**3GPP TSG- Meeting #**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** | 0017 | **rev** | **-** | **Current version:** |  |  |
|  |
| *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:***  |  |
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| ***Source to WG:*** | , BBC, Ericsson LM |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | 5MBUSA |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** | F |  | ***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). | *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:*** | There are several instances of mistakes and incomplete spec text in TS 26.502 to be fixed. |
|  |  |
| ***Summary of change:*** | * Clause 4.2.1
	+ Correcting mistake in copying the MBS network architecture from clause 5.1 of TS 23.247, by adding N5 reference point between AF/AS and PCF.
	+ Add description of additional functionality of Nmb2 previously missing in description.
* Clause 4.3.1 – Add description of additional functionality of Nmb2 previously missing in the description.
* Clause 5.4 – Update the call flow in Figure 5.4-1 by insertion of an additional step (e.g., call that 2c, and renumber the existing step 2c to 2d), as well as revise the corresponding description of steps, to indicate that 2c corresponds to employing MBS User Service Announcement delivery in the same MBS Distribution Session carrying the advertised MBS Application Service content from the MBSF to the MBSF Client, at reference point MBS-4-MC (and whereas the original step 2c description now corresponds to that of the renumbered step 2d).
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|  |  |
| ***Consequences if not approved:*** | Incorrect and incomplete specification. |
|  |  |
| ***Clauses affected:*** | 4.2.1, 4.3.1 and 5.4.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  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. Additionally, Nmb2 may be used by the MBSTF to ingest User Service Announcement objects from the MBSF via either the pull-based or push-based object ingest method (see clause 6.1) for subsequent delivery to the MBS Client via a suitable MBS Distribution Session (see clause 4.2.4).

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

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## 4.3 Functional entities

### 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, and supports Object ingest at the MBSTF of User Service Announcements for delivery to the MBS Client via reference point MBS‑4‑MC (as described in clause 4.2.4).

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

### 4.5.2 Static information model

Figure 4.5.2‑1 shows how the different service and session concepts depicted in figure 4.5.1‑1 above relate to each other. In this figure:

1. The MBS Application Provider provisions the parameters of a new MBS User Service by invoking the Nmbsf service either directly, or via the NEF. This specifies which of the *Service announcement modes* are to be used to advertise the MBS User Service, as well as descriptive metadata for inclusion in the MBS User Service Announcement.

2. The MBS Application Provider provisions a number of time-bound MBS User Data Ingest Sessions within the scope of the MBS User Service by invoking the Nmbsf service either directly, or via an equivalent Nnef service provided by the NEF. Each MBS User Data Ingest Session includes the details of one or more MBS Distribution Sessions.

- To indicate that it has a restricted MBS service area (i.e. corresponding to a local MBS Service, as defined in clause 6.2.2 of TS 23.247 [5]), an MBS Distribution Session may specify one or more *Target service areas*. In line with [5], MBS data is not transmitted outside the MBS service area derived from the indicated *Target service areas*.

- To provision location-dependent variants of an MBS User Service (see clause 6.2.3 of TS 23.247 [5]), a number of MBS Distribution Sessions conveying different MBS data may be provisioned within the scope of the same MBS User Service by setting the *Location-dependent service flag* on the MBS Distribution Sessions of each variant. Location-dependent MBS Distribution Session variants shall have the same *MBS Session Identifier*, but they shall have disjoint *Target service areas*.

- When the *Multiplexed service flag* is set on the MBS Distribution Session, all MBS Distribution Sessions with an identical (or empty) set of *Target service areas* shall be multiplexed onto the same MBS Session. The *MBS Session Identifier* shall be the same for all MBS Distribution Sessions within the multiplex. This feature may be combined with the *Location-dependent service flag*, in which case each location-dependent multiplex of MBS Distribution Sessions is mapped into a separate MBS Session.

 The MBSF provisions additional MBS Distribution Session parameters (denoted in table 4.5.6‑1 as assigned by the MBSF) and exposes some of them back to the MBS Application Provider (as indicated by the NOTE to table 4.5.6‑1). Additionally, the MBSF supports MBS User Service Announcement ingest by the MBSTF using either pull-based or push-based method (see clause 6.1) for ubsequent delivery to the MBS Client via a suitable MBS Distribution Session (see clause 4.2.4).

NOTE 1: The MBSF typically allocates an *MBS Session Identifier*, such as a Temporary Mobile Group Identity (TMGI) for each MBS Distribution session (see step 4 below) as a side-effect of provisioning, but it is also possible for the Nmbsf service invoker to nominate a particular value during this provisioning step if TMGI allocations are managed externally to the MBSF.

3. The MBS Application Provider may additionally provision an MBS Consumption Reporting Configuration within the scope of the MBS User Service by invoking the Nmbsf service either directly, or via the NEF.

