**3GPP TSG- S4 Meeting #119e *S4-220690***

**Electronic Meeting, 11th to 20th May 2022 (revision of S4-220532)**

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| *CR-Form-v12.2* | | | | | | | | |
| **draft CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **26.502** | **CR** |  | **rev** | **-** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *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:*** | [5MBUSA]: Various corrections around File Repair, Consumption Reporting and Reception Reporting | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** | S4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5MBUSA | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***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)*  Detailed explanations of the above categories can be 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This pCR focuses on corrections around File Repair (or Object Repair), | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2, 4.3.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\*\* First Change \*\*\*\*

## 4.2 System description

### 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 Services 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 is used by the AF/AS to provision MBS User Services in the MBSF by invoking the Nmbsf service defined in clause 7.2.

- Reference point Nmb2 is used by the MBSF to configure and control MBS User Services distribution methods in the MBSTF by invoking the Nmbstf service defined in clause 7.3.

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

### 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 Object Repair. It enables 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 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

### 4.2.3 User Services Distribution methods

The distribution methods defined for use by MBS User Services in clause 6 of the present document make use of MBS Sessions (see clause 4.1 of TS 23.247 [5]) to deliver MBS data packets to the MBS Client. The distribution methods may use either a multicast MBS Session or a broadcast MBS Session. 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:** A distribution method that 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 Distribution Method:** A distribution method that supports streaming of packetised media data over an MBS Session where Service Data Units (SDUs) are conveyed to the UE as part of Protocol Data Units (PDUs) or IP flows. Examples of upper layer SDUs are generic IP/UDP datagrams.

The use of MBS Sessions by the Packet Distribution Method is specified in clause 6.2.

The above distribution methods may use either a multicast MBS Session or a broadcast MBS Session to distribute content to an MBS Client and may also make use of the Object Repair feature, as defined in clause 4.2.5 below.

### 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 or via a regular PDU Session.

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

### 4.2.5 User Services Reception Reporting

Reporting by the MBS Client to the MBSF is for further study and may be realised by instantiating the data collection and reporting architecture specified in TS 26.531 [11]. This may include, for example, adjusting the Application Layer FEC redundancy level in the MBSTF according to the Packet Error Rate (PER) reported by the MBS Client.

### 4.2.5 Object Repair

When using the Object Distribution Method, Object Repair may be provisioned by the MBS Application Provider. This feature allows an MBS Client to retrieve from the MBS AS (via reference point MBS‑4‑UC) missing portions of objects not received intact from the MBSTF at reference point MBS‑4‑MC.

Two types of Object Repair are defined by the present document:

- *Object Repair during the MBS Distribution Session*.

- *Object Repair after the completion of the MBS Distribution Session*, including a randomized back-off period for different MBS Clients in order to avoid overloading the MBS AS.

The functions of the MBS AS are defined in clause 4.3.4.

\*\*\*\* Next Change \*\*\*\*

### 4.3.4 MBS AS

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

- 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 function, or it may be co-located with other Network Functions such as the MBSTF (see clause 4.3.3) or the 5GMS AS defined in TS 26.501 [7].

\*\*\*\* Last Change \*\*\*\*