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Contents

Foreword

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

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

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

shall indicates a mandatory requirement to do something

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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

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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".

[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"

[35] 3GPP TS 26.265: "Media Delivery: Video Capabilities and Operation Points"

[36] 3GPP TR 26.857, "5G Media Service Enablers"

[37] ISO/IEC 14496-14: "Information technology - Coding of audio-visual objects -Part 14: MP4 file format".

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
HDR	High Dynamic Range
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
SDR	Standard Dynamic Range

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.

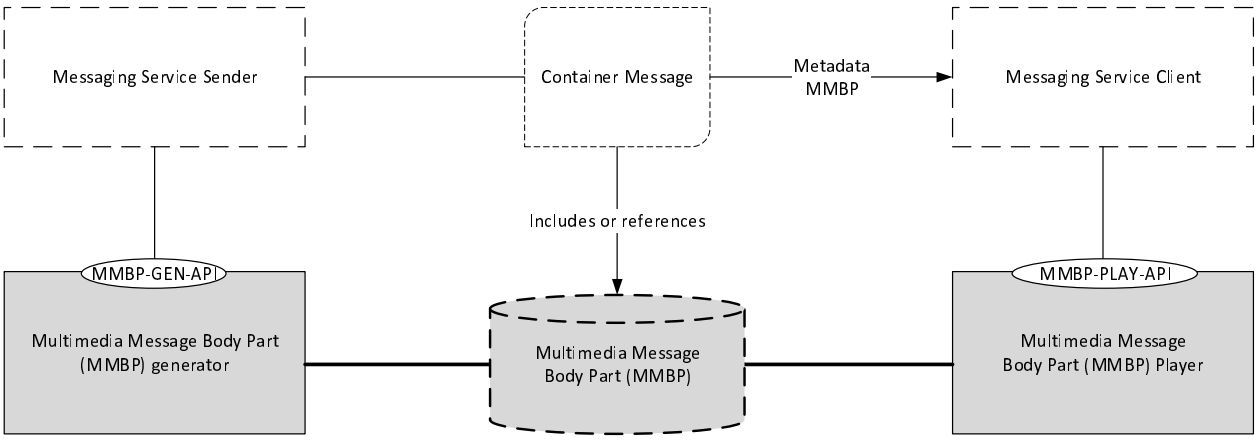

Figure 4.2-1 Example system for Messaging multimedia message exchange

A Messaging Service Sender instructs a MMBP generator to generate an MMBP, for example using an API. This for example allows to define configurations on codecs, size, experiences or other attributes of the MMBP. The details of such an API are outside the scope of this specification. The sender adds the MMBP to a Container Message (either included as a body part or by reference), together with MMBP metadata parameters that provide information about the MMBP. Metadata includes, but is not limited to:

- The media type of the MMBP, including subtypes and parameters for codecs, etc.
- The size of the MMBP
- Accessibility or language information about the MMBP
- processing requirements of recommendations of the MMBP

The client of the messaging service receives the container message that includes the above information. The client communicates with a MMBP player its capabilities whether the MMBP can be played back, and if multiple alternatives are present, which of those are to be selected. Then the messaging service client instructs the MMBP player to playback the MMBP as part of the messaging service, based on the processing requirements and instructions. Playback may be combined with additional instructions for a player, including play, pause, seek, etc.

In TR 26.857 [36], Media Service Enablers are introduced. The basic concept of the Media Service Enabler is to support third-party delivery of media over the 5G System. The Application Provider is equipped with a set of 3GPP-specified functions, possibly both on UE and network side, in order to simplify operations. These functions are bundled as a Media Service Enabler (MSE) and offered to the Application Provider.

The MMBP Generator and MMBP Player are aligned with the Media Service Enabler concept. In order to support MSE concepts, the specification includes:

- A call flow and high-level procedures in clause 4.6.
- Stage-2 APIs and parameter that can be assigned to player and generator in Annex D.
- Several examples for content offerings in Annex B.

4.3 MMBP Player Model

The design of the formats defined in this document is based on the player model as shown in Figure 4.3-2. The figure illustrates the logical components of a conceptual MMBP Player model. In this figure, the MMBP parser receives the MMBP, and playback instructions. The Messaging Service Client may use metadata provided in a container message for playback selection. Such metadata may for example include codec capability information, language codes, accessibility information and other information for the selection of alternative parts in the MMBP.

The client then provides the sub-parts for processing and decoding to the related sub-part processors, and controls those for playback. The rendered message output may be handed back to the Messaging Service client for inband rendering or may be rendered directly.

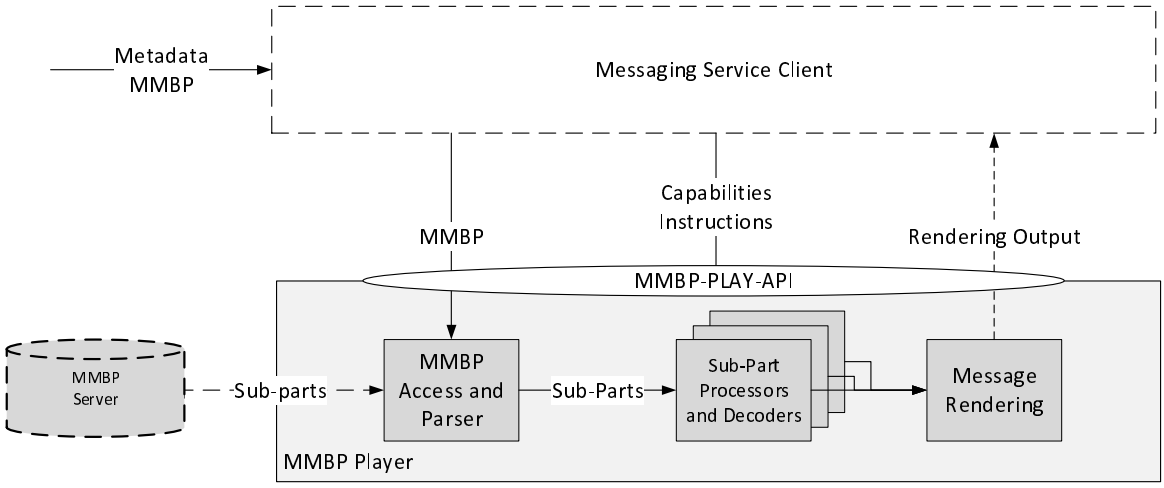

Figure 4.3-1 MMBP Player Model

Beyond the MMBP formats, this specification also defines capabilities of 3GPP-based MMBP players.

4.4 Generic MMBP Data Model

Based on the description in clause 4.1, an MMBP can be the full body or part of the body of a container message.

An MMBP itself is identified by a media type.

The MMBP may be a single content with a media type.

The MMBP may include multiple additional MMBPs. The following multi-part MMBPs are defined:

- *mixed MMBP*: multiple MMBPs are associated with the mixed MMBP that shall be rendered together. Each MMBP is identified by a media type. The receiver is expected to process *as many as possible* of the included MMBPs based on its capabilities.

- *parallel MMBP*: multiple MMBPs are associated with the parallel MMBP that shall be rendered together. Each MMBP is identified by a media type. Real-time MMBPs included in a parallel MMBP share the same MMBP presentation timeline, which has a value of zero at the earliest media sample intended for presentation. If presented jointly, they shall be presented using this common MMBP presentation timeline.

- *alternative MMBP*: multiple MMBPs are associated with the alternative MMBP. Each MMBP is identified by a media type. The receiver is expected to process *exactly one* based on its capabilities.

- *related MMBP*: multiple objects are associated with the process MMBP. One object is identified as a *root MMBP*. The root MMBP is identified by a media type. The root MMBP is processed and identifies if any, several or all of the remaining objects are used as well. Hence, all other objects are typically also identified by media types, and a URL that links the objects being part of the related MMBP. The processor of the root MMBP also controls the selection, presentation and timing of the other objects.

MMBPs are a recursive structure. Hence, a receiver shall expect that multi-part MMBPs contain other multi-part MMBPs.

4.5 Media Capabilities and Profiles

This specification defines media capabilities for both, MMBP generators as well as MMBP players in clause 5. The media capabilities provide requirements for content generation as well as playback instructions, respectively.

This specification also defines profiles for content generators and players. Profiles are a collection of media capability requirements and recommendations as defined in clause 6.

External specifications may reference capabilities defined in this specification.

Preferably, external specifications should reference full media profiles.

4.6 Typical Procedures for Messaging Services

Figure 4.6 provides a generic call flow based on the architecture shown in Figure 4.2-1 and the player model shown in Figure 4.3-1.

