MMS Conformance Document

Approved Version 1.3 – 13 Sep 2011

Open Mobile Alliance

OMA-TS-MMS-CONF-V1_3-20110913-A

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1. Scope

The scope of this document is in accordance with the charters of OMA IOP, OMA MMSG and OMA IOP MM Groups. The MMS conformance document defines the minimum set of requirements and guidelines for end-to-end interoperability of MMS handsets and servers. It further serves as a baseline for MMS interoperability testing. The test environment and the test cases that need to be created for MMS interoperability testing will be based on the definition from this document. Thus the scope of this document is to serve as the basis for MMS end-to-end interoperability testing. Another significant intent of this document is to be used as a basis for discussions between vendors, operators and value added service providers to explore any such requirements that might not be clearly defined in the specifications of 3GPP, 3GPP2 or OMA with respect to interoperability.

2. References

2.1 Normative References

[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt
[CS0045]	"MMS Media Formats and Codecs", 3rd Generation Partnership Project 2, C.S0045-0 v1.0, URI: http://www.3gpp2.org/
[CS0050]	"3GPP2 File Formats for Multimedia Services", 3rd Generation Partnership Project 2, C.S0050-0 v1.0, URI: http://www.3gpp2.org/
[EXIF]	"Exchangeable image file format for digital still cameras: EXIF 2.2", Specification by the Japan Electronics and Information Technology Industries Association (JEITA), April 2002., URL: http://www.exif.org/
[IMA]	"Recommended practices for enhancing digital audio compatibility in multimedia systems (version 3.00)," IMA Digital Audio Focus and Technical Working Groups, tech. rep., Interactive Multimedia Association, Annapolis, Maryland, Oct. 1992.
[IOPProc]	"OMA Interoperability Policy and Process", Open Mobile Alliance™, OMA-IOP-Process-v1_0. URL: http//www.openmobilealliance.org/
[ISO8859-1]	"8-bit single byte coded graphic character sets, Part 1: Latin Alphabet No. 1.", ISO/IEC 8859-1:1998(E).
[JFIF]	"JPEG File Interchange Format", Version 1.02, September 1, 1992, URL: http://www.w3.org/Graphics/JPEG/jfif3.pdf
[MMSCONF]	"MMS Conformance Document, Version 2.0.0", Open Mobile Alliance™, OMA-IOP-MMSCONF-2_0_0. URI: http://www.openmobilealliance.org/
[MMSCTR]	"MMS Client Transactions", OMA-WAP-MMS-CTR-v1_3, Open Mobile Alliance™. URL: http://www.openmobilealliance.org
[MMSENC]	"OMA MMS Encapsulation Protocol", Open Mobile Alliance™, OMA-WAP-MMS-ENC-v1.3. URI: http://www.openmobilealliance.org/
[OMADRM]	"Digital Rights Management version 1.0", Open Mobile Alliance ™, OMA-DRM-v1_0. URL: http//www.openmobilealliance.org/
[OMADRMCF]	"DRM Content Format", Open Mobile Alliance™, OMA-Download-DRMCFT-v1_0. URI: http//www.openmobilealliance.org/
[OMADRMREL]	"DRM Rights Expression Language", Open Mobile Alliance™, OMA-Download-DRMREL-v1_0, URI: http//www.openmobilealliance.org/
[OMAVOBJECT]	"OMA-vObject Minimum Interoperability Profile, V1.0", Open Mobile Alliance ™, OMA-TS-vObjectOMAProfile-V1_0. URI: http//www.openmobilealliance.org/
[RFC1738]	"Uniform Resource Locators (URL)", IETF, RFC 1738, URL: http://www.ietf.org/rfc/rfc1738.txt
[RFC2387]	"The MIME Multipart/Related Content-type", IETF, RFC 2387, URL: http://www.ietf.org/rfc/rfc2387.txt
[RFC2557]	"MIME Encapsulation of Aggregate Documents, such as HTML (MHTML)", IETF, RFC 2557, URL: http://www.ietf.org/rfc/rfc2557.txt
[RFC2821]	"Simple Mail Transfer Protocol", IETF, RFC 2821, URL: http://www.ietf.org/rfc/rfc2821.txt
[SMIL]	"Synchronized Multimedia Integration Language (SMIL 2.0)", W3C Recommendation 07 August 2001, URL: http://www.w3.org/TR/smil20/

[SR0064]	"Multimedia Messaging Service Stage 1, Requirements", 3rd Generation Partnership Project 2, S.R0064, URI: http://www.3gpp2.org/Public_html/specs/S.R0064-0_v1.0.pdf
[TS22140]	"Multimedia Messaging Service; Stage 1, Requirements", 3rd Generation Partnership Project, TS 22.140 Release 6. URI: http://www.3gpp.org/ftp/Specs/
[TS23140]	"Multimedia Messaging Service: Functional description; Stage 2", 3rd Generation Partnership Project, TS 23.140 Release 6. URI: http://www.3gpp.org/ftp/Specs/
[TS26140]	"Multimedia Messaging Service; Media formats and codecs", 3rd Generation Partnership Project, TS 26.140 Release 6. URI: http://www.3gpp.org/ftp/Specs/
[TS26246]	"Transparent end-to-end packet switched streaming service (PSS); 3GPP SMIL Language Profile", 3rd Generation Partnership Project, TS 26.246 Release 6. URI: http://www.3gpp.org/ftp/Specs/
[UAProf]	"User Agent Profile version 2.0", Open Mobile Alliance™, URI: http://www.openmobilealliance.org/.
[Unicode]	"The Unicode Standard Version 3.0", The Unicode Consortium, Addison-Wesley, Reading (MA), January 2000. ISBN 0-201-61633-5.
[WAPCSS]	"Wireless CSS Specification, V1.1", Open Mobile Alliance™, OMA-WAP-CSS-V1_1. URI: http://www.openmobilealliance.org/
[WAPWSP]	"Wireless Application Protocol, Wireless Session Protocol Specification", WAP-203-WSP, WAP Forum™. URI: http://www.openmobilealliance.org/.
[WAPWTP]	"OMA Wireless Transport Protocol", Open Mobile Alliance™, WAP-224-WTP. URI: http://www.openmobilealliance.org/
[WAPXHTMLMP]	"XHTML Mobile Profile 1.2", Open Mobile Alliance™, OMA-XHTMLMP-V1_2. URI: http://www.openmobilealliance.org/
[XHTMLMod]	"Modularization of XHTML", W3C Recommendation 10 April 2001, M. Altheim et al., editors. URL: http://www.w3.org/TR/2001/REC-xhtml-modularization-20010410
[XS0016200]	"Multimedia Messaging Service Stage 2, Service Description", 3rd Generation Partnership Project 2, X.S0016-200, URI: http://www.3gpp2.org/
[XS0016370]	"MMS MM7 VASP Interworking Stage 3", 3rd Generation Partnership Project 2, X.S0016.370-A v1.0, URI: http://www.3gpp2.org/

2.2   Informative References

[RFC2046]	"MIME Part Two: Media Types", IETF, RFC 2046, URL: http://www.ietf.org/rfc/rfc2046.txt
[RFC2781]	"UTF-16, an encoding of ISO 10646", IETF, RFC 2781, URL: http://www.ietf.org/rfc/rfc2781.txt
[RFC2822]	"Internet Message Format", IETF, RFC 2822, URL: http://www.ietf.org/rfc/rfc2046.txt
[WAPARCH]	"Wireless Application Protocol Architecture", Open Mobile Alliance™, OMA-WAP-210-WAPArch-a, URI: http://www.openmobilealliance.org/
[XS0016000A]	"MMS Specification Overview Multimedia Messaging System Specification", 3rd Generation Partnership Project 2, X.S0016.000-A v1.0, URI: http://www.3gpp2.org/Public_html/specs/X.S0016-000-A.pdf
[XS0016310]	"MMS MM1 Stage 3 Using OMA/WAP", 3rd Generation Partnership Project 2, X.S0016.310 v1.0, URI: http://www.3gpp2.org/Public_html/specs/X.S0016-310.pdf

3. Terminology and Conventions

3.1   Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2   Definitions

CMF	Compact Multimedia Format
Content-to-person messaging	In relation to MMS, the term is used to denote the usage of MMS by a Content Provider for sending MM to an MMS Client that uses .the MMS_M interface.
Creation	The action to create an MM, e.g., via the terminal MMI
Kilobyte	One kilobyte equals 1024 bytes.
Man-Machine Interface	The interface between terminal and user
Message Size	The message size of an MM, as defined for the MM Content Class concept (section 7), SHALL be determined as defined in [TS23140] or [XS0016200].
MMS SMIL	SMIL subset defined for MMS interoperability purposes in this document.
Multimedia Message Content Class (MM Content Class)	A Multimedia Message Content Class is a set of Multimedia Messages defined in terms of media types, size, media formats, presentation formats and applicable DRM mechanisms
Person-to-person messaging	In relation to MMS, the term is used to denote the usage of MMS by a user for sending MM from an MMS Client using the MMS_M interface to a user using an MMS Client that uses the MMS_M interface.
Person-to-service/application messaging	In relation to MMS, the term is used to denote the usage of MMS to send MM from an MMS Client using the MMS_M interface to a service/application.
Presentation	The presentation of the MM to the user as defined in [TS23140] or [XS0016200], e.g., via the terminal MMI.
Re-submission	This is a special submission mode, which allows the submission of an MM - that had been earlier retrieved in the terminal - by bypassing the creation mode Restricted.
Retrieval	The download of the MM as defined in [MMSCTR]
Submission	The sending of the MM to the MMS Proxy-Relay as defined in [MMSCTR]. This includes the case where the MM submitted had been earlier retrieved in the terminal

3.3   Abbreviations

13k	13k vocoder
AMR	Adaptive Multi Rate
BMP	Bit Map
CSS	Cascading Style Sheets
DRM	Digital Rights Management
GIF	Graphics Interchange Format
GIF 87a/89a	GIF with animations
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extension

MM	Multimedia Message
MMI	Man-Machine Interface
MMS	Multimedia Messaging Service
MMSIOP	MMS Interoperability between MMS handsets and MMS Servers
MPEG4	Moving Picture Experts Group -4
MSISDN	Mobile Station Integrated Services Digital Network
OMA	Open Mobile Alliance
PIM	Personal Information Management
QCIF	Quarter Common Intermediate Format
SMIL	Synchronized Multimedia Integration Language
UI	User Interface
UTF-8	Unicode Transformation Format
WAP	Wireless Application Protocol
WBMP	Wireless Bit Map
WCSS	WAP CSS
XHTML	Extensible HyperText Markup Language
XHTMLMP	XHTML Mobile Profile

4. Introduction

This document is an interoperability document, aiming at identifying the issues that need to be addressed in order to ensure interoperability of MMS functionalities between terminals produced by different manufacturers. In particular, this document focuses on the management of the content of multimedia messages, addressing in particular the coding and the presentation of multimedia messages.

In order to achieve interoperability, a minimum set of requirements needs to be defined at four levels:

• Content of the message

• Allowed elements and attributes of the presentation language.

• Media content format.

• Lower level capabilities

Depending on different levels of use cases, the MM Services can be categorized into: Image Messaging, Video messaging and Content messaging.

Image Messaging - Multimedia messaging using MM Content Classes Image Basic, Image Rich and Megapixel (defined in section 7), which are optimized for person-to-person use cases but also usable for content-to-person and person-to-service/application use cases

Video messaging - Multimedia messaging using MM Content Classes Video Basic and Video Rich MM (defined in section 7) which are optimized for person-to-person use cases but also usable for content-to-person and person-to-service/application use cases.

Content messaging - Multimedia messaging using MM Content Classes Content Basic and Content Rich MM (defined in section 7) which are optimized for person-to-application and content-to-person services but also usable to person-to-person services with assisting techniques.

4.1 Usage of SMIL

The MMS messages compliant with this interoperability document will use the Synchronized multimedia Integration Language (SMIL) as the presentation language ([SMIL]).

Limited displays of mobile terminals may not allow us to take full advantage of the presentation capabilities offered by SMIL 2.0 or even by its simplest profile "SMIL Basic" (see Sec. 8). However, the messages that are produced should be valid and complete SMIL messages, and should be displayed properly on non-mobile terminals (e.g., PCs).

In this document, we identify a very limited subset of SMIL elements ("MMS SMIL") which are needed to achieve the minimal presentation capabilities required by the first phase of the Multimedia Messaging Service MMS (see Sec. 8).

This proposal does not intend to constitute a conformance statement for the "MMS SMIL" subset. The interoperability is ensured by compliance to the guidelines about the overall content and organization of the message. No assumption is made about the capability of MMS Clients to handle correctly any SMIL presentation that uses "MMS SMIL" elements. All unknown elements/attributes not recognized by the MMS Client will be ignored (see section 7.1.8 for a corresponding conformance requirement).

MMS 1.3 specifications introduce the support of 3GPP PSS6 SMIL Language Profile as defined in [TS26246] for content messaging: MM Content Classes Content Basic and Content Rich. Further information concerning the use of 3GPP PSS6 SMIL Language Profile can be found in section 7.1.8 and section 11.

5. Structure of Multimedia Messages

5.1 Introduction

This section defines the limitations on the appearance of multimedia messages that will ensure interoperability among different terminals.

5.2 Structure

The multimedia messages of the Core MM Content Domain (section 6) SHALL consist of a "slide show", i.e. a succession of pages, each one containing at most two regions. One of the regions contains text and the other contains either an image or a video clip.

A simple scheme of the organization of a multimedia message is depicted in **Error! Reference source not found.**. The discussion about the coding formats to be used for the images and the text will be presented in section 7
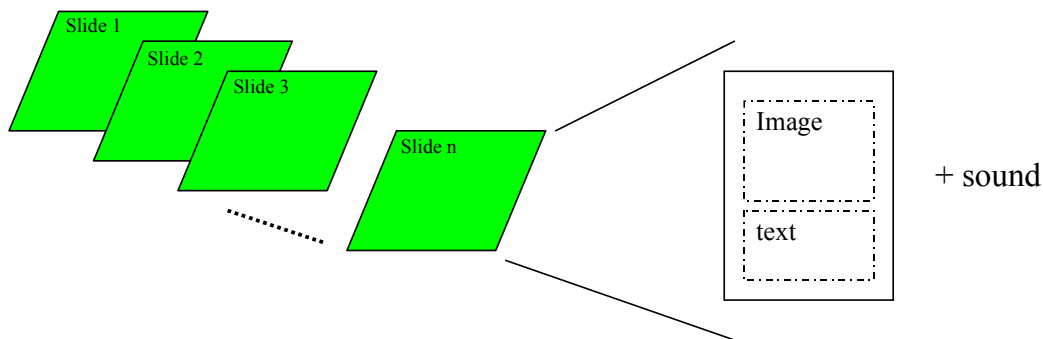
Figure 1: Structure of a multimedia message

Each multimedia message SHALL NOT contain more than one SMIL presentation. All the slides in the presentation SHALL have the same layout. There are some cases where the presence of a SMIL presentation is optional in a multimedia message (section 7.1.8).

6. MM Content Domains

The **Core MM Content Domain** includes multimedia messages containing content that is compliant with a subset of the media defined in 3GPP or 3GPP2 standards (specifications [TS26.140] and [CS0045] respectively). This subset consists of several MM Content Classes defined for the domain. Each multimedia message within the Core MM Content Domain SHALL be compliant with one of the MM Content Classes in the domain. By definition, each MM belonging to the Core MM Content Domain also belongs to the Standard MM Content Domain. Within the Core MM Content Domain, the maximum size of the MMs SHALL be restricted to the defined values for the MM Content Classes.

For MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP [TS23140], the **Content MM Content Domain** SHALL consist of all MM Content Classes defined for the Core MM Content Domain and two additional MM Content Classes, those classes are Content Basic MM Content Class and the Content Rich MM Content Class.

For MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 [XS0016200], the **Content MM Content Domain** SHALL consist of all MM Content Classes defined for the Core MM Content Domain and three additional MM Content Classes. Those classes are Content Basic MM Content Class, Content Rich MM Content Class and Content CMF MM Content Class.

By definition, each MM belonging to the Core MM Content Domain SHALL also belong to the Content MM Content Domain and each MM belonging to the Content MM Content Domain SHALL also belong to the Standard MM Content Domain. Within the Content MM Content Domain, the maximum size of the MMs SHALL be restricted to the defined values for the MM Content Classes.This domain addresses content messaging used typically for content-to-person and person-to-service/application messages. The **Standard MM Content Domain** SHALL include multimedia messages with content that are compliant with the 3GPP standard [TS26140] or the 3GPP2 standard [CS0045]. This document does not specify MM Content Classes for the Standard MM Content Domain. Consequently, the maximum size of the MMs SHALL be unlimited in Standard MM Content Domain.

The **Unclassified MM Content Domain** SHALL include multimedia messages with media elements/presentation part that are/is not compliant or is only partially compliant with the 3GPP or 3GPP2 standards. They MAY comply with other specifications, for instance IETF or W3C specifications. Within the Unclassified MM Content Domain, the maximum size of the MMs SHALL be unlimited.

6.1   Interoperability between Networks

As interoperability is only guaranteed within the Core Domain, when sending content outside of the Core Domain, the sending and the receiving network MAY support the requirements listed in this section.

The recipient MMS Proxy-Relay MAY be configured to restrict the transmission and reception of MMs that contain media formats or presentation languages that are not supported by the recipient network.

6.1.1   Rejection of Unsupported Content by the Recipient Network

If a recipient MMS Proxy-Relay receives an MM which is not supported by the recipient network (e.g., unsupported media format, presentation language, message size, or any other reason) then the recipient MMS Proxy-Relay MAY reject the MM. If the MM is rejected, then the recipient MMS Proxy-Relay SHALL respond with the appropriate error code, as defined in section 6.1.2

6.1.2   Error Codes

If the originator of the message was a MMS Proxy-Relay the value of the parameter "X-Mms-Request-Status-Code" in the MM4-forward.RES SHALL be set to "Error-content-not-accepted".

7. MM Content Classes

MM Content Classes are used to define the Core MM Content domain and Content MM Content domain, see Table 1, Table 2 and section 7.1.

Separate tables are used to clarify the distinction between [CS0045] and [TS26140] media types; reception of media types defined in either table SHALL be supported as specified by Section 9 of this specification.

MMS Clients conforming to the MMS suite of specifications defined by 3GPP:

- •   SHALL support at least one MM Content Class from the Core MM Content Domain (in addition to MM Content Class Text), as defined per Table 1, and

- •   SHOULD support at least one MM Content Class from the Content MM Content Domain as defined per Table 1.

