**3GPP TSG-S4 Meeting #120-e *S4-220937***

**Online, , 17th–26th August 2022**

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| *CR-Form-v12.0* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **TS 26.502** | **CR** | **—** | **rev** | **—** | **Current version:** | **17.1.1** |  |
|  |
| *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:***  | [5MBUSA] Modifications to reference architecture |
|  |  |
| ***Source to WG:*** | BBC |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5MBUSA |  | ***Date:*** | 2022-08-08 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  |  |
| ***Reason for change:*** | Modifications to reference architecture to allow scalable serving of unicast Service Announcements, user authentication credentials from MBS AS in addition to unicast object repair. |
|  |  |
| ***Summary of change:*** | * Revised network architecture and reference architecture figures.
* MBS‑3 reference point defined, but declared out of scope.
* Adjustment of text describing role assignment to Network Functions.
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| ***Consequences if not approved:*** | SA4 cannot complete addition of user plane security in a manner compatible with SA2 architecture for MBS. |
| ***Q*** |  |
| ***Clauses affected:*** | 2, 4.2.2, 4.2.4, 4.3.1, 4.3.2, 4.3.4, 4.3.5, 4.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

FIRST 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 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[6] 3GPP TS 26.348: "Northbound Application Programming Interface (API) for Multimedia Broadcast/Multicast Service (MBMS) at the xMB reference point".

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

[8] IETF RFC 3550: "RTP: A Transport Protocol for Real-Time Applications".

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

[10] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".

[11] 3GPP TS 26.531: "Data Collection and Reporting; General Description and Architecture".

[12] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE)".

[13] 3GPP TS 26.517: " 5G Multicast–Broadcast User Services; Protocols and Formats".

[14] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE)".

[15] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[16] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

NEXT CHANGE

### 4.2.2 User Services network architecture

MBS User Services enable high-level applications to make use of the low-level features of the MBS System. An MBS User Service is provided by the MBSF and MBSTF working in combination to support configuration option 2 and configuration option 3 defined in annex A of TS 23.247 [5]. In addition to the Network Functions defined in [5], the MBS AS provides unicast services such as User Service Announcement[, user plane client authentication ]and Object Repair. Together, these functions enable a complete service offering to an end-user, via a set of APIs that allows the MBS Client to activate or deactivate reception of MBS User Services.

The MBS User Services architecture depicted in figure 4.2.2-1 shows the MBS-related entities involved in providing MBS User Services 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 Services network architecture

NEXT CHANGE

### 4.2.4 User Service Announcement

The User Service Announcement provides information needed by the MBS Client to discover and activate the reception of one or more MBS User Services. User Service Announcement information may be delivered via MBS Distribution Sessions (at reference point MBS‑4‑MC) or via a regular PDU Session (at reference point MBS‑5).

The baseline information conveyed in User Service Announcements is defined in clause 4.5.7.

NEXT CHANGE

### 4.3.1 General

The MBSF and MBSTF offer service layer functionality for sending data via MBS Sessions. The MBSF (clause 4.3.2) offers control plane functionality while the MBSTF (clause 4.3.3) offers user plane functionality. The MBSTF acts as a User Plane anchor when it sources IP multicast traffic. Reference point Nmb2 provides the means for the MBSF to configure the delivery methods in the MBSTF.

Figure 4.3.1-1 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 shown in figure 4.2.2‑1, instead of via Nmb10.

Figure 4.3.1-1 MBS User Service reference architecture

In the above architecture, 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.

NEXT CHANGE

### 4.3.2 MBSF

The functionality of the MBSF is defined in clause 5.3.2.11 of TS 23.247 [5]. It receives provisioning and control commands either directly at reference point Nmb10 or at reference point Nmb5 (via the NEF). The MBSF invokes MBS Session operations on the MB‑SMF at reference point Nmb1. The MBSF configures the MBSTF at reference point Nmb2.

The User Service 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.

The present document defines additional Control Plane functionalities of the MBSF to support MBS User Services including:

1. Generating the User Service Announcement for each MBS Session.

2. Managing User Service Announcement updates.

3. Providing the User Service Announcement information to the MBS Client in a timely manner using one or more of the following mechanisms:

a) Unicast User Service Announcement delivered by the MBS AS via reference point MBS-5, including the possible use of push- or notification-based update mechanisms.

b) User Service Announcement delivered via an MBS Distribution Session generated by the MBSTF at reference point MBS-4-MC, optionally in the same MBS Distribution Session as the content it is advertising.

c) User Service Announcement delivered via application-private means at reference point MBS-8.

NEXT CHANGE

### 4.3.4 MBS AS

The MBS AS is an optional entity that performs the following functions to support MBS User Services:

- Delivering unicast User Service Announcements to the MBSTF Client via reference point MBS‑5.

[- Authenticating the MBS Client and supplying the MBS Session Key to it (via reference point MBS‑4‑UC) as part of the user plane security procedure defined in clause W.4.1.3 of TS 33.501 [16].]

- Providing a byte-range file repair service to the MBSTF Client (via reference point MBS‑4‑UC) for use with the Object Distribution Method.

The MBS AS is configured by the MBSF. The MBS AS may acquire content from the MBSTF. These interactions are not further defined by the present document.

The MBS AS may be deployed as a standalone entity, or its functions may be co-located with other Network Functions such as the MBSF (see clause 4.3.2), the MBSTF (see clause 4.3.3) or the 5GMS AS defined in TS 26.501 [7].

NEXT CHANGE

### 4.3.5 MBS Client

The MBS Client function is part of the UE. The functionality of the UE is defined in clause 5.3.2.8 of TS 23.247 [5].

The MBS Client is further divided into the following subfunctions:

- *MBSF Client:* Communicates with the MBS AS on MBS User Service control aspects.

- *MBSTF Client:* Communicates with the MBSTF or MBS AS in order to provide an MBS Application Data Session to the MBS-Aware Application.

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

- Acquisition of MBSF-compiled User Service Announcements from the MBS AS at reference point MBS‑4‑UC and/or from the MBSTF at reference point MBS-4-MC.

[- Optionally, authentication with the MBS AS to obtain an MBS Session Key.]

- Reception of MBS data via reference point MBS‑4‑MC from either a Multicast MBS Session or a Broadcast MBS Session.

- Exposure of MBS Application Data Sessions towards an MBS-Aware Application.

- Using AL-FEC to recover packets or objects , if this optional feature is provisioned for the MBS Session.

- Unicast recovery of the application payload data carried in multicast/broadcast packets that are not successfully received via MBS-4, if unicast repair is provisioned for the MBS Session.

NOTE: Roaming of the MBS Client is for further study.

NEXT CHANGE

## 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-3:** Used by the MBSF to configure the MBS AS and to publish User Service Announcements and MBS Traffic Keys to it.

 This reference point is not described further in 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 MBS AS 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 distributed using MBS User Services.

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

In addition, the following reference points are defined inside the MBS Client function:

- **MBS‑6′:** API exposed by the MBSTF Client and used by the MBSF Client to (de)activate reception of an MBS Session by the MBSTF. The reception parameters are supplied by the MBSF Client.

 This reference point is outside the scope of MBS User Services and is not described further in the present document.

- **MBS‑7′:** API exposed by the MSTF Client and used by the MBSTF to supply MBS Session configuration information that has been received from reference point MBS‑4‑MC.

 This reference point is outside the scope of MBS User Services and is not described further in the present document.

END OF CHANGES