

**Source: TSG-SA WG4**

**Title: CR TS 26.140 on Update of MMS codecs and formats with Release 6 functionality (Release 6)**

**Document for: Approval**

**Agenda Item: 7.4.3**

The following CR, agreed at the TSG-SA WG4 meeting #32, is presented to TSG SA #25 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Vers	WG	Meeting	S4 doc
26.140	007	1	Rel-6	Update of MMS codecs and formats with Release 6 functionality	B	5.2.0	S4	TSG-SA WG4#32	S4-040591

## CHANGE REQUEST

# 26.140 CR 007 # rev 1 # Current version: 5.2.0 #

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the # symbols.

**Proposed change affects:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	# Update of MMS codecs and formats with Release 6 functionality		
<b>Source:</b>	# TSG SA WG4		
<b>Work item code:</b>	# MMS6-Codec	<b>Date:</b>	# 14/09/2004
<b>Category:</b>	# <b>B</b>	<b>Release:</b>	# Rel-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	# Release-6 functionality agreed for MMS, and better wording for media type support requirements added.
<b>Summary of change:</b>	# A number of new features and functions have been included in R6, such as: <ul style="list-style-type: none"> <li>Extended support for synthetic audio with XMF and DLS</li> <li>Clarifications and updates to a number of references</li> <li>Support for 128 kbps video</li> </ul> <p>This CR reflects the non-controversial changes approved in SA4 during the Release 6 discussion for the TS 26.140, not including the audio codec(s) not yet decided (decision due in SA#25). Specification texts and references for new codec(s) will be presented in separate CRs.</p>
<b>Consequences if not approved:</b>	# TS 26.140 will not include all approved media formats, and has outdated references, potentially confusing media type support requirements.

<b>Clauses affected:</b>	# Foreword, 2, 3.2, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10								
<b>Other specs affected:</b>	# <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">#</td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications # <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">#</td> <td style="width: 20px; text-align: center;">X</td> </tr> </table> Test specifications # <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px; text-align: center;">#</td> <td style="width: 20px; text-align: center;">X</td> </tr> </table> O&M Specifications #	Y	N	#	X	#	X	#	X
Y	N								
#	X								
#	X								
#	X								
<b>Other comments:</b>	#								

## Foreword

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

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

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification;

The 3GPP Multimedia messaging service (MMS) specification consists of three 3GPP TSs; 3GPP TS 22.140, 3GPP TS 23.140 and the present document. The TS 3GPP TS 22.140 [22] provides a set of requirements which shall be supported for the provision of non real-time multimedia messaging service, seen primarily from the subscriber's and service providers' points of view. The TS 23.140 [23] identifies the functional capabilities and information flows needed to support the MMS. The present document provides the details of media types, formats and codecs used by the MMS service.

The issue of codecs for MMS services has been addressed initially in TS 23.140, owned by the 3GPP T2 group. During the TSG-T WG2 group meeting in Edinburgh in September 2001, the TSG-T WG2 group sent a Liaison statement (S4-AHP040) to the 3GPP SA WG4 group, requesting that the responsibility for the specification of codecs and formats to be used in MMS services is transferred to SA WG4 group starting with Release 5.

After the SA WG4 group agreed to take over this responsibility, and the present document is the result of such commitment [on Release 6](#).

For the sake of interoperability and alignment it is important there is no contradiction between the recommendations made in the present document and in the 26.234 specification [14].