Implementations conforming to the MMS suite of specifications defined by 3GPP2 SHALL support MM Content Class Text and at least one other Core MM Content Class as defined per Table 2.

For more details about conformance please refer to Section 12 of this specification.

The transcoding policy and requirements for content adaptation to bridge the gap between 3GPP and 3GPP2 MM Content Classes are specified in Section 9.2.

Table 1, Table 2, section 7.1. and its subsections are normative.

MM Content Class	MM Content Domain	Message Size (KB)	Plain Text	Rich Text	Image Resolution (pixels)	Still Image	Bitmap Graphics	Vector Graphics	Video	Speech Audio	Synth. Audio	Audio	PIM	DRM	Presentation
Text	Core	≤30	US-ASCII, UTF-8, UTF-16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MMS SMIL
Image Basic	Core	≤30	US-ASCII, UTF-8, UTF-16	N/A	≤160*120	Baseline JPEG	GIF87a, GIF89a, WBMP	N/A	N/A	N/A	N/A	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	N/A	MMS SMIL
Image Rich	Core	≤100	US-ASCII, UTF-8, UTF-16	N/A		Baseline JPEG	GIF87a, GIF89a, WBMP	N/A	N/A	N/A	SP-MIDI	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Full DRM (FL, CD, SD & Super dis.)	MMS SMIL
Video Basic	Core	≤100	US-ASCII, UTF-8, UTF-16	N/A	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP	N/A	H.263 & AMR (.3GP)	AMR-NB	SP-MIDI	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Full DRM (FL, CD, SD & Super dis.)	MMS SMIL with video support
Video Rich	Core	≤300	US-ASCII, UTF-8, UTF-16	N/A	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP	N/A	H.263 & AMR (.3GP)	AMR-NB	SP-MIDI	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Full DRM (FL, CD, SD & Super dis.)	MMS SMIL with video support
Mega-pixel	Core	see clause 7.1.11	US-ASCII, UTF-8, UTF-16	XHTML Mobile Profile	≤1600*1200	Baseline JPEG	GIF87a, GIF89a, WBMP	N/A	H.263 & AMR (.3GP)	AMR-NB	SP-MIDI	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Full DRM (FL, CD, SD & Super dis.)	MMS SMIL with video support
Content Basic	Content	≤100	US-ASCII, UTF-8, UTF-16	XHTML Mobile Profile	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP	N/A	N/A	AMR-NB	SP-MIDI	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Full DRM (FL, CD, SD & Super dis.)	3GPP PSS6 SMIL
Content Rich	Content	≤600	US-ASCII, UTF-8, UTF-16	XHTML Mobile Profile	≤1600*1200	Baseline JPEG	GIF87a, GIF89a, WBMP	SVG-Tiny	H.263 & AMR (.3GP)	AMR-NB	SP-MIDI	Enhanced AAC+	vCard 2.1 MIP, vCalendar 1.0 MIP	Full DRM (FL, CD, SD & Super dis.)	3GPP PSS6 SMIL

Table 1: MM Content Classes using media formats as per [TS26140]

MM Content Class	MM Content Domain	Message Size (KB)	Plain Text	Rich Text	Image Resolution(pixels)	Still Image	Bitmap Graphics	Vector Graphics	Video	Speech Audio	Synth. Audio	Audio	PIM	DRM	Presentation
Text	Core	≤30	US-ASCII, UTF-8, UTF-16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MMS SMIL
Image Basic	Core	≤30	US-ASCII, UTF-8, UTF-16	N/A	≤160*120	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	N/A	N/A	AMR-NB or 13K	N/A	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Fwd-Lock	MMS SMIL
Image Rich	Core	≤100	US-ASCII, UTF-8, UTF-16	N/A	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	N/A	N/A	AMR-NB or 13K	N/A	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Fwd-Lock	MMS SMIL
Video Basic	Core	≤100	US-ASCII, UTF-8, UTF-16	N/A	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	N/A	[H.263 and MPEG4] & 13k and/or AMR (.3G2)	AMR-NB or 13K	N/A	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Fwd-Lock	MMS SMIL with video support
Video Rich	Core	≤300	US-ASCII, UTF-8, UTF-16	N/A	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	N/A	[H.263 and MPEG4] & 13k and/or AMR (.3G2)	AMR-NB or 13K	N/A	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Fwd-Lock	MMS SMIL with video support
Mega-pixel	Core	see clause 7.1.11	US-ASCII, UTF-8, UTF-16	XHTML Mobile Profile	≤1600*1200	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	N/A	[H.263 and MPEG4] & 13k and/or AMR (.3G2)	AMR-NB or 13K	N/A	N/A	vCard 2.1 MIP, vCalendar 1.0 MIP	Fwd-Lock	MMS SMIL with video support
Content Basic	Content	≤100	US-ASCII, UTF-8, UTF-16	XHTML Mobile Profile	≤640*480	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	N/A	[H.263 and MPEG4] & 13k and/or AMR (.3G2)	AMR-NB or 13K	SP-MIDI, General MIDI level 1	Enhanced AAC+	vCard 2.1 MIP, vCalendar 1.0 MIP	Full (FL, CD, SD & Super dis.)	3GPP2 SMIL
Content Rich	Content	≤600	US-ASCII, UTF-8, UTF-16	XHTML Mobile Profile	≤1600*1200	Baseline JPEG	GIF87a, GIF89a, WBMP, PNG	SVG-Tiny	[H.263 and MPEG4] & 13k and/or AMR (.3G2)	AMR-NB or 13K	SP-MIDI, General MIDI level 1	Enhanced AAC+	vCard 2.1 MIP, vCalendar 1.0 MIP	Full (FL, CD, SD & Super dis.)	3GPP2 SMIL
Content CMF	Content	≤300	US-ASCII, ISO8859-1, ISO8859-2, ISO8859-3, ISO8859-4, ISO8859-5, ISO8859-6, ISO8859-7, ISO8859-8, ISO8859-9, ISO8859-10	N/A	≤640*480	Baseline JPEG	BMP, PNG	N/A	N/A	13K	SP-MIDI, General MIDI level 1	IMA ADPCM	N/A	Full (FL, CD, SD & Super dis.)	CMF

Table 2: MM Content Classes using media formats as per [CS0045]

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Note: For both Table 1 and Table 2 the purpose of MM Content Class Text is to enhance technical interoperability on text-only multimedia messaging.

For Table 2 Video Basic and Video Rich MM Content Classes, both H.263 and MPEG4 SHALL be supported plus either AMR or 13K.

For detailed information and references to media formats text, still image, bitmap, video, speech audio and synthetic audio which are mentioned in Table 1, please see [TS26140]. For Table 2, please see [CS0045]. For PIM standards, please see [OMAVOBJECT]. For DRM, please see [OMADRM]. For IMA ADPCM, please see [IMA].

The MM Content Classes defined in Table 1 and Table 2 are hierarchical, but this does not establish a principle for additional classes.

An MM specified in [MMSCONF] belongs to either MM Content Class Text or MM Content Class Image Basic. In [MMSCONF], support of the speech codecs described in either Table 1 or Table 2, SMIL and PIM objects are conditional (respectively under condition of support of audio, presentation part of the multimedia message and PIM). On the other hand, an MMS Client supporting MM Content Class Image Basic has to support presentation of speech codec attachments described in either Table 1 or Table 2, SMIL as well as PIM objects in the limits as defined in this section.

7.1 Refinement of MM Content Classes

This section gives further details of the MM Content Classes that are outlined in Table 1 and Table 2.

7.1.1   Still Image and Bitmap

The maximum image resolutions for which interoperability is guaranteed are defined for the MM Content Classes Image Basic, Image Rich, Megapixel Video Basic, Video Rich, Content Basic and Content Rich in Table 1 and Table 2. The receiving MMS Client SHALL be able to

- retrieve the MM;

- if necessary, downscale the images;

- render the images with maximum possible resolution.

Note: Rendering an MM containing JPEG images might cause problems if some Huffman tables are not available. As a consequence it is expected that JPEG images contain the following Huffman tables:

- 1 AC Luminance Table

- 1 DC Luminance Table

- 1 AC Chrominance Table

- 1 DC Chrominance Table

The MMS Client SHALL support retrieval and presentation of JPEG Baseline images conforming to the JFIF interchange format as defined in [JFIF].The MMS Client SHALL also support retrieval and presentation of JPEG images conforming to the EXIF compressed image file format as defined in [EXIF]. The MMS Client MAY use the EXIF parameters embedded in the JPEG EXIF image.

JPEG images contained in submitted MMs SHALL conform either to the JFIF interchange format or to the EXIF compressed image file format.

The MMS Client SHOULD comply with the following rules when generating EXIF metadata:

- The size of the image meta-information SHOULD NOT exceed 2KB.

- The image file SHOULD NOT contain any thumbnail.

- Transformations (rotation, trimming…) applied to the original image file (rotation, trimming…) SHOULD update the original EXIF fields accordingly, as specified in [EXIF] (section 7.4, "Application Software Guidelines").

- The image meta-information SHOULD allow to uniquely identify the device model as well as the embedded camera hardware that took the picture (use of Make, Model and Software EXIF fields is recommended, in a manner that the combined content of these 3 fields should be unique and constant for a given device model and camera hardware).

- JFIF compatibility restrictions: EXIF-specific image orientation SHOULD NOT be used.

Note: The image meta-information can contain any possible EXIF fields that are specifically useful for photo post-processing (see, e.g., [EXIF] section 7.3 for some recommended useful tags).

7.1.2   Audio

MMS Clients conforming to MM Content Class Content Rich that are compliant to the MMS suite of specifications defined by 3GPP (e.g,. [TS26140]) SHALL support Enhanced AAC+ in retrieval and presentation.

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [CP0050A]) SHALL support Enhanced AAC+ in retrieval and presentation.

7.1.3   PIM

The following PIM (Personal Information Management) objects SHALL be supported as attachments to an MM:

vCard version 2.1 MIP (Minimum Interoperability Profile) (mime-type: text/x-vCard) as defined in [OMAVOBJECT].

vCalendar version 1.0 MIP (Minimum Interoperability Profile) (mime-type: text/x-vCalendar) as defined in [OMAVOBJECT].

A presentation part (i.e. SMIL element) is not required in an MM that contains only PIM objects. The PIM object SHOULD not be referred from a SMIL element.

7.1.4   Video

The video encoder and decoder SHALL be compliant with the mandatory video codecs as defined in [TS26140] or [CS0045].

If a slide contains a video element, separate audio elements (speech, synthetic audio or audio) SHALL NOT be part of the same slide. This is valid even if the video element does not contain any audio information.

7.1.5   DRM

MMS Clients that are compliant to this MMS suite of specifications SHALL fulfil the following DRM requirements.

- MMS Clients conforming to Image Rich, Video Basic, Video Rich, Megapixel, Content Basic and Content Rich Content Classes SHALL support: Forward Lock (FL) and SHOULD support: Combined Delivery (CD), Separate Delivery (SD) and Superdistribution, as defined in [OMADRM] and in this section.

For more details about DRM see section 16.

7.1.6   Message Size

Each MM Content Class defines a minimum supported message size, for the definition of message size see section 3.2.

The terminal SHALL support receiving of multimedia messages of the minimum size to be conformant to a particular MM Content Class.

From a content provider's point of view this means that the maximum message size for which interoperability is guaranteed to a particular MM Content Class is the minimum supported message size of that MM Content Class.

For more details about conformance, see section 12.

7.1.7   Speech Audio

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS23140]) SHALL support AMR-NB as mentioned in Table 1 and referenced in [TS26140].

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]) SHALL support at least one of 13K or AMR-NB as mentioned in Table 2 and referenced in [CS0045].

7.1.8   Presentation

MMS SMIL is OPTIONAL in submission of MM Content Class Text and an MM containing only PIM objects. Support for presentation of MM Content Classes Text and Image Basic multimedia messages both with MMS SMIL presentation part and without any presentation part SHALL be mandatory.

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS23140]) SHALL support presentation by using MMS SMIL, for submission MMS SMIL SHALL be included in MMs that belong to the MM Core Content Domain but do not conform to MM Content Class Text.

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS23140]) SHALL support the 3GPP PSS6 SMIL Language Profile in retrieval and presentation for the MMs that belong to the MM content classes Content Basic and Content Rich as defined in section 11.

MMS Client SHALL ignore all unknown elements/attributes of an MMS SMIL or PSS SMIL presentation part.

MMS Clients supporting 3GPP PSS6 SMIL Language Profile SHALL also support MMS SMIL.

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 [XS0016200] SHOULD include a presentation part. MMS SMIL SHALL be employed for MMS creation and presentation for the Core MM Content Domain. For the Content CMF MM Content Class,

   • CMF MAY be employed for MMS creation and submission.

   • CMF SHALL be employed for MMS presentation.

CMF uses the application/cmf media type and the .cmf file extension.

7.1.9   Text

7.1.9.1   Plain Text

The SMIL part is encoded text and the character set shall be UTF-8 [Unicode] with lower half of ISO 8859-1 character set (us-ascii set).

The text parts (text/plain) of submitted MM SHALL support at least one of the following character encodings:

   • us-ascii (IANA MIBEnum 3)

   • utf-8 (IANA MIBenum 106) [Unicode]

Character encoding utf-16 SHOULD NOT be used in "text/plain" media parts for submitted MM.

Note: Use of utf-16 within a "text/plain" media part may entail interoperability problems when the MM may be transported over the MMS_E (MM3 in 3GPP terminology), MMS_R (MM4 in 3GPP terminology) interfaces, or other transport protocols as detailed in [RFC2781].

MMS Clients SHALL support received MM with text parts (text/plain) encoded in us-ascii and utf-8.

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS23140]) SHALL support received MM with text parts (text/plain) encoded in utf-16 (IANA MIBenum 1015) with explicit Byte Order Mark (BOM) [Unicode].

A MMS Proxy-Relay that identifies a text/plain part encoded in utf-16 that is intended for transfer over MMS$_E$ or MMS$_R$ SHALL adapt the content to comply with the appropriate transport protocol.

In the text parts, the supported characters (glyphs) shall be at least those in [ISO8859-1].

7.1.9.1.1 Emoticons (informative)

An MMS Client can support emoticons as defined in OMA, when available.

7.1.9.2 Rich Text Formatting (XHTML Mobile Profile)

The support for XHTML Mobile Profile (XHTMLMP) is defined for different MM content classes in the sections 7.1.9.2.1 and 7.1.9.2.2 below.

MIME type for the Rich Text object in MMS (for all the MM content classes defined below) SHALL be according to [WAPXHTMLMP].

In any case, in Content MM Content domain and Core MM Content domain XHTML SHALL NOT be used as presentation part, and SHALL NOT be the root part of a multipart/related message.

7.1.9.2.1 MM Content Classes Content Basic and Content Rich

The MMS Clients that are compliant to the MM content classes Content Basic or Content Rich SHALL support XHTML Mobile Profile [WAPXHTMLMP] markup with certain restrictions for guaranteed rendering of Rich Text with limited features. The restrictions for presentation are listed separately below. Guidance is given for the server-based MM creation (VASP).

In the creation of MMs according to MM content classes Content Basic and Content Rich the creators should take the following restrictionsinto account, and only if the creator knows that a recipient MMS Client supports additional modules of XHTMLMP should those modules of XHTMLMP be used.

Restrictions for presentation for MM content classes Content Basic and Content Rich:

- The following XHTMLMP modules SHALL be supported as a minimum in presentation according to [WAPXHTMLMP]: Structure, Text, Hypertext, List, Presentation, and Style Attribute. Beside supporting these mandatory modules, an MMS Client MAY support the remaining modules of [WAPXHTMLMP] in presentation, but there is no guarantee for such support. The modules are defined in [XHTMLMod]. The processing of [WAPXHTMLMP] based content SHALL be as specified in [WAPXHTMLMP].

- Support for WCSS properties within Style Attribute module:

  - MMS Client SHALL support the followings items of specific WCSS properties within the Style Attribute in presentation

    - Property `color` for Foreground color property, as described in section 11.1 of [WAPCSS]. Only the 16 HTML 4.0 colors are required for the item `foreground as color`. A Client either produces identical foreground color as indicated by the `color` property, or produces foreground color with best effort (e.g. using gray scale representation).

    - Text align as keywords `left`, `right` and `centre` for the Text Alignment property, as described in section 14.2 of [WAPCSS].

  - MMS Client MAY support the followings items of specific WCSS properties within the Style Attribute in presentation:

    - Text align as keyword `justify` for the Text Alignment property, as described in section 14.2 of [WAPCSS].

    - Text decoration `underline` for the Text Decoration property, as described in section 14.3 of [WAPCSS].

     o   An MMS Client MAY also support the other mandatory WCSS properties within Style Attribute in presentation, but there is no guarantee for such support.

     o   MMS Client SHALL process styling properties in accordance with [WAPCSS] including unsupported (whole or selected parts) styling (WCSS properties)

- If an MMS Client does not support rendering of certain XHTMLMP elements or attributes, it SHALL meet related criteria defined in section 3.5 of [XHTMLMod].

- Supported text encodings and glyphs SHALL be the same as in section 7.1.9.1.

7.1.9.2.2 MM Content Class Megapixel

MMS Clients creation/submission conformant to the MM Content Class Megapixel MAY support XHTML Mobile Profile [WAPXHTMLMP] in creation/submission. If supported, the restrictions listed below SHALL apply.

MMS Clients retrieval/presentation conformant to the MM Content Class Megapixel SHALL support XHTML Mobile Profile [WAPXHTMLMP] in retrieval/presentation with certain restrictions.

The restrictions are listed separately for creation/submission and presentation below. The restrictions apply for the MMS Clients.

Restrictions for creation/submission for MM content class Megapixel:

- The following XHTMLMP modules MAY be supported according to [WAPXHTMLMP]: Structure, Text, Hypertext, Presentation, and Style Attribute. No other module SHOULD be used in creation. The modules are defined in [XHTMLMod].

- Support for WCSS properties within Style Attribute module:

     o   The MMS Clients MAY support the followings items of specific WCSS properties within the Style Attribute in creation.

          ▪   Property `color` for the Foreground color property, as described in section 11.1 of [WAPCSS]. Only the 16 HTML 4.0 colors is required for the item `foreground as color`..

          ▪   Text decoration `underline` for the Text Decoration property, as described in section 14.3 of [WAPCSS].

Restrictions for presentation for MM content class Megapixel:

The restrictions defined for presentation for MM Content Classes Content Basic and Content Rich in section 7.1.9.2.1 also apply for the restrictions for presentation for MM Content Class Megapixel.

