some terms used in this document.

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

Messaging Service Control Function: Network element hosting network operator specific services enhancing the
capabilities of the MMS.

3.2   Abbreviations

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

AAA	Authentication, Authorization and Accounting
AS	Application Server
ABNF	Augmented Backus-Naur Form
AVP	Attribute-Value Pair
IANA	Internet Assigned Numbers Authority
IETF	Internet Engineering Task Force
MSCF	Messaging Service Control Function
NDS	Network Domain Security
RFC	Request For Comment
SCTP	Stream Control Transport Protocol
UCS	Universal Character Set
URL	Uniform Resource Locator
UTF	UCS Transformation Formats

4   Procedure Description

In the tables that describe the information elements transported by each command, each Information Element is marked
as (M) Mandatory, (C) Conditional or (O) Optional. A mandatory information element shall always be present. A
conditional information shall be present if certain conditions are fulfilled; if those conditions are not fulfilled it shall be
absent. An optional information element may be present or absent in the command, at the discretion of the application at
the sending entity.

The classification of information elements on application level is provided in 3GPP TS 23.140 [1]. The present
document provides the classification on protocol level, which may differ from the application requirements.

4.1. MM10 Interrogation Procedure

This procedure is used between the MMS Relay/Server and the MSCF. This procedure is invoked by the MMS Relay/Server and is used to request processing of addressing information related to a multimedia message (see 3GPP TS 23.140 [1]).

This procedure is mapped to the commands Message-Process-Request/Answer in the Diameter application specified in section xxx. Tables 4.1.1.1 detail the involved information elements.

4.1.1 Information Elements

Table 4.1.1.1: MM10 Interrogation Request

Information element name	Mapping to Diameter AVP	Cat.	Description
Message Type	Diameter Command Code	M	Identification of the MM10 message.
Trigger Event	Trigger-Event	M	Identification of the event leading to invocation of the MM10 interrogation
Served User Identity	Served-User-Identity	M	This information element contains the identification of the served user identity.
Served User IMSI	Served-User-IMSI	C	This information element contains the identity of the mobile subscriber (IMSI). This element shall be present if received via the access.
Initial Recipient Address	Initial-Recipient-Address	M	This information element contains the recipients of a multimedia message as requested by the sender. In case of multiple recipients multiple occurrences of this information element shall apply.
Originating Interface	Origination Interface	M	This information element identifies the interface the multimedia message has been received on.
Service Key	Service Key	C	This information element contains identification of the application on the MSCF. It shall be present if the MMS Relay/Server trigger configuration contains this information
Sender Address	Sender-Address	C	This information element contains the identity of the sender to be presented to the recipient. This information element shall be available if contained in the multimedia message.
Delivery Report	Delivery-Report	C	This information contains information about the users request for delivery reports. This information element shall be present if the request has been received in the multimedia message.
Read Reply	Read-Reply	C	This information contains information about the users request for rea reply reports. This information element shall be present if the request has been received in the multimedia message.
Sender Visibility	Sender-Visibility	C	This information element contains information about the users request to hide the own identity. This information element shall be present if the request has been received in the multimedia message.

Table 4.1.1: MM10 Interrogation Response

Information element name	Mapping to Diameter AVP	Cat.	Description
Message Type	Diameter Command Code	M	Identification of the MM10 message.
Result Code	Result-Code / Experimental-Result	M	This information request contains the result of the operation.
	Status	O	This information element contains message status information to notify the served user about the outcome of the message processing.
Result Address	Result-Recipient-Address	C	This information element contains the recipient address information resulting from the MSCF processing. This information element shall be available if a success result code is contained.
Delivery Report	Delivery-Report	O	This information element contains the delivery report request information resulting from the MSCF processing.
Sender Visibility	Sender-Visibility	O	This information element contains the sender visibility request information resulting from the MSCF processing.
Read Reply	Read-Reply	O	This information element contains the read reply request information resulting from the MSCF processing.
CDR Information	Billing-Information	O	This information element contains transparent billing data resulting from the MSCF processing.

4.1.2 Normal Operation

If the MMS Relay/Server sends MM10 interrogation request to the MSCF after it has detected that a multimedia message is subject to processing in the MSCF. The MM10 interrogation request contains the message data as received from the served user.

