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MMS Charging Principles Handbook

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High Level Document Summary:

[1] **Restricted – Confidential Information**

Status

CPWP Doc 008/02 was discussed at CPWP#3, 30 January, London.

CPWP Doc 008/02 Rev1 was circulated via e-mail to reflect the immediate agreements of CPWP#3.

CPWP Doc 008/02 Rev2 included comments received before CPWP#4.

CPWP Doc 008/02 Rev3 includes the results of CPWP#4, and in addition the following changes:

- the notion of square brackets (to surround items under discussion) and of "FFS" has been introduced at the end of the scope section;

- the *read-reply report* has been added to the list of transactions of MMS;

- a clarification has been made on MM Size classes in section 5.5, section between square brackets;

- a clarification paragraph has been added at the end of section 7.3.

At CPWP#5 it was decided to describe the identified technical measurement methods for charging in separate annexes, each annex to be drafted by the proponents of the method. This draft includes the changes for the MM Size class measurement method.

Update of 2 July produced by F. Hillebrand (T-Mobile).: "MM size" replaces "volume", update on standardisation, insertion of chapters 6.2 Charging principles, 6.3 MM size and CDRs, 6.4 Interworking Agreement AA.40, 6.5 Introduction of MMs interworking. The MMS Task Force has however identified the need for a comprehensive MMS handbook which covers all aspects. It is planned to produce such a document by the end of 2003.

Disclaimer

Depending upon the MMS Interworking traffic scenarios that the Parties intend to cover with the present Addendum and upon the jurisdiction under which the same Parties operate, different regulatory issues might arise. It is therefore strongly suggested that Operators involved in adopting the present Addendum obtain an internal corporate legal/regulatory check before signature.

Title:	**MMS Charging and Accounting Handbook**
Source:	F. Hillebrand (T-Mobile)
Date:	2 July 2003

Table of Contents

0 Definitions and Abbreviations

[to be completed]

0.1 Definitions

Collection charges	charges that the user has to pay
MMS Provider	A provider offering the Multimedia Messaging Service to users. In this document it is assumed that the MMS Provider acts at the same time as PMN Operator

0.2 Abbreviations

PMN	Public Mobile Network
MM	Multimedia Message

MMS Multimedia Messaging Service

1 Introduction

Multimedia Messaging Service (MMS) is one of the most important emerging services. It is rich of features including:

- multiple media in a single message;
- multiple recipients of a single message.

It works end-to-end between terminals with the following characteristics:

- the originator can generate and submit messages easily;
- the recipient is reached always: while the recipient is not reachable, the message is stored in the MMS Relay;
- the recipient can retrieve the messages, store and display them.

MMS is a robust service with high quality, low delay and low loss or corruption of messages.

The mature service will have a high number of communication partners.

MMS should be associated to SMS and build on the SMS success factors as much as possible and practical (“make SMS multimedia”).

2 Scope

This document gives a comprehensive overview on MMS.

3GPP defines MMS as an overlay service, which can be implemented, e.g.:

- together with a GSM or UMTS network
- standalone and interconnected to a GSM or UMTS network.

Whereas other implementations are not excluded, this document studies only the case where the MMS Provider and the GSM or UMTS PMN Operator is the same organisation. Also, due to its complexity, interaction with Mobile Number Portability is not yet considered.

The 3GPP Technical Specifications foresee support for streaming by MMS as an option for both the MMS User Agent and the MMS Relay/Server Function.

Charging and accounting aspects of streaming in MMS are at present not considered in this document.

The 3GPP Technical Specifications foresee support for reply-charging as an option for both the User Agent and the MMS Relay/Server, however the usage is (at present) restricted to the Home PMN. Hence, a study in BARG is not (yet) necessary.

The solution proposed consists of the following components:

(1) concept ***'Calling Party Pays'*** – section 4;

(2) concept ***'Integrated Service Pricing'*** – section 5;

(3) principles for ***interworking between MMS Providers*** – section 6;

(4) principles for ***International Roaming*** – section 7.

Principles listed in (3) and (4) are contained in BARG PRD BA.27 where inter-operator charging model is dealt with.

Concepts listed in (1) and (2) are charging options for retail charging implicitly derived from inter-operator charging model.

Annex A is a comprehensive presentation of MMS and its service aspects, functions, architecture and status in the 3GPP specification work.

Annex B analyses the technical needs to realize the MM Size Classes method for charging.

This document contains some issues that are for further study. These are identified by "FFS".

3 Subscription Aspects

The 3GPP Specifications do not foresee a specific subscription for MMS. Therefore, MMS can be used by every user who has a GSM or UMTS subscription. This may be an important condition for the broad introduction of MMS into the market.

However, it should of course be possible to 'bundle' the charging of a number of MMs (e.g., to include a number of free MM in the monthly rental).

4 Collection Charges Principle *'Calling Party Pays'*

4.1 Concept

It is anticipated that operators will charge the MM Originator only. The usage charge could cover all transactions related to the transmission of a message:

- submission;
- routing;
- notification;
- retrieval (including necessary functions as e.g. storage, conversion if applied);
- delivery report;
- read-reply report.