7.1.10 Vector Graphics

MMS Clients conforming to MM Content Class Content Rich, that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS23140]), SHALL support SVG Tiny version 1.2, as defined in [TS26140], in retrieval and presentation.

MMS Clients conforming to MM Content Class Content Rich, that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]), SHALL support SVG Tiny version 1.2, as defined in [CP0050A], in retrieval and presentation.

Apart from the guidelines available in the above-mentioned specifications, following restrictions apply when SVG Tiny is used in any MMS Message:

- The MMS Client is not required to handle an SVG Tiny file as a presentation part or as the root part of a multipart/related message in an MM. So, it is expected that an SVG Tiny file is neither used as a presentation part nor as the root part of a multipart/related message in MMS.

- The MMS Client is also not required to handle an SVG Tiny file that refers any media outside the file. So, it is also expected that an SVG Tiny file does not refer any media outside the file within the same MM.

7.1.11   Refinement of MM size in MM Content Class

For the MM Content Class Megapixel the following applies:

- Clients/terminals conforming to MM Content Class Megapixel SHALL support a maximum MM size of at least 600 KB in retrieval and presentation.

- For creation and submission, the MMS Client SHALL be configurable via a parameter called "max authorized MM size" to set the maximum size of MM belonging to MM Content Class Megapixel. The MMS Client SHALL support exactly two values for this parameter: 300 KB and 600 KB. Examples of methods of configuration are:

  - o   Preconfiguration at manufacturing phase

  - o   Configuration via Over The Air Provisioning

  - o   Configuration via device management

  - o   Configuration via (U)SIM

8. Presentation Methods

SMIL is a presentation language, i.e. a SMIL page contains information about the appearance of different multimedia elements on a display. When SMIL is used to represent content on a PC screen, normally a window is opened whose size is defined by the layout element of the SMIL page to be displayed. In this way, the appearance of the SMIL page on the screen will reflect exactly the organization of the content as the author had created it.

When SMIL is used for the presentation of multimedia messages on mobile terminals, the size of the window is severely limited by the resolution and appearance of the terminal display. The layout of a multimedia message represents the content as created by the originator, but it is well possible that the original layout simply does not fit into the display of the receiving terminal. Therefore, SMIL exchange must be simple enough to ensure that -if the displays of the originator and receiver terminal are different- the content can still be displayed, possibly by changing the relative position of the different elements.
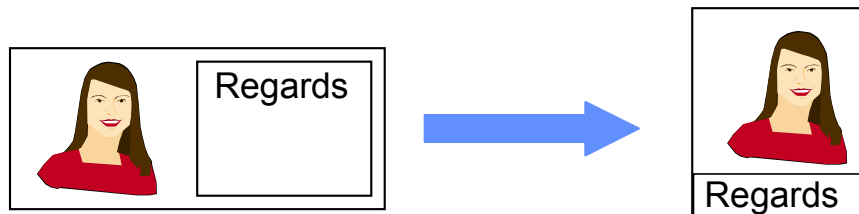
Figure 2: The same message needs to be reorganized for display on different displays.

Due to the limited processing power of the first generation of MMS-enabled devices, this adaptation process must be achieved without the need of complex content analysis and interpretation.

In order to achieve this goal, the layout of the outgoing message SHOULD reflect (in terms of size and orientation) the display characteristics of the originating terminal, and MUST always contain at most two regions one labeled as "**Text**", the other as "**Image**".

Region labeled as "**Text**" MUST contain only text media, whereas region labeled as "**Image**" MUST contain only Image or Video media.

If the receiving terminal can fit the SMIL layout in its screen as is, no change will be necessary. Otherwise, if the display of the receiving terminal does not allow the fitting of the layout as specified in the incoming message, the receiving MMS Client MAY replace the layout section with a terminal-specific one in which the size and the position of the "**Text**" and **"Image"** regions are appropriately redefined.

The following example (Example 1) shows a simple multimedia message composed of three slides, described in the **<body>** part of the message. There are two different **<layout>** parts, one corresponding to the "**landscape**" orientation of the display, one to the "**portrait**" orientation.

```
<smil>
                <head>
                                <meta name="title" content="mms" />
                                <meta name="author" content="John Smith" />

                                <layout>  <! --This an "landscape" screen (2*qcif)-->
                                        <root-layout width="352" height="144"/>
                                        <region id="Image" width="176" height="144" left="0"
top="0" />
                                <region id="Text" width="176" height="144" left="176" top ="0"/>
                </layout>

<!--   <layout>   // This is a "portrait" screen -->
<!--                        <root-layout width="176" height="216"/>  -->
<!--        <region id="Image" width="176" height="144" left="0" top="0" />  -->
<!--           <region id="Text" width="176" height="72" left="0" top ="144"/>  -->
<!--   </layout>  -->

                </head>
                <body>
                    <par dur = "8000ms">
                        <img  src = "FirstImage.jpg" region="Image" />
                        <text src = "FirstText.txt" region="Text" />
            <audio src = "FirstSound.amr"/>
                    </par>
                    <par dur = "7000ms" >
                        <img   src = "SecondImage.jpg" region="Image" />
                        <text  src = "SecondText.txt" region="Text" />
                        <audio src = "SecondSound.amr"/>
                    </par>
                    <par dur = "4000ms" >
            <img  src = "ThirdImage.jpg" region="Image"/>
            <text  src =  "ThirdText.txt" region="Text"/>
            <audio src = "ThirdSound.amr"/>
        </par>
    </body>
</smil>
```

Example 1: A multimedia message containing three slides

Even if low end terminals might disregard completely the incoming **<layout>** section and replace it with a terminal specific one, it is important that all outgoing messages are constructed in such way that they will be displayed properly on non-mobile terminals (such as PCs), and on more capable mobile terminals when they are available in the future.

A slide that contains video SHALL contain only video and text components.

An example of slide containing video is given below in Example 2:

```
<smil>
   <head>
      <layout>
         <root-layout height="200" width="176" />
         <region id="Image" height="144" width="176" />
         <region id="Text" height="56" width="176" fit="scroll" />
      </layout>
   </head>
   <body>
      <par dur="20000ms">
         <video src="videoclipname.3gp" region="Image" />
         <text src="Text1.txt" region="Text" />
      </par>
      <par dur="2000ms">
         <img src="image.gif" region="Image" />
         <text src="cid:Text2" region="Text" />
      </par>
   </body>
</smil>
```

Example 2: A multimedia message slide containing a slide with a video clip

8.1   MMS SMIL

This section presents a minimum selection of SMIL elements that allow the presentation of multimedia messages, as described in section 5. The elements of "MMS SMIL" are grouped by functionality, in analogy to the approach followed in the SMIL specification of W3C [SMIL].

All unknown elements/attributes, regardless of whether they belong to the subset defined by MMS SMIL or not, not recognized by the MMS Client SHALL be ignored, and the MMS Client SHALL use the supported parts for the presentation as described in this specification.

8.1.1   Collections Used in the Tables

For simplicity, some of the elements and attributes that appear more commonly in the definitions are here grouped in "collections" that are referred to in the following tables. The grouping of MMS SMIL elements in this specification SHALL be according to Table 3.

Collection Name	Elements in Collection
MMSSchedule	par,
MMSMediaContent	text, img, audio, video, ref

Table 3: MMS SMIL grouping of elements

8.1.2   Elements Used in MMS SMIL

8.1.2.1   Layout Modules

The Layout Modules provides a framework for spatial layout of visual components. MMS SMIL SHALL adopt parts of the SMIL 2.0 BasicLayout module as shown in Table 4.

Elements	Attributes	Content Model
Layout		region, root-layout
Region	left, top, height, width, fit, id	EMPTY

| root-layout | width, height, backgroundColor (1) | EMPTY |

Table 4: The MMS SMIL layout module

Note (1): **backgroundColor** attribute is not part of the original MMS SMIL. It was added as an optional attribute from MMS 1.3 onwards.

Default dimensions of the root-layout are the dimensions of terminal display area. Sizes of regions are calculated as in SMIL BasicLayout.

The dimensions of the regions inside the **root-layout** can be expressed in absolute terms (i.e. in pixels) or in percentages relative to the dimensions of the **root-layout**. For the sake of clarity, mixed absolute/relative notations SHOULD be avoided.

backgroundColor attribute in the **root-layout** element applies to the background color for the entire presentation.

In creation, MMS Clients MAY set **backgroundColor** attribute in **root-layout** element.

In submission, MMS Clients SHOULD be able to submit a MM that contain **backgroundColor** attribute in **root-layout** element.

In retrieval and presentation, MMS Clients SHOULD be able to render the background colour according to the **backgroundColor** attribute in **root-layout** element.

8.1.2.2   Media Object Modules

The Media Object Modules provide a framework for declaring media, which constitute the contents of a SMIL presentation. MMS SMIL includes parts of the SMIL BasicMedia module. The **begin** and **end** attributes belong to the BasicInlineTiming module. The media object modules of MMS SMIL SHALL be defined according to Table 5.

Elements	Attributes	Content Model
Text	src, region, alt, begin, end, dur	EMPTY
Img	src, region, alt , begin, end, dur	EMPTY
Audio	src, alt, begin, end, dur	EMPTY
Video	src, region, alt, begin, end, dur	EMPTY
ref,	src, region, alt, begin, end, dur	EMPTY

Table 5: The MMS SMIL media object modules

The media type referred to by **src** MUST match that of the element to which it refers. In other words expressions like **<img src = "text_object">** , although permitted by SMIL, are not allowed in SMIL MMS. **img** elements can only refer to images, **txt** to text, and **video** to video media.

According to the rendering capabilities of the receiving terminals, the timing attributes **begin** and **end** associated to single media elements MAY be neglected or overridden by user control.

The Video tag SHALL only be present in MMs that contain a video object.

8.1.2.3   Structure Modules

The Structure Modules describe the structure of the SMIL document. The structure modules of MMS SMIL SHALL be defined according to the parts of the SMIL Structure module listed in Table 6.

Elements	Attributes	Content Model
Smil		head, body
Head		layout
Body		MMSSchedule

Table 6: The MMS SMIL structure modules

8.1.2.4   Timing and Synchronization Modules

The Timing and Synchronization Module provides a framework for describing timing structure, timing control properties, and temporal relationships between elements.

The MMS SMIL includes the par element from the BasicTimeContainer module and the **begin**, **end**, **dur** attributes form the BasicInlineTiming module. The **begin**, **end** and **dur** attributes can be used in conjunction with the media object elements (see section 8.1.2.2). Some constraints are added in order to achieve a simple scheduled timeline. MMS SMIL SHALL NOT adopt nesting of time containers, as mentioned in the section of Timing and Synchronization Module, and only allows a single level of explicit time container elements.

An MM using MMS SMIL SHOULD have one or more (non nested) **<par>**….**</par>** time container(s) child(ren) of the body element, each one corresponding to one "slide" (see section 5.2). The structure element **body** is implicitly defined to be a seq time container in SMIL1.0 and SMIL Boston language profile, and MMS SMIL follows this definition. The succession of **<par>** … **</par>** clauses will therefore achieve the "slide show" presentation effect.

The MMS SMIL timing and synchronization module SHALL be defined according to Table 7.

Elements	Attributes	Content Model
Par	dur	MMSMediaContent

Table 7: The MMS SMIL timing and synchronization module

The receiving terminal MAY override the duration of the single slides specified in the SMIL page, e.g., by controlling the passage to the next slide with phone key.

Time SHALL be expressed in integer milliseconds.

8.1.2.4.1   Handling Media Objects as Part of an MMS SMIL Presentation.

a). Composing a slide presentation with an audio and/or video objects:

It is not mandatory to include **dur** attribute within each **<par>**….**</par>** time container.

In the composition of the MM, the MMS Client MAY:

- Skip inserting the attribute in a <par> … </par> time container , or

- Set this attribute to the same value as the duration of the media object contained in the slide presentation, e.g. (media video or audio file), or

- Set this attribute to a value selected by the user.

b). Rendering a slide presentation with a video or audio object.

- If in the **par** element of the original slide presentation the **dur** attribute value is missing, then the MMS Client SHALL play the video or audio object as defined in [SMIL].

Note: This implies that the MMS Client will not use a default value for the dur attribute if there is a media object with a certain duration.

8.1.2.5 Meta Information Modules

This module contains elements and attributes allowing to describe SMIL documents. The MMS messages MAY contain meta-information, included in the message by means of the **meta** element.

The MMS terminal MUST be able to parse the **meta** element, but the processing of the **meta** element is OPTIONAL. The MMS SMIL meta information module SHALL be defined according to Table 8.

Elements	Attributes	Content Model
Meta	Name, content	EMPTY

Table 8: The MMS SMIL meta information module

8.2 Hyperlinks

Hyperlinks SHOULD be supported as described in [TS22140], [TS23140] , [SR0064] and [XS0016200].

When hyperlinks are supported, a minimum length of 512 characters SHALL be supported.

Note: Conventions for embedding hyperlinks within plain text per [RFC1738] "APPENDIX: Recommendations for URLs in Context" are useful when hyperlinks are used in non-markup language.

9. Content Adaptation

9.1 Overview

The MM Content Classes defined for the Core MM Content Domain lay out basis for interoperable messaging with simple but mandatory requirements for multimedia support. The MM Content Classes permit media types as specified by both [CS0045] and [TS26140]. The reception of MMs conformant to the MM Content Classes including media formats defined in either Table 1 or Table 2 is supported directly within the terminal, or through transcoding within the network. The MM Content Classes provide seamless interoperability only within each content class, in other words, if the sender and recipient both support the same content class.

Although there are carefully considered multimedia support in each MM Content Class and relation of the supported multimedia formats between the classes, seamless interoperability for person-to-person messaging cannot be guaranteed between the classes. There is no end-to-end capability negotiation with MMS that would let the sender to know the exact MMS support of the recipient.

The term content adaptation consists of a series of functions and definitions, which alter the content not supported by the recipient MMS Client to a content which is supported by the recipient yet preserving the original information content to the extent possible. These functions, called transcoding functions, may resize multimedia objects, perform conversion between media formats, perform conversion between media types and, ultimately, even drop off some unsupported media objects.

The purpose of content adaptation is to bridge the gaps between MM Content Classes in core MM Content Domain to minimise the requirement for sending MMS Client to know the capabilities of the recipient MMS Client for person-to-person messaging. Content adaptation for MM Content Classes Content Rich and Content Basic are not specified.

The content adaptation is divided into two categories, minor adaptation and major adaptation.

"Minor adaptation" refers to transcoding functions, which mainly adapt the message size, image resolution, sound and video quality to match the capabilities of the receiving MMS Client while preserving the information content of the multimedia message. Minor adaptation does not in general contain removal of media content or media type conversions. Adaptations between media formats are considered minor if end-user perceives no drastic loss of quality or loss of content.

"Major adaptation" refers to transcoding functions, which perform more drastic message size, image resolution, sound and video quality adaptations which generally result to loss of information content. Major adaptation may include removal of media content and media type conversions. Adaptations between media formats are considered major if end-user perceives drastic loss of quality or content.

In this document, the media aspects of content adaptation are discussed. The related message flows are discussed in [MMSCTR].

9.2 Transcoding Policy within an MM Content Class

In order to provide interoperability between [CS0045] and [TS26140] media types, transcoding within a content class SHALL be done when required. For H.263 transcoding may also be required when different profile levels are supported as in earlier versions of MMS (cf. section 9.2.3).

9.2.1 Speech Audio Transcoding

Speech audio transcoding between differing voice codecs SHALL be classified according to Table 9 and Table 10.

To: From:	AMR
13k	Minor

Table 9: Classification of 13k to AMR speech audio transcoding

To: From:	13k
AMR	Minor

Table 10: Classification of AMR to 13k speech audio transcoding

9.2.2   Synthetic Audio Transcoding

Synthetic audio transcoding between differing synthetic audio modes and voice codecs SHALL be classified according to Table 11 and Table 12.

To: From:	13k
SP-MIDI	Major (2)

Table 11: Classification of SP-MIDI synthetic audio transcoding for 13k

To: From:	SP-MIDI	AMR
General MIDI Level 1	Major (1)	Major (2)

Table 12: Classification of General MIDI synthetic audio transcoding to SP-MIDI and AMR

(1) Reduction of size requires dropping of instruments which may result in major loss of quality.

(2) Considering the SP-MIDI and General MIDI Level 1 approach of synthetised instruments, this transcoding may result in significant loss of information.

9.2.3   Video Transcoding

Video transcoding between differing video codecs SHALL be classified according to Table 13.

To: From:	H.263 baseline profile 0 level 10
MPEG-4 Visual Simple Profile level 0	Minor

Table 13: Classification of MPEG4 video transcoding to H.263

Video transcoding between level 45 and level 10 for H.263 baseline profile 0 SHALL be according toTable 14.

To: From:	H.263 baseline profile 0 level 10
H.263 baseline profile 0 level 45	Minor

Table 14: Classification of H.263 profile 0 transcoding between level 45 and level 10

9.3 Transcoding Policy between MM Content Classes

The MM Content Classes in core MM content domain do not provide seamless interoperability, since different classes have different requirements for media type support. Thus, it is necessary to introduce content adaptation policy between the MM Content Classes. Messaging between the classes are described in Table 15 and below that, a transcoding policy is introduced in each case.

In practice, the content adaptation rules listed here result in the minimum conformant multimedia message. Additional knowledge of the terminal capabilities (e.g., learned through UAProf [UAProf]) SHALL be used when making the content adaptation decision. For example: if a terminal will support a download larger than the minimum allowed by its supported content class, this is encouraged.

If more detailed information than the supported MMS Content Class(es) is not available through UAProf, the rules in bullets 1-11 below SHALL be used.

Supported class → Received class ↓	Image basic	Image rich	Video basic	Video rich	Megapixel
Text	N/A	N/A	N/A	N/A	N/A
Image basic	N/A	N/A	N/A	N/A	N/A
Image rich	1, 2,3,5	N/A	N/A	N/A	N/A
Video basic	1, 2,3,5,6	7	N/A	N/A	N/A
Video rich	1, 2,3,5,6	4,7	4	N/A	N/A
Megapixel	1,8,9,5,6	4,7,10	4,10	10, 11	N/A

Table 15: Content adaptation within core MM content domain

1. **Major:** for the purpose of size reduction, GIF89a (animated) is converted to object(s) of any mandatory image format(s) with related presentation and GIF89a part is removed.

2. **Minor**: The image resolutions are reduced to 160*120 pixels.

3. **Minor:** The message size is reduced to 30 KB using resolution and quality reduction techniques for image and speech objects.

