**3GPP TSG-S4 ad hoc post Meeting #117-e *S4aI221306***

**Online, , 2nd March–11th May 2022**

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| *CR-Form-v12.0* |
| **DRAFT CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** | **1.1.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***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). |  |
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| ***Reason for change:*** | Provide procedures describing how Nmbsf and Nmbstf are intended to be used. |
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| ***Summary of change:*** | * Call flows for MBS User Service.
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| ***Consequences if not approved:*** | The procedures model will not be clearly defined for stage 3 realisation. |
| ***Q*** |  |
| ***Clauses affected:*** | 5.3, 5.4, 5.5, 5.6 |
|  |  |
|  | **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

## 5.3 Procedures for User Service provisioning

The procedure begins with the MBS Application Provider provisioning an MBS User Service and, within it scope, a set of MBS User Data Ingest Sessions, as shown in figure 5.3‑1 below.



Figure 5.3‑1: Call flow for MBS User Service provisioning by MBS Application Provider

Beforehand:

0. The MBSF subscribes to status events from the MBSTF by invoking the Nmbstf\_‌MBSDistributionSession‌StatusSubscribe service operation at reference point Nmb2.

The MBS Application Provider provisions a new MBS User Service Session in the MBS System:

1. The MBS Application Provider subscribes to status events from the MBSF by invoking Nmbsf\_‌MBSUserDataIngestSession\_‌StatusSubscribe service operation at reference point Nmb10 (or N33+Nmb5, if invoked via the NEF).

2. The MBS Application Provider invokes the Nmbsf\_MBSUserService\_Create service operation at reference point Nmb10 (or N33+Nmb5 if invoking via the NEF) to create a new MBS User Service, as defined in clause 4.5.3.

3. To support Use Cases where there is a requirement for TMGI allocation to be managed outside the MBS System, the MBS Application Provider may explicitly pre-allocate a TMGI for some or all of the MBS Distribution Sessions declared in step 4 below by invoking the Nmbsmf\_‌TMGI\_‌Allocate service operation on the MB‑SMF at reference point Nmb13 (or N33+N29mb, if invoked via the NEF), as specified in clause 9.1.2.2 of TS 23.247 [5].

Immediately, or at some later time, the MBS Application Provider creates at least one MBS User Data Ingest Session within the scope of the MBS User Service created in step 2 above:

4. The MBS Application Provider creates at least one MBS User Data Ingest Session (as defined in clause 4.5.5) within the scope of the MBS User Service created in step 3 by invoking the Nmbsf\_‌MBSUserData‌Ingest‌Session\_‌Create service operation at reference point Nmb10 (or N33+Nmb5, if invoked via the NEF).

Each MBS User Data Ingest Session optionally includes a schedule of start and end times.

The MBS User Data Ingest Session comprises the details of one or more MBS Distribution Session(s), as defined in clause 4.5.6. Each MBS Distribution Session fully specifies one of the distribution methods defined in clause 6 and may optionally nominate a TMGI to be used if one was pre-allocated in step 3 above.

5. The MBSF may notify the status of each created MBS User Data Ingest Session to the MBS Application Provider by invoking the Nmbstf\_‌MBSUserDataIngestSession\_‌Notify callback service operation at reference point Nmb10 (or N33+Nmb5, if invoked via the NEF).

Shortly before a provisioned MBS User Data Ingest session is scheduled to become active (see clause 4.5.5), or immediately if no schedule of active periods is provisioned, the MBSF establishes in the MBSTF all MBS Distribution Sessions comprising that MBS User Data Ingest Session as shown in figure 5.3‑2 below.



Figure 5.3‑2: Call flow for MBS User Service internal provisioning

For each such MBS Distribution Session:

6. If a TMGI was not nominated by the MBS Application Provider in step 3 above, the MBSF allocates one at this point for the MBS Distribution Session by invoking the Nmbsmf\_‌TMGI\_‌Allocate service operation on the MB‑SMF at reference point Nmb1, as specified in clause 9.1.2.2 of TS 23.247 [5].

7. The MBSF creates an MBS Session for the MBS Distribution Session to reserve resources in the MBS System by invoking the Nmbsmf\_‌MBSSession\_‌Create service operation on the MB‑SMF at reference point Nmb1, as specified in clause 9.1.3.6 of TS 23.247 [5]). The TMGI reserved for the MBS Distribution Session in step 3 or step 6 above is provided as an input parameter.

8. The MBSF creates the MBS Distribution Session in the MBSTF by invoking the Nmbstf\_‌MBSDistribution‌Session\_‌Create service operation at reference point Nmb2. This is a mirror of the entity in the MBSF (see clause 4.5.6).

9. The MBSTF attempts to establish content ingest from the MBS Application Provider at reference point Nmb8 according to the ingest parameters provisioned for the MBS Distribution Session and distribution method in question (see table 4.5.6‑1).

On success, the state of the MBS Distribution Session in the MBSTF becomes ESTABLISHED; on failure, it remains INACTIVE (see step 2 in clause 4.6.1).

NOTE: Success of this step varies according to the provisioned distribution method and its configuration. Success may, for example, be defined as establishing a network tunnel to the MBS Application Provider (see table 4.5.6‑3), or it may require successful ingest of an initial object from the MBS Application Provider (see table 4.5.6‑2).

10. The MBSTF invokes the Nmbstf\_‌MBSDistributionSession\_‌StatusNotify callback service operation at reference point Nmb2 to inform the MBSF of the (un)successful establishment of content ingest.

On success, the state of the MBS Distribution Session in the MBSF becomes ESTABLISHED; on failure, it remains INACTIVE (see step 2 in clause 4.6.1).