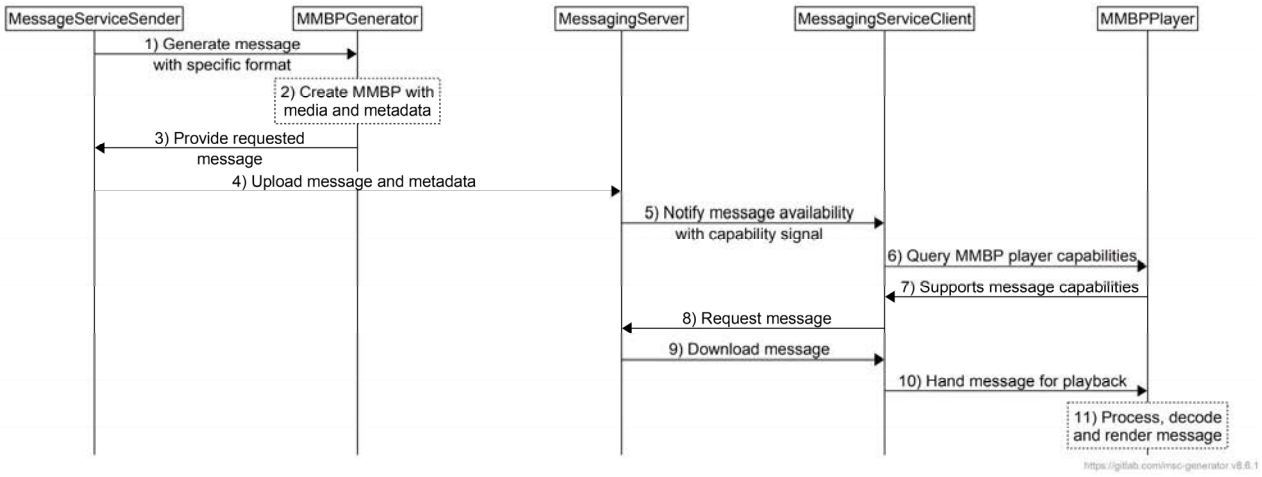

Figure 4.6-1 High-Level Call flow for messaging

The following high-level call flow is executed to address messaging:

1) A Message Service Sender instructs and MMBP generator to generate a message with the requested formats where the format is defined through a set of parameters handed over on an MMBP-GEN-API.

2) The MMBP generator creates an MMBP with relevant media data and adds relevant static and dynamic metadata.

3) The generated message is provided to the Message Service Sender.

4) The generated file with associated relevant static and dynamic metadata is provided in a container message that is uploaded to a messaging server, together with a signalling in the media type and associated parameters. The media signalling may include that the file is suitable for different clients.

5) A messaging service client is informed about the availability of a message in this format using the media type signalling together with appropriate sub-parameters.

6) A messaging service client uses the MMBP-PLAY-API to query the MMBP player with it can process, decode and render the message.

7-10) If the MMBP player indicates that it supports the capability, the messaging service client selects and downloads the message and hands it to the MMBP player for playback.

11) The MMBP player processes, decodes and renders the message based on its decoding and rendering capabilities.

5 MMBP Media Capabilities for different Media Types

5.1 Introduction

In order to guarantee a minimum support and compatibility between messaging capable terminals, MMBP Generators and MMBP Players in UEs supporting specific media content with associated media types.

The clause defines multimedia messaging body parts (MMBPs) for different media types as well as the associated media types.

According to the introduction in clause 4, MMBPs defined in this clause,

- may be used as full body parts or sub-parts in message bodies.
- may either be a single binary octet string, or they may consist of multiple parts. If the latter, the conceptual relationship introduced in clause 4.4 is defined that is mapped to container formats defined in clause 5.2.

Media Types and related capabilities defined in this specification for playback are provided in Table 5.1-1.

Table 5.1-1 Media Types and Capabilities defined in TS 26.143 for playback and decoding

Media Type in the present TS	Capabilities defined in this specification	Clause	Media Type signalling example
Multipart MMBPs and Container Formats	26143_CONTAINER_RFC2046_SINGLE 26143_CONTAINER_RFC2046_MIXED 26143_CONTAINER_RFC2046_ALTERNATIVE 26143_CONTAINER_RFC2046_PARALLEL 26143_CONTAINER_RFC2387_RELATED 26143_CONTAINER_MP4_3GP9 26143_CONTAINER_MP4_MP42	5.2.1	Media type of subtype multipart/mixed multipart/alternative multipart/parallel multipart/related video/mp4, profile="3gp9" video/mp4, profile="mp42"
Text	26143_TEXT_PLAIN	5.3.1	text/plain
Speech	26143_AUDIO_IVAS 26143_AUDIO_EVS 26143_AUDIO_AMR-WB 26143_AUDIO_AMR	5.5.1	audio/mp4
Audio	26143_AUDIO_IVAS 26143_AUDIO_XHE-AAC 26143_AUDIO_EAAC+	5.5.1	audio/mp4
Image	26143_IMG_JPEG 26143_IMG_HEIC 26143_IMG_GIF 26143_IMG_PNG	5.4.1	image/jpeg image/heic, profile="heic,MiHB" imageTypes="hvc1.2.4.L153.B0" image/gif image/png
Video	26143_VIDEO_AVC-HD 26143_VIDEO_AVC-FullHD 26143_VIDEO_HEVC-HD 26143_VIDEO_HEVC-FullHD	5.6.1	video/mp4, profile="3gp9" codecs="avc1.640028" video/mp4, profile="3gp9" codecs="avc1.640029"

	26143_VIDEO_HEVC-UHD		video/mp4, profile="3gp9" codecs="hvc1.1.2.L93.B0" video/mp4, profile="3gp9" codecs="hvc1.1.2.L123.B0" video/mp4, profile="3gp9" codecs="hvc1.1.2.L153.B0"
Subtitles and Text	26143_TT_3GPP 26143_TT_IMSC11	5.7.1	text/mp4, profile="3gp9" codecs="tx3g" application/mp4, profile="3gp9" codecs="stpp.ttml.im2t"
3d scenes and assets	26143_SCENE_GLTF20 26143_SCENE_GLTF20_AR 26143_SCENE_GLTF20_GLB 26143_SCENE_GLTF20_GLB_AR	5.8	model/gltf+json model/gltf-binary
Presentation format	26143_PRESENTATION_HTML5	5.9	text/html

Media Types and related capabilities defined in this specification for content generation are provided in Table 5.1-2.

Table 5.1-2 Media Types and Capabilities defined in TS 26.143 for generation

Media Type in the present TS	Capabilities defined in this specification	Clause	Media Type signalling example
Multipart MMBPs and Container Formats	26143_CONTAINER_RFC2046_SINGLE_GEN 26143_CONTAINER_RFC2046_MIXED_GEN 26143_CONTAINER_RFC2046_ALTERNATIVE_GEN 26143_CONTAINER_RFC2046_PARALLEL_GEN 26143_CONTAINER_MP4_3GP9_GEN 26143_CONTAINER_MP4_MP42_GEN	5.2.2	Media type of subtype multipart/mixed multipart/alternative multipart/parallel video/mp4, profile="3gp9" video/mp4, profile="mp42"
Text	26143_TEXT_ENC_PLAIN	5.3.1	text/plain
Speech	26143_AUDIO_ENC_IVAS 26143_AUDIO_ENC_EVS 26143_AUDIO_ENC_AMR-WB 26143_AUDIO_ENC_AMR	5.5.1	audio/mp4
Audio	26143_AUDIO_ENC_IVAS 26143_AUDIO_ENC_XHE-AAC	5.5.1	audio/mp4

	26143_AUDIO_ENC_EAAC+		
Image	26143_IMG_ENC_JPEG 26143_IMG_ENC_HEIC	5.4.1	image/jpeg image/heic, profile="heic,MiHB" itemTypes="hvc1.2.4.L153.B0"
Video	26143_VIDEO_ENC_AVC-HD 26143_VIDEO_ENC_AVC-FullHD 26143_VIDEO_ENC_HEVC-HD 26143_VIDEO_ENC_HEVC-FullHD 26143_VIDEO_ENC_HEVC-UHD	5.6.2	video/mp4, profile="3gp9" codecs="avc1.640028" video/mp4, profile="3gp9" codecs="avc1.640029" video/mp4, profile="3gp9" codecs="hvc1.1.2.L93.B0" video/mp4, profile="3gp9" codecs="hvc1.1.2.L123.B0" video/mp4, profile="3gp9" codecs="hvc1.1.2.L153.B0"
Text	26143_TT_ENC_3GPP	5.7.2	text/mp4, profile="3gp9" codecs="tx3g"

5.2 Multipart MMBPs and Container Formats

5.2.1 Player and Decoding capabilities

The capability 26143_CONTAINER_RFC2046_SINGLE is defined as the capability of processing a body part of with a top-level media type as defined in IETF RFC 2046 [12] with one of the following top-level media types: text, audio, image, video, model, multipart, and application.

The capability 26143_CONTAINER_RFC2046_MIXED is defined as the capability of processing a body part of subtype multipart/mixed as defined in IETF RFC 2046 [12] further restricted by the processing defined in clause 4.4 for *mixed MMBPs*. In the context of this specification, the media type for multipart media types with this capability 26143_CONTAINER_RFC2046_MIXED shall be signalled with multipart/mixed as defined in IETF RFC 2046 [12].

The capability 26143_CONTAINER_RFC2046_ALTERNATIVE is defined as the capability of processing a body part of subtype multipart/alternative as defined in IETF RFC 2046 [12] further restricted by the processing defined in clause 4.4 for *alternative MMBPs*. In the context of this specification, the media type for multipart media types with this capability 26143_CONTAINER_RFC2046_MIXED shall be signalled with multipart/alternative as defined in IETF RFC 2046 [12].