4. **Minor**: The message size is reduced to 100 KB using resolution, frame-rate and other quality reduction techniques for image, speech and video objects.

5. **Major**: Either the General MIDI level 1 or SP-MIDI media type is removed.

6. **Major**: One or more video frame(s) are converted to object(s) of any mandatory image format with related presentation and video part is removed. QCIF resolution is scaled to 160*120 pixels.

7. **Major:** One or more video frame(s) are converted to object(s) of any mandatory image format with related presentation and video part is removed.

8. **Major**: The image resolutions are reduced to 160*120 pixels.

9. **Major**: The message size is reduced to 30 KB using resolution and quality reduction techniques for image and speech and video objects.

10. **Minor**: The image resolutions are reduced to 640*480 pixels.

11. **Minor:** The message size is reduced to 300 KB using resolution, frame-rate and other quality reduction techniques for image, speech and video objects.

The rules in bullets 1-11 above do not imply any priority order.

9.4 Transcoding Matrices

In the following tables, content adaptation between media formats and types are classified as minor or major. Guidelines and reasoning are given as notes below the tables. The content adaptation is marked non-applicable when the original format is already supported as part of the target format or when original format is mandatory in all MM Content Classes.

9.4.1 Still Image and Graphics Transcoding

Still image and graphics transcoding SHALL be classified according to Table 16.

To: From:	JPEG baseline
JPEG Baseline	Minor

Table 16: Classification of still image and graphics transcoding

MMS Proxy-Relay MAY transcode JPEG EXIF images to JPEG Baseline JFIF images in case the receiving MMS Client does not conform to the MMS 1.3 suite of specifications.

In order to avoid unnecessary loss of image quality resulting from JPEG decompression-recompression, transcoding from JPEG EXIF to JPEG Baseline JFIF SHOULD only consist of the following:

• in all cases, replacement of the EXIF APP1 Application Segment with a generic JFIF APP0 Application Segment (typical content: version = 1.02, units = dpi, density = 72, thumbnail = none).

• in case the EXIF image display orientation differs from "Left-to-right/top-to-bottom", lossless JPEG rotation and/or lossless JPEG flipping of the image data.

9.4.2 Bitmap Graphics Transcoding

Bitmap graphics transcoding SHALL be classified according to Table 17.

To: From:	GIF87a	GIF89a	WBMP	JPEG
GIF87a	Minor	N/A	N/A	Minor
GIF89a (animated)	Major (1)	Minor	N/A	Major (1)
WBMP	N/A	N/A	Minor	Minor
PNG	Minor	Minor	N/A	Minor

Table 17: Classification of bitmap graphics transcoding

GIF89a contains GIF87 + animations + transparent mode (allowing one part of the image to be on top of transparent background).

(1) Driven by file size reduction only. If animated, one or more frame(s) of animation converted to any mandatory image format.

9.4.3 Speech Audio Transcoding

Speech audio transcoding SHALL be classified according to Table 18 for AMR and according to Table 19 for 13k.

To:	AMR
From:	
AMR	Minor (1)

Table 18: Classification of AMR speech audio transcoding

To:	13k
From:	
13k	Minor (1)

Table 19: Classification of 13k speech audio transcoding

(1) The size reduction with bearable quality loss is modest considering the required processing.

9.4.4 Synthetic Audio Transcoding

Synthetic audio transcoding SHALL be classified according to Table 20, Table 21 and Table 22.

To:	**SP-MIDI**	**AMR**
From:		
SP-MIDI	Major (1)	Major (2)

Table 20: Classification of SP-MIDI synthetic audio transcoding for AMR

To:	**SP-MIDI**	**13k**
From:		
SP-MIDI	Major (1)	Major (2)

Table 21: Classification of SP-MIDI synthetic audio transcoding for 13k

To:	**General MIDI Level 1**	**13k**
From:		
General MIDI Level 1	Major (1)	Major (2)

Table 22: Classification of General MIDI Level 1 synthetic audio transcoding for 13k

(1) Reduction of size requires dropping of instruments which may result in major loss of quality. SP-MIDI itself is compact format. Thus, increase of file size may result.

(2) Considering the SP-MIDI and General MIDI Level 1 approach of synthetised instruments, this transcoding may result in significant loss of information.

9.4.5 Video Transcoding

Video transcoding SHALL be classified according to Table 23 and Table 24.

To:	**H.263 baseline profile 0 level 10**	**JPEG**	**GIF87**	**GIF89a**
From:				
H.263 baseline profile 0 level 10	Minor	Major (1)	Major (1)	Major (1)

Table 23: Classification of H.263 profile 0 level 10 video transcoding

From: To:	MPEG-4 Visual Simple Profile level 0	JPEG	GIF87	GIF89a
MPEG-4 Visual Simple Profile level 0	Minor	Major (1)	Major (1)	Major (1)

Table 24: Classification of MPEG4 visual simple profile level 0 video transcoding

(1) Video to image transcoding involved conversion of one or more video frame(s) to one or more objects of the mandatory image formats (one JPEG, GIF89a (animated), SMIL incl. several JPEG attachments), depending on the size constraint).

9.4.6 Text Transcoding

Text transcoding SHALL be classified according to table 24.

From: To:	Plain Text
XHTMLMP	Minor

Table 25: Classification of transcoding from Rich Text to Plain text

Minor Content Adaptation: all Rich Text attributes are removed (however textual indications characterizing the formatting may be inserted in a limited amount) and Rich Text (including Hypertext) is converted to Plain Text.

9.5 Requirements for Content Adaptation

9.5.1 MMS Client and Terminal Requirements

The requirements for MMS Client to support content adaptation are:

- The recipient MMS Client SHALL NOT reject the multimedia message based on the message size indicated in the MMS notification

- MMS Client SHALL support UAProf [UAProf] for MMS Client capability negotiation.

The requirements for the terminal to support content adaptation are:

- If the MMS Client and a camera are integrated into the terminal, the terminal
SHALL be able to reduce in size any image taken by the integrated camera such that it fits into an MM of the Core MM Content Domain.

9.5.2 MMS Proxy-Relay Requirements

The MMS Proxy-Relay requirements for the content adaptation are:

- MMS Proxy-Relay SHALL support UAProf [UAProf] for MMS Client capability negotiation

- MMS Proxy-Relay SHALL be able to perform minor content adaptation as specified in this document.

- MMS Proxy-Relay MAY be able to perform major content adaptation

- If the MMS Proxy-Relay is able to perform major content adaptation it SHALL provide means to the MMS service provider to enable or disable the major content adaptation function.

- When major content adaptation is or needs to be applied to an MM, the original content of the MM SHOULD be available to the end-user through subsequent MMS transactions or by other means (e.g., web or IMAP interface store or forwarding to e-mail). No additional constraints on multimedia message retention time are implied.

When a media format/type adaptation is accomplished, the extension of the files and the MIME types MUST be modified accordingly in the corresponding header fields. These changes MUST be reflected in the presentation element.

When a media type adaptation is accomplished, the labels in the presentation element MUST be modified if appropriate (e.g., <video> to <img> in the adaptation from video to image)

If major content adaptation was performed or a media element is dropped during the content adaptation the MMS Proxy-Relay SHALL insert information in the MM (e.g., by modification of the text element contained in the same slide) to inform the user of this fact.

10.Technical Interoperability

The OMA MMS$_M$ interface SHALL adhere to the technical definitions in the following subsections of section 10.

10.1 WAP Flow Control

WTP SAR, using relevant TPIs (at least "PSN" and "Option Maximum Group"), SHALL be supported as described in [WAPWTP] sections 8.10 and 8.14.

10.2 MMS Encoding

10.2.1 Encoding and Values in MMS Headers

The Content-Type in M-Send.req and M-Retrieve.conf SHALL be application/vnd.wap.multipart.mixed when there is no presentation, and application/vnd.wap.multipart.related SHALL be used when there is SMIL presentation available. Use of other content types is outside the scope of this specification.

Some of the MMS headers have been defined as "Encoded-string-value". The character set IANA MIBEnum value in these headers SHALL be encoded as Integer-value ([WAPWSP] section 8.4.2.3). The character set us-ascii (IANA MIBenum 3) SHALL always be accepted. If the character set is not specified (simple Text-string encoding) the character set SHALL be identified as us-ascii (lower half of ISO 8859-1 [ISO8859-1]). When the text string cannot be represented as us-ascii, the character set SHALL be encoded as utf-8 (IANA MIBenum 106) which has unique byte ordering.

In the MMS headers the supported characters SHALL be at least those in ISO 8859-1.

The headers whose definition is Text-string (Content-Location, Message-ID, etc.) SHALL contain only us-ascii characters (lower half of ISO 8859-1 [ISO8859-1]).

10.2.2 Message Content Encoding

WSP multipart encoding SHALL be used [WAPWSP].

The shortest encoding of integer-values SHALL be used.

Content types in WSP multipart headers SHALL be encoded using WSP binary values whenever available. If they are not available in [WAPWSP], text encoding SHALL be used. When no parameters are present, the content type values SHALL be encoded according to Constrained-media = Constrained-encoding = Extension-Media | Short-integer, see [WAPWSP] 8.4.2.24.

A name for multipart object SHALL be encoded using name-parameter for Content-Type header in WSP multipart headers. In decoding, name-parameter of Content-Type SHALL be used if available. If name-parameter of Content-Type is not available, filename parameter of Content-Disposition header SHALL be used if available. If neither name-parameter of Content-Type header nor filename parameter of Content-Disposition header is available, Content-Location header SHALL be used if available. In creation, the character set SHALL be either us-ascii (IANA MIBenum 3) or utf-8 (IANA MIBenum 106) [Unicode]. In retrieval, both us-ascii and utf-8 SHALL be supported. The us-ascii character set SHALL be unencoded. In encoding utf-8, either Q-encoding [RFC2047, 4.1] or B-encoding [RFC2047, 4.2] SHALL be used. In decoding utf-8, both Q-encoding and B-encoding SHALL be supported.

Content type for SMIL SHALL be application/smil.

Techniques from [RFC2557] SHALL be used when referencing to multimedia objects from SMIL presentation (Content-Id and Content-Location). The maximum size of Content-Id or Content-Location SHALL be 100 characters.

Character encoding with WSP multipart headers (Content-Id, Content-Location, etc.) SHALL be us-ascii (lower half of ISO 8859-1), as there is no WSP specific definition for the character set encoding in part headers.

The use of WSP multipart headers to other than referencing purposes (Content-Id, etc.) and character set definition SHALL be outside of the scope of this specification

10.2.3   Start Parameter Referring to Presentation

The presentation part in an application/vnd.wap.multipart.related structure SHALL be identified by a Content-ID header in the multipart structure. ([WAPWSP] 8.5.3).

According to [RFC2387] Content-ID in start parameter contains < and > characters:

Content-Type: Multipart/Related;
             start="<950120.aaCC@XIson.com>";
             type="application/smil"

These < and > SHALL be retained in the header, but quotes SHALL be omitted. Also, quotes SHALL NOT be used in the content type specification of SMIL. The corresponding Content-ID header of the SMIL body part SHOULD contain the same string with < and > included.

10.2.4   SMIL Part Referring to Multimedia Objects

Within SMIL part the reference to the media object parts SHALL use either Content-ID or Content-Location mechanism [RFC2557] and the corresponding WSP part headers in media object parts contain the corresponding definitions.

In case of Content-ID, the URI:s SHALL be without < and > (compare to [RFC2557], <IMG SRC="cid:950120.aaCC@XIson.com">). To resolve a CID reference, "cid:" part SHALL be removed from the string, and the remaining string enclosed within < > marks. After this it can be compared to the value obtained from Content-ID header.

As the CID reference is only used within a single message, there is no need to create globally unique values for the content-ids, and there SHALL be no requirement for a legal address definition for the CID.

The Content-Location reference in the SMIL part SHALL be represented as relative URI, e.g., <img src="myimage.jpg">). The corresponding definition in media object parts shall be:

Content-Location: myimage.jpg

The content-location header MAY be used by the MMS Client as a hint when generating a filename for the media object. However, as different operating systems have different rules for valid filenames, there is no guarantee that a filename generated by one operating system is valid in another operating system.

10.2.5   Maximum Values of MMS Parameters

As id:s and references may vary a lot in different implementations this specification will also cover some of these as well as some other length dependent values, in order to achieve interoperability. The maximum values of MMS parameters SHALL be specified according to Table 26. Constraints SHALL NOT be put on the actual values, only on their lengths counted in us-ascii characters.

Message ID	40 characters
X-Mms-Transaction-Id	40 characters
X- Mms-Content-Location	100 characters
MMSC URL length	50 characters
Subject	40 characters (Max subject length in M_Notification.ind)
X-Mms-Response-Text	30 characters
To, Cc and Bcc	312 characters total, including phrase and mailbox. Note that the mailbox portion, including punctuation ("<>@"), is limited to 256 characters per [RFC2821].

Name-parameter for Content-Type in WSP multipart headers	40 characters
X-Mms-Retrieve-Text	30 characters
X-Mms-Store-Status-Text	30 characters

Table 26: Maximum values of MMS parameters

A minimum of 20 addresses SHALL be supported within the "To", "Cc"and "Bcc" header fields. These MAY be split up in the three field categories in any desired way but SHALL result in a total number less or equal to 20 addresses but no less than one address. The support of the "Bcc" field upon submission of an MM is OPTIONAL for the originating MMS Client. In addition the maximum number of characters per address SHALL be less or equal to 312 characters total, including phrase and mailbox; the mailbox portion, including punctuation ("<>@"), SHALL follow the limitations described in [RFC 2821].

10.3 General Interoperability Requirements.

If the MMS Client receives an MM that contains corrupted content or content that is not supported by the terminal, then the MMS Client SHALL employ best effort in presenting the MM. l The MMS Client SHOULD continue functioning after unsupported or corrupted content is received.

Note that malformed content is a potential security issue. Precautions should be used to guard against buffer overflows and other potentially exploitable security vulnerabilities.

11. Presentation Part Related Requirements to the MMS Client (Normative)

For content messaging it is particularly important that MM are presented to the user as intended, i.e., without modifications. This might be achieved by creating – for different target terminals/MMS Clients – different versions (that is, different MM) for a given content; however this is a cumbersome method.

For content messaging, MMS supports the PSS SMIL language definition fully as defined in [TS26.246]. However, necessarily, there are technical limits to present MM:

  (a) Technical/physical limitations of the MMS Client (and the hardware that it resides on);

  (b) Technical/physical limitations of the terminal associated with the MMS Client (e.g., screen size).

In order to achieve predictable presentations

  •   certain limits for the technical presentation of MM are defined in section 11.1.

  •   rules how the MMS Client has to handle the case where the technical capabilities of the associated terminal are exceeded are defined in section 11.2.

11.1 Limits for the Physical Presentation of MM

The restrictions of Table 27 SHALL apply for the usage of 3GPP PSS6 SMIL Language Profile (as defined in [TS26.246] for MMS. If these restrictions are exceeded, the exact presentation can not be guaranteed.

Restrictions

General
The MMS Client SHALL recognize the complete 3GPP PSS6 SMIL Language Profile (as defined in [TS26.246]). This means that the MMS Client SHALL be able to recognise a presentation part of this profile as a valid document and to handle it within the limits of this section.   Attributes and values that are not handled by the MMS Client SHALL be ignored by the MMS Client.
Nesting
The MMS Client SHALL be able to handle at least a nesting depth of timecontainers up to and including five (body element included). Deeper nestings MAY be discarded by the MMS Client, but SHALL be correctly parsed.
Basic Layout
The MMS Client and associated terminal SHALL be able to display up to at least 20 regions at the same time. The MMS Client and associated terminal is not required to be able to display more than 20 regions at the same time.
The MMS Client and associated terminal are not required to be able to present an object on top of video or animation
The MMS Client and associated terminal are not required to display at the same time regions with more than 4 different z index values.

Media
The MMS Client SHALL be able to handle **fit** value **scroll** for text media elements; the MMS Client is not required to handle **fit** values different from **scroll** for text media elements. The MMS Client SHALL be able to handle **fit** values **hidden**, **meet**, **fill** for image media elements; the MMS Client is not required to handle **fit** values different from **hidden**, **meet**, **fill** for image media elements. The MMS Client SHALL be able to handle **fit** values **hidden** for non-static media elements; the MMS Client is not required to handle **fit** values different from **hidden** for non-static media elements.

Basic Inline Timing
The MMS Client and associated terminal SHALL execute time related SMIL parts with an accuracy of at least 100 ms.
The MMS Client is not required to correctly handle negative values of **begin** and **end** attributes.
The MMS Client and associated terminal SHALL be able to render up to at least 4 media objects starting at the same time. The MMS Client and associated terminal is not required to be able to render more than 4 media objects starting at the same time.
The MMS Client is not required to simultaneously play two audio sources (this includes audio associated to video).

Basic Linking
If the MMS Client resides in a terminal with keypad, the MMS Client SHALL be able to handle 0-9, '#' and '*' for **access key**.
The MMS Client is not required to support the **target** attribute.
The MMS Client is not required to handle more than one volume control.
The terminal associated to the MMS Client is not required to support more than one volume control.
The MMS Client is not required to handle attributes **show**, **sourceplaystate** and **sourceLevel**.
The MMS Client is not required to handle audio and video element as child nodes of the **<a>** tag.

Basic Content Control
The MMS Client SHALL be able to handle the following **switch** attributes: **-systemLanguage** **-systemScreenSize** **-systemScreenDepth**
The MMS Client is not required to handle **switch** attributes different from those listed above.

Media Clipping
The MMS Client SHALL support attributes clipBegin and clipEnd for seekable remote media accessed with a streaming session controlled by RTSP (see TS 26.234). The MMS Client is not required to handle attributes clipBegin, clipEnd for local media and non seekable remote media accessed via a streaming session. An MMS Client residing in a terminal that does not

support streaming is not required to handle clipBegin, clipEnd.
__BasicTransitions__
The MMS Client is only required to handle **transition** applied to static media.
__PrefetchControl__
The MMS Client is not required to handle **prefetch**.
__EventTiming__
The MMS Client SHALL at least handle the types of events listed below: - **activateEvent** *(to handle user interaction);* Audio and video objects are not required to be selectable during the presentation. Hence, the activateEvent is only required to be generated by text and image objects. - **beginEvent**, **endEvent** *(fluidity between media)*

Table 27: Limits for the physical presentation of MM

11.2 Requirements to the MMS Client when Technical Limits of the Associated Terminal are exceeded

Content should be designed according to a targeted screen size.

