**3GPP TSG SA WG4#120e S4-220950**

**E-meeting, 17th – 26th August 2022**

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| *CR-Form-v12.0* |
| **Draft CHANGE REQUEST** |
|  |
|  | **26**.**501** | **CR** | **draft** | **rev** | **-** | **Current version:** | **17.2.0** |  |
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| *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:***  | **[5GMSA\_Ph2] End-to-end low latency live streaming** |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | **5GMSA\_Ph2** |  | ***Date:*** | 11/08/2022 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | 18 |
|  | *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)* |
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| ***Reason for change:*** | The work item in SP-220614 asks among others for the following:2. End-to-end low latency live streaming:- Inclusion of the collaboration scenarios and call flows for end-to-end low latency live streaming.- Updating the reference point to support low latency live streaming services.- Inclusion of the typical operational points. |
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| ***Summary of change:*** | The CR addresses the above objectives by addinga) one call flow into that documents provisioning, ingest, distribution, presentation and monitoring aspects of low-latency live streaming services using CMAF Chunks.b) Updates to reference points to support provisioning, ingest, distribution, presentation and monitoring aspects of low-latency live services using CMAF Chunks.c) Typical configurable service parameters and operation points in terms of bit rates, latencies, Audience Drift Gaps, etc. |
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| ***Consequences if not approved:*** | Work Item objectives not complete |
|  |  |
| ***Clauses affected:*** | 2  |
|  |  |
|  | **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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***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*.

[X] DASH-IF: "IOP Guidelines v5, Low-latency Modes for DASH",
<https://dash-industry-forum.github.io/docs/CR-Low-Latency-Live-r8.pdf>

===== CHANGE =====

## 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].

(SNIP)

**Service Description**: A set of parameters and/or parameter ranges describing the requirements of the streaming service that is used by the Media Player to follow the service requirements by association with a Service Operation Point.

**Service Operation Point**: A set of parameters and/or parameter ranges and used by the 5GMS AF to determine dynamic policies and QoS parameters based on the Service Description.

(SNIP)

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### 4.2.3 Service Access Information for Downlink Media Streaming

(SNIP)

When the content hosting feature is activated for a downlink streaming session, the parameters from Table 4.2.3-1a below can additionally be present.

Table 4.2.3-1a: Streaming Access parameters

|  |  |
| --- | --- |
| Parameters | Description |
| Media Player Entry | A document or a pointer to a document that defines a media presentation e.g. MPD for DASH content or URL to a video clip file. |
| Service Operation Point | Detailed information about the parameters that are associated with the selected Service Description to support the QoS requirements of the service, such as latency, bit rate targets and so on. |

(SNIP)

===== CHANGE =====

## 5.X Dynamic Policy based on Service Operation Point signalling

### 5.X.1 Procedure

This clause provides an extension to the general call flow in clause 5.2.3 in order to address the usage of Servic Descriptions and Service Operation Points in downlink 5G Media Streaming services.



Figure 5.11.4.1-1: High-level procedure for DASH content for Operation Point handling

Prerequisites:

- The 5GMSd Application Provider has provisioned the 5G Media Streaming System and has set up content ingest.

- The 5GMSd-Aware Application has received the Service Announcement from the 5GMSd Application Provider.

Extended Steps:

1: Policy Templates are defined

12: Media Player informs application about the current set of Service Descriptions.

13: 5GMSd-Aware Application selects a Service Description.

14: Media Player provides associated Service Operation Point parameters to the Media Session Handler.

15: Media Session Handler selects a Dynamic Policy based on the provided Service Operation Point parameters.

21: Media Player provides Service Description metrics to the Media Session Handler.

22: Media Session Handler sends Service Operation Point measurements and events to the 5GMSd AF.

### 5.X.2 Use of Service Operation Point signalling to optimise delivery of low-latency live media streaming services (informative)

#### 5.X.2.1 5GMS System acts as a CDN

In this case, the specific aspects are as follows:

1) A provisioning agreement is struck between the 5GMS Application Provider and the operator of the 5GMS System in the form of one or several Servcie Operation Points and/or Policy Templates. (Service Operation Points may be derived from Policy Templates if the latter are omitted, or *vice versa*.)

2) DASH or HLS content is provided externally. The content is published to the 5GMS System for distribution over downlink media streaming.

3) Content is ingested at reference point M2d such that the latency requirements can be met.

4) The 5GMS System distributes the ingested content according to the agreed Service Operation Points, i.e. meeting bit rate and latency requirements.

5) The Service Operation Point metrics collated by the 5GMSd AF are used by the 5GMS System to determine whether the agreed Service Operation Point has been satisfied, or whether the Policy Templates need to be adjusted so that it can be satisfied.

Editor’s Note: Create a call flow addressing:

For the above open issues, the following candidate solutions are considered:

- On M1d:

- Policy Template updates to support TV services.

- Provisioning extension to support Collaboration 3.

- On M2d:

- DASH-IF Ingest Specification: <https://dashif-documents.azurewebsites.net/Ingest/master/DASH-IF-Ingest.html>

- MPD extensions to support signalling of Operation Points using Service Description.

- On M4d:

- DASH-IF Low-Latency Extensions: <https://dash-industry-forum.github.io/docs/CR-Low-Latency-Live-r8.pdf>

- UTC Time Sync that can be used by the 5GMS AS and the 5GMS Client in order to measure latency accurately. A 3GPP-based network time source may be provided.

- New DASH and CMAF functionalities that support enhanced TV services, such as pre-selection.

- On M5d:

- Updates to DASH QoE metrics reporting for monitoring latency and Audience Drift Gap.

- On M6d:

- Extensions to M6 to address the requirements.

- General support:

- DASH-IF Low-Latency Extensions: <https://dash-industry-forum.github.io/docs/CR-Low-Latency-Live-r8.pdf>

#### 5.X.2.2 5GMS AS deployed in an external DN

Editor’s Note: Create a call flow addressing the case for which the 5GMS AS deployed in an external DN.