



# Americas MMS Inter-carrier Implementation Guidelines

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**3G Americas and CDMA Development Group  
MMS Project**

**Co-convenors:  
Ileana Leuca  
AT&T Wireless**

**Doug Alston  
Bell South International**

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## 1. Executive Summary

The CDMA Development Group (CDG) and 3G Americas participated in a series of joint workshops to identify key elements necessary to insure that Multimedia Messaging Service deployments are fully interoperable within the Americas region. This document, "Americas MMS Inter-Carrier Implementation Guidelines" presents the outcome of these discussions.

Through consensus, the participating operators and vendors have developed the following guidelines, covering Multimedia Message routing, MMS Relay/Relay network connectivity and MM charging.

**MM Routing:** for the MS-ISDN/MDN, the solution uses ENUM for routing the traffic between the GSM and CDMA networks. MM Routing supports Wireless Number Portability requirements.

**MMS Relay/Server Connectivity:** the MMS inter-carrier networks may be connected directly, through VPNs or through a GRX interconnect network. The interconnect method is determined by operators' mutual agreement.

**MM Charging:** charging is based on delivery reports being received by the originating MMS Relay/Server, which provide the positive acknowledgement that a MM has been successfully received by the terminating network.

## 2. Introduction

This document is the result of a cooperative joint effort between the CDG MMS team and the 3G Americas MMS team. This joint work group effort was formed ultimately to:

- Enable MMS service deployments in the Americas based on 3GPP Release 5 [R1] and 3GPP2 Release 0 [R6].
- Identify and document requirements to support the exchange of MMS messages between CDMA and GSM/UMTS operators.

## 2.1. Objectives

The objectives of the MMS CDMA and GSM industry work group are:

- Document a core set of technical and service-level requirements
- Identify guidelines for successful MMS inter-working between carriers
- Enable CDMA and GSM/UMTS subscribers to exchange MMS messages within the Americas

## 2.2. Scope

The primary focus of the inter-carrier implementation guidelines is on technical requirements between operators.

Note that several important aspects of end-to-end MMS interoperability are out of scope of this document. These other aspects may be addressed through Service Level Agreements (SLAs) and/or various standards bodies.

Factors considered in this document include MMS Relay/Server functionality, directly related to MMS exchange, such as

- address resolution
- routing
- application transport (e.g., MM4)
- network transport (e.g., GRX, VPN)
- delivery reports
- transcoding responsibility
- security and screening

Examples of factors considered out of scope include:

- Codec and presentation language selection (may be addressed in SLA and/or standards bodies)
- Mechanics of transcoding
- Billing and Charging Detail Records (CDRs), although some requirements needed to support charging are in scope (such as on delivery reports)

### 3. References

- [R1] 3GPP TS 23.140 V5.10.0 (2004-03) Multimedia Messaging Services (MMS); Functional Description; Stage 2 (Release 5)
- [R2] MMS Interworking Guidelines, GSM Association PRD IR.52, version 3.1.0, February-2003
- [R3] Inter-PLMN Backbone Guidelines, GSM Association PRD IR.34, version 3.4.0, March-2003
- [R4] RFC 2915 The Naming Authority Pointer (NAPTR) DNS Resource Record, IETF, September 2000
- [R5] RFC 2916 E.164 number and DNS, IETF, September 2000
- [R6] 3GPP2 X.S0016-000-B  
3GPP2 Multimedia Messaging System  
MMS Specification Overview
- [R7] 3GPP2 X.S0016-330
- [R8] 3GPP2 X.S0016-340

### 4. Definitions and Abbreviations

CD	Combined Delivery
CDG	CDMA Development Group
DNS	Domain Name System
DRM	Digital Rights Management
ENUM	Telephone Number Mapping Standard
ESMTP	SMTP with Extensions (Extended Simple Mail Transfer Protocol)
FL	Forward Lock
GGSN	Gateway GPRS Support Node
GRX	GPRS Roaming Exchange
IMSI	International Mobile Subscriber Identity
MDN	Mobile Directory Number
MM	Multimedia Message
MMS	Multimedia Messaging Service
MNP	Mobile Number Portability
MSISDN	Mobile Station ISDN Number

MTA	Mail Transfer Agent
OMA	Open Mobile Alliance
NAI	Network Access Identifier
SLA	Service Level Agreement
SMTP	Simple Mail Transfer Protocol
SD	Separate Delivery
SRI	Source Routing Indicator
VPN	Virtual Private Network

## 5. Requirements

1. The originating MMS Relay/Server decides if the MM destination requires inter-carrier transport.
2. The destination network is determined, including number portability, before the message is routed. The supported solutions are SRI\_SM and/or ENUM.
3. When receiving a message from a nother carrier, using MM4, if the intended recipient does not belong to the recipient operator the message is rejected with an MM4 rejection message sent back to the originating MMS Relay/Server.
4. When sending an MM on MM4, if the MM is sent to a list of recipients, currently it is expected that every message will be routed independently.
5. In the future, if there is a market requirement for message bundling on MM4, the implementation should be addressed by the existing fora (e.g., OMA, 3GPPs).
6. In general, the recipient MMS Relay/Server is responsible for MM transcoding.
7. MM4 MMS messages shall be addressed with the MSISDN/MDN of the destination device.
8. Operators shall be capable of exchanging MMS messages via MM4 interface.
9. Operators may exchange MMS messages using MM3.