4.2 Reasons for applying CPP

Below some reasons are given for choosing CPP as a reasonable charging option:

- CPP is a simple and easily understandable charging scheme;
- CPP is successfully used in SMS;
- CPP does not deter the user from retrieving messages that have arrived in his or her MMS Relay/Server.

4.3 Multiple Addressees of one MM

An MM may have multiple addresses. This can also be covered by CPP, because an appropriate MM charge may be applied.

~~1.4~~4.4 Forwarding of MMS

A MM stored in the recipient MMS Relay/Server can be forwarded to one or even multiple addresses without retrieving by the recipient.

If CPP is applied, the forwarding of MMS can be handled as a new transaction.

~~1.5~~4.5 MMS originated in the Internet

Cases in which MM are sent towards the recipient operators by non GSM entities (E.g. ISP's) are not being considered within the charging principles as described in this document.

~~1.6~~4.6 Charging Options for Message Routing to another network

MM charges can be differentiated, whether the MM remains in the home network of the originator or is routed to another network.

~~1.7~~4.7 Roaming

Case 1: Roaming Originator:

The charges applied for MM sent in a roaming situation are a matter for the HPMN.

Case 2: Roaming Recipient:

- If CPP is applied, the notification transaction between the MMS Relay/Server 2 and the recipient (User Agent B) should be covered by the message charge paid by the originator. This should be applied, if the B-user is in his HPMN or in a VPMN.
- GSM users are familiar with the concept to pay for a 'Roaming Leg' for incoming calls. Therefore, the roaming recipient could be charged for retrieved messages while roaming.

4.8 Reverse Charging as an option

As an option, ***Reverse Charging*** could be foreseen for MMS in order to enable Content Provision. The following charging options exist as well as mixed forms.

~~1.1.1~~4.8.1 Content provision charged to the Recipient

Content Provision charged to the Recipient enabled by “Reverse Charging” should be possible as an option. See Figure 4.1:

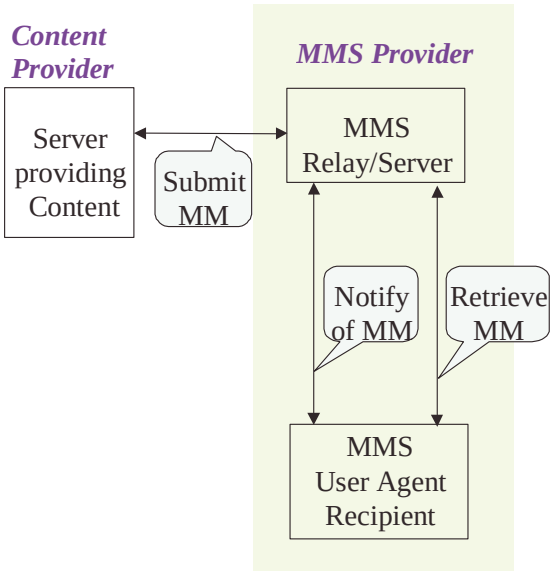

Figure 4.1: Content provision enabled by reverse charging (recipient pays)

A ***Content Provider*** provides, e.g., music, sport info, video clip:

- the Content Provider and MMS Provider conclude an agreement;
- the User orders information e.g. at fixed dates or events;
- the Content Provider sends MMs;
- the User is notified;
- the User retrieves MM
- the User is charged based on the agreements in the underlying contracts;
- The MMS Provider remunerates the Content Provider.

This case can be seen as the generalised principle '***Causing Party Pays***'.

4.8.2 Content provision paid by the Content Provider

The principle '*Calling Party Pays'* enables the option of content provision (with advertisement) paid by the Content Provider, see Figure 4.2:

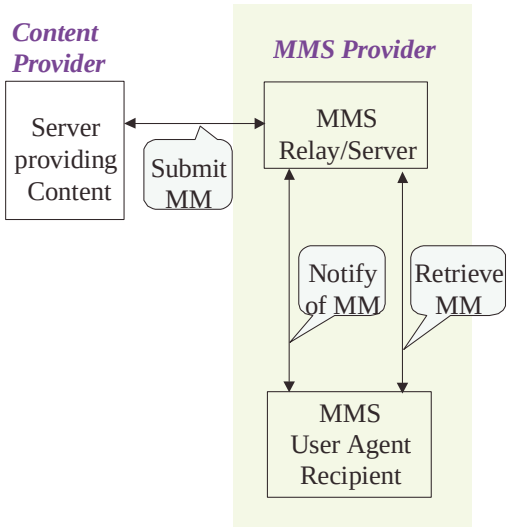

Figure 4.2: Content provision enabled by reverse charging (Content Provider pays)

- the Content Provider provides e.g. music, sport info, video clips with advertisements;
- Content Provider and MMS Provider conclude an agreement;
- the user agrees to receive this information e.g. at fixed dates or events;
- the Content Provider sends MMs;
- the User is notified;
- the User retrieves MM;
- All MM charges are levied to the Content Provider.

FFS: Is there a demand to standardise an Accounting Interface between Content Provider and MMS R/S?

4.9 Triggering events

The following events are to be registered at the network level:

- the successful submission at the originator MMS Relay/Server;
- the successful routing of the MM to the recipient MMS Relay/Server;
- [FFS: others?].

