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In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Contents

Foreword

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

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  - 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 document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

1 Scope

The present document specifies the media types, formats, codecs capabilities and profiles for the messaging applications used over the 5G System. The scope of the present document extends to codecs for speech, audio, video, still images, bitmap graphics, 3D scenes and assets, and other media in general, as well as scene description.

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] Khronos glTF 2.0, glTF™ 2.0 Specification (khronos.org)

[3] ISO/IEC 23090-14 AMD 2, Information technology — Coded representation of immersive media — Part 14: Scene description — Amendment 2: Support for haptics, augmented reality, avatars, Interactivity, MPEG-I audio, and lighting

[4] 3GPP TS 26.511: "5G Media Streaming (5GMS); Profiles, Codecs and Formats".

[5] 3GPP TS 26.117: "5G Media Streaming (5GMS); Speech and audio profiles".

[6] IETF Draft draft-ietf-mimi-content-01: "More Instant Messaging Interoperability (MIMI) message content", Rohan Mahy

[7] 3GPP TS 22.140: "Multimedia Messaging Service (MMS); Stage 1".

[8] Open Mobile alliance, "MMS Architecture" OMA-AD-MMS-V1_3-20110913-A.

[9] Open Mobile alliance, "Multimedia Messaging Service Encapsulation Protocol" OMA-TS-MMS_ENC-V1_3-20110913-A.

[10] GSMA "RCS Universal Profile Service Definition Document", Version 2.6, 19 December 2022

[11] GSMA PRD RCC.07 version 13.0 - "Rich Communication Suite - Advanced Communications Services and Client Specification" 19 December 2022[12] IETF RFC 2046: "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types"

[12] IETF RFC 2046, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types"

[13] ISO/IEC 14496-12: "Information technology - Coding of audio-visual objects -Part 12: ISO base media file format".

[14] ISO/IEC 23000-24:2023 Preliminary Draft of: Information technology — Multimedia application format (MPEG-A) — Part 24: Messaging Media Application Format (MeMAF) ".

NOTE: A preliminary draft of this standard is available as MDS23345_W03_N1082 here: https://www.mpeg.org/wp-content/uploads/mpeg_meetings/144_Hannover/w23345.zip

[15] 3GPP 23.140: "Multimedia Messaging Service (MMS); Functional Description; Stage 2".

[16] ITU-T Recommendation T.81: "Information technology; Digital compression and coding of continuous-tone still images: Requirements and guidelines".

[17] "JPEG File Interchange Format", Version 1.02, September 1, 1992.

[18] "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/

[19] 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.

[20] Compuserve Incorporated, Columbus, Ohio (1990): "Graphics Interchange Format (Version 89a)".

[21] IETF RFC 2083: "PNG (Portable Networks Graphics) Specification version 1.0 ", T. Boutell, et. al., March 1997.

[22] ISO/IEC 23000-22:2019 Information technology — Multimedia application format (MPEG-A) — Part 22: Multi-image application format (MIAF)

[23] IETF RFC 2045, "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", November 1996

[24] ISO/IEC 23008-12:2019 Information technology — High efficiency coding and media delivery in heterogeneous environments — Part 12: Image File Format

[25] ITU-T Recommendation H.265 (02/2018): "High efficiency video coding".

[26] 3GPP TS 26.244: "Transparent end-to-end packet switched streaming service (PSS); 3GPP file format (3GP)"

[27] 3GPP TS 26.245: "Transparent end-to-end packet switched streaming service (PSS); Timed text format"

[28] ISO/IEC 14496-30: "Information technology - Coding of audio-visual objects - Part 30: Timed text and other visual overlays in ISO base media file format".

[29] IETF RFC 2387, "The MIME Multipart/Related Content-type"

[30] IETF RFC 6381, "The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types"

[31] 3GPP TS 26.307, "Presentation Layer for 3GPP Services"

[32] 3GPP TS 26.140, "Multimedia Messaging Service (MMS); Media formats and codecs"

[33] IETF RFC 2077, "The Model Primary Content Type for Multipurpose Internet Mail Extensions"

[34] 3GPP TS 26.119, "Media Capabilities for Augmented Reality"

3 Definitions of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Messaging Media Profile: a set of UE capability requirements associated to a media-centric messaging service scenario.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