The capability 26143_CONTAINER_RFC2046_PARALLEL is defined as the capability of processing a body part of subtype multipart/parallel as defined in IETF RFC 2046 [12] further restricted by the processing defined in clause 4.4 for *parallel MMBPs*. In the context of this specification, the media type for multipart media types with this capability 26143_CONTAINER_RFC2046_PARALLEL shall be signalled with multipart/parallel as defined in IETF RFC 2046 [12].

The capability 26143_CONTAINER_RFC2387_RELATED is defined as the capability of processing a body part of subtype multipart/related as defined in IETF RFC 2387 [29] further restricted by the processing defined in clause 4.4 for *related MMBPs*. In the context of this specification, the media type for multipart media types with this capability 26143_CONTAINER_RFC2387_RELATED shall be signalled with multipart/parallel as defined in IETF RFC 2387 [29] with the *root MMBP* either signalled with the start parameter, or if not present, the *root MMBP* being the first body part within the Multipart/Related body and the type of the *root MMBP* signalled with the type parameter.

The capability 26143_CONTAINER_MP4_3GP9 is defined as the capability of processing a body part conforming to a 3GP file Rel-9 basic profile as defined in TS 26.244 [26] identified by the brand '3gp9' and further restricted by the processing defined in clause 4.4 for *parallel MMBPs*. In the context of this specification, the media type for multipart media types with this capability 26143_CONTAINER_MP4_3GP9 shall be signalled using a media type as defined IETF RFC 6381 [30] using for example video/mp4, profile="3gp9" or an equivalently compatible media type and shall use the codecs parameter to further provide information about the contained MMBPs.

The capability 26143_CONTAINER_MP4 is defined as the capability of processing a body part conforming to a file identified by the brand 'mp42' as defined in ISO/IEC 14496-14 [37] and further restricted by the processing defined in clause 4.4 for *parallel MMBPs*. In the context of this specification, the media type for multipart media types with this capability 26143_CONTAINER_MP4 shall be signalled using a media type as defined IETF RFC 6381 [30] using for example video/mp4 or an equivalently compatible media type and shall use the codecs parameter to further provide information about the contained MMBPs.

NOTE: This specification does not define mechanisms for referencing external content. This aspect is for further study.

5.2.2 MMBP Content Generator capabilities

The capability 26143_CONTAINER_RFC2046_SINGLE_GEN is defined as the capability of generating a body part of with a top-level media type as defined in IETF RFC 2046 [12] with one of the following top-level media types: text, audio, image, video, and multipart that can be processed by a MMBP processor with the capability 26143_CONTAINER_RFC2046_SINGLE.

The capability 26143_CONTAINER_RFC2046_MIXED_GEN is defined as the capability of generating a body part of subtype multipart/mixed as defined in IETF RFC 2046 [12] with media type signalling with multipart/mixed as defined in IETF RFC 2046 [12] that can be processed by a MMBP processor with the capability 26143_CONTAINER_RFC2046_MIXED.

The capability 26143_CONTAINER_RFC2046_ALTERNATIVE_GEN is defined as the capability of generating a body part of subtype multipart/alternative as defined in IETF RFC 2046 [12] with media type signalling with multipart/alternative as defined in IETF RFC 2046 [12] that can be processed by a MMBP processor with the capability 26143_CONTAINER_RFC2046_ALTERNATIVE.

The capability 26143_CONTAINER_RFC2046_PARALLEL_GEN is defined as the capability of generating a body part of subtype multipart/parallel as defined in IETF RFC 2046 [12] with media type signalling with multipart/parallel as defined in IETF RFC 2046 [12] that can be processed by a MMBP processor with the capability 26143_CONTAINER_RFC2046_PARALLEL.

The capability 26143_CONTAINER_MP4_3GP9_GEN is defined as the capability of generating a body part conforming to a 3GP file Rel-9 basic profile as defined in TS 26.244 [26] identified by the brand '3gp9' using a media type as defined IETF RFC 6381 [30], for example video/mp4, profile="3gp9" or an equivalently compatible media type and using the codecs parameter to further provide information about the contained MMBPs.

5.3 Text

5.3.1 Player and Decoding capabilities

The capability 26143_TEXT_PLAIN is defined as the capability of decoding and rendering plain text with any character encoding (charset) that contains a subset of the logical characters in Unicode [2] (e.g. US-ASCII [3], ISO-8859-1 [4], UTF-8 [5], Shift_JIS, etc.).In the context of this specification, the media type for text with this capability 26143_TEXT_PLAIN shall be signalled with text/plain as defined in IETF RFC 2046 [12]. However, the decoding and rendering capability 26143_TEXT_PLAIN includes that unrecognized subtypes of "text" shall be treated as subtype "plain" as long as the MIME implementation knows how to handle the charset.

Interoperability with SMS/MMS text type is according to [15].

5.3.2 MMBP Content Generator capabilities

The capability `26143_TEXT_ENC_PLAIN` for a content generator is defined as the combination of the following capabilities:

- the capability to generate plain text with any character encoding (charset) that contains a subset of the logical characters in Unicode [2], such that the file can be played back by a player with the capability `26143_TEXT_PLAIN`,
- the provisioning of media type signalling with the MMBP using `text/plain` as defined in IETF RFC 2046 [12].

5.4 Image

5.4.1 Player and Decoding capabilities

The capability `26143_IMG_JPEG` is defined as the capability of decoding and rendering images according to, ISO/IEC JPEG [8] together

- with JFIF [16] and the following two modes:
  - baseline DCT, non-differential, Huffman coding, as defined in table B.1, symbol 'SOF0' in [17];
  - progressive DCT, non-differential, Huffman coding, as defined in table B.1, symbol 'SOF2' [17].- with EXIF compressed image file format, as defined in [18] and the baseline DCT mode.

In the context of this specification, the media type for images with this capability `26143_IMG_JPEG` shall be signalled with `image/jpeg` as defined in IETF RFC 2046 [12].

The capability `26143_IMG_HEIC` is defined as the capability of decoding and rendering an MMBP that includes images and the MMBP conforming to

- the `'heic'` brand as defined in ISO/IEC 23008-12 [24],
- the `'MiHB'` brand as defined in ISO/IEC 23000-22:2019 [22], and
- the contained elementary bitstream conforming to H.265 (HEVC) Main 10 Profile, Main Tier, Level 5.1[25] bitstreams with the following constraints
  - `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.- the chroma sub-sampling is set to be 4:2:0 and the value of `chroma_format_idc` is set to 1.
  - the included signal being either a Standard Dynamic Range (SDR) signal with
    - the bit depth being 8 bit or 10 bit,
    - In the VUI, the values of `colour_primaries`, `transfer_characteristics` and `matrix_coeffs` each are set to 1,
    - The value of `chroma_sample_loc_type_top_field` is be set to 0,
  - or, the included signal being a High Dynamic Range (HDR) signal with
    - the bit depth being 10 bit,
    - in the VUI, the values of `colour_primaries` and `matrix_coeffs` each set to 9, and the value of `transfer_characteristics` is set to one of the following values: 14 (for SDR with WCG), 16 (for PQ) and 18 (for HLG).
    - The value of the `chroma_sample_loc_type_top_field` set to 2.

In the context of this specification, the media type for images with this capability `26143_IMG_HEIC` shall be signalled with `image/heic, profile="heic,MiHB" itemTypes="hvc1.2.4.L153.B0"` or an equivalently compatible media type as defined in [22].

The capability `26143_IMG_GIF` is defined as the capability of decoding and rendering bitmap graphics conforming either to GIF87a [19] or to GIF89a, [20]. In the context of this specification, the media type for images with this capability `26143_IMG_GIF` shall be signalled with `image/gif` as defined in IETF RFC 2046 [12].

The capability `26143_IMG_PNG` is defined as the capability of decoding and rendering bitmap graphics conforming to PNG [21]. In the context of this specification, the media type for images with this capability `26143_IMG_PNG` shall be signalled with `image/png`.

5.4.2 MMBP Content Generator capabilities

The capability `26143_IMG_ENC_JPEG` for a content generator is defined as the combination of the following capabilities:

- the capability to generate an image according to ISO/IEC JPEG [8] that can be played by a player conforming to `26143_IMG_JPEG` as defined in clause 5.4.1, i.e. restricted by either
  - using JFIF [16] and one of the following two modes:
    - baseline DCT, non-differential, Huffman coding, as defined in table B.1, symbol ‘SOF0’ in [17], or
    - progressive DCT, non-differential, Huffman coding, as defined in table B.1, symbol ‘SOF2’ [17].
  - using EXIF compressed image file format as defined in [18] and the baseline DCT mode.
- the provisioning of media type signalling with the MMBP using `image/jpeg` as defined in IETF RFC 2046 [12].

The capability `26143_IMG_ENC_HEIC` for a content generator is defined as the combination of the following capabilities:

- the capability to generate an image according to ISO/IEC 23008-12 [24] that can be played by a player conforming to `26143_IMG_HEIC` as defined in clause 5.4.1, i.e. restricted by either
- the provisioning of media type signalling with the MMBP using `image/heic, profile="heic,MiHB" itemTypes="hvc1.2.4.L153.B0"` or an equivalently compatible media type as defined in [22].