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# 1 Scope

The present document specifies the media types, formats and codecs for the MMS within the 3GPP system. The scope of the present document extends to codecs for speech, audio, video, still images, bitmap graphics, and other media in general, as well as scene description, multimedia integration and synchronization schemes.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] The Unicode Consortium: "The Unicode Standard", Version 2.0, Addison-Wesley Developers Press, 1996. URL: <http://www.unicode.org/>.
- [3] ANSI X3.4, 1986: "Information Systems; Coded Character Set 7 Bit; American National Standard Code for Information Interchange".
- [4] ISO/IEC 8859-1:1998: "Information technology; 8-bit single-byte coded graphic character sets; Part 1: Latin alphabet No. 1".
- [5] IETF; RFC 2279: "UTF-8, A Transformation format of ISO 10646", URL: <http://www.ietf.org/rfc/rfc2279.txt>.
- [6] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".
- [7] 3GPP TS 26.090: "AMR speech Codec Transcoding functions".
- [8] ITU-T Recommendation T.81: "Information technology; Digital compression and coding of continuous-tone still images: Requirements and guidelines".
- [9] "JPEG File Interchange Format", Version 1.02, September 1, 1992
- [10] ITU-T Recommendation H.263 [\(02/98\)](#): "Video coding for low bit rate communication".
- [11] ITU-T Recommendation H.263 – [Annex X \(03/04\)](#) ~~(annex X)~~: "Annex X: Profiles and levels definition".
- [12] ISO/IEC 14496-2 ~~(1999)~~; [2004](#): "Information technology - Coding of audio-visual objects - Part 2: Visual".
- [13] ~~(void) ISO/IEC 14496-2:1999/FDAM4, ISO/IEC JTC1/SC 29/WG11 N3904, Pisa, January, 2001.~~
- [14] 3GPP TS 26.234: "End-to-end transparent streaming Service; Protocols and codecs".
- [15] CompuServe Incorporated: "GIF Graphics Interchange Format: A Standard defining a mechanism for the storage and transmission of raster-based graphics information", Columbus, OH, USA, 1987
- [16] Compuserve Incorporated, Columbus, Ohio (1990): "Graphics Interchange Format (Version 89a)".

- [17] IETF RFC 2083: "PNG (Portable Networks Graphics) Specification version 1.0 ", T. Boutell, et. al., March 1997
- [18] ITU-T Recommendation H.263 (1998): "Video coding for low bit rate communication - Annex X, Profiles and Levels Definition".
- [19] ISO/IEC 14496-3:2001, "Information technology -- Coding of audio-visual objects -- Part 3: Audio".
- [20] ~~W3C Working Draft: "Scalable Vector Graphics (SVG)", <http://www.w3.org/TR/SVG11>~~, <http://www.w3.org/TR/2003/REC-SVG11-20030114/>, January 2003.
- [21] ~~W3C Working Draft: "Mobile SVG Profiles: SVG Tiny and SVG Basic", <http://www.w3.org/TR/SVGMobile>~~ W3C Recommendation: "Mobile SVG Profiles: SVG Tiny and SVG Basic", <http://www.w3.org/TR/2003/REC-SVGMobile-20030114/>, January 2003.
- [22] 3GPP 22.140: "Service Aspects; Stage 1; Multimedia Messaging Service".:
- [23] 3GPP 23.140: "Multimedia Messaging Service (MMS); Functional Description; Stage 2".
- [24] W3C Recommendation: "Synchronized Multimedia Integration Language (SMIL 2.0)", <http://www.w3.org/TR/2001/REC-smil20-20010807/>, August 2001
- [25] IETF RFC 2046: "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".
- [26] 3GPP TS 26.071: "Mandatory Speech Codec speech processing functions; AMR Speech Codec; General description".
- [27] 3GPP TS 26.171: "AMR speech codec; General description".
- [28] Scalable Polyphony MIDI Specification [Version 1.0](http://www.midi.org/about_midi/abtspmidi.htm), RP-34, MIDI Manufacturers Association, Los Angeles, CA, [February](http://www.midi.org/about_midi/abtspmidi.htm) 2002, [http://www.midi.org/about\\_midi/abtspmidi.htm](http://www.midi.org/about_midi/abtspmidi.htm).
- [29] Scalable Polyphony MIDI Device 5-to-24 Note Profile for 3GPP, RP-35, MIDI Manufacturers Association, Los Angeles, CA, [February](http://www.midi.org/about_midi/abtspmidi.htm) 2002, [http://www.midi.org/about\\_midi/abtspmidi.htm](http://www.midi.org/about_midi/abtspmidi.htm).
- [30] ~~WAP-277, XHTML Mobile Profile, WAP Forum, <http://www.wapforum.org/what/technical.htm>~~  
WAP Forum Specification: "XHTML Mobile Profile", <http://www1.wapforum.org/tech/terms.asp?doc=WAP-277-XHTMLMP-20011029-a.pdf>, October 2001.
- [31] "Standard MIDI Files 1.0", RP-001, in "The Complete MIDI 1.0 Detailed Specification, Document Version 96.1 " The MIDI Manufacturers Association, Los Angeles, CA, USA, February 1996.
- [32] IETF RFC 3267: " RTP payload format and file storage format for the Adaptive Multi-Rate (AMR) Adaptive Multi-Rate Wideband (AMR-WB) audio codecs ", March 2002.
- [33] [3GPP TS 26.244: "Transparent end-to-end packet switched streaming service \(PSS\); 3GPP file format \(3GP\)"](#)
- [34] [3GPP TS 26.246: "Transparent end-to-end packet switched streaming service \(PSS\); 3GPP SMIL Language Profile"](#).
- [35] [3GPP TS 26.245: "Transparent end-to-end packet switched streaming service \(PSS\); Timed text format"](#)
- [36] [IETF RFC 1952 "GZIP file format specification version 4.3", Deutsch P, May 1996.](#)
- [37] [3GPP TS 26.245: "Transparent end-to-end packet switched streaming service \(PSS\); Timed text format"](#).
- [38] [Mobile DLS, MMA specification v1.0. RP-41 Los Angeles, CA, USA. 2004.](#)
- [39] [Mobile XMF Content Format Specification, MMA specification v1.0., RP-42, Los Angeles, CA, USA. 2004](#)

