**3GPP TSG SA WG4#113-e** ***S4-210617***

**E-meeting, 6th-14th April, 2021 A revision of *S4-210495***

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| *CR-Form-v12.0* | | | | | | | | |
| **PSEUDO CHANGE REQUEST** | | | | | | | | |
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|  | **TR 26.802** | **CR** | **–** | **rev** | **–** | **Current version:** | **1.0.8** |  |
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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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:*** | pCR to TR26.802 on 5GS Broadcast-Multicast User Service | | | | | | | | | |
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| ***Source to WG:*** | TELUS | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_5GMS\_Multicast | | | | |  | ***Date:*** | | | 2021-04-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **D** |  | | | | | ***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)*. | | | | | | | |  | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Added potential standardization areas and solutions | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.2 and 7.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Changes against baseline document TR 26.802 v0.3.0 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

FIRST CHANGE

[26] 3GPP TS 23.247, v0.1.0: "Architectural enhancements for 5G multicast-broadcast services; Stage 2;" Release 17.

## 3.1 Terms

**Broadcast MBS Session:** See TS 23.247 [26].

**Multicast MBS Session:** See TS 23.247 [26].

**MBS Session:** See TS 23.247 [26].

**5MBS User Service:** Services provided to the end user by means of 5MBS transport and possibly other capabilities.

NEXT CHANGE

## 6.2 Potential Standardization Areas

### 6.2.1 Introduction

Initially, the following areas are identified as potential standardization areas:

* Create Delivery Methods in the MBSTF to support 5MBS User Service to use 5MBS capabilities.
* Define Service aspects in MBSF, such as User Service Announcement.
* Using 5MBS together with 5G Media Streaming Architecture is one scenario.
* Define Nmbsf/Nx4 (based on xMB-C) and Nmbstf/Nx5 (based on xMB-U). It is assumed that MB2 interface will be supported in Release 17 “as is”.
* Define the realization of Nx2 (between MBSF and MBSTF), which configures and controls the delivery functions (like object delivery).
* Expect to have a new spec TS 26.502 to document these potential standardization areas.

### 6.2.2 5MBS User Service Architecture

Figure 6.2-1 provides a view of the network architecture for 5MBS User Service delivery and control. In this figure, two potential standardization areas are identified:

1. How AF and MBSF interact to support MBS session operations and transport (i.e. xMB-C and MB2-C reference points).

2. How to provide MBSTF functionality related to MBS data handling (e.g. encoding) via xMB-U and MB2-U interfaces. Based on the definition in TS 23.247, MBSTF performs generic packet transport functionalities available to any IP multicast enabled application such as framing, multiple flows, packet FEC (encoding). It also performs multicast/broadcast delivery of input files as objects or object flows. If needed, MBSTF provides a media anchor for MBS data traffic and sourcing of IP multicast.



Figure 6.2-1: Network Architecture for 5MBS User Service Delivery and Control

NEXT CHANGE

# 7 Potential Solutions

## 7.1 General

This clause provides potential solutions for the standardization areas identified in clause 6.

## 7.2 Support of multicast ABR in 5G Media Streaming Architecture

(SNIPPED)

## 7.3 Multicast-Broadcast User Service

### 7.3.1 Introduction

An “MBMS user service”-like support is expected to be provided by the MBSF and MBSTF. 5MBS User Services enable applications. It presents a complete service offering to an end-user, via a set of APIs that allows the 5MBS Client to activate or deactivate reception of the service.

The 5MBS User Service architecture is independendent of 5G Media Streaming (5GMS) and may be used without 5GMS. There are scenarios where 5GMS is the northbound application function, as depicted in clause 5.4 where four different deployment models are presented. In another example, 5G Multicast ABR media streaming service could be a User Service where the 5MBS User Services allow streaming of DASH content as defined in TS 26.501, and it also includes the use of a MBS session to deliver the DASH segments in multicast. When delivering content to a 5MBS Client, the MBSTF uses one or more 5MBS Delivery Methods.

Figure 7.3.1-1 depicts a potential solution for functional entities in MBSF and MBSTF to support 5G Multicast-Broadcast User Service.



Figure 7.3.1-1: 5GS multicast-broadcast user service functional entities

### 7.3.2 MBSF

The following functions in the MBSF to support 5MBS will be defined in 3GPP TS 23.247 [26]:

- Interacting with MB-SMF for MBS session operations, determination of N6 transport parameters, and session transport (via interface Nx1).