5.5 Speech and Audio

5.5.1 Player and Decoding capabilities

The capability `26143_AUDIO_IVAS` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **IVAS** decoding capabilities as defined in clause 5.2 of TS 26.117 [5] and the receiver requirements in clause 6.3.5.2 of TS 26.117 [5],
- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'sivs'` as defined in TS 26.244 [26],
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_AUDIO_IVAS` shall be signalled with `audio/mp4, profiles="3gp9" codecs="sivs"` or an equivalently compatible media type.

The capability `26143_AUDIO_EVS` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **EVS** decoding capabilities as defined in clause 5.2 of TS 26.117 [5] and the receiver requirements in clause 6.2.4.2 of TS 26.117 [5],

- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'sevs'` as defined in TS 26.244 [26],
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_AUDIO_EVS` shall be signalled with `audio/mp4, profiles="3gp9" codecs="sevs"` or an equivalently compatible media type.

The capability `26143_AUDIO_AMR-WB` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **AMR-WB** decoding capabilities as defined in clause 5.2 of TS 26.117 [5] and the receiver requirements in clause 6.2.3.2 of TS 26.117 [5],
- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'sawb'` as defined in TS 26.244 [26],
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_AUDIO_EVS` shall be signalled with `audio/mp4, profiles="3gp9" codecs="sawb"` or an equivalently compatible media type.

The capability `26143_AUDIO_AMR` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **AMR** decoding capabilities as defined in clause 5.2 of TS 26.117 [5] and the receiver requirements in clause 6.2.2.2 of TS 26.117 [5],
- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'samr'` as defined in TS 26.244 [26],
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_AUDIO_EVS` shall be signalled with `audio/mp4, profiles="3gp9" codecs="samr"` or an equivalently compatible media type.

The capability `26143_AUDIO_XHE-AAC` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **xHE-AAC stereo** decoding capabilities as defined in clause 5.2 of TS 26.117 [5] and the receiver requirements in clause 6.4.2.2 of TS 26.117 [5],
- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'mp4a.40.42'`,
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_AUDIO_XHE-AAC` shall be signalled with `audio/mp4, profiles="3gp9" codecs="mp4a.40.42"` or an equivalently compatible media type.

The capability `26143_AUDIO_EAAC+` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **eAAC+** decoding capabilities as defined in clause 5.2 of TS 26.117 [5] and the receiver requirements in clause 6.3.2.2 of TS 26.117 [5],
- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'mp4a.40.29'`,
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability 26143_AUDIO_EAAC+ shall be signalled with audio/mp4, profiles="3gp9" codecs="mp4a.40.29" or an equivalently compatible media type.

5.5.2 MMBP Content Generator capabilities

The capability 26143_AUDIO_ENC_IVAS for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from an audio signal in real-time, such that the file can be played back by a player with the capability 26143_AUDIO_IVAS,
- the *IVAS* encoding capabilities as defined in clause 5.3 of TS 26.117 [5] and the sender requirements in clause 6.3.5.3 of TS 26.117 [5],
- the capability to generate an ISO BMFF track that conforms with the requirements of the sample entry 'sivs' as defined in TS 26.244 [26].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using audio/mp4, profiles="3gp9" codecs="sivs" or an equivalently compatible media type.

The capability 26143_AUDIO_ENC_EVS for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from an audio signal in real-time, such that the file can be played back by a player with the capability 26143_AUDIO_EVS,
- the *EVS* encoding capabilities as defined in clause 5.3 of TS 26.117 [5] and the sender requirements in clause 6.2.4.3 of TS 26.117 [5],
- the capability to generate an ISO BMFF track that conforms with the requirements of the sample entry 'sevs' as defined in TS 26.244 [26].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using audio/mp4, profiles="3gp9" codecs="sevs" or an equivalently compatible media type.

The capability 26143_AUDIO_ENC_AMR-WB for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from an audio signal in real-time, such that the file can be played back by a player with the capability 26143_AUDIO_AMR-WB,
- the *AMR-WB* encoding capabilities as defined in clause 5.3 of TS 26.117 [5] and the sender requirements in clause 6.2.3.3 of TS 26.117 [5],
- the capability to generate an ISO BMFF track that conforms with the requirements of the sample entry 'sawb' as defined in TS 26.244 [26].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using audio/mp4, profiles="3gp9" codecs="sawb" or an equivalently compatible media type.

The capability 26143_AUDIO_ENC_AMR for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from an audio signal in real-time, such that the file can be played back by a player with the capability 26143_AUDIO_AMR,
- the *AMR* encoding capabilities as defined in clause 5.3 of TS 26.117 [5] and the sender requirements in clause 6.2.2.3 of TS 26.117 [5],
- the capability to generate an ISO BMFF track that conforms with the requirements of the sample entry 'samr' as defined in TS 26.244 [26].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using audio/mp4, profiles="3gp9" codecs="samr" or an equivalently compatible media type.

The capability 26143_AUDIO_ENC_XHE-AAC for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from an audio signal in real-time, such that the file can be played back by a player with the capability 26143_AUDIO_XHE-AAC,
- the *xHE-AAC stereo* encoding capabilities as defined in clause 5.3 of TS 26.117 [5] and the sender requirements in clause 6.4.2.3 of TS 26.117 [5],
- the capability to generate an ISO BMFF track that conforms with the requirements of the sample entry 'mp4a.40.42' as defined in TS 26.244 [26].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using audio/mp4, profiles="3gp9" codecs="mp4a.40.42" or an equivalently compatible media type.

The capability 26143_AUDIO_ENC_EAAC+ for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from an audio signal in real-time, such that the file can be played back by a player with the capability 26143_AUDIO_EAAC+,
- the *eAAC+* encoding capabilities as defined in clause 5.3 of TS 26.117 [5] and the sender requirements in clause 6.3.2.3 of TS 26.117 [5],
- the capability to generate an ISO BMFF track that conforms with the requirements of the sample entry 'mp4a.40.29' as defined in TS 26.244 [26].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using audio/mp4, profiles="3gp9" codecs="mp4a.40.29" or an equivalently compatible media type.

5.6 Video

5.6.1 Player and Decoding capabilities

The capability 26143_VIDEO_AVC-HD is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **AVC-HD-Dec** decoding capabilities as defined in clause 4.2.1.1 of TS 26.511 [4],

- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'avc1'` as defined in ISO/IEC 14496-15 [15],

- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_VIDEO_AVC-HD` shall be signalled with `video/mp4, profile="3gp9" codecs="avc1.640028"` or `video/mp4, codecs="avc1.640028",` or an equivalently compatible media type.

The capability `26143_VIDEO_AVC-FullHD` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **AVC-FullHD-Dec** decoding capabilities as defined in clause 5.3.1 of TS 26.265 [35],

- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'avc1'` as defined in ISO/IEC 14496-15 [15],

- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_VIDEO_AVC-FullHD` shall be signalled with `video/mp4, profile="3gp9" codecs="avc1.640029"` or `video/mp4, codecs="avc1.640029",` or an equivalently compatible media type.

The capability `26143_VIDEO_HEVC-HD` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **HEVC-HD-Dec** decoding capabilities as defined in clause 5.3.2 of TS 26.265 [35],

- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'hvc1'` as defined in ISO/IEC 14496-15 [15],

- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_VIDEO_HEVC-HD` shall be signalled with `video/mp4, profile="3gp9" codecs="hvc1.1.2.L93.B0"` or `video/mp4, codecs="hvc1.1.2.L93.B0",` or an equivalently compatible media type.

The capability `26143_VIDEO_HEVC-FullHD` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **HEVC-FullHD-Dec** decoding capabilities as defined in clause 5.3.2 of TS 26.511 [35],

NOTE: HEVC decoders with this decoding capability can also decode bitstreams with a Main Profile.

- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'hvc1'` as defined in ISO/IEC 14496-15 [15],

- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_VIDEO_HEVC-FullHD` shall be signalled with `video/mp4, profile="3gp9" codecs="hvc1.2.4.L123.B0"` or `video/mp4, codecs=" hvc1.2.4.L123.B0",` or an equivalently compatible media type.

The capability `26143_VIDEO_HEVC-UHD` is defined as the capability of playing back (decoding and rendering) a file that

- is decodable by a decoder capable of the **HEVC-UHD-Dec** decoding capabilities as defined in clause 5.3.2 of TS 26.265 [35],

NOTE: HEVC decoders with this decoding capability can also decode bitstreams with a Main Profile.

- is encapsulated in an ISO BMFF Track [14] conforming with the requirements of the sample entry `'hvc1'` as defined in ISO/IEC 14496-15 [15],

- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_VIDEO_HEVC-UHD` shall be signalled with `video/mp4, profile="3gp9" codecs="hvc1.2.4.L153.B0"` or `video/mp4, codecs=" hvc1.2.4.L153.B0",` or an equivalently compatible media type.

NOTE: In the absence of knowledge of detailed capabilities, 16:9 and 9:16 image formats are preferably used.

5.6.2 MMBP Content Generator capabilities

The capability `26143_VIDEO_ENC_AVC-HD` for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from a video signal in real-time, such that the file can be played back by a player with the capability `26143_VIDEO_AVC-HD`,

- the **AVC-HD-Enc** encoding capabilities as defined in clause 4.1.2.2 of TS 26.511 [4] to generate a bitstream from the video signal

- the capability to generate an ISO BMFF track from the bitstream that conforms with the requirements of the sample entry `'avc1'` as defined in ISO/IEC 14496-15 [15].

