**3GPP TSG SA WG4#116-e meeting S4-211397**

**10th-19th November, 2021** ***revision of S4aI211245***

 ***revision of S4aI211239***

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| *CR-Form-v12.0* |
| **PSEUDO CHANGE REQUEST** |
|  |
|  | **TS 26.502** | **CR** | **–** | **rev** | **–** | **Current version:** | **0.1.0** |  |
|  |
| *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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:***  | pCR to TS 26.502 on reference architecture  |
|  |  |
| ***Source to WG:*** | TELUS, BBC, Qualcomm, Ericsson, Huawei, Enensys |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5MBUSA |  | ***Date:*** | 2021-10-26 |
|  |  |  |  |  |
| ***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 text in reference architecture for 5G Multicast-Broadcast User Services |
|  |  |
| ***Summary of change:*** |  |
|  |  |
| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** | Several clauses |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** | Changes against skeleton document TS 26.502 v0.1.0 |
|  |  |
| ***This CR's revision history:*** |  |

FIRST CHANGE

# 2 References

[7] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[8] IETF RFC 3500: "RTP: A Transport Protocol for Real-Time Applications".

[9] IETF RFC 2250: "RTP Payload Format for MPEG1/MPEG2 Video".

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# 3 Definitions of terms, symbols and abbreviations

## 3.1 Terms

**MBS Application Service**: An end-user service for which parts or all of the data are accessible by activating the reception of an MBS User Service.

**MBS User Service:** An abstract transport-level service configured by the MBSF and using one or more MBS Distribution Sessions, possibly in combination with unicast, for the purpose of supporting an MBS-Aware Application via a set of APIs that allows the MBS Client to activate and deactivate reception of the MBS Session.

**MBS User Data Ingest Session:** time, protocols and protocol state (i.e. parameters) provided by an MBS Application Provider for distribution over an MBS User Service, and provided to the MBS-Aware Application as an MBS Application Data Session.

**MBS Application Data Session:** time, protocols and protocol state (i.e. parameters) provided by the MBSTF Client to the MBS-Aware Application.

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## 4.2 System description

Editor’s Note: Explanation of fundamental concepts in the MBS User Services architecture.

### 4.2.1 Network architecture

Figure 4.2.1-1 depicts the MBS network architecture defined in clause 5.1 of TS 23.247 [5] using the reference point representation.



Figure 4.2.1-1: Network Architecture for MBS User Service delivery and control

The functions and reference points involved in providing MBS User Services within the MBS System are highlighted in green, in particular:

- Reference point Nmb10, used by the AF/AS to provision MBS User Services in the MBSF by invoking the Nmbsf service.

- Reference point Nmb2, used by the MBSF to configurre and control MBS Distribution Methods in the MBSTF by invoking the Nmbstf service.

- Reference point Nmb8, used by the MBSTF to ingest content from the AF/AS.

### 4.2.2 User Service network architecture

MBS User Services enable high-level applications to make use of the low-level features of the MBS System. The MBS User Service is provided by the MBSF and MBSTF working in combination. It presents a complete service offering to an end-user, via a set of APIs that allows the MBS Client to activate or deactivate reception of the service.

The MBS User Service architecture depicted in Figure 4.2.2-1 shows the MBS-related entities involved in providing MBS User Service delivery and control. These are described in the following clauses. The MBS Application Provider plays the role of the AF/AS.

 

Figure 4.2.2-1: MBS User Service network architecture

#### 4.2.2.1 MBSF

MBSF supports the following MBS User Service functions:

* User Service announcement.
* Data model for MBS services, including a session model and its mapping to MBS transport.

The User Service Discovery/Announcement function of the MBSF provides session access information, which is consumed by the MBS Client and subsequently used to discover and initiate the reception of one or multiple MBS User Services. The session access information may contain information for presentation to the end-user, as well as application parameters used in generating service content for consumption by the MBS Client. Service Announcement information may be delivered via MBS Sessions or via a regular PDU Session.

The MBS Application Provider and MBSF interact via reference point Nmb10 to invoke MBS procedures in the control plane, including service provisioning, MBS session operations and QoS management. The Nmbsf service is exposed at this reference point. The MBS Application Provider may interact with the MBSF via the NEF at reference point N33 for MBS-related service exposure. In this case, the Nmbsf service is exposed at reference point Nmb5.