The MMS Client SHOULD display as many media as possible (best effort) - even if some SMIL elements received are not fully supported. If technical limitations of the MMS Client are exceeded, priority SHOULD be given to video contents over other visual contents to be displayed simultaneously.

The MMS Client shall alter a SMIL presentation layout only if the technical limits of the associated terminal are exceeded.

The MMS Client SHOULD adapt the SMIL layout to the screen

- by rotating the presentation

    o by +90 degree (rotation to the left) from a landscape format to a portrait format, if the display of the associated terminal has a portrait format

    o by -90 degree (rotation to the right) from a portrait format to a landscape format, if the display of the associated terminal has a landscape format

- by zooming the layout to best fit the screen size without clipping parts and keeping the aspect ratio.

- by covering the unused parts of the screen by an appropriate background colour.

12. MMS Client Conformance

12.1 Conformance Requirements

It is recognised that an MMS Client declares MMS creation conformance, MMS submission conformance, MMS retrieval conformance and MMS presentation conformance (see section 12.3) to enable an interoperable MMS mass market. Declaration of partial conformance may be needed for devices where not all MMS functionalities are necessary, for instance, accessories.

The MMS Client can reach three levels of conformance to this document (for the definition of MM Content Class, see section 7):

(1) Full Conformance to an MM Content Class

Declaration of full conformance applies only to MM Content Classes defined in the Core MM Domain.

A fully conformant MMS Client to an MM Content Class SHALL satisfy the following requirements:

- the MMS Client is MMS creation conformant (as specified in section 12.3.1) to that MM Content Class

- the MMS Client is MMS submission conformant (as specified in section 12.3.2) to that MM Content Class

- the MMS Client is MMS retrieval conformant (as specified in section 12.3.3) to that MM Content Class

- the MMS Client is MMS presentation conformant (as specified in section 12.3.4) to that MM Content Class.

An MMS Client SHALL NOT be able to declare full conformance to MM Content Class Text alone.

(2) Service Conformance to an MM Content Class.

Declaration of service conformance applies only to MM Content Classes defined in the Content MM Content Domain.

A service conformant MMS Client to an MM Content Class SHALL satisfy the following requirements:

- the MMS Client is MMS retrieval and presentation conformant (as specified in sections 12.3.3 and 12.3.4) to that Content MM Content Class.

- If the MMS Client is service conformant to an MM Content Class in the Content MM Content Domain, it SHALL also be partially or fully conformant to one or more MM Content Class(es) in the Core MM Domain (but not to MM Content Class Text alone).

(3) Partial Conformance to an MM Content Class

The MMS Client is partially conformant to an MM Content Class, if the following requirements (A) and (B) are both fulfilled:

A. At least one of the following requirements SHALL be fulfilled:

1. The MMS Client is MMS creation conformant (as specified in section 12.3.1) to that MM Content Class

2. The MMS Client is MMS submission conformant (as specified in section 12.3.2) to that MM Content Class

3. The MMS Client is MMS retrieval conformant (as specified in section 12.3.3) to that MM Content Class

4. The MMS Client is MMS presentation conformant (as specified in section 12.3.4) to that MM Content Class

B. Each of the following requirements SHALL be fulfilled:

1. If the MMS Client supports the Stage 2 functions defined in [TS23140] or [XS0016200] for creation of MM, the MMS Client is MMS creation conformant to that MM Content Class.

2. If the MMS Client supports the functions defined in [MMSCTR] for submission of MM, the MMS Client is MMS submission conformant to that MM Content Class.

3. If the MMS Client supports the functions defined in [MMSCTR] for retrieval of MM, the MMS Client is MMS retrieval conformant to that MM Content Class.

4. If the MMS Client supports the Stage 2 functions defined in [TS23140] or [XS0016200] for presentation of MM, the MMS Client is MMS presentation conformant to that MM Content Class.

Note: [TS23140] and [XS0016200] specifiy that support of retrieval of MM is mandatory in the MMS Client, whereas creation, submission and presentation are optional.

12.2 Content Conformance

12.2.1 Media Object Conformance

For a multimedia element to be media object conformant to a given MM Content Class the media type and format of that multimedia element SHALL belong to the MM Content Class in question and the size, resolution, encoding and other requirements of that MM Content Class SHALL be followed.

12.2.2 Content Class Conformance

For a multimedia composite object to be content class conformant to a given MM Content Class all media objects comprising that multimedia composite object SHALL be media object conformant to the given MM Content Class. Additionally, the presentation element, if present, SHALL follow the rules and definitions of the MM Content Class in question.

12.2.3 Message Conformance

For an MM to be message conformant to given MM Content Class the following requirements SHALL be fulfilled:

1. Each multimedia element of the MM is a media object content class conformant to the given MM Content Class, , each multimedia composite object of the MM is content class conformant to the given MM Content Class.

2. The multimedia message is encoded according to relevant OMA specifications (see [MMSENC] and section 10.2),

3. The size of the MM (as defined in [TS23140] or [XS0016200]) is less than or equal to the maximum size defined for the given MM Content Class.

12.3 Functional Conformance

12.3.1 MMS Creation Conformance

For an MMS Client to be MMS creation conformant to a given MM Content Class, the following conditions SHALL all be fulfilled:

1. The MMS Client SHALL support the insertion, of all media formats for all media types defined in the given MM Content Class, to an MM.

2. If the MMS Client supports also creation of MM that do not belong to that given MM Content Class, the MMS Client SHALL follow the rules defined in section 14 for the current creation mode.

12.3.2 MMS Submission Conformance

For an MMS Client to be MMS submission conformant to a given MM Content Class the following conditions SHALL all be fulfilled:

1. The MMS Client SHALL support the submission of any MM being message conformant to the given MM Content Class from the MMS Client to the MMS Proxy-Relay according to [MMSCTR].

2. The MMS Client SHALL follow the rules defined in section 14 for the current creation mode.

12.3.3   MMS Retrieval Conformance

For an MMS Client to be MMS retrieval conformant to a given MM Content Class it SHALL support the retrieval of any MM being message conformant to the given MM Content Class from the MMS Proxy-Relay to the MMS Client, according to [MMSCTR].

12.3.4   MMS Presentation Conformance

For an MMS Client to be MMS presentaion conformant to a given MM Content Class it SHALL be able to present all the media objects of any MM being message conformant to the MM Content Class, according to the presentation object and additional rules and definitions given in this document.

13. Conformance Requirements for the MMS Proxy-Relay for Interoperability

The MMS Proxy-Relay SHALL be compliant to [TS23140] or [XS0016200].

The MMS Proxy-Relay may apply certain limitations to the processing of MM, depending on the size and contents (e.g. media formats) of an MM. However the MMS Proxy-Relay SHALL support the Core MM Content Domain and Content MM Content Domain as specified below:

1. The MMS Proxy-Relay SHALL be able to receive any MM belonging to the Core MM Content Domain and Content MM Content Domain submitted by the MMS Client via the MMS_M interface.

2. The MMS Proxy-Relay SHALL be able to support retrieval by the MMS Client via the MMS_M interface of any MM belonging to the Core MM Content Domain and Content MM Content Domain.

3. The MMS Proxy-Relay SHALL be able to perform appropriate Minor content adaptation as defined in section 9 if necessary.

4. The MMS Proxy-Relay SHALL be able to forward any MM belonging to the Core MM Content Domain and any MM belonging to the Content MM Content Domain via the MMS_R interface.

5. The MMS Proxy-Relay SHALL be able to receive any MM belonging to the Core MM Content Domain and any MM belonging to the Content MM Content Domain via the MMS_R interface.

6. If the MMS Proxy-Relay implements an interface according to the MM7 reference point defined in [TS23140] and [XS0016370] then:

    a. the MMS Proxy-Relay SHALL be able to receive any MM belonging to the Core MM Content Domain and any MM belonging to the Content MM Content Domain via that interface;

    b. the MMS Proxy-Relay SHALL be able to deliver any MM belonging to the Core MM Content Domain and any MM belonging to the Content MM Content Domain via that interface.

If an MMS Proxy-Relay supports MM3 or MM7 reference points (as defined in [TS23140] and [XS0016200]) or services such as postcard or upload content, it SHOULD be able to handle (accept, process, store, deliver) MMs belonging to the standard and unclassified domains. If an MMS Proxy-Relay does not support handling an MM belonging to the standard or unclassified domains, it SHALL respond back to the originating MMS Client with the appropriate reason why the MM was not accepted.

14. Creation Modes

MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS23140]) SHALL support the requirements in this section.

To facilitate creation and submission of interoperable person-to-person (i.e. from an MMS Client in a mobile terminal to another MMS Client in another mobile terminal) MMs, three creation modes are defined as follows. The terms 'creation' and 'submission' are defined in section 3.2 of this document.

Creation mode RESTRICTED. In this mode, a terminal SHALL only create and submit MMs belonging to the Core MM Content Domain.

Creation mode WARNING. In this mode, a terminal SHALL guide the user to create and submit only MMs belonging to the Core MM Content Domain. This guidance may, for instance, be implemented as warnings to the user. If the user chooses to create and submit an MM that is conformant with the Core MM Content Domain, the MM SHALL be conformant with the Core MM Content Domain. The form of the guidance and choice is not specified. The user has the option to ignore the guidance, i.e. the warning. If the guidance is ignored a terminal MAY allow the user to add any content to the MM.

Creation mode FREE. In this mode, a terminal MAY allow the user to add any content to the MM.

The terminal SHALL support the Creation mode RESTRICTED. The terminal MAY support the other creation modes, WARNING and FREE. The requirements for all supported creation modes SHALL be mandatory.

The creation mode SHOULD be configurable. Examples of methods of configuration are:

- Preconfiguration at manufacturing phase
- Configuration via user menu
- Configuration via device management
- Configuration via (U)SIM

In the future, the number of MM Content Classes may increase. Thus, in the configuration for creation modes it is important to attach information to which version of this specification the RESTRICTED and WARNING modes apply to.

An MMS Client MAY by-pass the requirements of the creation mode, as specified above, while creating an MM for non person-to-person messaging (e.g. messaging for services like postcard and content upload, sending an MM to an E-mail address). When bypassing the restriction of creation mode, the resulting MM may belong to any MM Content Domain.

15.Re-submission Mode (Optional)

MMS Clients that are compliant to the MMS Suite of specifications defined by 3GPP (e.g., [TS23140]) MAY support the requirements below:

To facilitate submission of an earlier retrieved MMs a new submission mode –re-submission - is defined as follows:

Re-Submission Mode. In this mode, a terminal is submitting MMs that have been earlier retrieved in the terminal. The MM received MAY belong to any of the defined MM Content Domains: Core, Content, Standard or Unclassified MM Content Domain.

In the re-submission mode the MMS Client MAY allow:

- removal of any media object, and

- addition of any media object conformant to any Content Class in Core MM Content Domain, and

- modification of the message 'Subject' header.

The first two requirements are subject to terminal capabilities.

If a media object is added to the MM, then size of the MM SHALL be limited by the largest MM content class to which the MMS Client is conformant to.

In addition to these requirements, for the Client in Creation Mode RESTRICTED, three re-submission modes are defined as follows:

Re-submission mode RESTRICTED. In this re-submission mode, a terminal SHALL only re-submit MMs belonging to the Core MM Content Domain.

Re-submission mode WARNING. In this re-submission mode, a terminal SHALL guide the user to re-submit only MMs belonging to the Core MM Content Domain. This guidance may, for instance, be implemented as warnings to the user. The form of the guidance and choice is not specified. The user has the option to ignore the guidance, i.e. the warning. If the guidance is ignored a terminal MAY allow the user to re-submit any earlier retrieved MM not belonging to the Core MM Content Domain.

Re-submission mode FREE. In this re-submission mode, a terminal SHALL allow the user to re-submit any earlier retrieved MM.

The Client in Creation Mode RESTRICTED

- SHALL support Re-submission mode RESTRICTED;

- MAY support Re-submission mode WARNING;

- MAY support Re-submission mode FREE.

Note: Re-submission follows the creation mode when the creation mode is set to WARNING or FREE.

The re-submission mode MAY be configurable. If more than one re-submission mode is available then the re-submission SHALL be configurable. Examples of methods of configuration are:

- Preconfiguration at manufacturing phase

- Configuration via user menu

- Configuration via device management

- Configuration via (U)SIM

16. DRM

The support for DRM protected media objects in MMS SHALL conform to the OMA DRM specifications [OMADRM], [OMADRMREL], [OMADRMCF] and as documented in [TS23140].The following sections describe the application of DRM protection to MMS.

16.1 DRM-Protected Content within a MM

DRM protected media within a MM SHALL behave as documented in [TS23140] section 7.1.15.1

DRM protection of media objects (including Text Objects, but excluding v-Card and v-Calendar objects) SHALL be supported.

16.2 DRM-Related Client Behavior

MMS Clients SHALL handle MM containing DRM protected content as documented in [TS23140] section 7.1.15.2.

An MMS Client which supports OMA DRM protection mechanisms SHALL indicate this support in its terminal capability profile using both of the following methods:

1. The MMS Client SHALL indicate supported OMA DRM v1.0 methods by listing the accepted DRM media types associated with each DRM method, as specified in [OMADRM], in the MmsCcppAccept attribute of the MmsCharacteristics component.

2. Additionally, the MMS Client SHALL advertise the class of OMA DRM v1.0 support in the MmsDrmClass attribute of MmsCharacteristics component as indicated in [MMSCTR].

16.2.1   Additional Requirements

16.2.1.1   Composing and Submitting of DRM Content

An MMS Client SHALL NOT use any Forward Lock or Combined Delivery protected content (i.e. DRM messages) while submitting or composing a MM. When submitting an already received MM that contains a combination of DRM Message(s) and DCF's protected objects, the MMS Client SHALL either submit the MM without enclosing the DRM Message(s) or restrict the submission of the MM.

The MMS Client that supports both Separate Delivery and Superdistribution SHALL allow inserting DCFs while composing a new MM.

16.2.1.2   Header Support

The MMS Client that supports Separate Delivery SHALL support the X-OMA-DRM-SEPARATE-DELIVERY header. The presence of this header aims to indicate that the service intends to push the required rights object to the MMS Client using different transport as defined in [OMADRM].

In addition, the service can indicate a delay time as a value for the X-OMA-DRM-SEPARATE-DELIVERY header. The delay time indicates the expected relative time for the rights object to arrive at the MMS Client after it receives the MM containing the associated DCF protected content.

The MMS Client SHOULD follow the delay time indicated in the X-OMA-DRM-SEPARATE-DELIVERY header. Followings apply, if a MMS Client follows the delay time:

- The timer on the device related to the estimated delay SHALL start as soon as the MM is received by the MMS Client.

- If several DCFs are embedded in a single MM, and if there are more than one X-OMA-DRM-SEPARATE-DELIVERY headers, the MMS Client SHALL use the maximum time indicated in these headers.

It is recognized that there are situations in MMS where the X-OMA-DRM-SEPARATE-DELIVERY header and the indicated delay time becomes invalid, however it is out of scope of this document, to address these situations.

When submitting an already received MM that contains a DCF protected object and X-OMA-DRM-SEPARATE-DELIVER header the MMS Client, that supports both Separate Delivery and Superdistribution, SHALL strip off this header.

16.2.1.3   Acquiring of Rights and Message Handling without Valid Rights

If an MMS Client resides in a terminal that supports the required transport for acquiring the rights object as defined in [OMADRM], the MMS Client SHALL provide the user with the option to acquire the rights object for a protected content. After receiving the pushed rights object the MMS Client MAY render the media object.

In the absence of a required valid rights object for a protected content within an MM, the MMS Client SHOULD present the MM without the protected content, or MAY restrict the presentation of the whole MM.

16.2.1.4   Rights Handling

In case where protected content is constrained by a **<count>** or an **<interval>** constraint, the related consumption SHALL be applied whenever the user initiates the rendering of the protected content.

The MMS Client that supports Separate Delivery SHALL apply the following rules in the order specified below when automatically selecting which rights object to apply when accessing content, in case there are multiple rights objects for this content.

1. Only rights objects valid at the time of requesting content access can be considered, for example, those with a **<datetime>** constraint whose **<begin>** date still lies in the future cannot be considered.

2. Rights objects with no constraints SHOULD be used first.

3. Rights objects containing a **<datetime>** constraint (and potentially other constraints) SHOULD be used to grant access to content before using rights objects that do not contain a **<datetime>** constraint.

4. If multiple rights objects exist that contain **<datetime>** constraints (and potentially other constraints), then these SHOULD be used in the order of ascending **<end>** dates first, i.e., those that expire first should be utilized first.

5. If multiple rights objects exist that do not contain a **<datetime>** constraint (and potentially other constraints), then those containing an **<interval>** constraint SHOULD be used to grant access to content before using rights objects that do not contain an **<interval>** constraint.

16.3 DRM-Related Relay/Server Behavior

An MMS Proxy-Relay SHALL support Forward Lock, Combined Delivery and Separate Delivery DRM functionalities according to [OMADRM], [OMADRMREL], [OMADRMCF] and [TS23140].

16.3.1   Support for Forward Lock and Combined Delivery

MMS Proxy-Relays SHALL handle DRM Forward Lock and Combined Delivery as documented in [TS23140] section 7.1.15.3.1.

16.3.2   Support for Separate Delivery

MMS Proxy-Relays SHALL handle DRM Separate Delivery as documented in [TS23140] section 7.1.15.3.2.

17. MMS Postcard Conformance

MMS Postcard is a name for a collection of person-to-service/application services where multimedia content of an MM is printed and physically delivered to recipient via postal services. While there is no attempt to define an MMS Postcard service, the conformance of some technical enablers need to be defined to enable interoperable, consistent implementation of these type of services. The identified enablers are:

- Recipient full name and postal address, and

- Greeting text (text to greet a recipient, e.g., "Greetings from Rome")

The MMS Postcard Client is a MMS Client that supports MMS Postcard Service functionality.

17.1 Recipient Addressing

The MMS Postcard Client SHALL provide the postal details of each postcard recipient in the form of a vCard attachment, as defined in [OMAVOBJECT], included as part of the submitted multimedia message. The MMS Postcard Client SHALL use the N, Version and ADR properties of the vCard attachment in order to specify the postal details of each postcard recipient. The MMS Postcard Client SHALL NOT use vCard properties other than N, Version and ADR.

The property value for ADR is concatenated string representing a set of fields (e.g. Post Office Address, Extended Address, Street, Locality, Region, Postal Code, Country). The SMIL presentation SHALL NOT refer to the vCard attachment. If the MM sent to MMS Postcard service is intended to multiple recipients, each recipient SHALL be identified by its own vCard attachments.