11. The MBSF invokes the Nmbsf\_‌MBSUserDataIngestSession\_‌StatusNotify callback service operation at reference point Nmb8 (or Nnm5+N33, if invoked via the NEF) to inform the MBS Application Provider of the (un)successful establishment of content ingest for the MBS Distribution Session in the context of its parent MBS User Data Ingest Session.

12. If content ingest was established successfully in step 9 above, the MBSF compiles the metadata relating to this MBS Distribution Sessions into an MBS User Service Announcement, as specified in clause 4.5.7.

## 5.4 Procedures for User Service advertisement/discovery

At this point, the MBS User Service Session is advertised to the MBS Client, as shown in figure 5.4‑1 below.



Figure 5.4‑1: Call flow for MBS User Service advertisement/discovery

The steps are as follows:

1. The MBSF compiles a composite MBS User Service Announcement from the set of individual MBS User Service Announcements assembled in step 12 in clause 5.3 describing the MBS Distribution Sessions that comprise an MBS User Data Ingest Session. The advertised start date–time is the next start time indicated in the MBS User Data Ingest Session schedule of active periods, or the current date–time if no schedule is provisioned.

2. The composite MBS User Service Announcement is distributed using one or more of the following mechanisms:

a. The composite MBS User Service Announcement is made available for unicast retrieval by the MBSF Client at reference point MBS‑5.

b. The composite MBS User Service Announcement is made available via a suitable multicast/broadcast Session Announcement Channel at reference point MBS‑4‑MC.

c. The composite MBS User Service Announcement is passed back to the MBS Application Provider by invoking the Nmbsf\_‌MBSUserDataIngestSession\_‌StatusNotify callback service operation at reference point Nmb8 (or Nnm5+N33, if invoked via the NEF).

 As a result, the MBS Application Provider advertises the MBS User Service to the MBS-Aware Application by private means at reference point MBS‑8.

## 5.5 Procedures for User Service data transfer

At the next start time indicated in the MBS User Data Ingest Session schedule of active periods, or immediately if no schedule is provisioned, the MBSF activates all MBS Distribution Sessions conprising that MBS User Data Ingest Session, as shown in figure 5.5‑1 below.

Figure 5.5‑1: Call flow for MBS Distribution Session activation by MBSF

For each such MBS Distribution Session:

1. The MBSF invokes the Nmbstf\_‌MBSDistributionSession\_‌Update service operation on the MBSTF at reference point Nmb2, updating the current state of the MBS Distribution Session to ACTIVE (see step 3 in clause 4.6.1).

2. As a direct result of the previous step, the MBSTF begins to ingest content from the MBS Application Provider.

3. The MBSTF processes the ingested content according to the provisioned distribution method, as defined in clause 4.3.3. This may optionally include the computation of Application Level FEC (AL‑FEC) information.

4: The MBSTF distributes the resulting MBS data at reference point MBS‑4‑MC. This is achieved by passing the MBS data to the MB‑UPF at reference point Nmb9, according to the protocol stacks defined in clause 8.2 of TS 23.247 [5].

5. On successful content ingest and MBS data distribution, the state of the MBS Distribution Session in the MBSTF becomes and remains ACTIVE (see step 3 in clause 4.6.1); on failure, it transitions through DEACTIVATING to INACTIVE (see step 4 in clause 4.6.1).

The MBSTF invokes the Nmbstf\_‌MBSDistributionSession\_‌StatusNotify callback service operation at reference point Nmb2 to inform the MBSF of any changes to the state of the MBS Distribution Session.

6. The MBSF invokes the Nmbsf\_‌MBSUserDataIngestSession\_‌StatusNotify callback service operation at reference point Nmb8 (or Nnm5+N33, if invoked via the NEF) to inform the MBS Application Provider of any changes to the state of the MBS Distribution Session in the context of its parent MBS User Data Ingest Session.

The MBS Client in the UE activates reception of an MBS User Service by establishing an MBS User Service Session between the MBSF Client and the MBSF, and consequently activating reception of one or more MBS Distribution Sessions by the MBSTF Client that are currently being distributed by the MBSTF. This call flow is shown in figure 5.5‑2 below:



Figure 5.5‑2: Call flow for MBS User Service activation by MBS Client

The steps are as follows:

7: The MBS-Aware Application invokes a client API exposed by the MBSF Client at reference point MBS-6 to activate the MBS User Services Session.

If the composite MBS User Service Announcement was received by the MBS-Aware Application in step 2c in clause 5.4, this is passed as one of the parameters in the API call. Otherwise, the target service is identified by one of the external service identifiers in the MBS User Service entity (see clause 4.5.3).

For each MBS Distribution Session listed in the composite MBS User Service Announcement:

8. The MBSF Client invokes a client API exposed by the MBSTF Client at reference point MBS‑6′ to activate reception of the MBS Distribution Session. The reception parameters for the MBS Distribution Session are taken from the relevant MBS User Service Announcement which, in turn, is extracted from the composite MBS User Service Announcement.

9. MBS data from the MBSTF is received by the MBSTF Client at reference point MBS‑4‑MC.

## 5.6 Procedures for User Service data repair

In the case of the Object Distribution Method (as defined in clause 6.1), the MBSTF Client may collaborate with the MBS AS at reference point MBS‑4‑UC to recover lost portions of content corresponding to MBS data that was not successfully received by the MBSTF Client at reference point MBS‑4‑MC (see step 9 in clause 5.5).

The procedure for data repair is illustrated in figure 5.6‑1 below:



Figure 5.6-1: Call flow for MBS User Service data repair

END OF CHANGES