A MM10 interrogation response received from the MSCF may be composed as follows:

- If the MM10 interrogation response contains a DIAMETER_SUCCESS result code, then the MSCF has authorised the message request unconditionally. The MMS Relay/Server shall continue to process the multimedia message unmodified

- If the MM10 interrogation response contains a DIAMETER_LIMITED_SUCCESS result code, then the MSCF has requested some modifications to the message. The MMS Relay/Server shall continue message processing with the updated data received form the MSCF.

- If the MM10 interrogation contains a DIAMETER_AUTHORIZATION_REJECTED result code, then the message attempt is not authorised. The MMS Relay/Server shall reject the message request. If a status information is received from the MSCF, this shall be used to notify the sender about the outcome.

5 Use of the Diameter base protocol

The Diameter Base Protocol as specified in IETF RFC 3588 [4] shall apply except as modified by the defined support of the methods and the defined support of the commands and AVPs, result and event codes specified in clause 6 of this specification. Unless otherwise specified, the procedures (including error handling and unrecognised information handling) are unmodified.

5.1 Securing Diameter Messages

For secure transport of Diameter messages, see 3GPP TS 33.210 [2].

5.2 Accounting functionality

Accounting functionality (Accounting Session State Machine, related command codes and AVPs) is not used on the MM10 interface.

5.3 Use of sessions

Diameter sessions are implicitly terminated between the MMS Relay/Server and the MSCF. An implicitly terminated session is one for which the server does not maintain state information. The client does not need to send any re-authorization or session termination requests to the server.

The Diameter base protocol includes the Auth-Session-State AVP as the mechanism for the implementation of implicitly terminated sessions.

The client (server) shall include in its requests (responses) the Auth-Session-State AVP set to the value NO_STATE_MAINTAINED (1), as described in IETF RFC 3588 [6]. As a consequence, the server does not maintain any state information about this session and the client does not need to send any session termination request. Neither the Authorization-Lifetime AVP nor the Session-Timeout AVP shall be present in requests or responses.

5.4 Transport protocol

Diameter messages over the MM10 interface shall make use of SCTP IETF RFC 2960 [5] and shall utilise the new SCTP checksum method specified in RFC 3309 [10].

5.5 Routing considerations

This clause specifies the use of the Diameter routing AVPs Destination-Realm and Destination-Host.

The MMS Relay/Server shall derive the address/name of the MSCF for a certain user or use case from the MMS user profile or from the MMS Relay/Server configuration. The MMS Relay/Server shall present both the Destination-Realm and Destination-Host AVPs in the request. Consequently, the Destination-Host AVP is declared as mandatory in the ABNF for all requests initiated by the MMS Relay/Server.

Requests initiated by the MSCF towards MMS Relay/Server shall include both Destination-Host and Destination-Realm AVPs. The MSCF obtains the Destination-Host AVP to use in requests towards an MMS Relay/Server, from the Origin-Host AVP received in previous requests from the MMS Relay/Server. Consequently, the Destination-Host AVP is declared as mandatory in the ABNF for all requests initiated by the MSCF.

5.6 Advertising Application Support (needs revision)

The MMS Relay/Server and MSCF shall advertise support of the Diameter Multimedia Application by including the value of 3GPP (10415) in the Supported-Vendor-Id AVP of the Message-Process-Request and Message-Process-Answer commands, and by including the value of 3GPP (10415) in the Vendor-Id AVP and the value of the application identifier (see chapter 6) in the Auth-Application-Id AVP.

6 Diameter application for MM10 interface

This clause specifies a Diameter application that allows a Diameter client and a Diameter server:

- to indicate that a submission or delivery request for a multimedia message has been received. The Diameter client provides the message data and additional data qualifying the messaging event to the server.

- to request in result to continue the processing of the multimedia message with the original or modified information or to reject the multimedia message.

The MM10 interface protocol is defined as an IETF vendor specific Diameter application, where the vendor is 3GPP. The vendor identifier assigned by IANA to 3GPP (http://www.iana.org/assignments/enterprise-numbers) is 10415.

The Diameter application identifier assigned to the MM10 interface application is xxxxxx (allocated by IANA).