- Selection of serving MB-SMF for an MBS Session (via interface Nx1).

- Configuration (via interface Nx2) of the sender IP multicast address to use for the MBS session in cases where the IP multicast stream is originated by the MBSTF.

The following MBSF functionality and procedures related to service and MBS data handling to support 5MBS User Service are studied in the present document:

- Interacting with the MBSTF (if needed) for 5MBS Delivery Method control (via Nx2).

- Interacting with the AF (optionally via NEF) (via xMB-C).

Editor’s Note: It is assumed that MB2-C interface will be supported in Release 17 “as is”, as specified in 3GPP TS 29.468 [18] and RFC 6733 [20].

- Interacting with the PCF (via Nx3) to relay or initiate a request for different PCF treatment.

- Interacting with the UE (via MBS-5).

NOTE: The MBS-5 interface might be a abstract interface, i.e. using an undefined/external transport.

- The User Service Discovery/Announcement provides session access information, which is necessary to initiate the reception of a 5MBS User Service. The session access information may contain information for presentation to the end-user, as well as application parameters used in generating service content to the 5MBS Client.

### 7.3.3 MBSTF

In MBSTF, the use of reference point N6 to provide IP multicast traffic delivery to the MB-UPF will be defined in 3GPP TS 23.247 [26].

The following MBSTF functionality and Delivery Methods related to MBS data handling, to support 5MBS User Services, will be studied in the present document.

- Interacting with the AS (via interface xMB-U).

- Interacting with the UE (via MBS-4-MC).

A set of 5MBS Delivery Methods are provided by the MBSTF. These provide functionality such as security and key distribution, reliability control (by means of FEC techniques) and associated delivery procedures. The following Delivery Methods will be studied in the present document:

***- Object delivery method:*** Functionally, this is equivalent to the “Download Delivery Method” in TS 26.346 [16] and also supports the delivery of media segments (as special objects).

Figure 5.3.1.1-1 illustrates a simplified user plane model of FLUTE as an example of a possible MBSTF object delivery method.

Editor’s Note: The protocol to support the object delivery function is for future study.

***- Transparent delivery method:*** This supports the IP streaming use cases, for which UDP payloads (also referred to as Application Data Units) are distributed as part of UDP or IP flows carried to the UE over an MBS session. Examples of higher layer protocols are RTP, packetized MPEG-2 TS or other UDP-based streams.

***- Group Communication delivery method:*** This delivers a multicast UDP/IP packet flow to the UE.

Editor’s Note: The potential merger of Transparent delivery method and Group Communication delivery method is for future study. Other delivery methods may be added beyond the current release.

The above Delivery Methods may use either a multicast or broadcast session to deliver content to a receiving application, and may also make use of a set of 5MBS associated delivery procedures.

***MBS session*** refers to a multicast session or a broadcast session, as defined in TS 23.247 [26].

- In a ***Multicast MBS session***, an MBS session delivers the multicast communication service. A Multicast MBS session is characterised by the content to send, by the list of UEs that may receive the service and, optionally, by a multicast area in which to distribute it

- In a ***Broadcast MBS session***, an MBS session delivers the broadcast communication service. A broadcast MBS session is characterised by the content to send and the geographical area for content distribution.

### 7.3.4 5MBS together with 5G Media Streaming Architecture

Figure 7.3.4-1 depicts a deployment of 5G Media Downlink Streaming delivery over multicast. The 5GMSd Application Provider is a combined external application entity and content-specific media functionality (e.g. media creation, encoding and formatting) that uses the 5GMS System to distribute media to a 5GMSd-Aware Application.



Figure 7.3.4-1: 5G multicast media streaming User Service functional entities

The 5GMSd AF provides 5G Media Downlink Streaming provisioning, and various control functions to the Media Session Handler in the 5GMS Client located in the UE. It may relay or initate a request for different PCF treatment.

In the deployment architecture as shown by Figure 7.3-2, the 5GMSdAF and MBSF are fully separated logical functions. Alternatively, as depicted in Figure 5.4.2-1, the MBSF could be integrated within the 5GMSd AF. In such a deployment, the embedded MBSF still uses the Nx2/Nmbstf API to configure and control the multicast delivery functionality of the MBSTF.

Detailed deployment options in the UE are described in clause 4.4.2 of the present document.

Editor’s Note: How to use the 5GS broadcast-multicast User Service to address key issues 1 and 4 is for future study.

END OF CHANGES