**3GPP TSG-SA WG6 Meeting #47-e S6-220711r3**

**e-meeting, 14th – 22nd February 2022 (revision of S6-22xxxx)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.289** | **CR** | **0060** | **rev** | **1** | **Current version:** | **18.1.0** |  |
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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:*** | Resolve the EN on SA4 aspect | | | | | | | | | |
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| ***Source to WG:*** | Huawei, HiSilicon | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MCOver5MBS | | | | |  | ***Date:*** | | | 2022-03-30 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **C** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | SA4 already complete their 5G MBS work in TS 26.502. So the following ENs depends on SA4 work can be resolved.  In clause 4.7.1 General  Editor's note: For Rel-17/Rel-18, the use by MCX of capabilities enabled by optional functional entities (e.g. MBSF/MBSTF) and their associated interfaces, e.g. features such as MCData file delivery via User service or media features (e.g. RoHC, FEC), is FFS.  The TS 26.502 provides two services towards the AF for MBS, Nmbsf\_MBSUserService and Nmbsf\_MBSUserDataIngestSession. The RoHC now is performed by the NG-RAN node, and the FEC is supported by the MBSTF and configured by the AF during MBS User Service Provisioning, which is already captured in clause 7.3.3.13.2.  In clause 7.3.1 General:  Editor's Note: The services considered is currently limited to transport only mode. Services related to full-service mode, such MCData related scenarios where FEC is needed (e.g., file transfer) are FFS, as they depend on further progress in SA4.  As indicated above, the FEC is supported and captured in clause 7.3.3.13.2.  In clause 7.3.3.12 Usage of 5G MBS for MCData:  Editor's Note: The related procedure and the reference to the SA4 specification is FFS.  Editor's note: How to implement the FEC request/response is FFS and up to SA4 to specify.  TS 26.502 provides the Object Distribution Method to support the file delivery case. | | | | | | | | |
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| ***Summary of change:*** | | For the EN in clause 4.7.1, remove the EN.  For the EN in clause 7.3.1, directly remove the EN.  For the ENs in clause 7.3.3.12, remove the EN. | | | | | | | | |
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| ***Consequences if not approved:*** | | Invalid editor’s note will mislead the readers. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.7.1, 7.3.1, 7.3.3.12.1, 7.3.3.13.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

## 4.7 Architectural aspects of MC services using MBS

### 4.7.1 General

The main purpose of 5G Multicast-Broadcast Service (MBS) use by mission critical services is to provide efficient downlink delivery of user traffic in group calls and communications. The architectural figures in this clause are aligned with the 5GS architecture for MBS shown in Figure 5.1-2 of 3GPP TS 23.247 [15], which identifies both mandatory and optional functional entities and interfaces, in reference point representation, available for use by the MC services.

Multicast and broadcast services in 5G for MC group communications rely on the creation and establishment of MBS sessions to deliver user data in downlink. Shared and individual delivery from the MC service server to multiple MC users (i.e., users affiliated to a certain MC group) is supported either as point-to-point or point-to-multipoint over the radio. The MBS sessions can either be of broadcast or multicast type and consist of one or multiple QoS flows for different service requirements.

NOTE 1: Support of MBS and specific session types is an implementation choice.

Within this arrangement, the MC service server decides whether to create broadcast or multicast MBS sessions to be associated with certain MC groups. The 5GC adaptively decides whether to deliver the MBS traffic from the MB-UPF in the form of shared delivery or individual delivery, where the latter is applicable to multicast MBS sessions. The NG-RAN decides to utilize point-to-point or point-to-multipoint delivery methods applicable for shared delivery only. MBS provides reliability enhancements and minimizes loss of information, e.g., due to mobility and handover.

MBS group scheduling mechanism enables simultaneous reception of MBS and unicast user traffic by the MC service UEs. The UEs can receive broadcast MBS sessions irrespective of their RRC state (i.e., connected, inactive or idle) and multicast sessions only in RRC‑CONNECTED state.

The following capabilities (non-exhaustive list) provided by MBS could be used by MCX services server:

- MBS session creation;

- MBS session update;

- MBS session release;

- MBS session ID allocation;

- Transparent MBS Data forwarding;

- Dynamic PCC control for MBS session.

Editor's Note: In clause 4.7 and its subclauses, the architecture representations and the reference points are FFS.

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

## 7.3 MC service over 5G MBS

### 7.3.1 General

This subclause defines information flows and procedures for 5G MBS usage that applies to MC services. 5G MBS session can be used by any MC service for any MC service group.

The following subclauses specify the procedures and information flows for the usage of 5G MBS transmission that are utilized by the following MC services:

- MCPTT (as specified in 3GPP TS 23.379 [6]);

- MCVideo (as specified in 3GPP TS 23.281 [4]); and

- MCData (as specified in 3GPP TS 23.282 [5]).

