**SA4-3GPP SA4 #122 S4-230380**

**20-24 Feb 2023, Athens, GR Rev of S4-230284**

**Source: Tencent, Qualcomm Incorporated, BBC, Ericsson LM, Orange, Huawei Technologies Co., Ltd, AT&T, Dolby Laboratories Inc., Sony Europe B.V.**

**Title: WID on Advanced 5G Media Streaming Architecture**

**Document for: Approval New**

**Agenda Item: 8.7**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: New WID on 5G Media Streaming Architecture Phase 2

## Acronym: 5GMS\_Ph2

## Unique identifier: 960047

Potential target Release: Rel-18

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  | X |  |
| **No** | X |  | X |  |  |
| **Don't know** |  |  |  |  | X |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a …

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| 5GMSA | SA4 | 820002 | 5GMSA 5G Media streaming architecture |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 840001 | 5GMS3 5G Media Streaming stage 3 | Addressed stage-3 in 5G Media Streaming by updating TS 26.247 as well as new specs in TS 26.511, TS 26.512, and TS 26.117. |
| 900029 | Study on 5G media streaming extensions | Studied the current limitation of 5G Media Streaming architecture, and documented possible extensions in TR 26.804. |
| 870014 | Feasibility Study on Multicast Architecture Enhancements for 5G Media Streaming | Identified and evaluated potential enhancements to the 5G Media Streaming Architecture to provide multicast-broadcast media streaming services in TR 26.802. |

## 3 Justification

TS 26.501 defines the 5GMS architecture, call flows, and procedures. While this specification defines the general architecture, core features and functionalities, several features are missing from it. The FS\_5GMS-EXT study has explored several of these topics which are documented in TR 26.804. Similarly, the FS\_5GMS\_Multicast study has identified and evaluated potential enhancements to the 5GMS architecture to provide multicast-broadcast streaming services, documented in TR 26.802.

Particularly, some of the TR 26.804 recommendations are:

1. Uplink streaming is one of the two key use cases in the 5G Media Streaming Architecture. However, while TS 26.501 and TS 26.512 extensively describe and define the functionalities and APIs for downlink streaming, the uplink streaming is severely underdefined and lacks the essential features needed for mainstream deployments. Recently, the FS\_5GMS-EXT study explored the 5GMSA uplink streaming features and compared them to the uplink streaming defined in TS 26.238. This study explored five collaboration scenarios for uplink streaming in 5GSMA architecture. For each scenario, a high-level call flow was developed. Several gaps were identified during this process. Additionally, the uplink steaming features of TS 26.501 and TS 26.512 were compared with both TS 26.238 as well as the download streaming features of TS 26.501 and TS 26.512, and the missing features and functionalities are identified. The goal of this work item for this topic is to add extensions to TS 26.501 to make the uplink streaming deployable in 5G networks.

2. Live TV services of different scales (professional, user-generated, session-based, etc.) are increasingly distributed over broadband and mobile networks, including 5G Networks. To address these s services, the 5G Media Streaming Architecture needs to support low latency live protocols including the combination of low-latency CMAF formats, chunked transfer from the content provider to the device, as well as consistent signaling and support of service quality points. The FS\_5GMS-EXT study developed the collaboration scenarios and related call flows for the distribution of low latency content using the 5G Media Streaming architecture. It also defined the gaps in TS 26.501 various reference points to support low latency live streaming.

3. Until now, 3GPP specifications for 5G Media Streaming have avoided addressing the detailed question of how to bootstrap 3GPP-defined UE and network functions such as the Media Session Handler or the MBMS/MBS Client. This is deferred to implementation, device pre-configuration, and so on. However, the lack of specification covering the key issue #12 in TR 26.804, is hindering adoption of 5GS-supported media services because today UE applications may have to be modified in order to support such services. For detailed discussion refer to clause 5.13 in TR 26.804.

In addition, TR 26.802 recommends documenting:

3. Relevant call flows and procedures to support carriage of 5GMS streaming sessions over 5MBS as documented in TR 26.802 clause 7.3.5.

4. Relevant call flows and procedures to support 5GMS hybrid services (5MBS and 5GMS), specifically architecture and call flows for the following hybrid 5GMS unicast and 5MBS scenarios with high priority (based on existing functionalities in eMBMS): (i) Interactive Service, (ii) Session Continuity, (iii) Time-shifted viewing, (iv) Targeted content replacement, (v) Reporting, and (vi) Unicast recovery.

5. MBMS supports Hybrid DASH/HLS delivery based on CMAF content as defined in TS 26.346, clause 5.6 and 5.7. This option is not supported in 5GMS which in itself results in limitations but results in limitations when running 5GMS via eMBMS. Support for hybrid DASH/HLS is essential.

In addition:

6. To support interoperability in scenarios where the 5GMS AS is deployed in the Trusted DN, reference point M3 needs to be more fully defined including:

- Definition of relevant call flows and procedures to support configuration of 5GMS AS instances by the 5GMS AF.

7. To provide more extensive reporting of Network Assistance usage for both the AF-based and ANBR-based Network Assistance methods, the definition of the data collection and reporting feature needs to be improved.

## 4 Objectives

The Work Item has the following objectives:

1. Uplink streaming:

- Updating the procedures for uplink streaming to be on par with downlink streaming.

- Include collaboration scenarios and their associated call flows.

- Adding informative call flows for connected uplink-downlink media streaming sessions.

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.

* 1. Inclusion of the typical operational points.

3. 5GMS over 5MBS:

- Adding call flows and procedures to support carriage of 5GMS streaming sessions over 5MBS.

4. 5GMS hybrid services (5MBS and 5GMS):

- Adding call flows and procedures to support 5GMS hybrid services (5MBS and 5GMS).

5. Hybrid DASH/HLS operation:

- Updating existing call flows and procedures to support hybrid DASH/HLS delivery in 5GMS architecture.

6. Configuration of 5GMS AS instances by 5GMS AF at reference point M3:

- Inclusion of collaboration scenarios and associated call flows for configuration of 5GMS AS.

7. Improvements to data collection and reporting to better support the Network Assistance feature:

- Data collection and reporting to be carried out also for the ANBR-based Network Assistance method.

- Allowing the usage of the appropriate Aggregation Functions for both Network Assistance methods.

8. Extension of the baseline 5G Media Streaming architecture and relevant call flows to add a 3GPP Service and URL Handler in the UE and the network based on the conclusions in clause 6.13.

The work is to be carried out in close collaboration with SA2 and other 3GPP groups.

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
|  |  |  |  |  |  |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| *26.501* | Phase 2 Features for 5G Media Streaming | *SA#100 (Jun’ 23)* |  |

## 6 Work item Rapporteur(s)

Iraj Sodagar, Tencent, <irajs@live.com>

## 7 Work item leadership

SA4

## 8 Aspects that involve other WGs

SA2 on architectural impacts.

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Tencent |
| Qualcomm Incorporated |
| BBC |
| Ericsson LM |
| Orange |
| Huawei Technologies Co., Ltd |
| AT&T |
| Dolby Laboratories Inc. |
| Sony Europe B.V. |