**3GPP TSG SA WG4#116e S4-211668**

**E-meeting, 10th – 19th November 2021**

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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  |  **[5MBUSA] 5GMS via MBS Procedures** |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | 5MBUSA |  | ***Date:*** | 03/11/2021 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** |   |
|  | *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:*** |  |
|  |  |
| ***Summary of change:*** |  |
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| ***Consequences if not approved:*** |  |
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| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR 26.502 |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
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| ***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 23.501: "System architecture for the 5G System (5GS)".

[3] 3GPP TS 23.502: "Procedures for the 5G System (5GS)".

[4] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[5] 3GPP TS 26.238: "Uplink streaming".

[6] 3GPP TS 26.307: "Presentation layer for 3GPP services".

[7] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[8] 3GPP TS 26.234: "Transparent end-to-end Packet-switched Streaming Service (PSS); Protocols and codecs".

[9] 3GPP TS 23.003: "Technical Specification Group Core Network and Terminals; Numbering, addressing and identification".

[10] 3GPP TS 28.530: "Management and orchestration; Concepts, use cases and requirements".

[11] 3GPP TS 28.531: "Management and orchestration; Provisioning".

[12] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[X] 3GPP TS 26.502: "5G Multicast-Broadcast User Service Architecture".

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

## 4.6 5G Downlink Media Streaming via MBS

### 4.6.1 Architecture for 5G Downlink Media Streaming over MBS

Figure 4.6.1-1 below depicts the architecture for downlink 5G Media Streaming via eMBMS.



Figure 4.6.1-1: Architecture for 5G Media Streaming over MBS

This arrangement allows 5GMS-based downlink media streaming to be deployed as an MBS-aware Application on top of MBS as defined in TS 26.502 [X].

In this case:

- The 5GMSd AF shall configure the delivery of 5GMSd content to an MBS Client in the UE by provisioning an MBS User Service session in the MBSF. In order to additionally deliver this content over an MBS User Service, the 5GMSd AF shall invoke Nmb10 control plane procedures on the MBSF as specified in clause X of TS 26.502 [X] and, as a result, content shall be ingested by the MBSTF from the 5GMSd AS using the Nmb8 Object Distribution procedures specified in clause Y of TS 26.502 [X].

- The *MBS Client* is controlled by the 5GMSd Client via the MBS-6 and MBS-7 APIs as specified in clause X of TS 26.502 [X].

- The MBS Client receives media objects from the MBSTF according to the Object Distribution Method specified in clause X of TS 26.502 [X]. If an uplink is available to the MBS Client and if associated delivery procedures as specified in clause X of TS 26.502 [X] are activated, it should use the associated delivery procedures to recover damaged media objects received from the MBSTF via MBS-4-UC from MBS AS.

- The *Media Server* function interfaces with the MBS Client and shall expose the content received (and possibly repaired) by the MBS Client to the 5GMSd Client via the HTTP client-to-application interface.

- In case a media object transmitted via the MBS User Service is not received in time by the MBS Client, or if it cannot be repaired in time for consumption by the 5GMSd Client, the Media Server returns an error in response to the Media Player’s request for the media object, and the Media Player may instead attempt to retrieve the media object from the 5GMSd AS at reference point M4d, if available.

NOTE: In this case, it is necessary to retrieve the entire media object via M4d.

In the architecture, no new functions or interfaces are defined. However, some of the reference points need extensions to support different scenarios for 5GMS via MBS delivery. Collaboration scenarios for 5GMS via MBS are documented in Annex D. Necessary extensions to support these scenarios are documented in the following clauses. Procedures for 5GMS via MBS are defined in clause 5.11.

### 4.6.2 Extensions to 5GMS reference points

#### 4.6.2.1 Extensions to reference point M1d

Reference point M1d is extended as follows to provision the carriage of 5GMS content via eMBMS:

- The permission to distribute content via MBS.

#### 4.6.2.2 Extensions to reference point M5d

Reference point M5d is extended as follows to support the reception of 5GMS content via MBS:

- The 5GMS Service Access Information is extended to include the relevant information of the MBS Service Announcement in order to bootstrap reception of the MBS user service, typically a service identifier. This is passed by the Media Session Handler to the MBS Client via reference point MBS-6 [X].

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## 5.11 5GMS via MBS

### 5.11.1 General

This clause defines prcoedures for different use cases and scenarios when 5GMS is using MBS for delivery.

### 5.11.2 Procedures for 5GMS content delivered exclusively via MBS

The call flow in Figure 5.11.2‑1 extends that defined in clause 5.3.2 to address the delivery of 5GMS media data exclusively via MBS, i.e. media content is not using M4d, but only MBS User Services.



**Figure 5.11.2-1: High-level procedure for DASH content delivery via MBS**

Prerequisites:

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

- The 5GMS AF has informed the MBSF about the availability of 5GMS content.

- The MBSF is ingesting content from the 5GMS AS, using either pull mode or push mode.

- The MBSF is pushing content.

- The MBSF has broadcast the MBS Service Announcement.

Steps:

1: The 5GMSd-Aware Application triggers the Service Announcement procedure and the 5GMS Service and Content Discovery procedure at reference point M8.

2: A media content item is selected.

3: The 5GMSd-Aware Application triggers the 5GMSd Client to start media playback. The Media Player Entry is provided to the 5GMSd Client.

4: If the 5GMS-Aware Application has received only a reference to the Service Access Information (see step 1), the Media Session Handler interacts with the 5GMSd AF to acquire the whole Service Access Information.

5–9: The Media Session Handler acts as an MBS-Aware Application and initiates service acquisition. For details, see TS 26.502 [X]. This establishes a transport session for the MPD and the Content.

10: The Media SessionHandler provides the MPD URL to the Media Player either directly or through the 5GMSd-Aware Application.

11: The Media Player is invoked to start media access and playback.

12: The Media Player retrieves the media entry point resource (an MPD) from the proxy Media Server.

13: The Media Player processes the retrieved MPD. It determines, for example, the number of transport sessions needed for media acquisition. The Media Player should be able to use the MPD information to initialize the media pipelines for each media stream (see step 17). The MPD should also contain sufficient information to initialize the DRM client, when DRM is used (see step 16).

14: The Media Player notifies the Media Session Handler about the start of a new downlink media streaming session. The notification may include parameters from the MPD.

15: Optional: The Media Player acquires any necessary DRM information, for example a DRM License.

16: The Media Player configures the media playback pipeline.

17: The Media Player retrieves initialization segment(s) referenced by the MPD.

18: The Media Player retrieves media segments from the proxy Media Server according to the MPD and forwards them to the appropriate media rendering pipeline.

### 5.10.3 5GMS Consumption Reporting procedures for MBS

Editor’s Note: To be determined.

### 5.10.4 5GMS Metrics Reporting procedures for MBS

Editor’s Note: To be determined.

### 5.10.5 Procedures for 5GMS content delivery via 5G System and MBS

Editor’s Note: To be determined.

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Annex D (informative):
Collaboration Models for 5GMS via MBS

# D.1 Introduction

For 5GMS via MBS as introduced in clauses 4.2.4 and 5.11, different deployment collaboration scenarios of the architecture as provided in clause 4.2.4 may be considered.

Editor’s Note: Detailed collaboration and deployment model are FFS