4.10 Conclusions on CPP

1. CPP for MMS can be implemented as for Voice and SMS.

2. The level of the collection charges is the sole responsibility of the Home Operator.

3. Technically, the Interworking principles should be harmonised with the user charging criteria for the sake of coherence. See sections 6 and 7.

5 Integrated service pricing for collection charges

Each operator defines his collection charges. The definition is out of the scope of this document. Technical prerequisites to allow definition of various collection charging methods are to be provided in order not to narrow down this tariff autonomy. This section analyses requirements on such technical prerequisites.

5.1 MM Size dependent charging

Service charging is a key success factor: The user should not care about technology (like the selection of the optimal bearer) but just about his message.

Integrated service charging is adequate, since MMS is a comprehensive end-to-end service and not just transmission.

Integrated service charging is a **key success factor in SMS.** It is anticipated that operators will be apply this principle in MMS as well.

The MMS **charging criteria** should only be related to the submission, routing and retrieving of the MM, since this leads to a simple charging method based on easily understandable criteria.

The many **bearer capabilities** should be seen as raw material, which the operator needs to produce the service. Their cost could be included in the service charge. The 'spurious' bearer and relay CDRs should not be charged to the end user directly.

The wide range of possible MM Size in each message may require a MM Size oriented message charge: The specified MIME container of the multimedia message is a very powerful and flexible MMS message format. This is used for all messages. The Call Data Records produced by the MMS Relay/Server provide comprehensive data for charging a message.

- Each message container can be filled by the user as he or she wishes:
    - all specified media/formats can be used;
    - any length is possible per media/format;

  - this may lead to a message MM Size from few Bytes to several Mega Bytes

- A fixed charge per message (like in SMS) may not be appropriate, since the MM Size per message varies in a very wide range.
- The multimedia objects in a message may not be reasonable charging criteria in their own right, since the MM Size per object may vary in a very wide range.

Conclusion: The total MM Size of a message can be used as a simple charging criterion.

5.2 Charging Transparency for users

Charging Transparency must be provided to the user.

- the user should be able, before submission, to calculate the MM Size of an MM as determined in the network.
- terminal and network should use the same principle to determine the MM Size of MM.

5.3 No Charging of MMS Bearer Capabilities to users

The MMS Bearer Capabilities used should not be charged directly to the end user: All bearer capabilities needed are raw products the operator needs for the production of MMS.

- GPRS and GSM CSD connections in the own network are produced by the operator himself.
- Internet connectivity is created under a separate agreement.
- International GPRS or GSM CSD bearers and SMS are provided in the framework of existing roaming agreements.

5.4 Technical prerequisites for Collection Charging

Service Pricing can be implemented as in SMS.

The level of the collection charges is the sole responsibility of the Originator MMS Provider and must not be discussed between competing operators.

The technical means to allow the tariff autonomy for competing operators must be given.

6 MMS Interworking between PMN Operators

6.1 General

Figure 6.1 shows the case where neither the Originator nor the Recipient is roaming (nationally or internationally). It will be shown in section 7 that the roaming case does not change the picture.

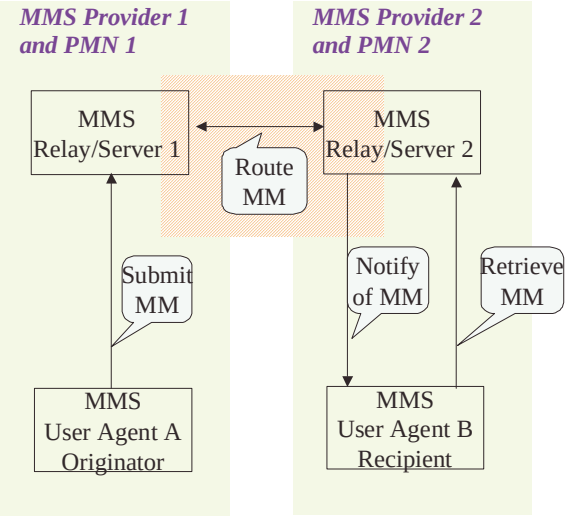

Figure 6.1: Interworking (no roaming)

The CPP principle means in this scenario:

- only the Originator pays user charges;
- MMS Provider 1 (at the same time PMN Operator 1) collects all user charges;
- MMS Provider 2 (at the same time PMN Operator 2) doesn't raise charges for the Recipient;
- MMS Provider 1 remunerates MMS Provider 2 for his services.

The Interworking agreement defines the duties of both parties, e.g. the responsibility of the B-Relay operator to notify the recipient whether he is roaming or not.

The B-Relay operator is remunerated for his efforts to complete the MM Service. This may cover in principle:

- use of the B-Relay;
- the notification including the response;
- the retrieval of the MM (including functions like storage)the delivery report if applicable.The criteria for interworking rates and collection charges are independent in principle, but coherence should be sought.

For Multimedia Messages with multiple addresses, separate charging for each recipient address should be possible. See section 6.3.

