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Contents

Foreword

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

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Introduction

The 3GPP Technical Specifications TS 22.340 [55] and TS 22.141 [56] define the requirements for the 3GPP IP Multimedia Subsystem (IMS) based messaging and presence services. This Technical Specification takes the requirements into account when defining the minimal baseline and optional media codecs and message container format to be used by IMS Messaging and associated Presence service, when supported.

IMS Messaging services incorporate one or more of the following messaging types Immediate messaging, Deferred delivery messaging, and Session based messaging. With Immediate messaging the sender expects immediate message delivery in what is perceived as real time compared with Deferred messaging where the sender expects the network to deliver the message as soon as the recipient becomes available. With Session based messaging a communications association is established between two or more users before communication can take place. In the simplest form Session based messaging may be a direct communication between two users. This specification defines the media types and container formats for both the Immediate message type and the Session based message type.

The specification provides the ability to have an interoperable baseline set of media types for messaging and presence services, that will simultaneously maximise the technology re-use of the already existing 3GPP services with media types, defined in TS 26.140 [13] and TS 26.511 [67]. Simultaneously, the specification will provide the ability to indicate the IMS system about the complete set of UE media and storage capabilities relevant for the IMS messaging and presence service.

For IMS terminals capable of Combined CS and IMS (CSI) operation [59][60], the specification provides an Annex with guidelines on how to combine IMS media with CS calls.

1 Scope

The present document specifies the basic media formats and codecs to be used in the IMS Messaging and Presence services, including CSI. It defines the mandatory 'baseline' set of media types for the services. Additionally, it also targets to allow possible message content type enhancements, either 3GPP-standardized or other generally used media types, in a flexible way.

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*.

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3 Definitions, symbols and abbreviations

3.1 Definitions

Deferred delivery messaging: A type of IMS Messaging service by which the sender expects the network to deliver the message as soon as the recipient becomes available.

Immediate messaging: A type of IMS Messaging service by which the sender expects immediate message delivery in (near) real time fashion.

IMS Messaging services: A group of services, supported by capabilities of the 3GPP IP Multimedia Subsystem 3GPP TS 22.228 [54], that allows an IMS user to send and receive messages to other users. IMS messaging services comprise of one or more types: Immediate messaging, Session based messaging and Deferred delivery messaging.

Session based messaging: A type of IMS Messaging service by which the sender expects immediate message delivery in (near) real time fashion. In addition the sender(s) and the receiver(s) have to join to a messaging session e.g. chat room, before message exchange can take place.

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

static 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

3GP	3GPP file format
AAC	Advanced Audio Coding
AMR	Adaptive Multi-rate Codec
AR	Augmented Reality
CC/PP	Composite Capability/Preference Profiles
CSI	Combination of CS and IMS services
DLS	Downloadable Sounds
Enhanced aacPlus	MPEG-4 High Efficiency AAC plus MPEG-4 Parametric Stereo
EXIF	Exchangeable image file format
GIF	Graphics Interchange Format
glTF	Graphics Library Transmission Format
IP	Internet Protocol
IMS	IP Multimedia Subsystem
ISOBMFF	ISO base media file format
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
MTSI	Multimedia Telephony Service for IMS
PSS	Packet-switched Streaming Service
SBR	Spectral Band Replication
SP-MIDI	Scalable Polyphony MIDI
SVG	Scalable Vector Graphics
UTF-8	Unicode Transformation Format (the 8-bit form)
XMF	Extensible Music Format

4 Formats for Static Media

4.0 Introduction

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

Media Types supported in this specification are provided in Table 4.0-1.

Media Type in TS 26.141	Applicable capability(ies) as specified in TS 26.143 [63]	Supported Media subtype(s)	Definition(s)
Text	26143_TEXT_PLAIN 26143_TEXT_ENC_PLAIN	text/plain	Clause 4.1
Speech	26143_AUDIO_EVS 26143_AUDIO_AMR-WB 26143_AUDIO_AMR [26143_AUDIO_IVAS] 26143_AUDIO_ENC_EVS 26143_AUDIO_ENC_AMR-WB 26143_AUDIO_ENC_AMR [26143_AUDIO_ENC_IVAS]	audio/3gp	Clause 5.1
Audio	26143_AUDIO_XHE-AAC 26143_AUDIO_EAAC+ [26143_AUDIO_IVAS] 26143_AUDIO_ENC_XHE-AAC 26143_AUDIO_ENC_EAAC+ [26143_AUDIO_ENC_IVAS]	Audio/mp4	Clause 5.2
Synthetic audio	n/a	Audio/sp-midi	Clause 4.4
Still Image	26143_IMG_ JPEG 26143_IMG_ENC_JPEG	image/jpeg	Clause 4.2