6.1 Command-Code values

This section defines Command-Code values for this Diameter application.

Every command is defined by means of the ABNF syntax (as defined in RFC 2234 [5]), according to the rules in IETF RFC 3588 [4]. Whenever the definition and use of an AVP is not specified in this document, what is stated in IETF RFC 3588 [4] or 3GPP TS 29.229 [6] shall apply.

The command codes for the MM10 interface application are taken from the range allocated by IANA in IETF RFC xxxx [7] as assigned in this specification. For these commands, the Application-ID field shall be set to xxxxxxx (application identifier of the MM10 interface application, allocated by IANA).

NOTE: Registration in IANA to be done; Once assigned, value will need to be added.

The following Command Codes are defined in this specification:

Table 6.1.1: Command-Code values

Command-Name	Abbreviation	Code	Section
Message-Process-Request	MPR	tbd	6.1.1
Message-Process-Answer	MPA	tbd	6.1.2

6.1.1 Message-Process-Request (MPR) Command

The Message-Process-Request (MPR) command, indicated by the Command-Code field set to TBD and the 'R' bit set in the Command Flags field, is sent by a Diameter client to a Diameter server in order to request the processing of a multimedia message.

Message Format

```
<Message-Process-Request> ::=    < Diameter Header: TBD, xxxxxxxx, REQ, PXY >
                                 < Session-Id >
                                 { Vendor-Specific-Application-Id }
                                 { Auth-Session-State }
                                 { Origin-Host }
                                 { Origin-Realm }
                                 { Destination-Host }
                                 { Destination-Realm }
                                 { Event-Timestamp }
                                 { Trigger-Event }
                                 { Served-User-Identity }
                                 [ Served-User-IMSI ]
                                 [ Sender-Address ]
                                 *[ Initial-Recipient-Address ]
                                 { Originating-Interface }
                                 [Service-Key]
                                 [ Delivery-Report ]
                                 [ Read-Reply ]
                                 [ Sender-Visibility ]
                                 *[ AVP ]
                                 *[ Proxy-Info ]
                                 *[ Route-Record ]
```

6.1.2 Message-Process-Answer (MPA) Command

The Message-Process-Answer (MPA) command, indicated by the Command-Code field set to TBD and the 'R' bit cleared in the Command Flags field, is sent by the Diameter server in response to the Message-Process-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in RFC 3588 [4].

Message Format

```
< User-Data-Answer > ::=        < Diameter Header: 306: 167772152 >
                                < Session-Id >
                                { Vendor-Specific-Application-Id }
                                [ Result-Code ]
                                [ Experimental-Result ]
                                { Auth-Session-State }
                                { Origin-Host }
                                { Origin-Realm }
                                [Status]
                                *[ Result-Recipient-Address ]
                                [ Delivery-Report ]
                                [ Read-Reply ]
                                [ Billing-Information
                                *[ AVP ]
                                *[ Proxy-Info ]
                                *[ Route-Record ]
```

6.2 Result-Code AVP values

This section defines new result code values that must be supported by all Diameter implementations that conform to this specification. When one of the result codes defined here is included in a response, it shall be inside an Experimental-Result AVP and Result-Code AVP shall be absent.

6.2.1 Success

Errors that fall within the Success category are used to inform a peer that a request has been successfully completed.

No errors within this category have been defined so far.

6.2.2 Permanent Failures

Errors that fall within the Permanent Failures category are used to inform the peer that the request failed, and should not be attempted again.

No errors within this category have been defined so far.

6.2.3 Transient Failures

Errors that fall within the transient failures category are those used to inform a peer that the request could not be satisfied at the time that it was received. The request may be able to be satisfied in the future.

No errors within this category have been defined so far.

6.3 AVPs

The following table describes the Diameter AVPs defined for the MM10 interface protocol, their AVP Code values, types, possible flag values and whether the AVP may or not be encrypted.