- [40] [3GPP TS 26.090: "Mandatory Speech Codec speech processing functions; Adaptive Multi-Rate \(AMR\) speech codec; Transcoding functions".](#)
- [41] [3GPP TS 26.073: "ANSI-C code for the Adaptive Multi Rate \(AMR\) speech codec".](#)
- [42] [3GPP TS 26.104: "ANSI-C code for the floating-point Adaptive Multi Rate \(AMR\) speech codec".](#)
- [43] [3GPP TS 26.190: "Speech Codec speech processing functions; AMR Wideband speech codec; Transcoding functions".](#)
- [44] [3GPP TS 26.173: "ANSI-C code for the Adaptive Multi Rate - Wideband \(AMR-WB\) speech codec".](#)
- [45] [3GPP TS 26.204: "ANSI-C code for the Floating-point Adaptive Multi-Rate Wideband \(AMR-WB\) speech codec".](#)

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## 3 Definitions and abbreviations

### 3.1 Definitions

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

**continuous media:** media with an inherent notion of time, in the present document speech, audio and video

**discrete media:** media that itself does not contain an element of time, in the present document all media not defined as continuous media

**scene description:** description of the spatial layout and temporal behaviour of a presentation, it can also contain hyperlinks

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply:

3GP	3GPP file format
AAC	Advanced Audio Coding
CC/PP	Composite Capability/Preference Profiles
<a href="#">DLS</a>	<a href="#">Downloadable Sounds</a>
GIF	Graphics Interchange Format
H.263	ITU-T video codec
ITU-T	International Telecommunications Union - Telecommunications
JFIF	JPEG File Interchange Format
JPEG	Joint Picture Expert Group
MIDI	Musical Instrument Digital Interface
MIME	Multipurpose Internet Mail Extensions
MM	Multimedia Message
MMS	Multimedia Messaging Service
MPEG	Motion Picture Expert Group
MP4	MPEG-4 file format
PSS	Packet-switched Streaming Service
SP-MIDI	Scalable Polyphony MIDI
SVG	Scalable Vector Graphics
UTF-8	Unicode Transformation Format (the 8-bit form)
<a href="#">XMF</a>	<a href="#">Extensible Music Format</a>

## 4 Media formats

Multiple media elements shall be combined into a composite single MM using MIME multipart format as defined in RFC 2046 [25]. The media type of a single MM element shall be identified by its appropriate MIME type whereas the media format shall be indicated by its appropriate MIME subtype.