	26143_IMG_HEIC	image/heic	
Bitmap graphics	26143_IMG_GIF 26143_IMG_PNG	image/gif image/png	Clause 4.2
Video	26143_VIDEO_AVC-HD 26143_VIDEO_AVC-FullHD 26143_VIDEO_HEVC-HD 26143_VIDEO_HEVC-FullHD 26143_VIDEO_HEVC-UHD	video/mp4	Clause 5.3
Vector graphics	image	image/svg+xml	Clause 5.6
Media synchronization and presentation format	26143_PRESENTATION_HTML5	Text/html	Clause 6
Subtitles and Text	26143_TT_3GPP 26143_TT_IMSC11	Text/mp4 Application/mp4	Clause 5.7.1 of TS 26.143
3d scenes and assets	n/a	model/gltf+json model/gltf-binary	Clause 5.7

In order to guarantee a minimum support and compatibility between IMS Messaging and Presence Service capable terminals and OMA IMPS 1.1 capable terminals, IMS Messaging User Agent and IMS Presence 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".

4.2 Still Image and Bitmap graphics

For IMS terminals supporting still images, 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].

For JPEG baseline DCT, EXIF compressed image file format should also be supported, as defined in [58]. In that case there is no requirement for the MMS Messaging and Presence client to interpret or present the EXIF parameters recorded in the file.

If still images are supported, HEIF should be supported which consists in conforming to:

- the `'heic'` brand as defined in ISO/IEC 23008-12 [69],

- the `'MiHB'` brand as defined in ISO/IEC 23000-22:2019 [70], and
- the contained elementary bitstream conforming to H.265 (HEVC) Main Profile, Main Tier, Level 5.1 [71] bitstreams have `general_progressive_source_flag` equal to 1, `general interlaced_source_flag` equal to 0, `general_non_packed_constraint_flag` equal to 1, and `general_frame_only_constraint_flag` equal to 1.
- signalled with `image/heic, profile="heic,MiHB" itemTypes="hvc1.1.2.L153.B0"` or an equivalently compatible media type as defined in [69].

For IMS terminals, supporting bitmap graphics, the following bitmap graphics formats should be supported:

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

5 Formats for Continuous Media

In order to guarantee a minimum support and compatibility between IMS Messaging and Presence Service capable terminals and MMS capable terminals that offer support of continuous media formats (section 5) and media synchronisation and scene description (see section 6), IMS Messaging User Agent and IMS Presence User Agent supporting specific media types should in addition to formats listed in section 4 of this document comply with the following selection of media formats:

5.1 Speech

NOTE: when Speech is supported, the following requirements imply support for narrow-band, wideband and super wideband operations, in alignment with MTSI TS 26.114 [63].

For IMS terminals supporting Speech, the 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 for wideband speech working at 16 kHz sampling frequency.

When using speech media type alone, AMR or AMR-WB data stored according to the file format specified in [32] and EVS data is stored according to the storage specified in Clause A.2.6 of TS 26.445 [72] should be supported. The mandatory format is defined in clause 5.4.

If Speech is supported, then **EVS** decoding capability shall be supported as defined in 3GPP TS 26.117 [68] clause 5.2; and the **EVS** encoding capabilities as defined in clause 5.3 of TS 26.117 [68] and the sender requirements in clause 6.2.4.3 of TS 26.117 [68] shall be supported.

Multi-channel sessions shall not be used when using AMR, AMR-WB and EVS codecs.

If Speech is supported, then **IVAS** decoding capability should be supported as defined in 3GPP TS 26.117 [68] clause 5.2; and the **IVAS** encoding capabilities as defined in clause 5.3 of TS 26.117 [68] and the sender requirements in clause 6.3.5.3 of TS 26.117 [68] should be supported.

NOTE: IVAS codec level setting is TBD.

5.2 Audio

For IMS terminals supporting Audio, **eAAC+** decoding capability shall be supported as defined in 3GPP TS 26.117 [68] clause 5.2 and **eAAC+** encoding capability shall be supported as defined in 3GPP TS 26.117 [68] clause 5.3 and the sender requirements in clause 6.3.2.3 of TS 26.117 [68].

If Audio is supported, then **xHE-AAC stereo** decoding capability should be supported as defined in 3GPP TS 26.117 [68] clause 5.2; and the **xHE-AAC stereo** encoding capabilities as defined in clause 5.3 of TS 26.117 [68] and the sender requirements in clause 6.4.2.3 of TS 26.117 [68] should be supported.

NOTE: xHE-AAC® is a registered trademark of Fraunhofer in Germany and other countries and is used with Fraunhofer's permission.