6.2 BARG Charging Principles (BA.27)

BARG agreed in February 2003 on the complete MMS Charging principles (BA.27 version 3.21.0). BARG describes inter-working as the functionality of two networks to talk to each other enabling services to be delivered across the two networks. For Mobile originated traffic, the visited network of the originator may charge the home network of the originator for the usage of the WAP bearer corresponding to the submission of the MM. For mobile terminated traffic, the visited network of the recipient may charge the home network of the recipient for the usage of the WAP bearer corresponding to the retrieval of the MM. Several charging models are described in BA.27 section 18.3.4 for MMS Interworking:

The charging criteria for MMS interworking are event and/or data volume. Interworking charges related to the data volume of an MM may depend on the data volume in a linear or non-linear (e.g. step charging) manner. This general charging principle caters for various pricing models. For example:

- Charging based purely on data volume
  x SDR per n Bytes
- Charging based on fixed volume classes on a per message basis e.g.
  x SDR CLASS A 0-15 KB
  y SDR CLASS B 15-30 KB
  z SDR CLASS C 30-100 KB
- Charging based on event charge plus a linear charge by data volume
  x SDR + y SDR per KB (on a per message basis) .

The recommended model for interworking between operators is:

w SDR CLASS A 0-3 kB

x SDR CLASS B 3-10 KB

y SDR CLASS C 10-30 KB

z SDR CLASS D 30-100 KB”

Interworking does not require the regular exchange of CDRs. Both operators measure the traffic. The terminating operator sends an invoice. The originating operator checks it. If there is no dispurte, then the invoice is paid.

6.3 MM Size and CDRs

When MMS was standardised initially for 3GPP R99 and R4 there was no consististent definition of the MM size in the 3GPP specifications. CPWP requested a consistent definition of the MM size which is meaningful to the user. Finally this was agreed in 3GPP: The size of the message is defined as the total length in octets of the subject information element and all media objects including the presentation object (SMIL). It is contained in 3GPP TSD 23.140 Version 5.5.0 or higher.

The first version of the CDR did not consider inter operator charging and had flaws for end user charging. Therefore a revised version was elaborated by 3GPP at request of BARG. It can be found in 3GPP TS 32.235 Version 5.1.0 or higher. Guidance for the selection of options is provided in BARG CPWP document 077/02 of CPWP meeting #7.

6.4 Interworking Agreement AA.40

The Interworking agreement is constructed after the model of the SMS interworking agreement as an extension of an existing roaming agreement. It is intended for use in international interworking. The Annex AA.40 contains all agreements relevant for MMS interworking between two operators. It defines the duties of the originating and terminating operator.

In order to enable a similar look and feel for MMS as for SMS where subscribers are able to send messages across network boundaries, it is crucial that MMS interworking is implemented as quickly as possible. Commercially this means that corresponding interworking agreements need to be signed.

The GSMA Association is trying to facilitate MMS inter operability in general (and the implementation of MMS interworking specifically) by promoting that operators sign an MMS MoU worked out by the MMS task force:

The MMS MoU is a voluntary agreement between operators to accelerate the acceptance of MMS. It contains milestones which are defined by an extension of the network and terminal functions and other milestones which contain commitments to roll-out roaming for MMS and national as well as international interworking. It was approved by the GSMA Board in June 2003. Operators are invited to sign it in due course. The latest version can be found at the Infocentre under the MMS Task Force as document MMS TF 043/03Rev6.

6.5 Introduction of MMS Interworking

In order not to delay an early start of MMS a two phases approach should be possible:

- initial phase: pragmatic measures agreed between operators, e.g. traffic measurement;
- final phase: subject to discussion but possibly based on the refined 3GPP CDRs.

7 International roaming

In this section, the consequences on payment flows are examined in the case where the originator and/or the recipient are roaming.

~~1.1~~7.1 MMS Roaming Case 1: Originator in another MMS Provider's MMSE

Note that in Figure 7.1, it is irrelevant whether PMN operators 3 and 4 provide MMS. As stated in section 2 (scope), it is assumed that both MMS Provider 1 and 2 are PMN operators.