10. Two primary network transport solutions are described briefly in the following table:

Alternative	Description
Existing GRX network with modifications to support MMS	The GRX network is a closed carrier controlled IP network for the exchange of GPRS roaming data and other information. This alternative is described in [R2] and [R3].
VPN between participating carriers	Establish VPN connections between carriers using the public internet or dedicated connections. This approach is feasible for a small number of connections but does not scale well if many carriers participate.

The inter-carrier connectivity should be based on mutual transport implementations.

11. Delivery Reports: If an agreement exists between operators, the originator MMS Relay/Server may request a delivery report, on MM4, regardless of whether the originator MMS User Agent requested the delivery report. Then, if the originator MMS Relay/Server requests a delivery report, the recipient MMS Relay/Server shall generate a delivery report for each MM, for which a delivery report has been requested, received from that specific originator MMS Relay/Server [R 1]<sup>1</sup>, [R7], [R8].

12. If a delivery report has been requested by the originator MMS User Agent and if the recipient MMS User Agent did not request that a delivery report should not be generated, the recipient MMS Relay/Server
- shall generate the delivery report;
  - shall deliver the delivery report to the originator MMS Relay/Server;

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<sup>1</sup> Note that reference [R1] does not provide mechanism to implement requirements 10 & 11. These are covered in 3GPP release 6 through (i.e. v6.5.0, 2004-03).

- shall store delivery reports in the network until the originator MMS Relay/Server becomes reachable or until the delivery report expires.
13. When using MM4, the originator MMS Relay/Server shall route an MM forward to the recipient MMS Relay/Server using the MM4\_forward.REQ, which contains MMS control information and the MM content.

The recipient MMS Relay/Server shall respond with a MM4\_forward.RES, which provides the status of the request if an MM4\_forward.RES was requested.

Support for MM4\_forward.REQ and MM4\_forward.RES is mandatory for the MMS Relay/Server.

For failure conditions, the recipient MMS Relay/Server shall respond with a MM4\_forward.RES, which includes a status code that indicates the reason the multimedia message was not accepted, e.g., no subscription, bad address, network not reachable, etc., if an MM4\_forward.RES was requested.

## **6. Security and Screening**

### **6.1. Security**

The security of the inter-carrier MMS system depends on securing the transportation between MMS Relay/Servers. The two identified and recommended mechanisms for inter-carrier connectivity are using a GRX network or a VPN. Both of these mechanisms provide a secure transport for the inter-carrier MMS traffic. These guidelines do not preclude other mechanisms.

### **6.2. Screening**

Screening refers to assuring the deliverability of an incoming MM by the recipient MMS Relay/Server. This includes verifying that the MM is addressed to a valid subscriber, that the MM conforms to the SLA parameters, and that the MM conforms to the MM4 signaling. This must be performed prior to the recipient MMS Relay/Server generating the MM4\_Forward.RES.

## **7. Usage of Service Level Agreements between operators**

### **7.1. Usage of Service Level Agreements between operators**

In addition to standards, operators may use Service level Agreements (SLA) to assess the capabilities of the “other” MMS Relay/Server that they interoperate with. Such SLA can, as an example:

- Identify inter operator MM size limitation
  - Size limitation may be further specified, as a function of the MIME type (e.g., 10 K for text, 200K for picture)
- Provide maximum queue time for inter operator transiting MMSs (e.g., during outages)
- Transcode MIME types, character sets, markup language
- Indicate the possibility for the other system to send or receive:
  - end user requested delivery report, or
  - recipient MMS Relay/Server acknowledgement<sup>2</sup> delivery report
- Support DRM (e.g., FL, CD, SD)
- Support “SMTP Service Extension for Message Size Declaration”
- Support “SMTP Service Extension for 8-bit MIME extension”

### **7.2. Possible extension of the Service Level Agreements for inter-operator transcoding**

The MMS specifications [R1] and [R6] state that MMS transcoding is done at the recipient’s MMS Relay/Server. Consequently, the originator’s MMS Relay/Server does not need to know the recipient User Agent capabilities.

The SLA could be extended so that the originator’s MMS Relay/Server is aware of the recipient’s capabilities. The originator MMS Relay/Server could use the SLA to transcode the MM before sending.

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<sup>2</sup> That functionality will be part of 3GPP release 6; similarly for 3GPP2 X.S-0016.

## 8. Contact information regarding this document:

### **3G Americas**

Ileana Leuca  
AT&T Wireless  
[Ileana.leuca@attws.com](mailto:Ileana.leuca@attws.com)

Chris Pearson  
3G Americas  
[chris.pearson@3gamericas.org](mailto:chris.pearson@3gamericas.org)

### **CDMA Development Group**

Doug Alston  
BellSouth International  
[Douglas.alston@bellsouth.com](mailto:Douglas.alston@bellsouth.com)

Sam Samra  
CDMA Development Group  
[samsamra@swbell.net](mailto:samsamra@swbell.net)

Steve Willhoff  
Nokia  
[Steve.wilhoff@nokia.com](mailto:Steve.wilhoff@nokia.com)

### **3G Americas**

1756 114<sup>th</sup> Ave SE Suite 100  
Bellevue, WA 98004  
+1 425 372 8922  
[info@3gamericas.org](mailto:info@3gamericas.org)

### **CDMA Development Group**

575 Anton Blvd. Ste. 560  
Costa Mesa, CA 92626  
+1 714 545 5211  
[cdg@cdg.org](mailto:cdg@cdg.org)