- the generation of a 3GP file from the ISO BMFF track that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

- the provisioning of media type signalling with the generated file using `video/mp4, profile="3gp9" codecs="avc1.640028"` or `video/mp4, codecs="avc1.640028",` or an equivalently compatible media type.

The capability `26143_VIDEO_ENC_AVC-FullHD` for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from a video signal in real-time, such that the file can be played back by a player with the capability `26143_VIDEO_AVC-FullHD`,

- the **AVC-FullHD-Enc** encoding capabilities as defined in clause 5.4 of TS 26.265 [35] to generate a bitstream from the video signal

- the capability to generate an ISO BMFF track from the bitstream that conforms with the requirements of the sample entry `'avc1'` as defined in ISO/IEC 14496-15 [15].

- the generation of a 3GP file from the ISO BMFF track that conforms to the `26143_CONTAINER_MP4_3GP9` or `26143_CONTAINER_MP4` capability as defined in clause 5.2.

- the provisioning of media type signalling with the generated file using `video/mp4, profile="3gp9" codecs="avc1.640029"` or `video/mp4, codecs="avc1.640029",` or an equivalently compatible media type.

The capability 26143_VIDEO_ENC_HEVC-HD for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from a video signal in real-time, such that the file can be played back by a player with the capability 26143_VIDEO_HEVC-HD,
- the **HEVC-HD-Enc** encoding capabilities as defined in clause 5.4 of TS 26.265 [35] to generate a bitstream from the video signal
- the capability to generate an ISO BMFF track from the bitstream that conforms with the requirements of the sample entry 'hvc1' as defined in ISO/IEC 14496-15 [15].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 or 26143_CONTAINER_MP4 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using video/mp4, profile="3gp9" codecs="hvc1.1.2.L93.B0" or video/mp4, codecs=" hvc1.1.2.L93.B0", or an equivalently compatible media type.

The capability 26143_VIDEO_ENC_HEVC-FullHD for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from a video signal in real-time, such that the file can be played back by a player with the capability 26143_VIDEO_HEVC-FullHD,
- the **HEVC-FullHD-Enc** encoding capabilities as defined in clause 5.4 of TS 26.265 [35] to generate a bitstream from the video signal
- the capability to generate an ISO BMFF track from the bitstream that conforms with the requirements of the sample entry 'hvc1' as defined in ISO/IEC 14496-15 [15].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 or 26143_CONTAINER_MP4 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using video/mp4, profile="3gp9" codecs="hvc1.2.4.L123.B0" or video/mp4, codecs="hvc1.2.4.L123.B0", or an equivalently compatible media type.

The capability 26143_VIDEO_ENC_HEVC-UHD for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from a video signal in real-time, such that the file can be played back by a player with the capability 26143_VIDEO_HEVC-UHD,
- the **HEVC-UHD-Enc** encoding capabilities as defined in clause 5.4 of TS 26.265 [35] to generate a bitstream from the video signal
- the capability to generate an ISO BMFF track from the bitstream that conforms with the requirements of the sample entry 'hvc1' as defined in ISO/IEC 14496-15 [15].
- the generation of a 3GP file from the ISO BMFF track that conforms to the 26143_CONTAINER_MP4_3GP9 or 26143_CONTAINER_MP4 capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using video/mp4, profile="3gp9" codecs="hvc1.2.4.L153.B0" or video/mp4, codecs="hvc1.2.4.L153.B0", or an equivalently compatible media type.

5.7 Timed Text and Subtitles

5.7.1 Player and Decoding capabilities

The capability `26143_TT_3GPP` is defined as the capability of decoding and rendering a file that

- includes a track conforming conforms to the sample entry `'tx3g'` as defined in TS 26.245 [27] and
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_TT_3GPP` shall be signalled with `text/mp4, profile="3gp9" codecs="tx3g"` or an equivalently compatible media type.

The capability `26143_TT_IMSC11` is defined as the capability of decoding and rendering a file that

- includes a track conforming conforms to the sample entry `'stpp'` as defined in ISO/IEC 14496-30 [28] and
- is contained in a 3GP file that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.

In the context of this specification, the media type for files with this capability `26143_TT_IMSC11` shall be signalled with `application/mp4, profile="3gp9" codecs="stpp.ttml.im2t"` or an equivalently compatible media type.

5.7.2 MMBP Content Generator capabilities

The capability `26143_ENC_TT_3GPP` for a content generator is defined as the combination of the following capabilities:

- the capability to generate a file from a timed text signal, such that the file can be played back by a player with the capability `26143_TT_3GPP`,
- the capability to generate an ISO BMFF track from the bitstream track that conforms with the requirements of the sample entry `'tx3g'` as defined in TS 26.245 [27].
- the generation of a 3GP file from the ISO BMFF track that conforms to the `26143_CONTAINER_MP4_3GP9` capability as defined in clause 5.2.
- the provisioning of media type signalling with the generated file using `video/mp4, profile="3gp9" codecs="tx3g"` or an equivalently compatible media type.

5.8 3D scenes and assets

The capability `26143_SCENE_GLTF20` is defined as the capability of rendering glTF 2.0 scenes as specified in [2] for which all components of the 3D scene are included as multiple parts in a *related MMBP* as defined in clause 4.4, for which the *root MMBP* is a glTF2.0 JSON document.

The capability `26143_SCENE_GLTF20_GLB` is defined as the capability of rendering glTF 2.0 scenes as specified in [2] for which all components of the 3D scene are either

- encapsulated in a GLB file, or
- included as multiple parts in a *related MMBP*, for which the *root MMBP* is a GLB file.

The capability 26143_SCENE_GLTF20_AR is defined as the capability of 26143_SCENE_GLTF20 with the addition, that the scene may include MPEG_anchor extension, EXT_lights_image_based and MPEG_lights_texture_based extensions as defined in [3].

The capability 26143_SCENE_GLTF20_GLB_AR is defined as the capability of 26143_SCENE_GLTF20_GLB with the addition, that the scene may include MPEG_anchor extension, EXT_lights_image_based and MPEG_lights_texture_based extensions as defined in [3].

It is recommended that clients supporting such capabilities determine if the media can be safely processed prior to any processing and rendering.

In the context of this specification, the media type for scenes with this capability 26143_SCENE_GLTF20 and 26143_SCENE_GLTF20_ AR shall be signalled with model/gltf+json as defined in [2].

In the context of this specification, the media type for scenes with this capability 26143_SCENE_GLTF20_GLB and 26143_SCENE_GLTF20_GLB_AR shall be signalled with model/gltf-binary as defined in [2].

NOTE: Annex C provides guidelines on the transcoding of 3D scenes and assets in messages for legacy devices.

5.9 Presentation format

The capability 26143_PRESENTATION_HTML5 is defined as the capability of rendering HTML-5 content according to the profile defined TS 26.307 [31] with the following further restrictions:

- all components of the 3D scene are included as multiple parts in a *related MMBP* as defined in clause 4.4, for which the *root MMBP* is an HTML-5 document.
- the functionalities as defined in TS 26.307 [31], clause 4, are further restricted to the Markup in clause 4.2 and Style in clause 4.3.

NOTE: In order to address potential security risks, Scripting as defined in TS 26.307 [31], clause 4.4 is excluded from the capabilities.

- the APIs as defined in TS 26.307 [31], clause 5, are further restricted to the Forms API and the Canvas API.
- the media types may be further restricted.

NOTE: As this specification does not define mechanisms for referencing external content, any network APIs from TS 26.307 [31] are excluded.

It is recommended that clients supporting such capabilities determine if the media can be safely processed prior to any processing and rendering.

In the context of this specification, the media type for scenes with this capability 26143_PRESENTATION_HTML5 shall be signalled with text/html as defined in [2].

6 Messaging Media Profiles

6.1 Overview

This specification defines several messaging media profiles that apply for the player or the content generator.

6.2 Baseline MMBP Player Profile

6.2.1 Overview

The baseline MMBP Player profile is aligned with TS 26.140 [32].

The container format is based on IETF RFC 2045 [23] as the format for the MMBPs. Offering of alternative content is the container is permitted. In addition, the profile permits to encapsulate encapsulation of real-time video into the 3GP file format using the baseline profile. The container does not support external bodies, i.e. the MMBP is expected to be delivered as a single message. For details on the container format requirements, refer to clause 6.2.2.

The media types address basic text, audio/speech, images, video, text/subtitle, 3D scenes including AR as well as simple HTML-5 presentations.

Content conforming to the baseline MMBP player may include media types that are not explicitly supported by the media capabilities as defined in clause 6.2.3. Receivers shall ignore non-recognized media types. However, based on the container requirements, ignoring media types may results in specific processing requirements, for example pick an alternative, or ignore the entire MMBP.