In order to guarantee a minimum support and compatibility between multimedia messaging capable terminals, MMS User Agent supporting specific media types shall comply with the following selection of media formats:

### 4.1 Text

Plain text. Any character encoding (charset) that contains a subset of the logical characters in Unicode [2] shall be used (e.g. US-ASCII [3], ISO-8859-1 [4], UTF-8 [5], Shift\_JIS, etc.).

Unrecognized subtypes of "text" shall be treated as subtype "plain" as long as the MIME implementation knows how to handle the charset. Any other unrecognized subtype and unrecognized charset shall be treated as "application/octet - stream".

[Interoperability with SMS text type is according to \[23\].](#)

~~NOTE 1: SMS MIME type shall be used as soon as the MIME registration has been completed.~~

~~NOTE 2: a reference to T2 specification regarding interoperability with SMS will be added here.~~

### 4.2 Speech

[If speech is supported,](#) ~~t~~he AMR codec shall be supported for narrow-band speech [26][40][41][42].

The AMR wideband speech codec [27][43][44][45] shall be supported when wideband speech working at 16 kHz sampling frequency is supported.

When using speech media type alone, AMR or AMR-WB data is stored according to the file format specified in [32].

Multi-channel sessions shall not be used.

### 4.3 Audio

[If audio is supported,](#) MPEG-4 AAC Low Complexity object type [19] should be supported. The maximum sampling rate to be supported by the decoder is 48 kHz. The channel configurations to be supported are mono (1/0) and stereo (2/0). In addition, the MPEG-4 AAC Long Term Prediction object type may be supported.

### 4.4 Synthetic audio

[If synthetic audio is supported,](#) ~~t~~he Scalable Polyphony MIDI (SP-MIDI) content format defined in Scalable Polyphony MIDI Specification [28] and the device requirements defined in Scalable Polyphony MIDI Device 5-to-24 Note Profile for 3GPP [29] should be supported.

SP-MIDI content is delivered in the structure specified in Standard MIDI Files 1.0 [31], either in format 0 or format 1.

[In addition the Mobile DLS instrument format defined in \[38\] and the Mobile XMF content format defined in \[39\] should be supported.](#)

[A MMS client supporting Mobile DLS shall meet the minimum device requirements defined in \[38\] in section 1.3 and the requirements for the common part of the synthesizer voice as defined in \[29\] in sections 1.2.1.2. If Mobile DLS is supported, wavetables encoded with the G.711 A-law codec \(wFormatTag value 0x0006, as defined in \[38\]\) shall also be supported. The optional group of processing blocks as defined in \[39\] may be supported. Mobile DLS resources are delivered either in the file format defined in \[38\], or within Mobile XMF as defined in \[39\]. For Mobile DLS files delivered outside of Mobile XMF, the loading application should unload Mobile DLS instruments so that the sound bank required by the SP-MIDI profile \[29\] is not persistently altered by temporary loadings of Mobile DLS files.](#)

Content that pairs Mobile DLS and SP-MIDI resources is delivered in the structure specified in Mobile XMF [39]. As defined in [39], a Mobile XMF file shall contain one SP-MIDI SMF file and no more than one Mobile DLS file. MMS clients supporting Mobile XMF must not support any other resource types in the Mobile XMF file. Media handling behaviours for the SP-MIDI SMF and Mobile DLS resources contained within Mobile XMF are defined in [39].

## 4.5 Still Image

If still images are supported, ISO/IEC JPEG [8] together with JFIF [9] shall be supported. The support for ISO/IEC JPEG only apply to the following two modes:

- mandatory: baseline DCT, non-differential, Huffman coding, as defined in table B.1, symbol 'SOF0' in [8];
- optional: progressive DCT, non-differential, Huffman coding, as defined in table B.1, symbol 'SOF2' [8].

## 4.6 Bitmap graphics

If bitmap graphics is supported, the following bitmap graphics formats should be supported:

- GIF87a [15];
- GIF89a, [16];
- PNG, [17].