Table 6.3.1: Diameter MM10 Application AVPs

Attribute Name	AVP Code	Section defined	Value Type	AVP Flag rules				
				Must	May	Should not	Must not	May Encr.
Served-User-Identity	TBD	6.3.1	Grouped	M, V				N

MSISDN	101	6.3.2	OctetString	M, V				N
VASP-ID	TBD	6.3.3	UTF8String	M, V				N
VAS-ID	TBD	6.3.4	UTF8String	M, V				N
Trigger-Event	TBD	6.3.5	Enumerated	M, V				N
Served-User-IMSI	TBD	6.3.6	OctetString	M, V				N
Sender-Address	TBD	6.3.7	UTF8String	M, V				N
Initial-Recipient-Address	TBD	6.3.8	Grouped	M,V				N
Result-Recipient-Address	TBD	6.3.9	Grouped	M,V				N
Sequence-Number	TBD	6.3.10	Unsigned32	M, V				N
Recipient-Address	TBD	6.3.11	UTF8String	M, V				N
Routeing-Address	TBD	6.3.12	UTF8String	M, V				N
Originating-Interface	TBD	6.3.13	Enumerated	M, V				N
Delivery-Report	TBD	6.3.14	Enumerated	M, V				N
Read-Reply	TBD	6.3.15	Enumerated	M, V				N
Sender-Visibility	TBD	6.3.16	Enumerated	M, V				N
Service-Key	TBD	6.3.17	UTF8String	M, V				N
Billing-Information	TBD	6.3.18	UTF8String	M, V				N
Status	TBD	6.3.19	Grouped	M, V				N
Status-Code	TBD	6.3.20		M, V				N
Status-Text	TBD	6.3.21	UTF8String	M, V				N

NOTE 1: The AVP header bit denoted as 'M', indicates whether support of the AVP is required. The AVP header bit denoted as 'V', indicates whether the optional Vendor-ID field is present in the AVP header. For further details, see IETF RFC 3588.

6.3.1   Served-User-Identity AVP

The User-Identity AVP (AVP Code TBD) is of type Grouped. This AVP contains identity of the served subscriber for whom a messaging processing is requested.

AVP format

> User-Identity ::= <AVP header: TBD 10415>

>> [MSISDN]

>> [VASP-Code]

>> [VAS-Code]

>> *[AVP]

6.3.2 MSISDN AVP

The MSISDN AVP contains MSISDN. For is the definition of this AVP refer to 3GPP TS 29.329.

6.3.3 VASP-ID AVP

The VASP-ID AVP (AVP Code TBD) is of type UTF8String. This AVP contains the identification of a Value Added Service Provider.

6.3.4 VAS-ID AVP

The VAS-ID AVP (AVP Code TBD) is of type UTF8String. This AVP contains the identification of a Value Added Service.

6.3.5 Trigger-Event AVP

The Trigger-Event AVP (AVP code TBD) is of type Enumerated. It indicates the type of the event that triggered the Message-Process-Request.

MM1 Message Submission, Profile based (0)

MM1 Message Submission, Address based (1)

MM1 Message Delivery (2)

MM7 Message Submission, Profile based (3)

MM7 Message Submission, Address based (4)

6.3.6 Served-User-IMSI

The Served-User-IMSI AVP (AVP Code TBD) is of type OctetString. This AVP contains an IMSI as described in 3GPP TS 23.003 [8] encoded as a TBCD-string, i.e. digits from 0 through 9 are encoded 0000 to 1001; 1111 is used as a filler when there is an odd number of digits; bits 8 to 5 of octet n encode digit 2n; bits 4 to 1 of octet n encode digit 2(n-1)+1.

6.3.7 Sender-Address AVP

The Sender-Address AVP (AVP code TBD) is of type UTF8String. This AVP contains the identification of a multimedia message sender to be provided to the multimedia message recipient.

6.3.8 Initial-Recipient-Address AVP

The Initial-Recipient-Address AVP (AVP code TBD) is of type grouped. It contains recipient address information sent to the MSCF.

   Result-Recipient-Address ::= <AVP header: TBD 10415>

      [Sequence-Number]

      [Recipient-Address]

      *[AVP]

6.3.9 Result-Recipient-Address AVP

The Result-Recipient-Address AVP (AVP code TBD) is of type grouped. It contains recipient address information as returned from the MSCF.

   Result-Recipient-Address ::= <AVP header: TBD 10415>

      [Sequence-Number]

      [Recipient-Address]

[Routeing-Address]

[Sender-Address]

[Sender-Visibility]

*[AVP]

6.3.10　Sequence-Number AVP

The Sequence-Number AVP (AVP code TBD) is of type unsigned32. It contains the unique identification (counter) of a recipient address group.