Content generated to be compatible for playback on players for this profile as well as players expose their capabilities should use the URN identifier `"urn:3GPP:26143:19:baseline-mmbp-player".`

6.2.2 Container Format

The following capabilities for the container format as defined in clause 5.2.1 shall be supported:

- `26143_CONTAINER_RFC2046_SINGLE`
- `26143_CONTAINER_RFC2046_MIXED`
- `26143_CONTAINER_RFC2046_ALTERNATIVE`
- `26143_CONTAINER_RFC2387_RELATED`
- `26143_CONTAINER_MP4_3GP9`
- `26143_CONTAINER_MP4_MP42`

The following capabilities for the container format as defined in clause 5.2 should be supported:

- `26143_CONTAINER_RFC2046_PARALLEL`

In addition, `multipart/parallel` shall not be present in an MMBP on the same level if a 3GP file Rel-9 basic profile as defined in TS 26.244 [26] identified by the brand `'3gp9'` is present and contains more than on track.

6.2.3 Media Types

The capability `26143_TEXT_PLAIN` as defined in clause 5.3 shall be supported.

If still images are supported,

- the `26143_IMG_JPEG` capability as defined in clause 5.4.1 shall be supported,
- the `26143_IMG_HEIC` capability as defined in clause 5.4.1 should be supported.

If bitmap graphics are supported,

- the `26143_IMG_GIF` capability as defined in clause 5.4.1 should be supported.
- the `26143_IMG_PNG` capability as defined in clause 5.4.1 should be supported.

If the reception of audio or speech is supported, then the following applies:

- the `26143_AUDIO_IVAS` capability as defined in clause 5.5.1 should be supported.
- the `26143_AUDIO_EVS` capability as defined in clause 5.5.1 shall be supported.
- the `26143_AUDIO_AMR-WB` capability as defined in clause 5.5.1 shall be supported.
- the `26143_AUDIO_XHE-AAC` capability as defined in clause 5.5.1 should be supported.

- the 26143_AUDIO_AMR capability as defined in clause 5.5.1 shall be supported.
- the 26143_AUDIO_EAAC+ capability as defined in clause 5.5.1 shall be supported.

If the reception of video is supported, then the following applies:

- the 26143_VIDEO_AVC-HD capability as defined in clause 5.6.1 shall be supported.
- the 26143_VIDEO_HEVC-HD capability as defined in clause 5.6.1 should be supported.

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

- the 26143_VIDEO_AVC-FullHD capability as defined in clause 5.6.1 shall be supported.
- the 26143_VIDEO_HEVC-FullHD capability as defined in clause 5.6.1 shall be supported.
- the 26143_VIDEO_HEVC-UHD capability as defined in clause 5.6.1 should be supported.

If timed text is supported,

- the 26143_TT_3GPP capability as defined in clause 5.7.1 shall be supported.
- the 26143_TT_IMSC11 capability as defined in clause 5.7.1 should be supported.

If a processor for media type 'model' as defined in RFC2077 [33] is supported (i.e. a processor for 3D scenes and objects), then a processor for the media subtype 'model/gltf' should be supported. If a processor for the media subtype 'model/gltf' is supported,

- the 26143_SCENE_GLTF20 capability and the 26143_SCENE_GLTF20_GLB capability as defined in clause 5.8 shall be supported assuming either a single body part or a multipart/related body part as defined in clause 5.2.
- and if the device is a device type as defined in TS 26.119 [34], clause 10, the 26143_SCENE_GLTF20_AR and the 26143_SCENE_GLTF20_GLB_AR capability as defined in clause 5.8 shall be supported assuming either a single body part or a multipart/related body part as defined in clause 5.2.

If a processor for the media type text/html is supported, the 26143_PRESENTATION_HTML5 capability as defined in clause 5.9 should be supported assuming either a single body part or a multipart/related body part as defined in clause 5.2. The media formats shall be restricted to the capabilities defined in this clause.

6.3 Baseline MMBP Generator Profile

6.3.1 Overview

The baseline MMBP Generator profile is aligned with TS 26.140 [32].

It primarily addresses the ability for users to generate content, for example on a mobile device.

The container format is based on IETF RFC 2045 [23] as the format for the MMBPs. Offering of alternative content is the container is permitted. In addition, the profile permits to encapsulate encapsulation of real-time video into the 3GP file format using the baseline profile. The container does not support external bodies, i.e. the MMBP is expected to be delivered as a single message. For details on the container format requirements, refer to clause 6.3.2.

The media types supported by this profile are basic text, audio/speech, images, video, and text.

Content conforming to the baseline MMBP generator profile may include media types that are not explicitly supported by the media capabilities as defined in clause 6.3.3. Receivers are expected to ignore non-recognized media types. However, based on the container requirements, ignoring media types may results in specific processing requirements, for example pick an alternative, or ignore the entire MMBP.

Additional packaging requirements and recommendations are provided in clause 6.3.4.

Content generated to be compatible for this profile as well as generators expose their capabilities should use the URN identifier "urn:3GPP:26143:19:baseline-mmbp-generator".

6.3.2 Container Format

The following capabilities for the container format as defined in clause 5.2.2 shall be supported:

- 26143_CONTAINER_RFC2046_SINGLE_GEN
- 26143_CONTAINER_RFC2046_MIXED_GEN

In addition, at least one of the the following two capabilities for the container format as defined in clause 5.2.2 shall be supported:

- 26143_CONTAINER_MP4_3GP9_GEN
- 26143_CONTAINER_MP4_MP42_GEN

The following capabilities for the container format as defined in clause 5.2 should be supported:

- 26143_CONTAINER_RFC2046_PARALLEL_GEN
- 26143_CONTAINER_RFC2046_ALTERNATIVE_GEN

6.3.3 Media Types

If the transmission of images is supported, then the following applies:

- the 26143_IMAGE_ENC_JPEG capability as defined in clause 5.4.2 shall be supported.
- the 26143_IMAGE_ENC_HEIC capability as defined in clause 5.4.2 should be supported.

If the transmission of speech is supported, then the following applies:

- the 26143_AUDIO_ENC_IVAS capability as defined in clause 5.5.2 should be supported.
- the 26143_AUDIO_ENC_EVS capability as defined in clause 5.5.2 shall be supported.
- the 26143_AUDIO_ENC_AMR-WB capability as defined in clause 5.5.2 should be supported.
- the 26143_AUDIO_ENC_AMR capability as defined in clause 5.5.2 may be supported.

If the transmission of audio is supported, then the following applies:

- the 26143_AUDIO_ENC_IVAS capability as defined in clause 5.5.2 should be supported.
- the 26143_AUDIO_ENC_EAAC+ capability as defined in clause 5.5.2 shall be supported.
- the 26143_AUDIO_ENC_XHE-AAC capability as defined in clause 5.5.2 should be supported.

If the transmission of video is supported, then the following applies:

- the 26143_VIDEO_ENC_HEVC-FullHD capability as defined in clause 5.6.2 shall be supported.

If the transmission of timed text is supported, then the following applies:

- the 26143_TT_ENC_3GPP capability as defined in clause 5.7.2 shall be supported.

6.3.4 Packaging Requirements and Recommendations

For content generated by this baseline generator, multipart/parallel shall not be present in an MMBP on the same level if a 3GP file Rel-9 basic profile as defined in TS 26.244 [26] identified by the brand '3gp9' is present and contains more than on track.

NOTE: This avoids the necessity to playback multiple tracks included in a single file with tracks provided to the multipart MMBP in the parallel structure.

When generating a speech message, the MMBP Generator shall at least include an **EVS** Content together with potential alternatives.

When generating an Audio message, the MMBP Generator shall at least include an **eAAC+ stereo** Content together with potential alternatives.

Annex A (informative): Registration Information

A.1 3GPP Registered URIs

The clause documents the registered URIs in this specification following the process in https://www.3gpp.org/3gpp-groups/core-network-terminals-ct/ct-wg1/uniform-resource-identifier-uri-list,

Table A-1 lists all registered URN values as well as

- a brief description of its functionality;
- a reference to the specification or other publicly available document (if any) containing the definition;
- the name and email address of the person making the application; and
- any supplementary information considered necessary to support the application.

Table A-1: 3GPP Registered URNs

URN	Description	Reference	Contact	Remarks
urn:3GPP:26143:18:baseline-mmbp-player	Media Messaging Baseline MMBP Player Profile	TS 26.143, clause 6.2.1	Thomas Stockhammer tsto@qti.qualcomm.com	none
urn:3GPP:26143:18:baseline-mmbp-generator	Media Messaging Baseline MMBP Generator Profile	TS 26.143, clause 6.3.1	Thomas Stockhammer tsto@qti.qualcomm.com	none

Annex B (informative): Examples

B.1 MMBP message with a 3D asset

In this example we show an excerpt of a message that contains a 3D asset. The root entry is a glTF 2.0 file. The message has two additional parts: a binary file that contains the geometry of the 3D asset and an image that provides the texture of the 3D asset.

```
MIME-Version: 1.0
Content-Type: multipart/related; boundary="==============="

===============
Content-Type: model/gltf+json
Content-Disposition: attachment; filename="sofa.gltf"

{
    "asset": {
        "version": "2.0"
    },
    "buffers": [
        {
            "uri": "buffer.bin",
            "byteLength": 1024
        }
    ],
    "images": [
        {
            "uri": "texture.jpg"
        }
    ],
    "scenes": [
        {
            "nodes": [0]
        }
    ],
    "nodes": [
        {
            "mesh": 0
        }
    ],
    "meshes": [
        {
            "primitives": [
                {
                    "attributes": {
                        "POSITION": 0
                    },
                    "indices": 1
                }
            ]
        }
    ],
    "accessors": [
        {
            "bufferView": 0,
            "componentType": 5126,
            "count": 24,
            "type": "VEC3"
        }
    ],
    "bufferViews": [
        {
            "buffer": 0,
            "byteOffset": 0,
            "byteLength": 288
        }
    ]
}

===============
Content-Type: application/octet-stream
```

```
Content-Disposition: attachment; filename="buffer.bin"

… binary data …

===============
Content-Type: image/jpeg
Content-Disposition: attachment; filename="texture.jpg"

… binary data …

===============
```

B.2 Single Media Type

B.2.1 Introduction

This clause provides examples for MMBP message with a single media type according to 26143_CONTAINER_RFC2046_SINGLE.