17.2 Content

A multimedia message sent to MMS Postcard service MAY contain a greeting text, which is a text attachment labeled as X-MMS-GREETINGTEXT without parameters in the WSP multipart object headers, as described in section 10.2.2. Encoding of the string is shown below for clarification:

> 'X' '-' 'M' 'M' 'S' '-' 'G' 'R' 'E' 'E' 'T' 'I' 'N' 'G' 'T' 'E' 'X' 'T' 0x00 -- field name coded as a null terminated text string
>
> 0x00 – blank field value coded as null terminated text string

A text attachment labeled as greeting text SHALL NOT be referred from SMIL presentation.

The supported multimedia content for the MMS Postcard service is service specific. The content MAY be constrained according to Core MM Domain, or Standard MM Domain, or, it MAY be unconstrained according to Unclassified MM Domain.

18. Requirements for MMS Interoperation between Networks

Before configuring the parameter *max authorized MM size* to 600 KB in the MMS Clients of subscribers of the network, the network (in particular the MMS Proxy-Relay interfacing other networks) SHALL ensure that no MM are rejected on MMS_R due to the new size limits. This includes all MMS_R interfaces to other networks or intermediate networks. Methods to fulfill this requirement are described in Appendix D.

19. Transporting Application Data

An MMS Proxy-Relay supporting the Application ID feature SHALL be configurable, so that the MMS Proxy-Relay can reject all or any incoming MM targeting an application with a specific Application ID.

The following additional security related requirements apply to an MMS Client, if it supports the mechanism for transporting application data as defined in [TS23140] and [XS0016200].

- Activation/De-activation of the MMS_A interface:

    The MMS Client SHALL be configurable, so that the user or the Network Operator can enable or disable and the Network Operator can lock the MMS_A interface (Interface between the MMS Client and an application).

    In the "disabled" state, the MMS Client SHALL NOT submit any MM with Application Data Header(s), and SHALL NOT handover any data of an MM received with Application data Header(s) to any application via the MMS_A interface.

    In the "enabled" state the MMS Client SHALL be able to submit any MM with Application Data Header(s), and handover any data of an MM received with Application data Header(s) to applications via the MMS_A interface.

    In the "locked" state, the MMS Client SHALL behave as in the "disabled" state. In addition, the user SHALL NOT have the possibility to modify the activation state of the MMS_A interface

    The default state SHALL be "disable".

    Examples of configuration methods for MMS_A interface are:

    - Pre-configuration at manufacturing phase.

    - Configuration via Over The Air Provisioning.

    - Configuration via Device Management.

    - Configuration via (U)SIM.

    - Configuration via user menu (not applicable when in "locked" state)

    If the user manually activates the MMS_A interface via user menu, then he or she SHOULD be warned about potential security risks.

- User confirmation for activation on a per application basis:

    When the MMS_A interface is in enabled state, the user SHALL be asked for confirmation every time a new application registers its application ID with the MMS Client (upon installation or first usage). Only when confirmed, the MMS_A interface should be activated for the concerned Application ID.

Appendix A.   Change History   (Informative)

A.1   Approved Version 1.3 History

Reference	Date	Description
OMA-MMS-CONF-V1_3-20110913-A	13 Sep 2011	Status changed to Approved by TP: OMA-TP-2011-0329-INP_MMS_V1_3_ERP_for_final_Approval

Appendix B.   Samples of OMA DRM-protected Elements (Informative)

B.1   One Forward-Lock Media Object

Example 3 below shows the textual representation of a multimedia message with a forward-locked media object (a jpg image).

```
From:user@example.com
To:+40123456789/TYPE=PLMN
Subject:Hi!
X-MMS-Version:1.0
Content-Type:multipart/related;boundary=ID_1234567


--ID_1234567

Content-Type:application/smil


<smil>
  :
</smil>
--ID_1234567

Content-Type:application/vnd.oma.drm.message;boundary=PUTJTBYRBYTYBV

Content-Location:drmimage.dm


--PUTJTBYRBYTYBV

Content-Type:image/jpeg
Content-Transfer-Encoding:binary


XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

--PUTJTBYRBYTYBV--

--ID_1234567--
```

Example 3: Multimedia message with DRM protected content

B.2   One Separate Delivery Media Object

Example 4 below shows the textual representation of a multimedia message with a Separate Delivery media object.

```
From:user@example.com
To:+40123456789/TYPE=PLMN
Subject:Hi!
X-MMS-Version:1.0
Content-Type:multipart/related;boundary=ID_1234567


--ID_1234567

Content-Type:application/smil
```

```
<smil>
    --- reference to "drmimage.dcf" ---

 :
</smil>

--ID_1234567

Content-Type:application/vnd.oma.drm.content

X-Oma-Drm-Separate-Delivery : 15

Content-Transfer-Encoding : binary

Content-Location:drmimage.dcf


XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

--ID_1234567--
```

Example 4: Multimedia message with DRM Separate Delivery protected content

B.3   DRM Protected CMF Content

Since CMF content is a unit, the CMF content MAY have OMA DRM applied as for any other content (e.g., as for JPEG).
See Example 5 for use with OMA DRM Forward Lock.

```
From: user@example.com
To: +40123456789/TYPE=PLMN
Subject: Hi!
X-MMS-Version: 1.3


Content-Type: application/vnd.oma.drm.message;boundary=foo


--foo

Content-Type: application/cmf
Content-Transfer-Encoding: binary


XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

--foo--
```

Example 5: DRM protected CMF content

Appendix C.   Static Conformance Requirements   (Normative)

The notation used in this appendix is specified in [IOPProc].

C.1   MMS Client

C.1.1   General MMS Client Requirements

For those MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]) that do not support WAP, the requirements in Table 28 are not mandatory.

Item	Function	Reference	Status	Requirement
MMSCONF- GEN-C-001	Support for WAP flow control	10.1	M	
MMSCONF- GEN-C-002	Messages are encoded as specified	10.2	M	
MMSCONF- GEN-C-003	Support for maximum values for MMS parameters	10.2.5	M	
MMSCONF-GEN-C-004	Continue functioning after unsupported or corrupted content is received. .	10.3	O	

Table 28: General MMS Client requirements

C.1.2   General Content Class Conformance Requirements

Item	Function	Reference	Status	Requirement
MMSCONF-CCC-C-003	Full conformance to at least one MM content class from Core MM Content Domain	12.1	O	MMSCONF-CCC-C-005 OR MMSCONF-CCC-C-006 OR MMSCONF-CCC-C-007 OR MMSCONF-CCC-C-011 OR MMSCONF-CCC-C-017
MMSCONF-CCC-C-004	Partial conformance to at least one MM content class from Core MM Content Domain	12.1	O	MMSCONF-CCC-C-008 OR MMSCONF-CCC-C-009 OR MMSCONF-CCC-C-010 OR MMSCONF-CCC-C-012 OR MMSCONF-CCC-C-018
MMSCONF- CCC-C-005	Full conformance to image basic class	12.1	O	MMSCONF-IBC-C-001 AND MMSCONF-IBC-C-002 AND MMSCONF-IBC-C-003 AND MMSCONF-IBC-C-004
MMSCONF-CCC-C-006	Full conformance to image rich class	12.1	O	MMSCONF-IRC-C-001 AND MMSCONF-IRC-C-002 AND MMSCONF-IRC-C-003 AND MMSCONF-IRC-C-004 AND MMSCONF-CCC-C-005
MMSCONF-CCC-C-007	Full conformance to video basic class	12.1	O	MMSCONF-VBC-C-001 AND MMSCONF-VBC-C-002 AND MMSCONF-VBC-C-003 AND MMSCONF-VBC-C-004 AND MMSCONF-CCC-C-006
MMSCONF-CCC-C-008	Partial conformance to image basic class	12.1	O	MMSCONF-IBC-C-001 OR MMSCONF-IBC-C-002 OR MMSCONF-IBC-C-003 OR MMSCONF-IBC-C-005
MMSCONF-CCC-C-009	Partial conformance to image	12.1	O	MMSCONF-IRC-C-001 OR

Item	Function	Reference	Status	Requirement
	rich class			MMSCONF-IRC-C-002 OR MMSCONF-IRC-C-003 OR MMSCONF-IRC-C-004
MMSCONF-CCC-C-010	Partial conformance to video basic class	12.1	O	MMSCONF-VBC-C-001 OR MMSCONF-VBC-C-002 OR MMSCONF-VBC-C-003 OR MMSCONF-VBC-C-004
MMSCONF-CCC-C-011	Full conformance to video rich class	12.1	O	MMSCONF-VRC-C-001 AND MMSCONF-VRC-C-002 AND MMSCONF-VRC-C-003 AND MMSCONF-VRC-C-004 AND MMSCONF-CCC-C-005
MMSCONF-CCC-C-012	Partial conformance to video rich class	12.1	O	MMSCONF-VRC-C-001 OR MMSCONF-VRC-C-002 OR MMSCONF-VRC-C-003 OR MMSCONF-VRC-C-004
MMSCONF-CCC-C-013	Full conformance to text class	12.1	O	MMSCONF-TXC-C-001 AND MMSCONF-TXC-C-002 AND MMSCONF-TXC-C-003 AND MMSCONF-TXC-C-004
MMSCONF-CCC-C-014	Partial conformance to text class	12.1	O	MMSCONF-TXC-C-001 OR MMSCONF-TXC-C-002 OR MMSCONF-TXC-C-003 OR MMSCONF-TXC-C-004
MMSCONF-CCC-C-015	Conformance to at least one MM Content Class from Core MM Content Domain (in addition to MM Content Class Text)	7	M	
MMSCONF-CCC-C-016	Conformance to at least one MM Content Class from Content MM Content Domain	7	O	
MMSCONF-CCC-C-017	Full conformance to megapixel class	12.1	O	MMSCONF-MPC-C-001 AND MMSCONF-MPC-C-002 AND MMSCONF-MPC-C-003 AND MMSCONF-MPC-C-004
MMSCONF-CCC-C-018	Partial conformance to megapixel class	12.1	O	MMSCONF-MPC-C-001 OR MMSCONF-MPC-C-002 OR MMSCONF-MPC-C-003 OR MMSCONF-MPC-C-004
MMSCONF-CCC-C-019	Service conformance to at least one MM content class from Content MM Content Domain	12.1	O	MMSCONF-CCC-C-020 OR MMSCONF-CCC-C-021
MMSCONF-CCC-C-020	Service conformance to content basic class	12.1	O	MMSCONF-CCC-C-022 AND MMSCONF-CBC-C-001 AND MMSCONF-CBC-C-002
MMSCONF-CCC-C-021	Service conformance to content rich class	12.1	O	MMSCONF-CCC-C-022 AND MMSCONF-CRC-C-001 AND MMSCONF-CRC-C-002
MMSCONF-CCC-C-022	Partial or full conformance to one or more MM Content Class(es) in the Core MM Domain (but not to Text class alone)	12.1	O	MMSCONF-CCC-C-003 OR MMSCONF-CCC-C-004

Table 29: General content class conformance requirements

C.1.3   Functional Conformance to the Image Basic Class

Item	Function	Reference	Status	Requirement
MMSCONF-IBC-C-001	Creation conformance to image basic class	12.3.1	O	MMSCONF-IBC-C-005 AND MMSCONF-CMO-C-001
MMSCONF-IBC-C-002	Submission conformance to image basic class	12.3.2	O	MMSCONF-IBC-C-006 AND MMSCONF-CMO-C-001 AND MMSCTR-SND-C-001
MMSCONF-IBC-C-003	Retrieval conformance to image basic class	12.3.3	O	MMSCONF-IBC-C-007 AND MMSCTR-FTC-C-001
MMSCONF-IBC-C-004	Presentation conformance to image basic class	12.3.4	O	MMSCONF-IBC-C-008
MMSCONF-IBC-C-005	Support for the insertion in a created message of all media formats for all media types defined in the image basic class	12.3.1	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-023
MMSCONF-IBC-C-006	Support for the submission of any MM being message conformant to the image basic class	12.3.2	O	
MMSCONF-IBC-C-007	Support for the retrieval of any MM being message conformant to the image basic class	12.3.3	O	
MMSCONF-IBC-C-008	Ability to present all the media objects of any MM being conformant to the image basic class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-004

Table 30: Functional conformance to the image basic class

C.1.4   Functional Conformance to the Image Rich Class

Item	Function	Reference	Status	Requirement
MMSCONF-IRC-C-001	Creation conformance to image rich class	12.3.1	O	MMSCONF-IRC-C-005 AND MMSCONF-CMO-C-001
MMSCONF-IRC-C-002	Submission conformance to image rich class	12.3.2	O	MMSCONF-IRC-C-006 AND MMSCONF-CMO-C-001 AND MMSCTR-SND-C-001
MMSCONF-IRC-C-003	Retrieval conformance to image rich class	12.3.3	O	MMSCONF-IRC-C-007 AND MMSCTR-FTC-C-001
MMSCONF-IRC-C-004	Presentation conformance to image rich class	12.3.4	O	MMSCONF-IRC-C-008
MMSCONF-IRC-C-005	Support for the insertion in a created message of all media formats for all media types defined in the image rich class	12.3.1	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023
MMSCONF-IRC-C-006	Support for the submission of any MM being message conformant to the image rich	12.3.2	O	

Item	Function	Reference	Status	Requirement
	class			
MMSCONF-IRC-C-007	Support for the retrieval of any MM being message conformant to the image rich class	12.3.3	O	
MMSCONF-IRC-C-008	Ability to present all the media object of any MM being conformant to the image rich class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-004

Table 31: Functional conformance to the image rich class

C.1.5　　Functional Conformance to the Video Basic Class

Item	Function	Reference	Status	Requirement
MMSCONF-VBC-C-001	Creation conformance to video basic class	12.3.1	O	MMSCONF-VBC-C-005 AND MMSCONF-CMO-C-001
MMSCONF-VBC-C-002	Submission conformance to video basic class	12.3.2	O	MMSCONF-VBC-C-006 AND MMSCONF-CMO-C-001 AND MMSCTR-SND-C-001
MMSCONF-VBC-C-003	Retrieval conformance to video basic class	12.3.3	O	MMSCONF-VBC-C-007 AND MMSCTR-FTC-C-001
MMSCONF-VBC-C-004	Presentation conformance to video basic class	12.3.4	O	MMSCONF-VBC-C-008
MMSCONF-VBC-C-005	Support for the insertion in a created message of all media formats for all media types defined in the video basic class	12.3.1	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026
MMSCONF-VBC-C-006	Support for the submission of any MM being message conformant to the video basic class	12.3.2	O	
MMSCONF-VBC-C-007	Support for the retrieval of any MM being message conformant to the video basic class	12.3.3	O	
MMSCONF-VBC-C-008	Ability to present all the media object of any MM being conformant to the video basic class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026 AND

Item	Function	Reference	Status	Requirement
				MMSCONF-MED-C-004

<div align="center">**Table 32: Functional conformance to the video basic class**</div>

C.1.6   Functional Conformance to the Video Rich Class

Item	Function	Reference	Status	Requirement
MMSCONF-VRC-C-001	Creation conformance to video rich class	12.3.1	O	MMSCONF-VRC-C-005 AND MMSCONF-CMO-C-001
MMSCONF-VRC-C-002	Submission conformance to video rich class	12.3.2	O	MMSCONF-VRC-C-006 AND MMSCONF-CMO-C-001 AND MMSCTR-SND-C-001
MMSCONF-VRC-C-003	Retrieval conformance to video rich class	12.3.3	O	MMSCONF-VRC-C-007 AND MMSCTR-FTC-C-001
MMSCONF-VRC-C-004	Presentation conformance to video rich class	12.3.4	O	MMSCONF-VRC-C-008
MMSCONF-VRC-C-005	Support for the insertion in a created message of all media formats for all media types defined in the video rich class	12.3.1	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026
MMSCONF-VRC-C-006	Support for the submission of any MM being message conformant to the video rich class	12.3.2	O	
MMSCONF-VRC-C-007	Support for the retrieval of any MM being message conformant to the video rich class	12.3.3	O	
MMSCONF-VRC-C-008	Ability to present all the media object of any MM being conformant to the video rich class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026 AND MMSCONF-MED-C-004

<div align="center">**Table 33: Functional conformance to the video rich class**</div>

C.1.7   Functional Conformance to the Megapixel Class

Item	Function	Reference	Status	Requirement
MMSCONF-MPC-C-001	Creation conformance to megapixel class	12.3.1	O	MMSCONF-MPC-C-005 AND MMSCONF-CMO-C-001
MMSCONF-MPC-C-002	Submission conformance to megapixel class	12.3.2	O	MMSCONF-MPC-C-006 AND MMSCONF-CMO-C-001 AND MMSCTR-SND-C-001
MMSCONF-MPC-C-003	Retrieval conformance to	12.3.3	O	MMSCONF-MPC-C-007 AND

Item	Function	Reference	Status	Requirement
	megapixel class			MMSCTR-FTC-C-001
MMSCONF-MPC-C-004	Presentation conformance to megapixel class	12.3.4	O	MMSCONF-MPC-C-008
MMSCONF-MPC-C-005	Support for the insertion in a created message of all media formats for all media types defined in the megapixel class	12.3.1	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026 AND MMSCONF-MED-C-029 AND MMSCONF-MED-C-030 AND MMSCONF-MED-C-032 AND MMSCONF-MED-C-033 AND MMSCONF-MED-C-035 AND MMSCONF-RTX-C-003 AND MMSCONF-MPC-C-009
MMSCONF-MPC-C-006	Support for the submission of any MM being message conformant to the megapixel class	12.3.2	O	MMSCONF-MPC-C-010
MMSCONF-MPC-C-007	Support for the retrieval of any MM being message conformant to the megapixel class	12.3.3	O	
MMSCONF-MPC-C-008	Ability to present all the media object of any MM being conformant to the megapixel class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026 AND MMSCONF-MED-C-004 AND MMSCONF-MED-C-029 AND MMSCONF-MED-C-030 AND MMSCONF-MED-C-032 AND MMSCONF-MED-C-033 AND MMSCONF-MED-C-034 AND MMSCONF-RTX-C-002
MMSCONF-MPC-C-009	In creation support a maximum message size of 300KB and 600KB	7.1.11	O	
MMSCONF-MPC-C-010	In submission support a maximum message size of 300KB and 600KB	7.1.11	O	

