**3GPP TSG-SA4 Meeting #108e *S4-200XXX***

**e-meeting, 2 - 9 April 2020 revision of S4-200556**

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| *CR-Form-v12.0* | | | | | | | | |
| **Pseudo CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.511** | **CR** | **<CR#>** | **rev** | **1** | **Current version:** | **1.2.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Proposed Updates to Subtitles | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated, Orange | | | | | | | | | |
| ***Source to TSG:*** | SA4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GMS3 | | | | |  | ***Date:*** | | | 2020-03-31 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Subtitles not supported | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Recommends IMSC1.1 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No subtitle support | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.3, 4.5, 5.2.5 (new, inserted), 5.2.7.5 (new, inserted), 5.2.7.6, 5.2.8.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This pCR assumes that document S4-200510 is agreed. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**===== CHANGE =====**

# 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] ITU-T Recommendation H.264 (06/2019): "Advanced video coding for generic audiovisual services".

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

[4] 3GPP TS 26.117: "5G Media Streaming (5GMS); Speech and audio profiles".

[5] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[6] 3GPP TS 26.307: "Presentation Layer for 3GPP Services".

[7] ISO/IEC 23000-19: "Information Technology Multimedia Application Format (MPEG-A) – Part 19: Common Media Application Format (CMAF) for segmented media".

NOTE: This references the second edition which in FDIS stage is available as MPEG output document N18636.

[8] ISO/IEC 23001-7: "MPEG systems technologies - Part 7: Common encryption in ISO base media file format files".

[9] CTA-5003: "Web Application Video Ecosystem (WAVE): Device Playback Capabilities Specification" available here https://cdn.cta.tech/cta/media/media/resources/standards/pdfs/cta-5003-final.pdf.

[10] 3GPP TS 26.512: " 5G Media Streaming (5GMS); Protocols".

[11] IETF RFC 6381: The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types.

[12] 3GPP TS 26.116: "Television (TV) over 3GPP Services; Video Profiles".

[13] 3GPP TS 26.118: "Virtual Reality (VR) profiles for streaming applications".

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

[15] ISO/IEC 14496-15: "Information technology — Coding of audio-visual objects — Part 15: Carriage of network abstraction layer (NAL) unit structured video in the ISO base media file format".

[16] W3C IMSC1.1, "TTML Profiles for Internet Media Subtitles and Captions 1.1"*,* <http://www.w3.org/TR/ttml-imsc1.1>

[17] 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".

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## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP 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 3GPP TR 21.905 [1].

5GMS 5G Media Streaming

5GMSA 5G Media Streaming Architecture

AMR Adaptive Multi Rate

AMR-WB Adaptive Multi Rate – Wide Band

API Application Programming Interface

AS Application Server

AVC Advanced Video Coding

AVC-HD Advanced Video Codec – High Definition

CMAF Common Media Application Format

DASH Dynamic Adaptive Streaming over HTTP

EVS Enhanced Voice Services

HD High Definition

HDR High Dynamic Range

HEVC High Efficiency Video Coding

HLG Hybrid Log-Gamma

IMSC Internet Media Subtitles and Captions

MPEG Moving Picture Experts Group

MPEG-H It is a group of international standards under development by the ISO/IEC Moving Picture Experts Group (MPEG) - formally known as ISO/IEC 23008 - High efficiency coding and media delivery in heterogeneous environments

OMAF Omnidirectional Media Application Format

PSS Packet-switched Streaming Service

TTML Timed Text Markup Language

TV Television

UE User Equipment

UHD Ultra High Definition

VR Virtual Reality

VCL Video Coding Layer

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## 4.5 Subtitles

### 4.5.1 IMSC1.1. Text Track

##### 4.5.1.1 Decoding Capability

The IMSC1.1. Text Track decoding capability is defined as **IMSC1.1-TEXT-DEC**. Support for **IMSC1.1-TEXT-DEC** requires the support of an IMSC1.1 text processor as defined in W3C IMSC1.1 [16].

##### 4.5.1.2 ISO BMFF File Format

If an IMSC1.1. Text Track is provided in a bitstream that is decodable by a decoder capable of the **IMSC1.1-TEXT-DEC** decoding capabilities as defined in clause 4.5.1.1 and the media is encapsulated in an ISO BMFF Track [14], then the file format track shall conform to the requirements of the codec entry 'imt2' as defined in ISO/IEC 14496-30 [17].

##### 4.5.1.3 CMAF Track Definition

If **IMSC1.1-TEXT-DEC** media is provided in an CMAF track, then the CMAF track shall conform to

- the requirements of the ISO BMFF File format track defined in clause 4.5.1.2,

- the general CMAF Track constraints in ISO/IEC 23000-19, clause 7, as well as

- the general subtitle track constraints defined in ISO/IEC 23000-19, clause 11.