B.2.2 Audio

The following example provides an MMBP that includes a single media in an 3gp file encoded with EVS.

```
MIME-Version: 1.0
Content-Type: audio/mp4, profiles="3gp9" codecs="sevs"; name="evs.3gp"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="evs.3gp"

AAAAHGZ0eXBNNA... (base64-encoded 3GP EVS audio-only data truncated)
```

B.2.3 Images

The following example provides an MMBP that includes a single png image containing the 3GPP logo.

```
MIME-Version: 1.0
Content-Type: image/png; name="3gpp.png"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="3gpp.png"

url(
8PD6+vrsAACIiIi2trbq6upFRUX09PTMzMy7u7toaGiZmZknJyfY2NiqqqpLS0uRkZHS0tLs7OxQUFBZWVltbW3k5ORycnJ8fH
whISGsrKyjo6PFxcUZGRk3NzctLS07Ozt6enoRERFgYGAzMzNXV1ednZ0cHBxGRkaEhIT71NULCwvuLDP4sbT1mp34p6n1io3z
dXnsABD6ysv5wcL2kpb83+HxY2fuIiv+7e70honxVlrvOD74u7ztER3wREnwWFylhzClAAAM9ElEQVR4nO2deX+bOBOALTAxNj
Y2tvF94PtIHKdNum2z7Xbb7ff/TK81EphDAuEYnPdXPf/EgEBoJEajmYEUChKJRCKRSCQSiUikQkgkEolIpFIJBKJRCKRSCQS
iYRJ0aq1h5vNbmOupnb51ndzU+zpcLe8Rz6OD/tB7rfRUSxLKeZebQijjdi0nNzuwZ4cKke33sVIV3OrOcKUIw3M3Mm+fqPabk
VrNu3sa2ahbWLEcWKTrSIp6+aRU7PZybRmDoyuCaFnVrda68VVfMyuZi6rRHEg1M6maiu57lE2NfNxBMSRiUA0fRGpZrZYdnu9
1rxx3vWgXb/qOHZC8kDOlavttNfBCubmtKp4c0rZrnfpgaVx5apjKYfavTbNCkse91etdXAIXt1sKtFhMKgf8xdILXhjddxDqt
OPCiSk2ZTafrirVCpds12zUtbZCaqNns5rsFqCAq0L2nUpdXajyxG1Xzmfo9XC8tpMxPuwM/KfOavHGqMWaBLzgoZdyMR/c35l
HhTUCdcKsYfRwYN7uSZmUCr+k7q1pOIqWAPTC1p2GUX/7QWe4XCzq7DX6SIe47aQ4bY8jyohAxTKK6kbdim+AVINHCiGmou7sv
rAlQawElgAuhVuBNVOEWvVZfqGXYq3eKmGDkTkoTLUbJhh4hjR2LXxAQspvyemoOxgsEcmvFBLbTHLDY2SVutkrk1hieNumOU5
6ZZtKzr968FmHhNWfT7qUc2qFsuDgXJiMOhUoVBX/PYsXH7/lgZeAXUm3P4IDa/zDas6KfV7D9ux7yj5I/7AFPDkv83Zbg+TvO
qNo4KV5Wi3XceUWQwFp2gyVNNafVfFWMY0RIRNIaKAWCQbIBiwWeoZNzmO6uyN4kBYqY6Ti5300lRgkOBh1s+81TzosuEtgPYT
HGON5DGCJZujCRKk1khsQhILuFBgDbTomqvSiZXZioybxK7HZ1x3hS2MxVzup4TMHWQZuys1nbDZGjZlkpb061vJwxZ0D1HGy1
5/tOr3WsvFzLd7SC4GQYwZsx5wja3Pa6FtrEBAn1biSmSCWkszyY77uuVrRVGxbL0+MrtbhKhbHFYCR6a5ShYJquX5hTZxNwbz
7ep6DRXCPqTRG6bDdeJ03ChBE0oyYwYGHDotSoqu7o6zP3u0cE4YilVbsSfH5py5O3nVhiEWP3vJC0vDLf6lUIXFX9IrMde5Pt
UtbwzM9oU9a39PMEDlxLQT1iSIOEBIsHTLvQ6snPJyGvIit6iia4UOY/9ayKTE2FCeY2fDqDiQ32QgTTiXIS7enCJTPHGsoOsY
Do+uePB9ECcPkEFD9W3cs1dsJAKQkzVW5YwNoiyt6JFSiourcAbHKWjAUs+hW+CtZWpMjWj5FKvht8CZUqhzwowcSKfk4+RB3E
Ke5xzbPawlvTFP3Q1vgDEAKAcl5AoHeI84h9ieJVcv+recSKEB6bBdunovZsCVx6nrlMiyLq0JMIuTB4mUNt2tEWLEWWi0rJub
L4g712LCzpzUg3YeKw9orGeFw1AN2ngGDXls8ksV4j8wUUIeTyUO0jBYnzjcykHennmChReYypvHC7vhLdhCThsYLYGJVovNY6
HWE+hjvrlSD7QWb/kChPqMXOk+p5nFRd0Lum2CBlG8OKgD5BA9zw+JeLlbjncaDu3TTMdjNAySPQNLb/eTFnPBp4Vr1VLmUAoU
cpNVJQEMcYdulKlwVGvv+gHW8cHuTNHKzdg+D5qZCeJAPSgFUouZlMAa9CYVvNFeVbwcWLN24xBDwZhyR0kvULDGK+ZCtAJ4Oe
L84qC8GutoVGLedrJrZhpqHG0StDJH7EJniOEGyxJu6pmm30dPXM+7I92+YS5uhCarfaHFONsr4oMmR+CfB049ltk4y2O9aIHS
mN4k4zSeAcNICw36JHHQTBKwbvgZk5pRLFLpVzUymHKeXMVQo90fcupYCRGaBikGU8YwvjJi/5wKQWpJrrmEwhjh9i2iD7Q9ir
Hk6JgAd1JCcIWq5g6MpRvFWBIJ5TqwE9o0Z8hQiABdBxe55/ogT2cdXE88XXNzQg3lLSFUjslCfb/g84mNJBSCsambxvDjCE2o
XBuTnYC+oIaUivu+xzvX5ZyTliJHJmdC9rjDK8eWhxc6wvGtRF/O2Wf5bodHITR/cBMj2Rl2sIRTavtSQ0QeBTcTK9eFfTpCrx
44vHLspDKIz9hUVrNSQre7udB5OQUvYBJqIHcNwsxHdUNHxT2dkhcHvp3V8YZifjm3aYk4krlzRPQVFhRYsZz1UG/CCjg6vgH2
bh8XhhOREzxlJyH6no9gfKe/rxZVMvdoRseph5IrbmOcFhU7/g1X1mKeYygx3a8NXwHiwF9MTG9NtF72TNPcBZcERIPkmIPsUe
tBl963Spw5Q2Ov5dkPNzNlOSA7cG2czHC1rB942SWmTeap/DPELL93Y8vybE45GaNz5vWYsgvoTpLMQDc0ZRJ50Za8OkM0lnPN
tgoQfhKWIbVghV7j8sNapmreU7A0z7lPgSKH6K6C4uiTeqnUnuqOlzkBkk00Za9LNP6IHO+gYZdig1MsP5enLfF87P4OThNk5k
```

```
7WlLG5ABnBMp5gJTqw65tZrDCiDfVfEDSGa6oG20REJpDbAwMp3xwxZiu3rQrTiMA0lMDTbob83Z42hS3q6QopGlW030nqTa5T
buIICDEKe4aOjv9y3quqTf9meNKEnSJuQLBTc01ST5ejv4QJOWRh9M6ztKc8qK9ZI8MsbNkkxHDPkJF0lYYKwvScc2i4qR5hE6
NStwadjqKfPUGuiMA2jygZ2CuUcgYl8/yAgTYTlcba99IBw1yd+Y2UswT0ORpGQmowwQjl0cCzmWsWsuAbcONJirMCq3RGgBEe
ODG1AMmduX4EJe5DMC6biPKzY0on9ieoBbGvVqjYPZDju9iFZIE8TFm5tgPuOw8VGBHPn/mRZ1Czgo2Eu8v3G04O79s0uHF1nk
tG4xjyfSqHr0+fPjy+vj4+Pn55/voaPBcnxQi6viC3MqNvr/Aw2K/fo00zNgubmUd0dru//n1H+Pbxe+hMbFeIakk8Ax7zznJQ
wk7g424qoMWas9Bpw4Cp8f3n138+/gwLo0BiW8Ir+XsUm0CTEUV92KrMt9t5pTucOsJ+y5rvWwaLkuhXp/AqcpFcjICFNxYtfG
W09AOz7JT6u26v37a9c7XnL/Hn4IXJWHhdgrXvuwzyi/Py9NGnQl8/fwgGv7XT5LQW/oQZtv7eb5hOjM9/3X37/fL88eXTj6e7
u6/hYYcnGPFYAp7a32+cTpDnf8ns8uvHh+hD2E7VwpM1PCOLGPU9ZU2l5fHDy8vzZ8b0Qh6BFFZ4m6oPta6bhXebAMFGSCUbVc
u6xM9jG6X9/5k8Cs8/s7u2VazVnewunw1fn6IS+f54gxt5L3y5+/Xy6OoN7fvrh5f/PjHVyJ/C99PS5dvvT/+8/PPp7/9+3d39
+JNHB/D5x93dX5jTjPvpj5cG5vXj76dvTz9evtw6A18ikUgkEolEIpFIJBKJRNw/wSl5XQfHzd0lzWh2Rfkwp4H6pRcoLA5nxz
lNbbPnlc05y63rRdpWi2DQrTimwQH4fJ2zdmBjOobQy77S3Wy6S8ir08deep37L6Im5DBUo5Pvw6olnJg2qEA0ptjYrrMIcxtr
FI6k1hFa0JQc702NIkLt5pqmktqoVPeS5mrnVI5eKOhWdFPc1zj6VKNR6Tr52zRHaDYyHfjtpRtW3avp5hCh0Qb2T0mOYQdSN0
fkO49lVNGzyDwsRVJ12qjlNctLSzDxLQ3oW9k2qiluQpzWGHsZkZtQUNaTB8L5lTV6dO9F69ED/XGWR6Phpe9qjTX9NaE17FH7
JAeSOWJk8/VkBU2bwVxQhWaAkTt25bFGWBI0lctGS/d7dad7HDy4OdUmVx7mHDUdmgc2PcvDHVneLUyQtXHzd43GseDupeHbMS
oc6NkGavQyeFvo1O8175uB9HZPPb/akSa68lCPRB5r+PiEjeoT+oqggSrVg5ssaIYy387yaBtL9JAsD/W4qLbdVLuoPE4/Su6w
MNCyLfwZSWEgb3IcSCF2cEt3tJO8r3xUcAJtk96Mfbq/Bsmjxm8f37vB6U1IFfnkUdC67v+LiZEHjvvPju4IiMoDv9lPq8jmeW
nA5e8D47yPUO/oyuMkLFAmyknNtNCcjJoq2oyRQ3Z3YZs80zs0C+TZFuk9dyBDcEW/i1snpxZ80qYKcwDq26LpUSdN7x0+p4q7
1++gY8v/Wt51cGBk6NPArO+semaJPEKl0dAko7zc7pkTWkwZlmpEMioJLx/I+JiOVn2/zjdGJBGuOITubxIZOyNX+iO3cdURXE
DbQ7kRGR9quxQ8jPHSVo3VaJj0XQSJRCKRSCQSiUQikUgkEolEIpFIJBKJRCKRSCQSiUQikUgkEolEIrky/wPjxbQKm0Pj6gAA
AABJRU5ErkJggg==)
```