## 4.7 Video

~~For terminals supporting media type video~~If video is supported, ITU-T Recommendation H.263 ~~[10]~~ profile 0 level ~~4540 [10][11]~~ shall be supported. ~~This is the mandatory video codec for the MMS.~~ In addition, ~~MMS should support:~~

- H.263 ~~[11]~~ Profile 3 Level ~~4540 [10][11]~~;
- MPEG-4 Visual Simple Profile Level 0 ~~b~~, [12]; ~~and [13];~~

should be supported. ~~These two video codecs are optional to implement.~~

An optional video buffer model is given in Annex G of document [14].

NOTE: ITU-T Recommendation H.263 profile 0 has been mandated to ensure that video-enabled MMS supports a minimum baseline video capability. Both H.263 and MPEG-4 visual decoders can decode an H.263 profile 0 bitstream. It is strongly recommended, though, that an H.263 profile 0 bitstream is transported and stored as H.263 and not as MPEG-4 visual (short header), as MPEG-4 visual is not mandated by MMS.

## 4.8 Vector graphics

~~For terminals supporting media type "2D vector graphics"~~If "2D vector graphics" is supported, the "Tiny" profile of the Scalable Vector Graphics (SVG-Tiny) ~~format~~ shall be supported, and the "Basic" profile of the Scalable Vector Graphics (SVG-Basic) ~~format~~ may be supported [20] [21].

NOTE: The compression format for SVG content is GZIP [35], in accordance with the SVG specification [20].

NOTE 2: Adoption of SVG Tiny 1.2 to Release 6 is still being considered (as a working assumption) to MMS. Decision will be made as a late Release 6 item during TSG SA Meeting #26



## 4.9 File Format for ~~dynamic media~~video and associated speech/audio media types

~~NOTE 1: The 3GPP file format (3GP), used in this specification for timed multimedia (such as video, associated audio and timed text), is structurally based on the ISO base media file format. The conformance statement for 3GP files is defined in [14] by addressing the registration of codecs, file identification, file extension and MIME type definition.~~

To ensure interoperability for the transport of video and associated speech/audio and timed text in an MM, the 3GPP file format with Basic profile shall be supported.

The usage of the 3GPP file format shall follow the technical specifications and the implementation guidelines specified in TS 26.234 [14], 233 [33].

~~NOTE 2:~~ When using speech media type alone, AMR or AMR-WB data is stored according to the file format specified in [32].

## 4.10 Media synchronization and presentation format

~~The mandatory format 3GPP MMS uses a subset of SMIL 2.0 [24] for media synchronization and scene description of multimedia messaging is SMIL. MMS clients and servers with support for media synchronization and scene descriptions shall support the 3GPP SMIL Language Profile defined in [34].~~

- ~~The 3GPP MMS uses a subset of SMIL 2.0 as format of the scene description. MMS clients and servers with support for scene descriptions shall support the 3GPP PSS5 SMIL Language Profile defined in clause 8.2 of TS 26.234 [14]. This profile is a subset of the SMIL 2.0 Language Profile [24] but a superset of the SMIL 2.0 Basic Language Profile. TS 26.234 also includes an informative annex B that provides guidelines for SMIL content authors. This profile is a subset of the SMIL 2.0 Language Profile but a superset of the SMIL 2.0 Basic Language Profile. Document [34] also includes an informative annex A that provides guidelines for SMIL content authors.~~

~~Additionally, 3GPP MMS should provide the following format: XHTML Mobile Profile [30] for scene description should be supported. MMS clients and servers with support for scene descriptions based on XHTML shall support XHTML Mobile Profile [30], defined by the WAP Forum.~~

- ~~XHTML Mobile Profile~~
- ~~The 3GPP MMS uses a subset of XHTML 1.1 as a format for scene description. MMS clients and servers with support for scene descriptions shall support XHTML Mobile Profile [30], defined by the WAP Forum. XHTML Mobile Profile is a subset of XHTML 1.1 but a superset of XHTML Basic.~~

## 4.11 Timed text

If timed text is supported, MMS clients shall support [37] with 3GP files using Basic profile [33].