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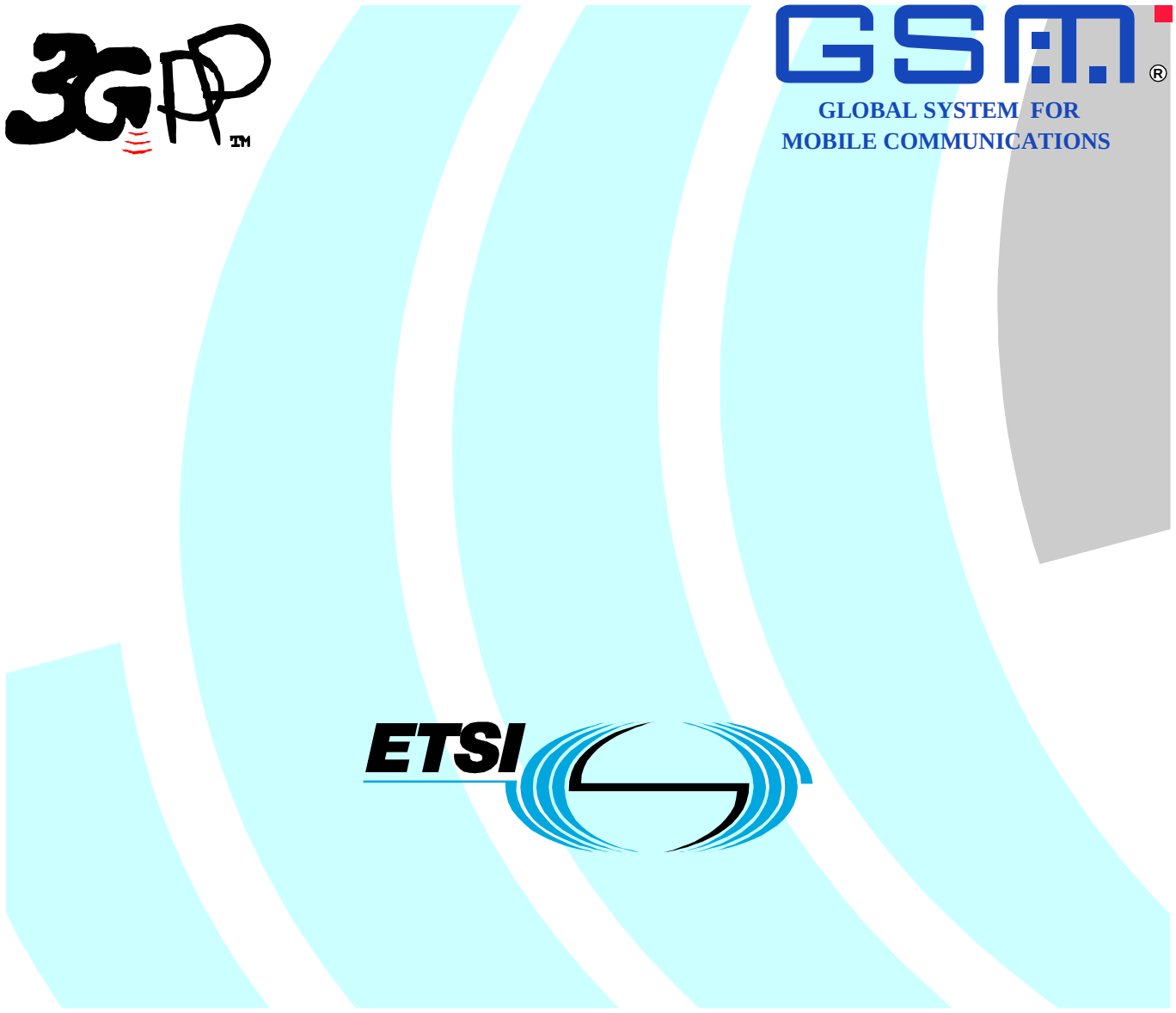
Technical Specification

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Multimedia Messaging Service (MMS);
Media formats and codes
(3GPP TS 26.140 version 5.1.0 Release 5)



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Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under www.etsi.org/key .

Contents

Foreword

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

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

Version x.y.z

where:

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

The issue of codecs ad 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.

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].

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.

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: "Video coding for low bit rate communication".

[11] ITU-T Recommendation H.263 (annex X): "Annex X: Profiles and levels definition".

[12] ISO/IEC 14496-2 (1999): "Information technology - Coding of audio-visual objects - Part 2: Visual".

[13] 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.

[21] W3C Working Draft: "Mobile SVG Profiles: SVG Tiny and SVG Basic", http://www.w3.org/TR/SVGMobile

[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, RP-34, MIDI Manufacturers Association, Los Angeles, CA, 2002, 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, 2002, http://www.midi.org/about-midi/abtspmidi.htm

[30] WAP-277, XHTML Mobile Profile, WAP Forum, http://www.wapforum.org/what/technical.htm

[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.

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:

AAC	Advanced Audio Coding
CC/PP	Composite Capability/Preference Profiles
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)

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".

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

The AMR codec shall be supported for narrow-band speech [26].

The AMR wideband speech codec [27]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

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

The 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.

4.5 Still Image

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

The following bitmap graphics formats should be supported:

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

4.7 Video

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

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

These two video codecs are optional to implement.

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

NOTE: ITU-T Recommendation H.263 [10] baseline has been mandated to ensure that video-enabled MMS support a minimum baseline video capability and interoperability can be guaranteed (an H.263 baseline bitstream can be decoded by both H.263 and MPEG-4 decoders). It also provides a simple upgrade path for mandating more advanced codecs in the future (from both the ITU-T and ISO MPEG).

4.8 Vector graphics

For terminals supporting media type "2D vector graphics" 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].

4.9 File Format for dynamic media

NOTE 1: The file format used in the present document for timed multimedia (such as video, associated audio and timed text) is structurally based on the MP4 file format as defined in [14]. However, since non-ISO codecs are used here, it is called the 3GPP file format and has its own file extension and MIME type to distinguish these files from MPEG-4 files. When the present document refers to the MP4 file format, it is referring to its structure (ISO file format), not to its conformance definition.

To ensure interoperability for the transport of video and associated speech/audio and timed text in an MM, the MP4 file format shall be supported.

The usage of the MP4 file format shall follow the technical specifications and the implementation guidelines specified in TS 26.234 [14].

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

NOTE 3: 3GPP TS 26.234 [14] specifies a mechanism for the registration of AMR and H.263 codestreams to be included in MP4 files.

4.10 Media synchronization and presentation format

The mandatory format for media synchronization and scene description of multimedia messaging is SMIL.

- 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.

Additionally, 3GPP MMS should provide the following format:

- 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.

Annex A (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2002-03	15	SP-020075			Version 2.0.0 presented for approval	2.0.0	5.0.0
2002-06	16	SP-020224	001		Correcting the reference to AMR and AMR-WB RTP payload	5.0.0	5.1.0

History

Document history		
V5.0.0	March 2002	Publication
V5.1.0	June 2002	Publication