**3GPP TSG SA WG4 #110 *S4-201221***

**19th – 28th August 2020** revision of ***S4-201074***

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| *CR-Form-v12.0* |
| **Pseudo CHANGE REQUEST** |
|  |
|  | **26.512** | **CR** | **<CR#>** | **rev** | **2** | **Current version:** | **1.3.0** |  |
|  |
| *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 |  |

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|  |
| ***Title:***  | DASH/CMAF in 5GMSd |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** | SA4 |
|  |  |
| ***Work item code:*** | 5GMS3 |  | ***Date:*** | 2020-08-17 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *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 canbe 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:*** | DASH and CMAF not mentioned, no relation to TS26.511 |
|  |  |
| ***Summary of change:*** | First attempt to connect the dots |
|  |  |
| ***Consequences if not approved:*** | We have control for nothing to stream |
|  |  |
| ***Clauses affected:*** | 2, 4.6., 10 |
|  |  |
|  | **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:*** |  |
| ***56***  |  |
| ***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] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[3] DASH Industry Forum, "Specification of Live Media Ingest",
<https://dashif-documents.azurewebsites.net/Ingest/master/DASH-IF-Ingest.pdf>

[4] 3GPP TS 26.247: "Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP‑DASH)".

[5] Standard ECMA-262, 5.1 Edition, "ECMAScript Language Specification", June 2011.

[6] IETF RFC 6234: "US Secure Hash Algorithms (SHA and SHA-based HMAC and HKDF)".

[7] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[8] ITU-T Recommendation X.509 (2005) | ISO/IEC 9594-8:2005: "Information Technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks".

[9] IETF RFC 7230: "Hypertext-Transfer Protocol (HTTP/1.1): Message Syntax and Routing".

[10] IETF RFC 4648: "The Base16, Base32, and Base64 Data Encodings".

[11] IEEE Standard 1003.1, Issue 7: "The Open Group Base Specifications", 2018.
<https://pubs.opengroup.org/onlinepubs/9699919799/>

[12] 3GPP TS 26.511: "5G Media Streaming (5GMS); Profiles, codecs and formats".

[13] ISO/IEC 23009-1: "Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats".

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

## 4.6 Procedures of the M4d (Media Streaming) interface

### 4.6.1 Procedures for DASH Session

This procedure is used by a 5GMSd Client to establish a DASH session via the M4d interface. In order to establish such a session, the 5GMSd AS shall host an MPD as defined in ISO/IEC 23009-1 [13] or TS26.247 [4] and the MPD URL is known to the 5GMSd Client typically using M8d.

The Media Player receives an MPD URL from the the 5GMSd-Aware Application through M7d by methods defined in clause 13. The Media Player shall send an HTTP GET message to the 5GMSd AS including the URL of the MPD resource. On success, the 5GMSd AS shall respond with a 200 (OK) message that includes the requested MPD resource.

Additional procedures for reactions to different HTTP status codes are provided in TS26.247 [4], clause A.7 and ISO/IEC 23009-1 [13] clause A.7.

Additional procedures for handling partial file responses are provided in TS26.247 [4], clause A.9.

### 4.6.2 Procedures for Progressive Download Session

This procedure is used by a 5GMSd client to establish a Progressive Download session via the M4d interface. In order to establish such a session, the 5GMSd AS shall host an 3GP/MP4 file as defined in TS26.247 [4]. The 3GP/MP4 URL is known to the Media Player (in this case a progressive download player), typically by using M8d.

The Media Player receives a URL from the the 5GMSd-Aware Application through M7d by methods defined in clause 13. The Media Player shall send an HTTP GET message to the 5GMSd AS including the URL of the 3GP/MP4 resource. On success, the 5GMSd AS shall respond with a 200 (OK) message that includes the requested 3GP/MP4 resource.

Additional procedures for reactions to different HTTP status codes are provided in TS26.247 [4].**===== CHANGE =====**

## 10 Media Streaming (M4) APIs10.1 General

This clause deals with the interface and APIs for media streaming for different distribution formats and protocols.

## 10.2 DASH Distribution

In the case of DASH distribution, M4d is relevant for the distribution as shown in Figure 10.1-1.



Figure 10.1-1 M4d usage for DASH distribution

For DASH-based distribution according to TS26.247 [4] and ISO/IEC 23009-1 [13], two main formats are of relevance:

1. The Media Presentation Description (MPD) that is processed in the DASH Access Client.
2. The Segment formats that are passed through the DASH access client and processed in the Media Playback and Content Decryption Platform. Note that the DASH access client may parse Segments to extract for example Inband Events or producer reference times.

Other resources may be referenced in the MPD, for example DRM related information.

The Segment formats for DASH Streaming in the context of 5G Media Streaming are defined in TS 26.511 [12] based on the CMAF encapsulation. The DASH Access Client downloads the Segments from the 5GMSd AS based on the instructions in the MPD and the instructions from the 5GMSd-Aware Application through M7d (see clause 13 for details).

The interface between the DASH Access Client and the Media Playback and Content Decyrption Platform as well as the 5GMSd Client requirements for media codecs are documented in TS 26.511 [12].

The following requirements apply for M4d:

1. The Media Presentation Description (MPD) and Segments shall conform to an MPD according to ISO/IEC 23009-1 [13] or TS 26.247 [4].
2. The Segment formats should conform to CMAF addressable resources as well as to the requirements in TS 26.511 [12].
3. The Media Presentation should conform to the 5G Media Streaming DASH Interoperability Point as defined in clause 7.3.11 of TS 26.247 [4].

A 5GMSd Client shall support the 5G Media Streaming DASH Interoperability Point as defined in TS 26.247 [4], clause 7.3.11. A 5GMSd Client may support additional DASH profiles and interoperability points.