MC service specific pre-requisites and resultant behavior by functional entities in performing these procedures are specified in the respective MC service TSs as listed above.

The first phase to utilize MBS sessions for MCX media transmission is to have the sessions created hence the network resources are reserved. The MC service server needs to interact with the 5GC for this matter. During the interaction, the necessary information related to the requested session is determined, e.g., MBS session mode (either a broadcast or a multicast session) and the required QoS profile. This interaction depends on the configuration option under consideration, i.e., whether the MC service server is in trusted domain (limited operations), and whether the session creation is done with or without a dynamic PCC rule.

NOTE 1: it is implementation specific whether the MC service server decides to use multicast or broadcast MBS sessions.

NOTE 2: It is implementation specific whether the MC service server decides to create (one or multiple) MBS sessions for MC media for MC group communications associated to a certain MC group or create (one or multiple) dynamic MBS sessions once the need has emerged, e.g., dynamic MBS sessions to be associated for an ad hoc group.

NOTE 3: It is implementation specific whether an MBS session is associated to one or multiple MC group, and whether it is re-assigned to other MC groups

The information elements describing the MBS session under consideration is then sent to the MC service clients via MBS session announcement, where the latter need to react according the announced session mode.

If eMBMS and 5G MBS are co-existed for MC services, the MC service server may decide to trigger the establishment of an eMBMS bearer to deliver the MC media associated to the MC service group communications if the target MC service group(s) consists of members with MBMS capable RAT. As a result, the MC service server subsequently needs to send an eMBMS service announcement towards the clients camping on LTE.

NOTE 4: It is implementation specific whether the MC service server triggers an eMBMS bearer or a unicast bearer to serve MC service clients camping on LTE.

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

#### 7.3.3.12 Usage of 5G MBS for MCData

##### 7.3.3.12.1 General

The procedures and information flows for Short data service and file distribution of MC Data group are defined in 3GPP TS 23.282 [5].

When using 5G MBS, MCData server can determine to use either pre-created MBS session or dynamic MBS session as defined in clause 7.3.3.1 for the transmission of DL link media for different types of MCData service capabilities.

MCData may use the 5G MBS session for the MCData features short data service and file distribution for MC Data group. The 5G MBS session can be used by any group.

Both the media packets as well as application level control signalling (e.g. transmission control) to the receiving users may be sent on the MBS session. Optionally, a separate MBS Session could be used for the application level control signalling (e.g. transmission control).

When MBSF/MBSTF are deployed in 5GS, MCData server could also determine to use File distribution capabilities provided by MBSF/MBSTF for file distribution.

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

##### 7.3.3.13.2 FEC encoding by the MBSTF

In this procedure, depicted in figure 7.3.3.13.2-1, the MC service server asks the MBSF/MBSTF to apply FEC to a set of media, transported by a 5G MBS session, using the Setup FEC request.

This procedure can be applied when using pre-created MBS session and service announcement (as specified in clause 7.3.3.1.2) or using MBS session and service announcement (as specified in clause 7.3.3.1.3).

Pre-condition:

1. The MC service server has already configured and activated a 5G MBS session.



Figure 7.3.3.13.2-1: Application of FEC by the MBSF-MBSTF

1. The MC service server decides to set up FEC for a set of MC service media flows. It will send the FEC request to MBSF/MBSTF.

It includes the following elements: the TMGI of the MBS session transporting those media, the media descriptions (codecs, transport protocols, bitrates, destination ip addresses and ports), the identification of the FEC repair packet flow (IP destination and port), and an upper bound to the additional latency resulting due to FEC application. The MC Service server may perform this request several times to protect separately different sets of media transported within the same 5G MBS session.

2. If the MBSF can satisfy the request, the Setup FEC response includes a modified list of media information and FEC information. The response also includes an identifier of the corresponding FEC process instance, which can be used to release the application of FEC for these media flows.

NOTE 1: Source media packets may be modified by the application of FEC (e.g. addition of a footer or header), leading to a modification of the delivery protocol to be announced within the media information.

NOTE 2: The Release FEC request is not shown in the figure.

3. The MC service server announces the 5G MBS session to the MC service client with the MBS session announcement procedure, including the modified list of media information and FEC information within the SDP information.

4. When the MC service server decides to transmit the MC service media flow for a group communication, the MC service server sends to the group a message identifying the MC service media flow and the TMGI of the 5MBS session, such as the MapGroupToSessionStream message for MCPTT or MCVideo.

5. The MC service server sends the downlink media to the MBSTF over Nmb8.

6. The MBSTF performs FEC encoding of the downlink media in accordance to the announced FEC algorithm and parameters and delivers it over 5G MBS.

7. The MC service client performs FEC decoding of the encoded media flows in accordance with the announced FEC information and delivers the decoded flows to the media player.

\* \* \* End of Change \* \* \* \*