Table 34: Functional conformance to the megapixel class

C.1.8   Functional Conformance to the Content Basic Class

Item	Function	Reference	Status	Requirement

Item	Function	Reference	Status	Requirement
MMSCONF-CBC-C-001	Retrieval conformance to content basic class	12.3.3	O	MMSCONF-CBC-C-003 AND MMSCTR-FTC-C-001
MMSCONF-CBC-C-002	Presentation conformance to content basic class	12.3.4	O	MMSCONF-CBC-C-004
MMSCONF-CBC-C-003	Support for the retrieval of any MM being message conformant to the content basic class	12.3.3	O	
MMSCONF-CBRC-C-004	Ability to present all the media object of any MM being conformant to the content basic class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-004 AND MMSCONF-MED-C-029 AND MMSCONF-MED-C-030 AND MMSCONF-MED-C-032 AND MMSCONF-MED-C-033 AND MMSCONF-MED-C-034 AND MMSCONF-MED-C-044 AND MMSCONF-RTX-C-002

Table 35: Functional conformance to the content basic class

C.1.9 Functional Conformance to the Content Rich Class

Item	Function	Reference	Status	Requirement
MMSCONF-CRC-C-001	Retrieval conformance to content rich class	12.3.3	O	MMSCONF-CRC-C-003 AND MMSCTR-FTC-C-001
MMSCONF-CRC-C-002	Presentation conformance to content rich class	12.3.4	O	MMSCONF-CRC-C-004
MMSCONF-CRC-C-003	Support for the retrieval of any MM being message conformant to the content rich class	12.3.3	O	
MMSCONF-CRC-C-004	Ability to present all the media object of any MM being conformant to the content rich class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-006 AND MMSCONF-MED-C-008 AND MMSCONF-MED-C-012 AND MMSCONF-MED-C-015 AND MMSCONF-MED-C-017 AND MMSCONF-MED-C-019 AND MMSCONF-MED-C-022 AND MMSCONF-MED-C-023 AND MMSCONF-MED-C-026 AND MMSCONF-MED-C-004 AND MMSCONF-MED-C-029 AND MMSCONF-MED-C-030 AND MMSCONF-MED-C-032 AND MMSCONF-MED-C-033 AND MMSCONF-MED-C-034 AND MMSCONF-MED-C-037 AND MMSCONF-MED-C-044 AND MMSCONF-MED-C-045 AND

Item	Function	Reference	Status	Requirement
				MMSCONF-RTX-C-002

Table 36: Functional conformance to the content rich class

C.1.10   Functional Conformance to the Text Class

Item	Function	Reference	Status	Requirement
MMSCONF-TXC-C-001	Creation conformance to text class	12.3.1	O	MMSCONF-TXC-C-005 AND MMSCONF-CMO-C-001
MMSCONF-TXC-C-002	Submission conformance to text class	12.3.2	O	MMSCONF-TXC-C-006 AND MMSCONF-CMO-C-001 AND MMSCTR-SND-C-001
MMSCONF-TXC-C-003	Retrieval conformance to text class	12.3.3	O	MMSCONF-TXC-C-007 AND MMSCTR-FTC-C-001
MMSCONF-TXC-C-004	Presentation conformance to text class	12.3.4	O	MMSCONF-TXC-C-008
MMSCONF-TXC-C-005	Support for the insertion in a created message of all media formats for all media types defined in the text class	12.3.1	O	MMSCONF-MED-C-001
MMSCONF-TXC-C-006	Support for the submission of any MM being message conformant to the text class	12.3.2	O	
MMSCONF-TXC-C-007	Support for the retrieval of any MM being message conformant to the text class	12.3.3	O	
MMSCONF-TXC-C-008	Ability to present all the media objects of any MM being conformant to the text class	12.3.4	O	MMSCONF-MED-C-001 AND MMSCONF-MED-C-004 AND MMSCONF-MED-C-023

Table 37: Functional conformance to the text class

C.1.11   Creation Mode Requirements

All the requirements in Table 38 SHALL NOT be valid for MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]).

Item	Function	Reference	Status	Requirement
MMSCONF-CMO-C-001	Support for requirements defined by the current creation mode	14	M	
MMSCONF-CMO-C-002	Support for creation mode RESTRICTED as current creation mode	14	M	
MMSCONF-CMO-C-003	Support for creation mode WARNING as current creation mode	14	O	
MMSCONF-CMO-C-004	Support for creation mode FREE as current creation mode	14	O	
MMSCONF-CMO-C-005	Support for configuration methods for selecting the creation mode	14	O	
MMSCONF-CMO-C-006	Support for requirements defined for re-submission mode	15	O	MMSCONF-CMO-C-007
MMSCONF-CMO-C-007	Support for re-submission mode RESTRICTED	15	O	
MMSCONF-CMO-C-008	Support for re-submission mode WARNING	15	O	
MMSCONF-CMO-C-009	Support for re-submission	15	O	

Item	Function	Reference	Status	Requirement
	mode FREE			
MMSCONF-CMO-C-010	Support for configuration methods for selecting the re-submission mode	15	O	
MMSCONF-CMO-C-011	In the re-submission mode, support for removal of any media object	15	O	
MMSCONF-CMO-C-012	In the re-submission mode, support for addition of any media object conformant to any Content Class in Core MM Content Domain	15	O	MMSCONF-CMO-C-014
MMSCONF-CMO-C-013	In the re-submission mode support for modification of the "Subject" header	15	O	
MMSCONF-CMO-C-014	In the re-submission mode, support for limiting message size to the largest MM Content Class supported by the terminal.	15	O	

Table 38: Creation mode requirements

C.1.12   Media Type and Format Requirements

Requirements MMSCONF-MED-C-014, MMSCONF-MED-C-021 and MMSCONF-MED-C-036 in Table 39 SHALL NOT be valid for MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP (e.g., [TS26140]).
Requirements MMSCONF-MED-C-004, MMSCONF-MED-C-020 and MMSCONF-MED-C-044 in Table 40 SHALL NOT be valid for MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]).

Item	Function	Reference	Status	Requirement
MMSCONF-MED-C-001	Support for media type text	7.1.9	M	
MMSCONF-MED-C-002	Support for us-ascii as media type text	7.1.9	M	
MMSCONF-MED-C-003	Support for utf-8 as media type text	7.1.9	M	
MMSCONF-MED-C-004	Support for presentation of utf-16 as media type text	7.1.9	O	
MMSCONF-MED-C-005	Support for at least characters from ISO-8859-1 with media type text	7.1.9	M	
MMSCONF-MED-C-006	Support for media type still image	7	M	
MMSCONF-MED-C-007	Support for baseline JPEG as media type still image	7	M	MMSCONF-MED-C-034 AND MMSCONF-MED-C-035
MMSCONF-MED-C-008	Support for media type bitmap	7	M	
MMSCONF-MED-C-009	Support for GIF87a as media type bitmap	7	M	
MMSCONF-MED-C-010	Support for GIF89a as media type bitmap	7	M	
MMSCONF-MED-C-011	Support for WBMP as media type bitmap	7	O	
MMSCONF-MED-C-012	Support for media type speech	7	M	MMSCONF-MED-C-013 OR MMSCONF-MED-C-014
MMSCONF-MED-C-013	Support for AMR-NB as media type speech	7	O	
MMSCONF-MED-C-014	Support for 13K as media type speech	7	O	

Item	Function	Reference	Status	Requirement
MMSCONF-MED-C-015	Support for PIM objects	7	M	MMSCONF-MED-C-016 AND MMSCONF-MED-C-027
MMSCONF-MED-C-016	Support for vCard 2.1 MIP as PIM object	7	O	
MMSCONF-MED-C-017	Support for media type synthetic audio	7	O	MMSCONF-MED-C-018
MMSCONF-MED-C-018	Support for SP-MIDI as media type synthetic audio	7	O	
MMSCONF-MED-C-019	Support for media type video	7	O	MMSCONF-MED-C-020 OR MMSCONF-MED-C-021
MMSCONF-MED-C-020	Support for mandatory video codecs as media type video defined in [TS26140]	7	O	
MMSCONF-MED-C-021	Support for mandatory video codecs as media type video defined in [CS0045]	7	O	
MMSCONF-MED-C-022	Support of OMA DRM Forward-Lock functionality	7.1.5	O	DRM-GEN-C-001 AND MMSCONF-DRM-C-001 AND MMSCONF-DRM-C-002 AND MMSCONF-DRM-C-003
MMSCONF-MED-C-023	Support for presentation part of the message	7.1.8	O	MMSCONF-MED-C-024 AND MMSCONF- MED-C-025
MMSCONF-MED-C-024	Support for MMS SMIL in presentation part	7.1.8	O	MMSCONF-MED-C-028 AND MMSCONF-MED-C-050
MMSCONF- MED-C-025	Support for defined SMIL tags (without video tag) in presentation part	8	O	
MMSCONF- MED-C-026	Support for the SMIL video tag in presentation part	8	O	
MMSCONF-MED-C-027	Support for vCalendar 1.0 MIP as PIM object	7	O	
MMSCONF-MED-C-028	Ignore unknown SMIL elements/attributes	8.1	O	
MMSCONF-MED-C-029	Support of OMA DRM Combined Delivery method.	7.1.5, 16	O	DRMT-GEN-C-002 AND MMSCONF-DRM-C-001 AND MMSCONF-DRM-C-002 AND MMSCONF-DRM-C-003 AND
MMSCONF-MED-C-030	Support of OMA DRM Separate Delivery method	7.1.5, 16	O	DRMT-GEN-C-003 AND MMSCONF-DRM-C-001 AND MMSCONF-DRM-C-002 AND MMSCONF-DRM-C-004 AND MMSCONF-DRM-C-005 AND MMSCONF-DRM-C-006 AND MMSCONF-DRM-C-007 AND MMSCONF-DRM-C-008 AND MMSCONF-DRM-C-009 AND MMSCONF-DRM-C-0010 AND MMSCONF-DRM-C-0011
MMSCONF-MED-C-031	Support for Hyperlink minimum length	8.2	O	
MMSCONF-MED-C-032	Support of JFIF as JPEG interchange format	7.1.1	O	
MMSCONF-MED-C-033	Support of EXIF compressed image file format as JPEG interchange format	7.1.1	O	
MMSCONF-MED-C-034	Support of JPEG Baseline in received MM	7.1.1	M	MMSCONF-MED-C-032 AND MMSCONF-MED-C-033
MMSCONF-MED-C-035	Support of JPEG Baseline in	7.1.1	M	MMSCONF-MED-C-032 OR

Item	Function	Reference	Status	Requirement
	submitted MM			MMSCONF-MED-C-033
MMSCONF-MED-C-036	Support for CMF in presentation part in 3GPP2	7.1.8	O	
MMSCONF-MED-C-037	Support for SVG Tiny 1.2	7.1.10	O	
MMSCONF-MED-C-038	Support of Hyperlinks	8.2	O	MMSCONF-MED-C-031 AND MMSCONF-MED-C-039 AND MMSCONF-MED-C-040 AND MMSCONF-MED-C-041 AND MMSCONF-MED-C-042 AND MMSCONF-MED-C-043
MMSCONF-MED-C-039	Adding a hyperlink at any position in the MM	8.2	O	
MMSCONF-MED-C-040	Recognition of a hyperlink	8.2	O	
MMSCONF-MED-C-041	No impact on presentation by the hyperlink	8.2	O	
MMSCONF-MED-C-042	Support of following the hyperlink	8.2	O	
MMSCONF-MED-C-043	Not follow the hyperlink automatically	8.2	O	
MMSCONF-MED-C-044	Support for 3GPP PSS6 SMIL Language Profile as presentation part	7.1.8	O	
MMSCONF-MED-C-045	Support for media type audio	7	O	MMSCONF-MED-C-046
MMSCONF-MED-C-046	Support for eAAC+ as media type audio	7.1.2	O	
MMSCONF-MED-C-047	Support backgroundColor in MM creation	8.1.2.1	O	
MMSCONF-MED-C-048	Support backgroundColor in MM submission	8.1.2.1	O	
MMSCONF-MED-C-049	Support backgroundColor in MM retrieval and presentation	8.1.2.1	O	
MMSCONF-MED-C-050	Not referring a PIM object from a SMIL element	7.1.3	O	
MMSCONF-MED-C-051	In creation support for omit **dur** attribute in the slide interval.	8.1.2.4.1	O	MMSCONF-MED-C-054
MMSCONF-MED-C-052	In creation support for set the **dur** attribute – in the slide interval - to the same value as the duration of the media object	8.1.2.4.1	O	
MMSCONF-MED-C-053	In creation support for set the dur attribute – in the slide interval - to a value selected by the user	8.1.2.4.1	O	
MMSCONF-MED-C-054	In presentation support for playing video or audio as defined in [SMIL] when **dur** attribute is omitted from the slide presentation.	8.1.2.4.1	O	

Table 39: Media type and format requirements

C.1.13   Content Adaptation Requirements

Requirement MMSCONF-CAD-C-002 in Table 40 SHALL NOT be valid for MMS Clients that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]).

Item	Function	Reference	Status	Requirement
MMSCONF-CAD-C-001	Non-rejection of MMs based on the message size indicated in the MMS notification	9.5.1	M	
MMSCONF-CAD-C-002	Support of UAProf for MMS Client capability negotiation	9.5.1	M	UAProf: MCF

Table 40: Content adaptation requirements

C.1.14 Postcard Conformance Requirements

Item	Function	Reference	Status	Requirement
MMSCONF-PST-C-001	Creating a MM with multimedia content for a postcard	17	O	MMSCONF-PST-C-002, MMSCONF-PST-C-004
MMSCONF-PST-C-002	Using vCard attachment with only N, Version and ADR properties for each postcard recipient	17.1	O	MMSCONF-PST-C-003
MMSCONF-PST-C-003	When an MM is created for the postcard service and there is a SMIL attachment, the SMIL attachment shall not refer to the vCard attachment within the MM	17.1	O	
MMSCONF-PST-C-004	Including greeting text as a text attachment labeled as X-MMS-GREETINGTEXT	17.2	O	MMSCONF-PST-C-005
MMSCONF-PST-C-005	When an MM is created for the postcard service and there is a SMIL attachment, the SMIL attachment shall not refer to the greeting text within the MM.	17.2	O	

Table 41: Postcard conformance requirements

C.1.15 Functional Conformance to Rich Text Formatting

Item	Function	Reference	Status	Requirement
MMSCONF-RTX-C-001	Support XHTML Mobile Profile	7.1.9.2	O	MMSCONF-RTX-C-002 AND MMSCONF-RTX-C-003 AND MMSCONF-RTX-C-004
MMSCONF-RTX-C-002	In presentation, support in Megapixel, Content Basic and Content Rich content classes the following XHTMLMP modules: presentation, hypertext, text, list, structure and the following Style Attribute properties: "color" for the foreground color property, "left","right", "centre" and "justify"for the Text Alignment property, "underline" for the text decoration property.	7.1.9.2.1, 7.1.9.2.2	O	MMSCONF-RTX-C-005 AND MMSCONF-RTX-C-006
MMSCONF-RTX-C-003	In creation, support in Megapixel content class, the following XHTMLMP modules: presentation, hypertext, text, structure and the following Style Attribute properties: "color" for the foreground color property and "underline" for the Text	7.1.9.2.2	O	

Item	Function	Reference	Status	Requirement
	Decoration property.			
MMSCONF-RTX-C-004	In presentation, support in Megapixel, Content Basic and Content Rich content classes other WCSS properties or WAPXHTMLMP modules	7.1.9.2.1 7.1.9.2.2	O	
MMSCONF-RTX-C-005	In presentation, support section 3.5 of [XHTMLMod]	7.1.9.2.1	O	
MMSCONF-RTX-C-006	In presentation, support for text encoding and glyphs.	7.1.9.2.1	O	

Table 42: Functional conformance to the rich text class

C.1.16   DRM Related Client Requirements

Item	Function	Reference	Status	Requirement
MMSCONF-DRM-C-001	Indication of support of DRM restrictions in the MmsCcppAccept attribute of the MmsCharacteristics component	16.2	O	
MMSCONF-DRM-C-002	Indication of the class of OMA DRM v1.0 support in the MmsDrmClass attribute of MmsCharacteristics component.	16.2.1	O	
MMSCONF-DRM-C-003	No use DRM Forward Lock or Combined Delivery protected content while submitting or composing a MM	16.2.1	O	
MMSCONF-DRM-C-004	When submitting an already received MM that contains a combination of DRM Message(s) and DCF's protected objects: • Submit MM without enclosed DRM Message(s) • Not submit	16.2.1	O	
MMSCONF-DRM-C-005	Allow inserting of DCFs when composing a new MM	16.2.1.1	O	
MMSCONF-DRM-C-006	Support of X-OMA-DRM-SEPARATE-DELIVERY	16.2.1.2	O	
MMSCONF-DRM-C-007	Strip off the X-OMA-DRM-SEPARATE-DELIVERY Header when submitting an already received MM	16.2.1.2	O	
MMSCONF-DRM-C-008	Acquiring of new rights	16.2.1.3	O	
MMSCONF-DRM-C-09	Rights handling	16.2.1.4	O	

Table 43: DRM related conformance for MMS Client

C.1.17   Application Addressing Related Client Requirements

Item	Function	Reference	Status	Requirement
MMSCONF-APA-C-001	Support for Application Addressing.	19	O	MMSCONF-APA-C-002 AND MMSCONF-APA-C-003 AND MMSCONF-APA-C-004 AND MMSCONF-APA-C-005 AND MMSCONF-APA-C-006 AND MMSCONF-APA-C-007 AND

Item	Function	Reference	Status	Requirement
				MMSCONF-APA-C-008
MMSCONF-APA-C-002	Support for configuration of "enabled" state.	19	O	
MMSCONF-APA-C-003	Support for configuration of "disabled" state.	19	O	
MMSCONF-APA-C-004	Support for configuration of "locked" state.	19	O	
MMSCONF-APA-C-005	Support for "disabled" as default state.	19	O	
MMSCONF-APA-C-006	Support for configuration methods for selecting MMS$_A$ state.	19	O	
MMSCONF-APA-C-007	Support for providing a warning to the user about potential security risks.	19	O	
MMSCONF-APA-C-008	Support for user confirmation for enabling MMS$_A$ interface per application basis.	19	O	

Table 44: Application Addressing conformance for MMS Client

C.2   MMS Proxy-Relay

C.2.1   General Server Requirements

For those MMS implementations that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]) that do not support WAP, requirements MMSCONF-GEN-S-002 through MMSCONF-GEN-S -004 in table 27 are not mandatory.

For those MMS implementations that are compliant to the MMS suite of specifications defined by 3GPP2 (e.g., [XS0016200]) that do not support UAProf, requirement MMSCONF-GEN-S-001 in table 27 is not mandatory.