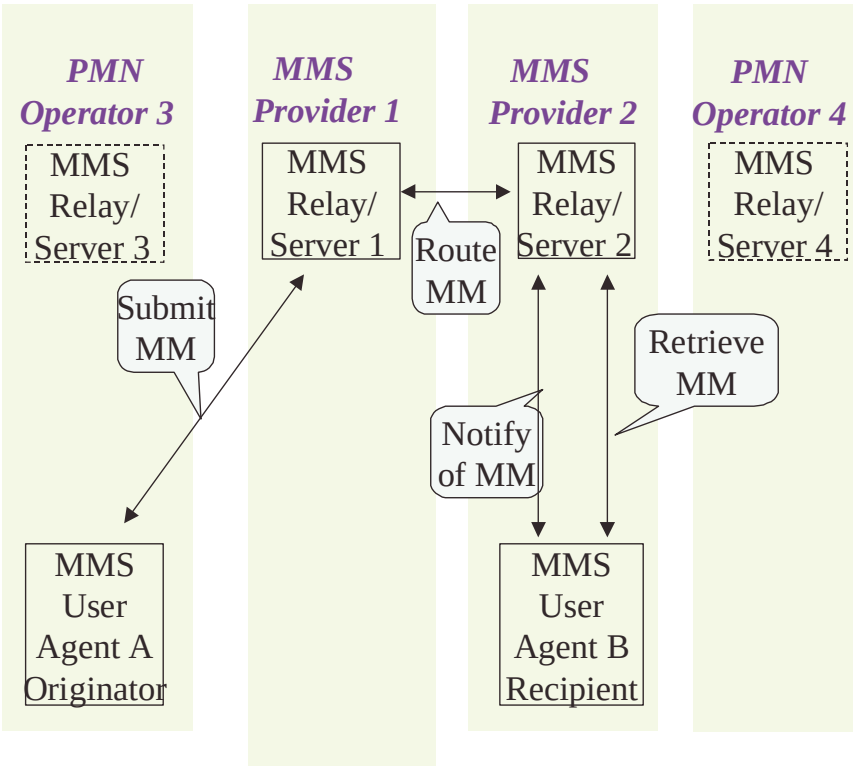

Figure 7.1: Originator of MMS is roaming

CPP means in this scenario:

- User A pays all MM charges to the MMS Provider 1.
- PMN Operator 3 levies the cost for the bearer between PMN 3 and MMSE 1 to the MMS Provider 1.
- MMS Provider 1 may levy the bearer as a part of the MM charge.

7.2 MMS Roaming Case 2: Recipient in another MMS Provider's MMSE

See Figure 7.2:

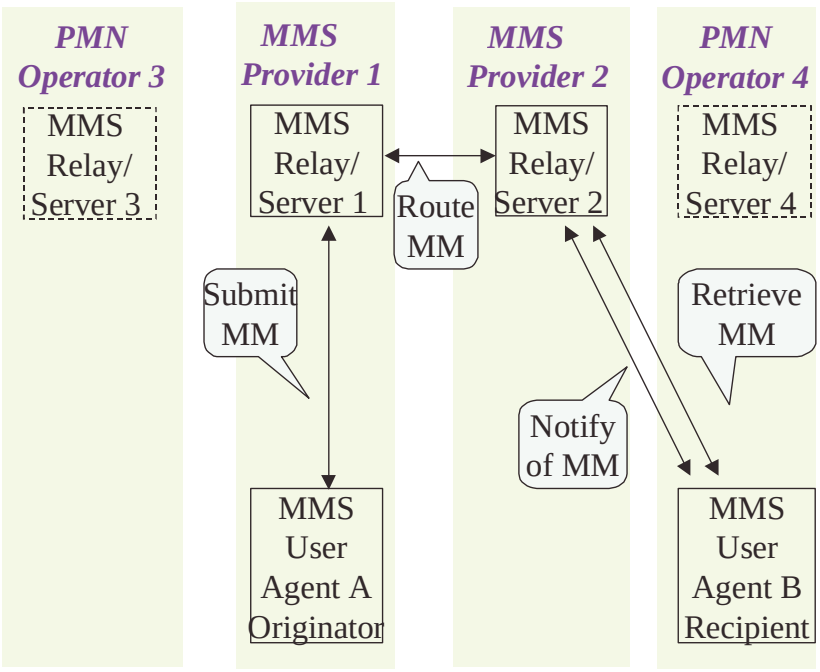

Figure 7.2: Recipient is roaming

CPP means in this scenario:

- User B causes the 'roaming leg' and may be charged for retrieval only by MMS Provider 2.
- PMN Operator 4 levies the cost for his bearer services to the MMS Provider 2.
- MMS Provider 2 levies a message related service charge to the user in order to be consistent with the integrated service pricing.

7.3 Conclusion on the roaming case

In both roaming cases (MM Originator or MM Recipient roaming) the visited network cannot identify the traffic as MMS traffic.

MMS International Roaming is not visible to the visited Networks:

- Prerequisites of MMS are functioning GSM roaming for CSD, GPRS and SMS.
- The visited networks see just normal GSM bearer usage.
- All MM user charges (originating of a message or 'roaming leg') can be collected directly by the home operator from their subscribers.

This means that the subscribers of an Operator can use MMS in all visited networks, where for the bearer capability used (e.g. GPRS) a roaming agreement is operational. The visited network need not have a MMS Relay/Server. Subscribers can submit MMs, can receive notifications and can retrieve MMs.

Annex A: MMS Tutorial

A.1 Status of standardisation

The MMS Standard is defined in 3GPP (complemented by the WAP Forum Specifications Client User Agent specification and Encapsulation Protocol).MMS is defined in 3GPP Release 99, frozen[2] in mid 2000.

MMS is further elaborated:

- in Release 4, frozen in 2001;
- in Release 5, frozen in 2002.
- In Release 6, freezing planned for early 2004

Since the standards in 3GPP leave too many options a MMS Conformance Document version 2.0 was elaborated by the MMS IOP Forum (now OMA MAG MMSG). 'This defines a basic image service with messages up to 30 kB. This is part of the OMA MMS Enabler Release 1.2, which contains also the former WAP Forum Specifications Client User Agent Transactions and Encapsulation Protocol.