NOTE 2: Reception reporting for MBS User Services is for future study.

Shortly before the current time enters the time window of a provisioned MBS User Data Ingest Session:

4. The MBSF provisions an MBS Session in the MBS System by invoking the Nmbsmf service on the MB‑SMF (see clause 9 of TS 23.247 [5]) to allocate a TMGI (if one has not already been allocated) for each MBS Distribution Session and to create an MBS Session Context for each one. The parameters of the MBS Session Context shall be populated as specified in clause 4.5.9. In response, the MB-SMF provides the MB-UPF ingest information (specifically, the MB‑UPF tunnel endpoint address and traffic flow information to be used by the MBSTF) to the MBSF.

5. The MBSF provisions an MBS Distribution Session in the MBSTF by invoking the Nmbstf service at reference point Nmb2 using the parameters from the newly created MBS Session Context.

6. Using the parameters from the MBS Distribution Session and from the newly created MBS Session Context, the MBSF compiles an MBS User Service Announcement to advertise the availability of the MBS User Service and makes this service access information available by one or more of the *Service announcement modes* provisioned in the MBS User Service.



NOTE 1 Square brackets after a parameter name indicate multiplicity; parameter names rendered in italics with parentheses are optional. See the following clauses for details.

NOTE 2: Parameters and entities not exposed to the MBS Application Provider via the Nmbsf service at reference point Nmb10 are annotated with the dagger symbol †.

NOTE 3: MBS Session Identifier is defined by clause 6.5.1 of TS 23.247 [5] as a Temporary Mobile Group Identity (TMGI) or a Source-Specific Multicast (SSM) IP address.

Figure 4.5.2-1: MBS User Services static information model

NEXT CHANGE

## 5.4 Procedures for User Service advertisement/discovery

At this point, the MBS User Service Session is advertised to the MBSF 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 Distribution Session Announcements compiled in step 14 of clause 5.3. The compiled MBS User Service Announcement describes the current set of MBS Distribution Sessions that comprise the active 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 MBS User Service Announcement is distributed using one or more of the following mechanisms:

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

b. The MBS User Service Announcement is made available to the MBSTF via reference point Nmb2 for ingest using the *Nmbstf\_MBSUserServiceAnnouncement\_Create* service operation as described in clauses 7.3.1 and 7.3.3. Depending on the object acquisition method configured for the intended MBS Distribution Session, the MBS User Service Announcement is either pulled from the MBSF by the MBSTF or pushed to the MBSTF by the MBSF.

As a result, the MBS User Service Announcement is delivered repeatedly via a suitable MBS Distribution Session at reference point MBS‑4‑MC using the Object Distribution Method. As specified in clause 4.2.4, this may be the same MBS Distribution Session as that carrying the advertised MBS Application Service content and/or a separate and dedicated MBS Distribution Session (i.e., the MBS User Service Announcement Channel).

c. The MBS User Service Announcement is passed back to the MBS Application Provider by invoking the Nmbsf\_MBSUserDataIngestSession\_StatusNotify callback service operation at reference point Nmb10 (or Nmb5+N33, if invoked via the NEF).

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

The MBSF may rescind an MBS User Service Announcement at any time for operational reasons.

NEXT CHANGE

## 7.3 MBSTF Services

### 7.3.1 General

The following table illustrates the set of NF services exposed by the MBSTF.

Table 7.3-1: NF services provided by MBSTF

|  |  |  |  |
| --- | --- | --- | --- |
| Service name | Service operation name | Operation semantics | Example consumer(s) |
| Nmbstf\_MBSDistributionSession | Create | Request/Response | MBSF |
| Retrieve | Request/Response | MBSF |
| Update | Request/Response | MBSF |
| Destroy | Request/Response | MBSF |
| StatusSubscribe | Subscribe/Notify | MBSF |
| StatusUnsubscribe | MBSF |
| StatusNotify | MBSF |
|  | StatusSubscribeMod |  | MBSF |
| Nmbstf\_MBSUserServiceAnnouncement | Create | Request/Response | MBSF |
| Retrieve | Request/Response | MBSF |
| Update | Request/Response | MBSF |
| Destroy | Request/Response | MBSF |

### 7.3.2 Nmbstf\_MBSDistributionSession service

#### 7.3.2.1 Nmbstf\_MBSDistributionSession\_Create service operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_Create

**Description:** Create a new MBS Distribution Session within the MBSTF.

**Input parameters (Required, Optional):** Parameters in table 4.5.6‑1 and either table 4.5.6‑2 or table 4.5.6‑3, depending on the distribution method.