6.3.911 Recipient-Address AVP

The Recipient-Address AVP (AVP code TBD) is of type UTF8String. It contains the Recipient address of a multimedia message. The UTF8String identifying the Recipient shall be represented according to the following ABNF definition:

Recipient-Address = {Sequence-Number} {recipient type} {recipient}

Recipient Type = ("To:" / "Cc:" / "Bcc:")

Recipient = address ; address is coded according to the MMS addressing model defined in [6].

6.3.12　Routeing-Address AVP

The Routeing-Address AVP (AVP code TBD) is of type UTF8String. It contains the Recipient address for routeing of a multimedia message. The UTF8String identifying the Recipient shall be represented according to the following ABNF definition:

Routeing-Address = [Recipient-Type] [Recipient]

Recipient-Type = ("To:" / "Cc:" / "Bcc:")

Recipient = (Address / MM4-Address)

Address; it is coded according to the MMS addressing model defined in [6].

MM4-Address; it is coded according to the MM4 address encoding model on SMTP protocol level defined in [1]

6.3.13　Originating-Interface AVP

The Originating-Interface-AVP (AVP code TBD) is of type Enumerated. It indicates the interface a multimedia Message has been received on.

MM1 (0)

MM3 (1)

MM4 (2)

MM7 (3)

6.3.14　Delivery-Report AVP

The Delivery-Report AVP (AVP code TBD) is of type enumerated. It indicates whether an delivery report is requested.

No Delivery Report Requested (0)

Delivery Report Requested (1)

If the Delivery-Report AVP is not present, then the default "No Delivery Report Requested" shall be assumed.

6.3.15   Read-Reply AVP

The Read-Reply AVP (AVP code TBD) is of type enumerated. It indicates whether a delivery report is requested.

No Read Reply Requested (0)

Read Reply Requested (1)

If the Read-Reply AVP is not present, then the default "No Read Reply Requested" shall be assumed.

6.3.16   Sender-Visibility AVP

The Sender-Visibility AVP (AVP code TBD) is of enumerated. It indicates whether the sender identification is requested to be hidden or not.

Sender Identification requested not to be hidden (0)

Sender Identification requested to be hidden (1)

If the Sender-Visibility AVP is not present, then the default "Sender Identification requested not to be hidden" shall be assumed.

6.3.17   Service-Key AVP

The Service-Key AVP (AVP code TBD) is of type UTF8String. It identifies an application of the target MSCF.

6.3.18   Billing-Information AVP

The Billing-Information AVP (AVP code TBD) is of type UTF8String. It contains transparent information to be forwarded to the billing system.

6.3.19   Status AVP

The Status AVP (AVP code TBD) is of type grouped. It contains message status information to allow notification of the served user..

Result-Recipient-Address ::= <AVP header: TBD 10415>

[Status-Code]

[Status-Text]

6.3.20   Status-Code AVP

The Status-Code AVP (AVP code TBD) is of type ???. If contains a response code to qualify the outcome of the message processing.

6.3.21   Status-Text AVP

The Status-Code AVP (AVP code TBD) is of type UTF8String. If contains a response status text to qualify the outcome of the message processing.

6.4   Use of namespaces

This clause contains the namespaces that have either been created in this specification, or the values assigned to existing namespaces managed by IANA.

6.4.1 AVP codes

This specification assigns the values TBD-TBD from the AVP Code namespace managed by 3GPP for its Diameter vendor-specific applications. See section 6.3 for the assignment of the namespace in this specification.

6.4.2 Experimental-Result-Code AVP values

6.4.3 Command Code values

6.4.4 Application-ID value

IANA has allocated the value xxxxxxx for the 3GPP MM10 interface application.

7 Special Requirements

7.1 Version Control

The same mechanisms specified in 3GPP TS 29.229 [6] apply to this specification.

Annex A (informative):
Change history

Date	TSG #	TSG Doc.	CR#	Rev	Subject/Comment	In	Out
08/09/2004	T#25	TP-040173	-	-	Presentation for information	1.0.0	1.0.0