OMA has developed and approved in principle in the meeting 9 – 13 June 2003 a MMS Enabler Release 1.2. This contains a new version of the MMS Conformance Document. It improves the interoperability and introduces a MM core content domain with MM content classes (text, image basic, image rich, video basic and video rich as well as content adaptation to bridge between the two image classes respective video classes).

Some operators start with Release 99 and terminals according to Release 99 will be in the market. However, most operators will probably start with Release 4 and MMS Conformance Document Version 2.0, since this is sufficiently complete.

Reference for this Annex is Release 4 and MMS Enabler Release 1.1.

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[2] In *frozen Releases* only error correction is possible, no introduction of new functions is allowed.

A.2 Multimedia Message Formats

A Multimedia Message contains one or several elements with one or more media in a MIME container (Multipurpose Internet Mail Extensions). It is generated by the Originator User Agent and transferred to the Recipient User Agent. The minimum set of formats supported in MMS Relay/Servers is shown in Table A1:

Contents type	***presented as***
text	Unicode
speech	AMR
still image	JPEG
video	H.263
dynamic media	MPEG

Table A.1: Supported formats

A.3 MMS Basic Transactions

In this presentation it is assumed that the MMS Provider operates an associated PMN. The message flow follows the 3GPP Technical Specifications.

(1) The User Agent submits the Multimedia Message (MM) to the *MMS Relay/Server* of its MMS Provider.

(2) The MM is routed to the MMS Server/Relay of the Recipients MMS Provider.

(3) The Recipient's User Agent is notified of the MM.

(4) The Recipient's User Agent retrieves the MM.

Cf. Figure A1:

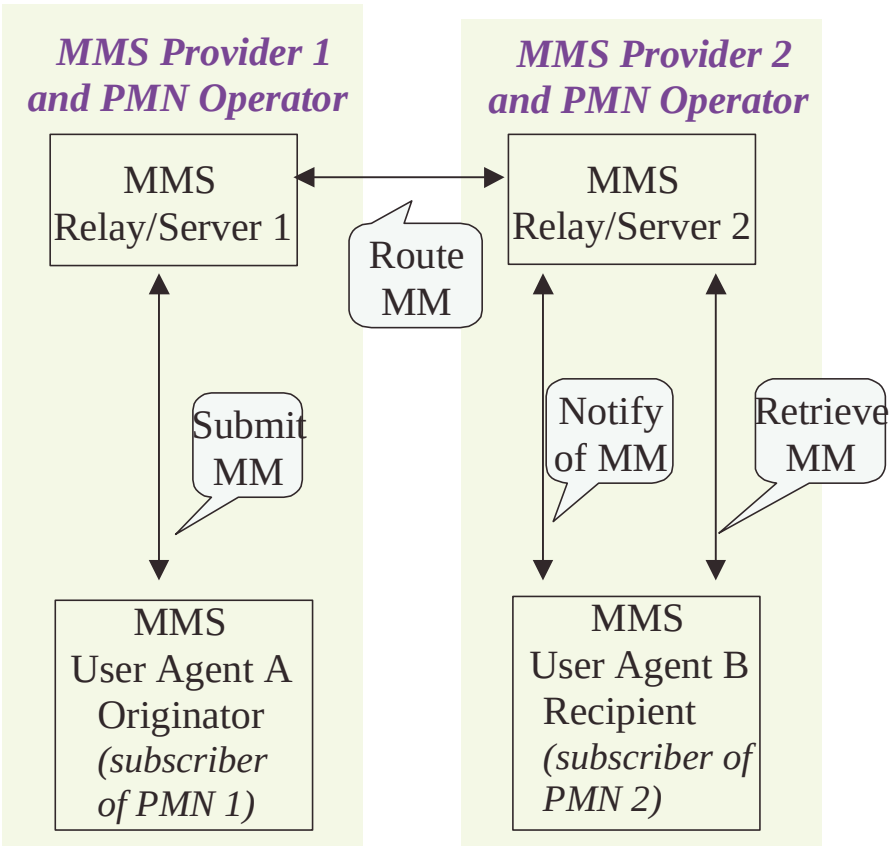


Figure A1: MMS information flow, no roaming

MMS Roaming Case 1: Originator roaming in another PMN:

The Originator (User Agent A) roaming into another PMN submits the MM to his home MMS Relay/server

The visited MMS Provider provides just a Bearer Capability, which transports the MM and control messages transparently. See Figure A.2:

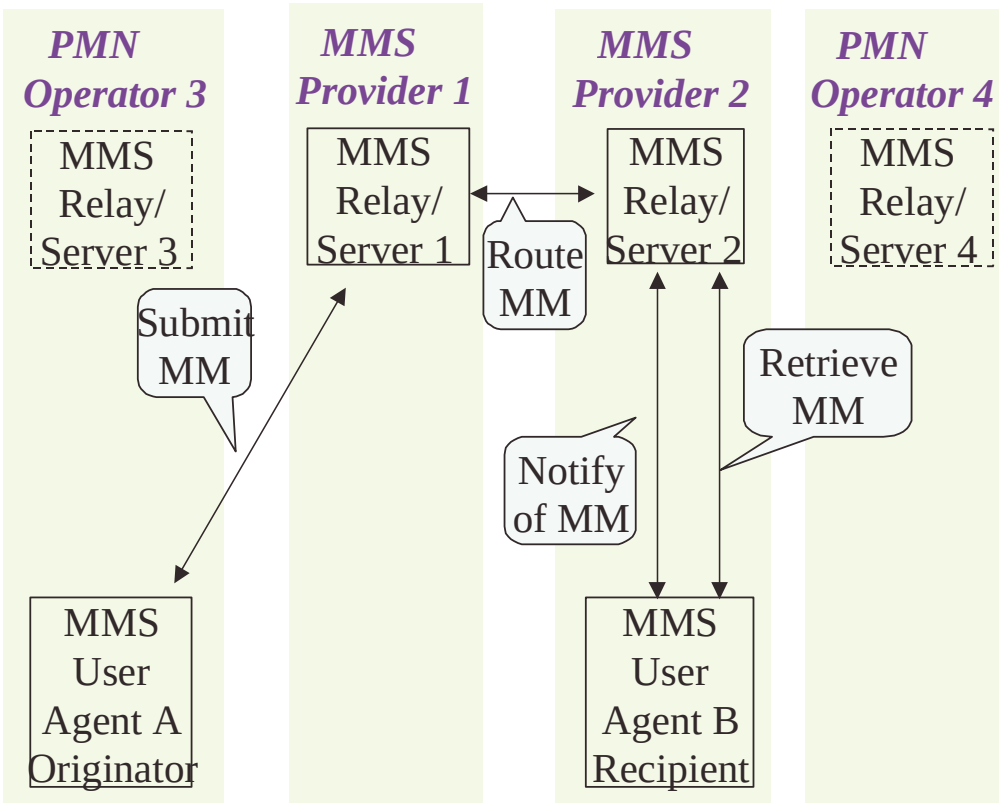


Figure A2: MMS information flow, originator is roaming

MMS Roaming Case 2: Recipient roaming in another PMN:

If the Recipient (User Agent B) is roaming in another PMN, it is notified by its home MMS Relay/Server 2 and retrieves the messages from it.

The visited PMN provides a Bearer Capability, which transports the MM and control messages transparently.

See Figure A.3:

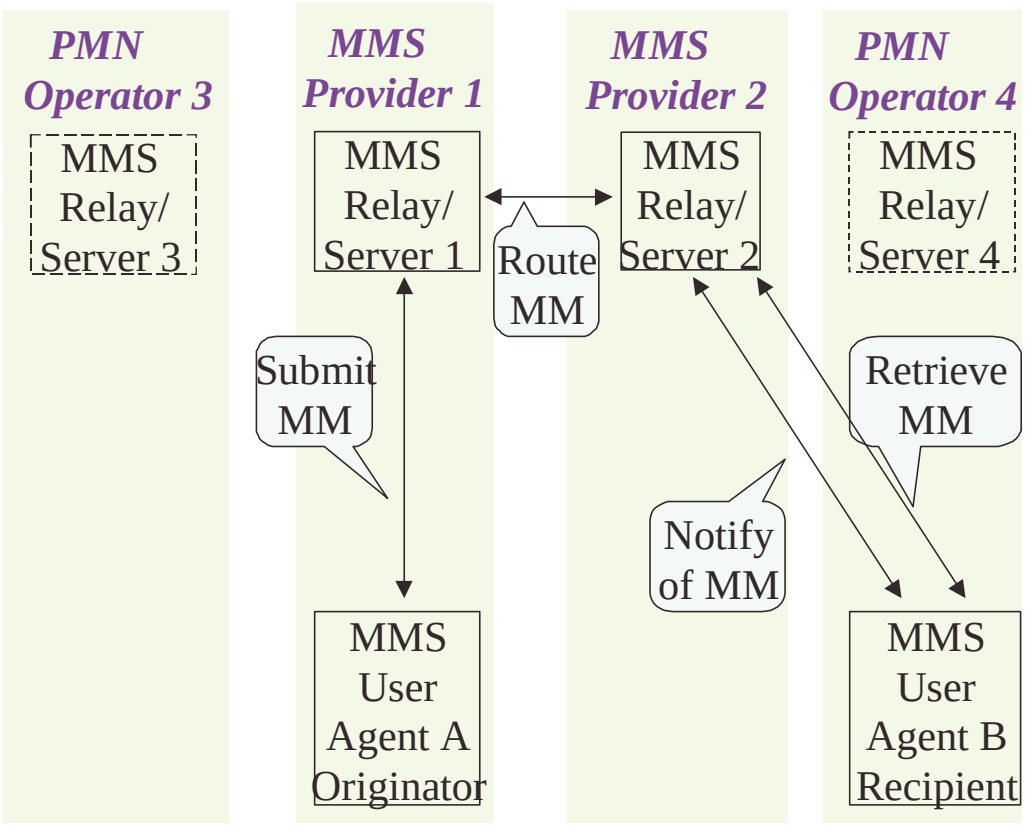


Figure A3: MMS information flow, recipient is roaming

A.4 Subscription Aspects

The 3GPP specifications do not foresee a specific subscription mechanism for MMS: Every GSM / UMTS subscriber can use MMS.