If Audio is supported, then **IVAS** decoding capability should be supported as defined in 3GPP TS 26.117 [68] clause 5.2; and the **IVAS** encoding capabilities as defined in clause 5.3 of TS 26.117 [68] and the sender requirements in clause 6.3.5.3 of TS 26.117 [68] should be supported.

NOTE: IVAS codec level setting is TBD.

5.3 Video

For IMS terminals supporting Video, the following applies:

- Image ratios of 16:9 and 9:16 shall be supported. Other image formats should be supported.
- the `26143_VIDEO_AVC-HD` capability as defined in clause 5.6.1 of TS 26.143 [64] shall be supported and the capability `26143_VIDEO_ENC_AVC-HD` as defined in clause 5.6.2 of TS 26.143 [64] may be supported.
- the `26143_VIDEO_HEVC-HD` capability as defined in clause 5.6.1 of TS 26.143 [64] should be supported and the capability `26143_VIDEO_ENC_HEVC-HD` as defined in clause 5.6.2 of TS 26.143 [64] may be supported.

If the reception of HD-HDR video is supported by the MMS client, then the following applies:

- the `26143_VIDEO_AVC-FullHD` capability as defined in clause 5.6.1 of TS 26.143 [64] shall be supported and the capability `26143_VIDEO_ENC_AVC-FullHD` as defined in clause 5.6.2 of TS 26.143 [64] may be supported.
- the `26143_VIDEO_HEVC-FullHD` capability as defined in clause 5.6.1 of TS 26.143 [64] shall be supported and the capability `26143_VIDEO_ENC_HEVC-FullHD` as defined in clause 5.6.2 of TS 26.143 [64] shall be supported.
- the `26143_VIDEO_HEVC-UHD` capability as defined in clause 5.6.1 of TS 26.143 [64] should be supported and the capability `26143_VIDEO_ENC_HEVC-UHD` as defined in clause 5.6.2 of TS 26.143 [64] may be supported.

5.4 File Format for video and associated speech/audio media types

To ensure interoperability for the transport of video and associated speech/audio in an IMS Messaging and Presence client, the 3GPP file format with Basic profile shall be supported :

- For the AMR encoded content, the ISO BMFF track shall conform with the requirements of the sample entry `'samr'` as defined in TS 26.244 [33].
- For the AMR-WB encoded content, the ISO BMFF track shall conform with the requirements of the sample entry `'sawb'` as defined in TS 26.244 [33].
- For the EVS encoded content, the ISO BMFF track shall conform with the requirements of the sample entry `'sevs'` as defined in TS 26.244 [33].
- For the EAAC+ encoded content, the ISO BMFF track shall conform with the requirements of the sample entry `'mp4a'` as defined in TS 26.244 [33].
- For the xHE-AAC encoded content, the ISO BMFF track shall conform with the requirements of the sample entry `'mp4a'` as defined in TS 26.244 [33].
- For video encoded content, the ISO BMFF track shall conform with the requirements corresponding to the capability as indicated in TS 26.143 [64] clause 5.6.

The usage of the 3GPP file format shall follow the technical specifications and the implementation guidelines specified in TS 26.244 [33].

5.5 Synthetic audio

For IMS terminals supporting 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] may 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] may be supported.

A MSS client supporting Mobile DLS may 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 [38] 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]) may also be supported. The optional group of processing blocks as defined in [38] 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].

5.6 Vector graphics

For IMS terminals supporting 2D vector graphics, the Scalable Vector Graphics (SVG) Tiny 1.2 format [20][21] and ECMAScript [54] may be supported.

NOTE 1: The compression format for SVG content is GZIP [35], in accordance with the SVG specification [20].

NOTE 2: Only media formats supported by IMS Messaging and Presence, as specified in clauses 4 and 5 of this specification, shall be used. MMS Messaging and Presence clients do not support the Ogg Vorbis format.

NOTE 3: Content creators of SVG Tiny 1.2 for IMS Messaging and Presence clients are strongly recommended to follow the content creation guidelines provided for PSS clients in Annex L of [14].

NOTE 4: If SVG Tiny 1.2 will not be published within a reasonable timeframe, the decision to adopt SVG Tiny 1.2 in favour of SVG Tiny 1.1 may be reconsidered.

5.7 3D scenes and assets

If 3D scenes and assets are supported, the `26143_SCENE_GLTF20` capability and the `26143_SCENE_GLTF20_GLB` capability as defined in clause 5.8 of TS 26.143 [64] shall be supported assuming either a single body part or a `multipart/related` body part as defined in clause 3A.