Item	Function	Reference	Status	Requirement
MMSCONF-GEN-S-001	Support of UAProf for MMS Client capability negotiation	9.5.2	M	UAProf: MSF
MMSCONF-GEN-S-002	Use of additional knowledge of terminal capabilities when making the content adapation decision.	9.3	M	
MMSCONF-GEN-S-003	Support for WAP flow control	10.1	M	
MMSCONF-GEN-S-004	Messages are encoded as specified	10.2	M	
MMSCONF-GEN-S-005	Support Core MM Content Domain and Content MM Content Domain.	13	M	MMSCONF-GEN-S-006 AND MMSCONF-GEN-S-007 AND MMSCONF-GEN-S-008 AND MMSCONF-GEN-S-009
MMSCONF-GEN-S-006	Support to receive any MM belonging to the Core and Content MM Content Domain via the MMS$_M$interface.	13	M	
MMSCONF-GEN-S-007	Support retrieval by MMS Client of any MM belonging to the Core MM and Content Content Domain via the MMS$_M$ interface.	13	M	

MMSCONF-GEN-S-008	Support to forward any MM belonging to the Core MM Content Domain and any MM belonging to the Content MM Content Domain via MMS$_R$ interface	13	M	
MMSCONF-GEN-S-009	Support to receive any MM belonging to the Core MM Content Domain and any MM belonging to the Content MM Content Domain via MMS$_R$ interface	13	M	
MMSCONF-GEN-S-010	Support MM7 interface	13	O	MMSCONF-GEN-S-011 AND MMSCONF-GEN-S-012
MMSCONF-GEN-S-011	Support to receive any MM belonging to the Core MM Content Domain and to the Content MM Content Domain via MM7 interface.	13	O	
MMSCONF-GEN-S-012	Support to deliver any MM belonging to the Core MM Content Domain and to the Content MM Content Domain via MM7 interface.	13	O	

Table 45: General server requirements

C.2.2   Content Adaptation - General

Item	Function	Reference	Status	Requirement
MMSCONF-CAG-S-001	Support of minor content adaptation	9.5.2	M	MMSCONF-MIN-S-001 AND MMSCONF-MIN-S-002 AND MMSCONF-MIN-S-003 AND MMSCONF-MIN-S-004 AND MMSCONF-MIN-S-005 AND MMSCONF-MIN-S-006 AND MMSCONF-MIN-S-007 AND MMSCONF-MIN-S-008 AND MMSCONF-MIN-S-009
MMSCONF-CAG-S-002	Ability to perform major content adaptation	9.5.2	O	MMSCONF-CAG-S003 AND MMSCONF-CAG-S-004
MMSCONF-CAG-S-003	Function to enable or disable major content adaptation	9.5.2	O	
MMSCONF-CAG-S-004	Support of major content adaptation when enabled	9.5.2	O	MMSCONF-MAJ-S-001 AND MMSCONF-MAJ-S-002 AND MMSCONF-MAJ-S-003 AND MMSCONF-MAJ-S-004 AND MMSCONF-MAJ-S-005 AND MMSCONF-MAJ-S-006 AND MMSCONF-MAJ-S-007
MMSCONF-CAG-S-005	Availability of the original content of the MM to the end-user when major content adaptation is or needs to be applied	9.5.2	O	
MMSCONF-CAG-S-006	Function to insert information in the MM that major content adaptation was performed or a media element was dropped during content adaptation if major content adaptation is applied	9.5.2	M	

MMSCONF-CAG-S-007	Function to update labels in the presentation if media type adaptation is applied	9.5.2	M	
MMSCONF-CAG-S-008	Function to update file extensions and MIME types if media format/type adaptation is applied	9.5.2	M	

Table 46: General content adaptation requirements

C.2.3   Functions for Minor Content Adaptation

Item	Function	Reference	Status	Requirement
MMSCONF-MIN-S-001	Adapting Image Rich to Image Basic	9.3	O	MMSCONF-AMN-S-001 AND MMSCONF-AMN-S-002
MMSCONF-MIN-S-002	Adapting Video Basic to Image Basic	9.3	O	MMSCONF-AMN-S-001 AND MMSCONF-AMN-S-002
MMSCONF-MIN-S-003	Adapting Video Rich to Image Basic	9.3	O	MMSCONF-AMN-S-001 AND MMSCONF-AMN-S-002
MMSCONF-MIN-S-004	Adapting Video Rich to Image Rich	9.3	O	MMSCONF-AMN-S-003
MMSCONF-MIN-S-005	Adapting Video Rich to Video Basic	9.3	O	MMSCONF-AMN-S-003
MMSCONF-MIN-S-006	Adapting Rich Text to Plain Text	9.4.6	O	
MMSCONF-MIN-S-007	Adapting Megapixel to Image Rich.	9.3	O	MMSCONF-AMN-S-003 AND MMSCONF-AMN-S-005
MMSCONF-MIN-S-008	Adapting Megapixel to Video Basic.	9.3	O	MMSCONF-AMN-S-003 AND MMSCONF-AMN-S-005
MMSCONF-MIN-S-009	Adapting Megapixel to Video Rich.	9.3	O	MMSCONF-AMN-S-005 AND MMSCONF-AMN-S-006

Table 47: Minor content adaptation function requirements

C.2.4   Functions for Major Content Adaptation

Item	Function	Reference	Status	Requirement
MMSCONF-MAJ-S-001	Adapting Image Rich to Image Basic	9.3	O	MMSCONF-AMJ-S-001 AND MMSCONF-AMJ-S-004
MMSCONF-MAJ-S-002	Adapting Video Basic to Image Basic	9.3	O	MMSCONF-AMJ-S-001 AND MMSCONF-AMJ-S-003 AND MMSCONF-AMJ-S-004
MMSCONF-MAJ-S-003	Adapting Video Rich to Image Basic	9.3	O	MMSCONF-AMJ-S-001 AND MMSCONF-AMJ-S-003 AND MMSCONF-AMJ-S-004
MMSCONF-MAJ-S-004	Adapting Video Basic to Image Rich	9.3	O	MMSCONF-AMJ-S-002
MMSCONF-MAJ-S-005	Adapting Video Rich to Image Rich	9.3	O	MMSCONF-AMJ-S-002
MMSCONF-MAJ-S-006	Adapting Megapixel to Image Basic.	9.3		MMSCONF-AMJ-S-001 AND MMSCONF-AMJ-S-003 AND MMSCONF-AMJ-S-004 AND MMSCONF-AMJ-S-005 AND MMSCONF-AMJ-S-006
MMSCONF-MAJ-S-007	Adapting Megapixel to Image Rich.	9.3		MMSCONF-AMJ-S-002

Table 48: Major content adaptation function requirements

C.2.5   Actions for Minor Content Adaptation

Item	Function	Reference	Status	Requirement
MMSCONF-AMN-S-001	For any Image attachment in the MM: Reduction of image resolutions to 160*120 pixels	9.3	O	
MMSCONF-AMN-S-002	If MM size exceeds 30 KB: Reduction of message size to 30 KB using resolution and quality reduction techniques for image and speech, if possible	9.3	O	
MMSCONF-AMN-S-003	If MM size exceeds 100 KB: Reduction of message size to 100 KB using resolution, frame-rate and other quality reduction techniques for image, speech and video objects, if possible	9.3	O	
MMSCONF-AMN-S-004	For receiving terminals not conforming to MMS 1.3, transcoding from JPEG/EXIF to JPEG/JFIF	9.4.1	O	
MMSCONF-AMN-S-005	For any Image attachment in the MM: Reduction of image resolutions to 640*480 pixels	9.3	O	
MMSCONF-AMN-S-006	If MM size exceeds 300 KB: Reduction of message size to 300 KB using resolution, frame-rate and other quality reduction techniques for image, speech and video objects, if possible.	9.3	O	

Table 49: Minor content adaptation action requirements

C.2.6   Actions for Major Content Adaptation

Item	Function	Reference	Status	Requirement
MMSCONF-AMJ-S-001	For any SP-MIDI attachment in the MM: Removal of SP-MIDI attachment	9.3	O	
MMSCONF-AMJ-S-002	For any video attachment in the MM: Converting one or more video frame(s) to any mandatory image format with related presentation, removing video part	9.3	O	
MMSCONF-AMJ-S-003	For any video attachment in the MM: Converting one or more video frame(s) to any mandatory image format, removing video part, scaling QCIF resolution to 160*120 pixels	9.3	O	
MMSCONF-AMJ-S-004	For the purpose of size reduction, converting GIF89a (animated) to object(s) of any mandatory image format(s) with related presentation and GIF89a part is removed.	9.3	O	
MMSCONF-AMJ-S-005	For any Image attachment in the MM: Reduction of image resolutions to 160*120 pixels	9.3	O	

Item	Function	Reference	Status	Requirement
MMSCONF-AMJ-S-006	If MM size exceeds 30 KB: Reduction of message size to 30 KB using resolution and quality reduction techniques for image and speech and video objects.	9.3	O	

Table 50: Major content adaptations requirements

C.2.7 DRM Related Server Requirements

Item	Function	Reference	Status	Requirement
MMSCONF-DRM-S-001	Not deliver any DRM Forward Lock or Combined Delivery protected MM elements to any MMS Client which does not support DRM	16.3.1	M	
MMSCONF-DRM-S-002	Not route forward any DRM Forward Lock or Combined Delivery protected MM elements over the E, MMS_R and the MM7 (3GPP and 3GPP2 terminology) interface to a receiving entity that does not support DRM	16.3.1	M	
MMSCONF-DRM-S-003	Not store any DRM Forward Lock or Compined Delivery protected MM elements into a user accessible persistent network storage	16.3.1	M	
MMSCONF-DRM-S-004	Not forward any DRM Forward Lock or Compined Delivery protected MM elements prior to retrival	16.3.1	M	
MMSCONF-DRM-S-005	Not alter or strip off any part of the 'DRM Forward Lock or Combined Delivery Message' Header	16.3.1	M	
MMSCONF-DRM-S-006	Accept DRM Separate Delivery protected Messages on all interfaces	16.3.2	M	
MMSCONF-DRM-S-007	Relay any DCF objects unaltered for MMS Clients which support Separate Delivery	16.3.2	M	
MMSCONF-DRM-S-008	Replace all DCF objects and send the modified MM to the user or Not deliver the whole MM to MMS Clients which do not support Separate Delivery	16.3.2	M	

Table 51: DRM related conformance for Proxy-Relay

C.2.8 Actions for MM4 Interface General Capabilities

Item	Function	Reference	Status	Requirement
MMSCONF-S-MM4-001	Support for MM4_forward.REQ	13	M	
MMSCONF-S-MM4-002	Support for MM4_forward.RES	13	M	
MMSCONF-S-MM4-003	Support for MM4_delivery_report.REQ	13	M	
MMSCONF-S-MM4-004	Support for MM4_delivery_report.RES	13	M	

MMSCONF-S-MM4-005	Support for MM4_read_reply_report.REQ	13	M	
MMSCONF-S-MM4-006	Support for MM4_read_reply_report.RES	13	M	
MMSCONF-S-MM4-008	SMTP Service Extension for Message Size Declaration [RFC1870]	13	O	
MMSCONF-S-MM4-009	SMTP Service Extension for 8bit-MIME transport [RFC1652]	13	O	

Table 52: Static Conformance Requirement for general MM4 support. (references from [TS23140] or [3GPP2 X.S0016-200])

C.2.9   Actions for MM4 Information Elements in MM4_forward.REQ

Item	Function	Reference	Status	Requirement
MMSCONF-S-MM4-010	3GPP MMS Version	13	M	
MMSCONF-S-MM4-011	Message Type	13	M	
MMSCONF-S-MM4-012	Transaction ID	13	M	
MMSCONF-S-MM4-013	Message ID	13	M	
MMSCONF-S-MM4-014	Recipient(s) address	13	M	
MMSCONF-S-MM4-015	Sender address	13	M	
MMSCONF-S-MM4-016	Content type	13	M	
MMSCONF-S-MM4-017	Message class	13	O	
MMSCONF-S-MM4-018	Date and time	13	M	
MMSCONF-S-MM4-019	Time of Expiry	13	O	
MMSCONF-S-MM4-020	Delivery report	13	O	
MMSCONF-S-MM4-021	Priority	13	O	
MMSCONF-S-MM4-022	Sender visibility	13	O	
MMSCONF-S-MM4-023	Read reply	13	O	
MMSCONF-S-MM4-024	Subject	13	O	
MMSCONF-S-MM4-025	Acknowledgement Request	13	O	
MMSCONF-S-MM4-026	Forward_counter	13	O	
MMSCONF-S-MM4-027	Previously-sent-by	13	O	
MMSCONF-S-MM4-028	Previously-sent-date-and-time	13	O	
MMSCONF-S-MM4-029	Content	13	O	

Table 53: Static Conformance Requirement for forward multimedia message over MM4 (references from [TS23140] or [3GPP2 X.S0016-200]).

C.2.10   Actions for MM4 Information Elements in MM4_forward.RES

Item	Function	Reference	Status	Requirement
MMSCONF-S-MM4-030	3GPP MMS Version	13	M	
MMSCONF-S-MM4-031	Message Type	13	M	
MMSCONF-S-MM4-032	Transaction ID	13	M	
MMSCONF-S-MM4-033	Message ID	13	M	
MMSCONF-S-MM4-034	Request Status	13	M	
MMSCONF-S-MM4-035	Request Status text	13	O	

Table 54: Static Conformance Requirement for forward response over MM4

C.2.11   Actions for MM4 Information Elements in MM4_delivery_report.REQ

Item	Function	Reference	Status	Requirement
MMSCONF-S-MM4-036	3GPP MMS Version	13	M	
MMSCONF-S-MM4-037	Message Type	13	M	
MMSCONF-S-MM4-038	Transaction ID	13	M	
MMSCONF-S-MM4-039	Message ID	13	M	
MMSCONF-S-MM4-040	Recipient address	13	M	
MMSCONF-S-MM4-041	Sender address	13	M	
MMSCONF-S-MM4-042	Date and time	13	M	
MMSCONF-S-MM4-043	Acknowledgement Request	13	O	
MMSCONF-S-MM4-044	MM Status	13	M	
MMSCONF-S-MM4-045	MM Status text	13	O	

Table 55: Static Conformance Requirement for delivery report request over MM4.

C.2.12   Actions for MM4 Information Elements in MM4_delivery_report.RES

Item	Function	Reference	Status	Requirement

MMSCONF-S-MM4-046	3GPP MMS Version	13	M	
MMSCONF-S-MM4-047	Message Type	13	M	
MMSCONF-S-MM4-048	Transaction ID	13	M	
MMSCONF-S-MM4-049	Message ID	13	M	
MMSCONF-S-MM4-050	Request Status	13	M	
MMSCONF-S-MM4-051	Request Status text	13	O	

Table 56: Static Conformance Requirement for delivery report response over MM4.

C.2.13 Actions for MM4 Information Elements in MM4_read_reply_report.REQ

Item	Function	Reference	Status	Requirement
MMSCONF-S-MM4-052	3GPP MMS Version	13	M	
MMSCONF-S-MM4-053	Message Type	13	M	
MMSCONF-S-MM4-054	Transaction ID	13	M	
MMSCONF-S-MM4-055	Message ID	13	M	
MMSCONF-S-MM4-056	Recipient address	13	M	
MMSCONF-S-MM4-057	Sender address	13	M	
MMSCONF-S-MM4-058	Date and time	13	M	
MMSCONF-S-MM4-059	Acknowledgement Request	13	O	
MMSCONF-S-MM4-060	MM Status	13	M	
MMSCONF-S-MM4-061	MM Status text	13	O	

Table 57: Static Conformance Requirement for read reply report request over MM4.

C.2.14 Actions for MM4 Information Elements in MM4_read_reply_report.RES

Item	Function	Reference	Status	Requirement
MMSCONF-S-MM4-062	3GPP MMS Version	13	M	
MMSCONF-S-MM4-063	Message Type	13	M	
MMSCONF-S-MM4-064	Transaction ID	13	M	
MMSCONF-S-MM4-065	Request Status	13	M	
MMSCONF-S-MM4-066	Request Status text	13	O	

Table 58: Static Conformance Requirement for read reply report response over MM4.

C.2.15 Actions for MM4 Address Lookup

Item	Function	Reference	Status	Requirement

MMSCONF-S-MM4-067	DNS-ENUM recipient MSISDN address resolution	13	O	
MMSCONF-S-MM4-068	Recipient MSISDN address resolution based on IMSI	13	O	
MMSCONF-S-MM4-069	Recipient MDN address resolution based on MSID (MIN or IMSI)	13	O	

Table 59: Static Conformance Requirement for address lookup for MM4.

C.2.16   Application Addressing Related Server Requirements

Item	Function	Reference	Status	Requirement
MMSCONF-APA-S-001	Support of application addressing	19	O	MMSCONF-APA-S-002
MMSCONF-APA-S-002	Support for rejection of all or any incoming MM targeting an application with a specific Application ID	19	O	

Table 60: Application Addressing Related Server Requirements

Appendix D.   Guidelines for Migration to 600 KByte Maximum Size in the Megapixel Class (Informative)

MMS Enabler 1.3 allows migration to 600 KByte maximum size in the MM Content Class Megapixel:

a. **Retrieval / presentation:** Section 7.1.11specifies that MMS Clients/terminals conforming to MM Content Class Megapixel shall support a maximum MM size of at least 600 KB in retrieval and presentation. This prepares MMS for the larger size at the recipient side.

b. **Creation / submission:** Section 7.1.11 specifies a parameter *max authorized MM size*. This parameter sets the maximum size of MM belonging to MM Content Class Megapixel for creation and submission by the MMS Client. The possible values of this parameter are 300 KB and 600 KB. The parameter is configurable, in particular via OTA configuration by the operator.

These means allow the increase in size of person-to-person MM at a time when the market requires so and when the networks are prepared.

For this migration, mandatory requirements are specified in section 18.

The following methods are described to fulfill this requirement.

1. To apply content adaptation 600 =>300 KB in network A before forwarding MM via MMS_R to network B; in this case it has to be taken into account that the recipient network B may have to apply content adaptation as well.

2. To migrate to 600 KB in coordination with MMS interworking partners. Then no content adaptation is needed;

3. Network operators A and B find an agreement that network B as the recipient network accepts incoming 600 KB MM forwarded by network A.

Methods 1, 2, and 3 are applicable to the cases where network A is

   a.   the originator network; or

   b.   an intermediate network (i.e.forwarding MM received from a network to another network);

and to the cases where network B is

   c.   the recipient network or

   d.   an intermediate network (i.e.forwarding MM received from a network to another network).