A.5 MMS Call Data Records

The Call Data Records of the MMS Relay/Server allow calculating MM Charges:

The MMS Relay/Server produces two types of Call Data Records (3GPP TS 32.235):

- MMSO-CDR for originating MMS;
- MMSR-CDR for recipient MMS.

Call Data Records contain comprehensive data, e.g.

- originator address;
- recipient address;
- content type: text, image, audio, video...;
- message type: notification, message, delivery report, read-reply;
- message size: number of octets;
- duration of transmission.

A.6 Transport Infrastructure to support MMS

Without roaming:

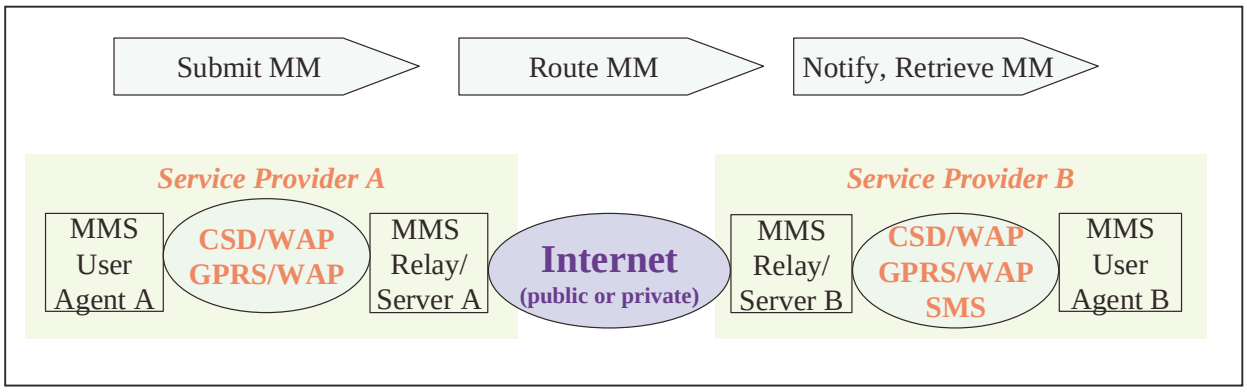
- MM submission: GPRS and CSD WAP connections in the HPMN
- MM routing: IP connections
- MM notification: SMS in the HPMN
- MM retrieval: GPRS and CSD WAP connections in the HPMN

With roaming:

- MM submission: GPRS and CSD WAP connections from the V to HPMN
- MM routing: IP connections
- MM notification: SMS from the H to VPMN
- MM retrieval: GPRS and CSD WAP connections from the V to HPMN

See Figure A.4:

Figure A4: MMS transport infrastructure



Annex B: MM Size Classes

The analysis of potential applications shows that there are several typical classes with a wide variation of the MM Size per message, e.g.:

- Short messages with e.g. text only or a simple photo with a short text (postcard).
- Intermediate size messages containing e.g. a photo with higher resolution and voice message.
- Long messages with e.g. a video sequence.

A limited number of Message MM Size Classes as charging criteria is simple and enables short and long messages.

B.1 Implementation example:

In the following, an advanced example based on the principle of MM Size classes is given. An implementation example could use the following components:

- Display of the MM Size class during message composition.
- Linear scale with pointer.
- MMI dialogue before message submission.
- Access via menu.

The terminal display shows the “Class Indicator”, see figure B.1 below:

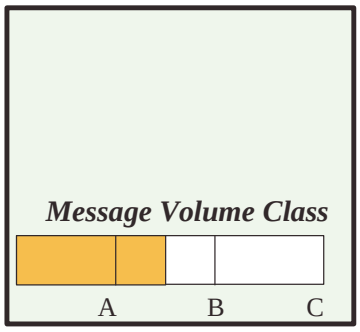


Figure B.1: Message MM Size Class indicator (example)

In this example, the display shows the total MM Size generated together with the MM Size classes supported.

7.4 Fixed charge for each MM Size class (EXAMPLE)

The MM charge is a fixed amount in each class. See Figure 5.2.

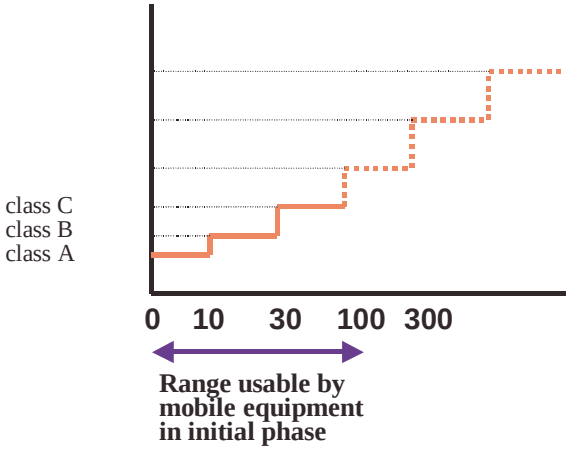


Figure 2: Charge per class

The Message Classes can be seen as “envelopes” of different sizes the user can fill as he wishes.

For an initial phase five classes are proposed. Of course several classes can be combined.