If 3D scenes including AR assets are supported, the `26143_SCENE_GLTF20_AR` and the `26143_SCENE_GLTF20_GLB_AR` capability as defined in clause 5.8 of TS 26.143 [64] shall be supported assuming either a single body part or a `multipart/related` body part as defined in clause 3A.

6 Media synchronisation and presentation format

The 3GPP IMS Messaging and Presence Clients and Servers shall support the 3GPP HTML5 profile as defined in TS 26.307 [73]. 3GPP IMS Messaging and Presence Servers [may/should] support translation from other scene description formats, such as SMIL [24] and XHTML Mobile Profile [30] to HTML5. The Client that supports HTML shall include the HTML5 MIME type “text/html” as part of the User Agent header field in the request sent to the server.

A 3D scene as described in clause 5.7 may be used as the presentation format for the message. In that case, the glTF 2.0 document or the GLB file shall be carried as the first MIME part of the multi-part MIME message.

Annex A (informative): CSI Handling

A.1 Introduction

The Combination of CS and IMS services (CSI) is an operation mode combining circuit switch calls and IMS services, where the UE presents the CS and IMS services within one context to the user [59][60]. However, the capabilitiy to simultaneously render certain media types of a CS call and IMS session may be limited by a UE and capability exchange alone may not be enough to resolve such conflicts. For instance:

- During a CS speech call, a UE may not be able to render additional speech accompanying a video clip in an IMS session. This limitation is not clear if the UE has indicated that it is capable of receiving video clips.
- During a CS multimedia call, a UE may not be able to both display video from the CS call and images from the IMS session. Although the UE is not capable to fully render images and video simultaneously, it may be possible to view images in front of video.

The above conflicts are resolved by applying default rules specified in [59]. This Annex describes the UE behaviour for a number of scenarios drawn from the rules in [59]. This list may be extended in future versions of this specification.

Note that the IMS media types and formats applicable to CSI are specified in:

- clauses 6 and 9 of reference [61] for streamed media;
- clauses 4 and 5 of the present document for media delivered in messages.

A.2 Sharing personal content during CS voice call

In a person-2-person communication, participants can combine a CS voice call with an IMS session and share content such as still images and video. In particular participants may share media content that is (or has been) created by the participants in the session.

TS 22.279 [59] defines that if media, or parts thereof, accepted by a user cannot be rendered by the UE simultaneously with the CS call, conflicts shall be resolved such that the user is presented with CS speech with preference over IMS speech/audio.

A.3 Sharing personal content during CS multimedia call

In a person-2-person communication, participants can combine a CS multimedia call (3G-324M) with an IMS session and share content such as still images. In particular participants may share media content that is (or has been) created by the participants in the session.

TS 22.279 [59] defines that if media, or parts thereof, accepted by a user cannot be rendered by the UE simultaneously with the CS call, conflicts shall be resolved such that the user is presented with:

- CS speech with preference over IMS speech/audio;
- IMS video and images with preference over CS video.

Annex B (informative): Change history

Change history								
TSG SA#	SA Doc.	Spec	CR	Rev	Cat	Subject/Comment	Old	New
26	SP-040835	26.141				Version 1.0.0 approved at TSG SA#26	1.0.0	6.0.0
27	SP-050098	26.141	001	1	F	Editorial correction on missing IMS Presence UA	6.0.0	6.1.0
30	SP-050789	26.141	0003	2	F	Adding missing reference numbers	6.1.0	6.2.0
30	SP-050790	26.141	0002	5	B	CSI interoperability of media types and formats	6.2.0	7.0.0
31	SP-060009	26.141	0005	1	A	Addition of a reference to TR 26.936	7.0.0	7.1.0
42		26.141				Version for Release 8	7.1.0	8.0.0
46		26.141				Version for Release 9	8.0.0	9.0.0
51		26.141				Version for Release 10	9.0.0	10.0.0
57		26.141				Version for Release 11	10.0.0	11.0.0
62	SP-130578	26.141	0006		D	Clarification of H.264 profile support requirement	11.0.0	12.0.0
63	SP-140015	26.141	0007	1	C	Video Coding Enhancements in IMS Messaging and Presence	12.0.0	12.1.0
70		26.141				Version for Release 13	12.1.0	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	75					Version for Release 14	14.0.0
2018-06	80					Version for Release 15	15.0.0
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	**16.0.0**
2022-04	-	-	-	-	-	Update to Rel-17 version (MCC)	**17.0.0**
2024-03	SA#103	SP-240047	0011	2	B	CR 26.141-0011r2 Updates to codecs and formats (Rel-18)	**18.0.0**
2025-10	-	-	-	-	-	Update to Rel-19 version (MCC)	**19.0.0**

History

Document history		
V19.0.0	October 2025	Publication