<symbol> <Explanation>

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

AAC	Advanced Audio Coding
AMR	Adaptive MultiRate
API	Application Programming Interface
AVC	Advanced Video Coding
DCT	Discrete Cosine Transform
glTF	Graphics Library Transmission Format
IANA	Internet Assigned Numbers Authority
MIME	Multipurpose Internet Mail Extensions
MIMI	More Instant Messaging Interoperability
MMBP	multimedia messaging body part
MMS	Multimedia Messaging Service
OMA	Open Mobile Alliance
PDU	Protocol Data Unit
RCS	Rich Communication Services

4 Overview and Context

4.1 Background and Assumptions

Messaging services typically define a message container. Such a container typically carries one or more body parts with the actual message content (for example, an emoji used in a reaction, a plain text or rich text message or reply, a link, or an inline image, or richer media types).

An important feature of messages are body parts that include media content. Different media content exists, such as simple and rich text, still images, graphics, speech, audio, video, 3D scenes and many other media types.

This specification is not defining a container format, but it addresses the usability of 3GPP defined media types and formats into messages as part of a message body within message containers. Examples for message containers are OMA MMS PDUs [7][8][9][15], IETF MIMI message containers [6] or GSMA RCS [10][11].

The focus of this specification is the definition of parts of *message body* that carry multimedia content, referred to as *multimedia messaging body part* (MMBP). This specification does not generally define how the body part is encoded: existing functionalities, for example the ones defined in OMA MMS PDUs [7][8][9][15] or MIMI message containers [6] may be used for this purpose. However, this specification provides the definition of an MMBP using the ISO Base Media File format [13] to provide features for mixing multiple sub-parts into a single body part. The specification relies on ISO/IEC 23000-24 [14].

NOTE: This specification does not define advanced MMBP features using the ISO Base Media File format [13] such that multiple sub-parts may be mixed into a single body part. This feature is for further study, possibly in alignment with ISO/IEC 23000-24 [14].

However, this specification is not restricted to be used with a fully specified Messaging Service, it may as well be used as part of third-party messaging services as message body, or more specifically as MMBP. It may also serve to support content interoperability across different messaging services.

The term *media type* is used as short to refer to the IANA media type, subtype, and parameters as defined in IETF RFC 2046 [12] and provides defined properties of a *content*. For example, it may tell if the content is video or audio, it

provides the encapsulation format, and it may provide parameters such as the codec in use. This specification defines, or at least assigns to each defined MMBP a media type, in order to uniquely identify the media type.

In order to use MMBPs as defined in this specification as part of a message container format, it is expected that the message container format supports the following functionalities:

1) It can carry an octet string representing the *content* of the MMBP

2) It can signal the *media type* of the content.

3) The content and media type of the content is not restricted but allows to include formats that are not defined in the core container format.

In addition, a container format may support one or more of the following functionalities in alignment of definitions in IETF MIMI [6] and IETF RFC 2046 [12]:

- the body can be *multi-part*, i.e, it can have multiple, possibly nested parts, referred to as *sub-parts*, with one of the following properties and structures

  - *mixed*: there are multiple media types associated with the same message which need to be rendered together, for example a rich-text message with an inline image. The receiver is expected to process as many of the nested parts at this level as possible.

  - *alternative*: there are multiple media types associated with the same message and the receiver can choose an appropriate one based on its own policies using the media type or possibly other parameters (e.g. a language) of each part.

  - *related*: there are multiple media types associated with the same message and all the nested body parts at this level are part of a single entity that are processed jointly, possibly by providing a root object for initial processing. If the receiver does not understand even one of the nested parts at this level, the receiver is not expected to process any of them.

  - *nested*: there are multiple media types associated with the same message, and one or several of the media types are representing a single, mixed, alternative or related structure.

- it may have body parts that reference external content via URI that will be processed automatically. It includes a media type and may optionally include the size of the data, an expiration timestamp other parameters. The content may be rendered with the other parts of the message, or a be downloaded or rendered separately.

- it may have body parts for which the content is encrypted.

Note that based on the above, the MMBP may be the entire part of a message body, or it may be a sub-part.

4.2 System Description

Based on the background and assumptions in clause 4.1, Figure 4.2-1 provides an example system for a messaging services and highlights scope of this specification, namely the definition of a *multimedia messaging body part* (MMBP) and the associated metadata.