#### 4.2.2.2 MBSTF

The MBSTF performs generic packet transport functions available to any IP multicast-enabled application, such as framing, multiple flows and computation of packet-level FEC. It also performs multicast/broadcast delivery of input objects or object flows. If needed, the MBSTF provides a media anchor point for MBS data traffic and sourcing of IP multicast.

The MBSTF, together with MBS AS, supports the following MBS User Service functions:

* Distribution Methods to allow MBS User Services to use available MBS capabilities, including support for Group Communication delivery.
* File repair.
* Reception reporting.

The MBS Application Provider and MBSTF interact via reference point Nmb8 to support MBS data handling in the user plane. The MBS Application Provider uses MBS User Data Ingest Session to transmit service content.

#### 4.2.2.3 MBS AS

The MBS AS performs the following functions to support MBS User Services:

- Providing a byte-range file repair service for the Object Distribution Method.

### 4.2.3 Distribution Methods

Editor’s Note: Explanation of what a distribution method is and what distribution methods are for.

Editor’s Note: Decide whether to refer at all to associated delivery procedures.

The MBS Distribution Methods defined in clause 6 of the present document make use of MBS Sessions (see clause 4.1 of TS 23.247 [5]) to deliver data to the MBS Client. A set of MBS Distribution Methods is provided by the MBSTF. These provide functionality such as security and key distribution, reliability control (by means of FEC techniques) and associated delivery procedures.

**- Object Distribution Method:** Delivers discrete binary objects over an MBS Session. This may be used to support real-time distribution of media segments (as special objects) including Low-Latency CMAF segments.

The use of MBS Sessions by the Object distribution method is specified in clause 6.1.

**- [Packet|PDU] Distribution Method:** Supports IP streaming use cases for which UDP payloads (also referred to as Service Data Unit) are distributed as part of UDP or IP flows carried to the UE over an MBS session. Examples of higher layer protocols are RTP [8] and packetized MPEG-2 Transport Stream [9].

The use of MBS Sessions by the [Packet|PDU] distribution method is specified in clause 6.2.

Editor’s Note: The name of this distribution method is pending further discussion. For example, transparent mode was suggested. The discussion was around whether to describe the MBS distribution function or the service that is supported to the outside by the distribution.

The above Distribution Methods may use either a multicast MBS Session or a broadcast MBS Session to distribute content to a MBS Client, and may also make use of a set of MBS associated delivery procedures.

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## 4.3 Functional entities

Editor’s Note: Reference architecture for MBS User Services, including client functions.

Figure 4.3-1 shows the complete set of functional entities involved in supporting MBS User Services when the MBS Application Provider is deployed in the Trusted DN, including client functions in the UE.



NOTE: When the MBS Application Provider is deployed outside the Trusted DN, it interacts with the MBSF via the NEF at reference point N33, as descried in clause 4.2.2.1, instead of via Nmb10.

Figure 4.3-1 MBS User Service reference architecture

In the architecture above, MBS-specific functions such as the MBS AS and MBSF are shown as independent and standalone. In deployments, they may be co-located on physical devices with other functions. As an example, the MBS AS may be hosted in the MBS Application Provider domain, or it may be hosted in a 5GMS AS.

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## 4.4 Reference points and interfaces

### 4.4.1 Overview

The following reference points defined in clause 5.1 of TS 23.247 [5] are relevant to MBS User Services architecture: Nmb1, Nmb2, Nmb5, Nmb8, Nmb9, Nmb10 and Nmb12.

The following additional reference points are defined by the present document:

**- MBS-4-MC:** Unidirectional multicast distribution of content from the MBSTF to the MBS Client.

**- MBS-4-UC:** File-based unicast repair between the MBS Client and the MBS AS.

**- MBS-5:** Interactions between the MBS Client and the MBSF for the purpose of MBS control plane and service handling.

**- MBS-6:** API exposed by the MBS Client and used by the MBS-Aware Application to manage and control MBS User Services.

**- MBS-7:** API exposed by the MBS Client and used by the MBS-Aware Application to receive user data information about MBS User Services.

**- MBS-8:** Announcement of MBS User Services to the MBS-Aware Appliction by the MBS Application Provider.

END OF CHANGES