**Output parameters:** Result indication.

#### 7.3.2.2 Nmbstf\_MBSDistributionSession\_Retrieve service operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_Retrieve

**Description:** Retrieve the parameters of an existing MBS Distribution Session.

**Input parameters (Required):** Distribution Session Identifier in request URL.

**Output parameters:** MBS Distribution Session resource entity, including parameters in table 4.5.6‑1 and either table 4.5.6‑2 or table 4.5.6‑3, depending on the distribution method.

#### 7.3.2.3 Nmbstf\_MBSDistributionSession\_Update service operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_Update

**Description:** Update an existing MBS Distribution Session, for example to change the session stop time, object delivery session, application session, packets delivery session, files, and ancillary information.

**Input parameters (Required, Optional):** MBS Distribution Session Identifier. Parameters in table 4.5.6‑1 and either table 4.5.6‑2 or table 4.5.6‑3, depending on the distribution method.

**Output parameters (Required):** Result indication.

**Output parameters (Optional):** MBS Distribution Session resource entity.

#### 7.3.2.4 Nmbstf\_MBSDistribtutionSession\_Destroy service operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_Update

**Description: D**estroy an existing MBS Distribution Session.

**Input parameters (Required):** MBS Distribution Session Identifier.

**Output parameters:** Result indication.

#### 7.3.2.5 Nmbstf\_MBSDistributionSession\_StatusSubscribe operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_StatusSubscribe

**Description:** Invoked by MBSF on the MBSTF when it needs to monitor at least one event relevant to the MBS Distribution session. The MBSF may subscribe to multiple events in a subscription.

**Input parameters (Required):** MBS Distribution Session Identifier, Event ID(s) as described in table 4.6.2-1, notification target address.

**Output parameters:** When the subscription is accepted: Subscription correlation ID.

#### 7.3.2.6 Nmbstf\_MBSDistributionSession\_StatusUnsubscribe operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_StatusUnsubscribe

**Description:** Remove an existing subscription.

**Input parameters (Required):** Subscription correlation ID.

**Output parameters:** Result indication.

#### 7.3.2.7 Nmbstf\_MBSDistributionSession\_StatusNotify operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_StatusNotify

**Description:** Used by the MBSTF to notify the MBSF about the status change of the MBS Distribution Session.

**Input parameters (Required):** MBS Distribution Session Identifier, Event ID(s) as described in table 4.6.2-1, informative message.

**Output parameters:** Result indication.

#### 7.3.2.8 Nmbstf\_MBSDistributionSession\_StatusSubscribeMod operation

**Service operation name:** Nmbstf\_MBSDistributionSession\_StatusSubscribeMod

**Description:** Invoked by the MBSF on the MBSTF to modify an existing status subscription.

**Input parameters (Required):** Subscription correlation ID.

**Input parameters (Optional):** Event ID(s) as described in table 4.6.2-1, notification target address, subscription expiration time.

**Output parameters (Required, Optional):** Result indication.

### 7.3.3 Nmbstf\_MBSDistributionSession service

#### 7.3.3.1 Nmbstf\_MBSUserServiceAnnouncement\_Create service operation

**Service operation name:** Nmbstf\_MBSUserServiceAnnouncement\_Create

**Description:** Provides a new MBS Service Announcement to the MBSTF. Parameters as in table 4.5.7.1

**Input parameters (Required, Optional):** Parameters in table 4.5.7‑1 and table 4.5.X.1.

**Output parameters:** Result indication.

#### 7.3.3.2 Nmbstf\_MBSUserServiceAnnouncement\_Retrieve service operation

**Service operation name:** Nmbstf\_MBSUserServiceAnnouncement\_Retrieve

**Description:** Retrieve the parameters of an existing MBS User Service Announcement.

**Input parameters (Required):** User Service Announcement Identifier in request URL.

**Output parameters:** MBS User Service Announcement resource entity, including parameters in table 4.5.7‑1 and table 4.5.X.1.

#### 7.3.3.3 Nmbstf\_MBSUserServiceAnnouncement\_Update service operation

**Service operation name:** Nmbstf\_MBSUserServiceAnnouncement\_Update

**Description:** Update an existing MBS User Service Announcement, for example to change the validity time, service names, service description information, main service language, and other announcement-related information.

**Input parameters (Required, Optional):** MBS User Service Announcment Identifier. Parameters in table 4.5.7‑1 and table 4.5.X.1.

**Output parameters (Required):** Result indication.

**Output parameters (Optional):** MBS User Service Announcment resource entity.

#### 7.3.3.4 Nmbstf\_MBSDistribtutionSession\_Destroy service operation

**Service operation name:** Nmbstf\_UserServiceAnnouncement\_Update

**Description:** Destroy an existing MBS User Service Announcment.

**Input parameters (Required):** MBS User Service Announcment Identifier.

**Output parameters:** Result indication.

END OF CHANGES