- the IMSC1.1. text track constraints defined in ISO/IEC 23000-19, Annex L.2.

##### 4.5.1.4 CMAF Switching Set Definition

If **IMSC1.1-TEXT-DEC** media is provided in an CMAF Switching Set, then

- only a single CMAF track according to the requirements in clause 4.5.1.3 shall be present.

##### 4.5.1.5 Playback Requirements

For a receiver supporting the IMSC1.1 Text Track media profile the following applies:

- It shall support the **IMSC1.1-TEXT-DEC** decoding capabilities as defined in clause 4.5.1.1.

- It shall support the following playback requirements as documented in clause 8 of CTA-WAVE 5003 [9] for any content conforming to a CMAF Switching Set as defined in clause 4.5.1.4, namely:

- 8.2 Sequential Track Playback

- 8.3 Random Access to Fragment

- 8.4 Random Access to Time

- It should support the following playback requirements as documented in clause 8 of CTA-WAVE 5003 [9] for any content conforming to a CMAF Switching Set as defined in clause 4.2.1.4 namely:

- 8.9 Out-Of-Order Loading

- 8.10 Overlapping Fragments

- 8.12 Playback of Encrypted Content

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### 5.2.5 Subtitles

If the 5GMS client supports the reception of subtitles:

- the IMSC1.1 Text Track decoding capabilities **IMSC1.1-TEXT-DEC** as defined in clause 4.5.1.1 should be supported.

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#### 5.2.7.5 Subtitle media profiles

If the 5GMSd client supports the reception of subtitle, then the following should be supported:

- the **IMSC1.1 text track** playback requirements as defined in clause 4.5.1.5.

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#### 5.2.7.6 Encrypted content

If the 5GMSd client supports encrypted content and any of the video playback requirement as defined in clause 5.2.5.2, then the 5GMSd client shall support the playback requirements for encrypted content as documented in clause 8 of CTA-WAVE 5003 [9], clause 8.12 for either:

- video content encrypted according to [7] clause 8, using the 'cenc' AES-CTR subsample pattern encryption scheme, as specified in [8], clause 10.1; or

- video content encrypted according to [7] clause 8, using the 'cbcs' AES-CBC subsample pattern encryption scheme, as specified in [8], clause 10.4, with the following restrictions Pattern Block length of 10 and an encrypt:skip pattern of 1:9 as defined in clause 9.6 of [8].

If the 5GMSd client supports decrypted content and any of the video playback requirement in clause 5.2.5.2, then the 5GMSd client should support the playback requirements for encrypted content as documented in clause 8 of CTA-WAVE 5003 [9], clause 8.12 for both:

- video content encrypted according to [7] clause 8, using the 'cenc' AES-CTR subsample pattern encryption scheme, as specified in [8], clause 10.1, and

- video content encrypted according to [7] clause 8, using the 'cbcs' AES-CBC subsample pattern encryption scheme, as specified in [8], clause 10.4, with the following restrictions Pattern Block length of 10 and an encrypt:skip pattern of 1:9 as defined in clause 9.6 of [8].

If the 5GMSd client supports encrypted content and any of the speech and audio playback requirement in clause 5.2.5.3 and clause 5.2.5.4, then the 5GMSd client shall support the playback requirements for encrypted content as documented in clause 8 of CTA-WAVE 5003 [9], clause 8.12 for either:

- audio content encrypted according to [7] clause 8, using the 'cenc' AES-CTR subsample pattern encryption scheme, as specified in [8], clause 10.1, or

- audio content encrypted according to [7] clause 8, using the 'cbc1' AES-CBC subsample pattern encryption scheme, as specified in [8], clause 9.7.

If the 5GMSd client supports encrypted content and any of the speech and audio playback requirement in clause 5.2.5.3 and clause 5.2.5.4, then the 5GMSd client should support the playback requirements for encrypted content as documented in clause 8 of CTA-WAVE 5003 [9], clause 8.12 for both:

- audio content encrypted according to [7] clause 8, using the 'cenc' AES-CTR subsample pattern encryption scheme, as specified in [8], clause 10.1, and

- audio content encrypted according to [7] clause 8, using the 'cbc1' AES-CBC subsample pattern encryption scheme, as specified in [8], clause 9.7.

Any subtitle track, if present, should not be encrypted.

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#### 5.2.8.4 Subtitle media profiles

For IMSC1.1 Text Tracks,

- the <profiles> parameter is defined in ISO/IEC 23000-19 [7], clause 11.3.3 as application/mp4 profiles='im2t'

- the <codecs> parameter is defined in ISO/IEC 23000-19 [7], clause 11.3.3 as 'stpp.ttml.im2t'