B.3 3GP File with multiple media types

B.3.1 Introduction

This clause provides examples for MMBP message with conforming to `26143_CONTAINER_MP4_3GP9`.

B.3.2 Audio and Video in single file

The following example provides an MMBP that includes an EVS audio track and an HEVC video track in a single media in an 3gp file.

```
MIME-Version: 1.0
Content-Type: video/mp4, profiles="3gp9" codecs="hvc1.1.2.L93.B0,sevs"; name="av.3gp"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="av.3gp"

AAAAHGZ0eXBNNA... (base64-encoded 3GP AV file data truncated)
```

B.3.3 Audio and Video in Container

The following example provides an MMBP that includes an EVS audio file and an HEVC video file in a single container.

```
MIME-Version: 1.0
Content-Type: multipart/mixed; boundary="boundary42"

--boundary42
Content-Type: message/external-body; access-type=URL;
Content-Type: video/mp4, profiles="3gp9" codecs="hvc1.1.2.L93.B0";
name="video.3gp"
Content-Transfer-Encoding: base64

AAAAHGZ0eXBNNA... (base64-encoded 3GP video file data truncated)

--boundary42
Content-Type: message/external-body; access-type=URL;
Content-Type: audio/mp4, profiles="3gp9" codecs="sevs"; name="video.3gp"
Content-Transfer-Encoding: base64

BNAXGZeX... (base64-encoded 3GP audio file data truncated)
```

Annex C (informative): Transcoding Guidelines

C.1 Transcoding 3D scenes and assets

Transcoding may need to be performed to support UEs that lack the capabilities to render 3D scenes and assets as defined in clause 5.8. The transcoding operation for 3D scenes and assets is effectively a rendering operation, where the 3D scene or asset is rendered into an image, image sequence, or video. The Messaging Server (e.g. MMS Server/Relay) may select an appropriate pose or set of poses (e.g. along a pre-defined path) that it uses to render the 3D scene or asset.

Annex D (normative): API Definitions

D.1 Introduction

This Annex collects the stage-2 API definition supported with Interface Definition Language (IDL) description MMBP-GEN-API and MMBP-PLAY-API. Note that this does not form a full implementation but can be used as a reference for implementations in different environments.

D.2 MMBP-GEN-API

D.2.1 Introduction

The MMBP-GEN-API is typically used by a Message Service Sender to generate an MMBP according to this specification.

D.2.2 Filter Concept

D.2.2.1 General

The general methods defined in this clause allows packaging media resources into a conforming MMBP with focus on the baseline MMBP Generator Profile as defined in clause 6.3.

The encoding API is described by filters as for example defined here: https://wiki.gpac.io/Filters/filters_general.

Encoding architectures can be built by using filters. Filters are configurable processing units consuming and producing data packets. These packets are carried between filters through a data channel called *PID*. A PID is in charge of allocating/tracking data packets and passing the packets to the destination filter(s). Each output PID carries a set of properties describing the data it delivers (e.g. *width*, *height*, *codec*, ...).

Each filter exposes a set of argument to configure itself, using property types and values described as strings formatted with separators.

Each filter is declared by its name, with optional filter arguments appended as a list of colon-separated `name=value` pairs. For encoding, typical parameters are:

- `c=NAME`: identifies the desired encoding codec capability as defined in clause 5.
- `b=UINT`: indicates the bitrate in bits per second

Filters can then be linked, for example using the following principle:

```
generate [options] FILTER [LINK] FILTER [...]
```

For typical generation processes in the context of this specification, the following is applied

```
generate [options] INPUT_FILTER + ENCODE_FILTER + PACKAGE_FILTER +
  MULTIPLEX_FILTER
```

D.2.2.2 Specific Filters

Specific filters are for further study.

D.3 MMBP-PLAY-API

D.3.1 Introduction

The MMBP-PLAY-API is typically used by a messaging service client to playback an MMBP according to this specification.

D.3.2 Filter Conpcept

D.3.2.1 Overview

The general methods defined in this clause allow playing back media resources for conforming MMBP with focus on the baseline MMBP Player Profile as defined in clause 6.2.

D.3.2.2 Specific Filters

Specific filters are for further study.

Annex E (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2023-08	SA4#125	S4-231444				Initial draft	0.1.0
2023-11	SA4#126	S4-231670				New draft: S4-231993 (alignment from 26.140), S4-231958, S4-231871	0.2.0
2023-11	SA4-e (AH) MBS SWG post 126 (30 Nov. 2023)	S4aI230180				New draft: S4aI230183, S4aI230184	0.3.0
2023-12	SA#102	SP-231575				Version 1.0.0 created by MCC	1.0.0
2024-02	SA4#127	S4-240214				Version 1.1.0 created by the editor Agreed pCRs: - S4-240365 - S4-240419 - S4-240420 - S4-240287	1.1.0
2024-03	SA#103	SP-240025				Version 2.0.0 created by MCC	2.0.0
2024-03	SA#103	SP-240502				Version 2.1.0 created by the editor. Agreed pCR: - SP-240284	2.1.0
2024-03	SA#103					version 18.0.0 created by MCC	18.0.0
2024-06	SA#104	SP-240694	0001	1	B	Adding IVAS codec support	18.1.0
2024-06	SA#104	SP-240695	0002	2	F	CR on Corrections and Transcoding Guidelines	18.1.0
2025-03	SA#107	SP-250129	0003	1	F	Correction to xHE-AAC codecs parameter, AMR and EVS capability and media type signalling syntax	18.2.0
2025-04						Editorial correction	18.2.1
2025-09	SA#109	SP-250924	0004	1	B	[VOPS] On video coding capabilities and operating points	19.0.0
2025-09	SA-109	SP-251150	0005	5	B	[MeME-MED] Media Messaging Enhancements	19.0.0

History

Document history		
V19.0.0	October 2025	Publication