**3GPP TSG-RAN WG3 #117bis-eR3-225963**

**Online, 10th - 18th October 2022 was R3-225444**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **0245** | **rev** | **2** | **Current version:** |  |  |
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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 |  | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_MBS-Core |  | ***Date:*** | 2022-09-27 |
|  |  |  |  |  |
| ***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 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)* |
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| ***Reason for change:*** | The example message flow for multicast MBS Context establishment is neither aligned with the current status of specifications nor unambiguously interpretable and needs to be restructured. |
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| ***Summary of change:*** | The example message flow for multicast MBS Context establishment was devided into three scenarios:a) a first UE joining an inactive multicast MBS session as the first UE in a gNBb) multicast session activationc) UE joing an active multicast MBS session.d) MRB type configuration change for a UE and establishment of an F1-U ptp retransmission tunnelwith the possibility for the gNB-CU-CP to establish and leave established gNB-DU multicast MBS session contexts during deactivated multicast MBS session context and F1-U resources..Impact Analysis:Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release) because it restructures stage 2 specification of the multicast MBS function in NG-RAN.The impact can be considered isolated because the change affects only the stage 2 specification of the multicast MBS function in NG-RAN. |
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| ***Consequences if not approved:*** | Stage 2 specification of the multicast MBS function in NG-RAN would be neither aligned with the current status of specifications nor unambiguously interpretable. |
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| ***Clauses affected:*** | 8.15.1.2 |
|  |  |
|  | **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:*** | r0: submission to RAN3#117-er1: submission to RAN3#117bis-er2: revised at RAN3#117bis-e |

<<<<<<<<<<<<<<<<<<<< First Change >>>>>>>>>>>>>>>>>>>>

#### 8.15.1.2 Multicast MBS Session Context Establishment

Figures 8.15.1.2-1, 8.15.1.2-2 and 8.15.1.2-3 illustrate an examplified interaction of NGAP, E1AP, F1AP and RRC protocol functions for Multicast MBS Session Context Establishment.

**A UE joins an inactive multicast MBS Session as first UE in a gNB:**

  Figure 8.15.1.2-1: Multicast MBS Session Context establishment -
a UE joins an inactive multicast MBS Session as first UE in a gNB

0. For a certain multicast MBS session (TMGI), which is currently inactive, no multicast MBS session context is yet established in the gNB.

1. The gNB(-CU-CP) receives for a UE within the NGAP PDU Session Modification Request message the information that the UE has joined a multicast MBS session. A multicast MBS session context is established within the gNB.

NOTE 1: NAS related details for PDU Session signalling are not shown in Figure 8.15.1.2-1.

2/3. If not yet existing, the gNB-CU-CP establishes the multicast MBS session context at the gNB-CU-UP, in order to retrieve for unicast NG-U transport the GTP DL TEID, a shared resource address (GTP DL TEID).

4/5. The gNB-CU CP triggers the NGAP Distribution Setup procedure. For unicast transport, DL/UL GTP TEIDs are exchanged, for multicast transport, multicast address information is fetched from the 5GC.

6/7. The UE context in the gNB-DU is modified to include the information that the UE has joined the multicast MBS session.

8./9. The NG-U UP entity is established by means of the E1AP MC Bearer Context Modification procedure, providing the DU side F1-U TNL address and the 5GC NG-U TNL address to the gNB-CU-UP, which provides the gNB-CU-UP side F1-U TNL address in return.

10. In case of NG-U multicast transport, the gNB-CU-UP joins the NG-U multicast group.

11. The gNB successfully terminates the NGAP PDU Session Modification procedure.

12./13. The gNB-CU-CP may decide, probably after a couple of UEs have joined the inactive MBS session, to establish the multicast MBS session context at the gNB- DU, providing the current MBS Session Status and the MRB configuration, and, if applicable, MBS Service area information.

14. If the MBS session context is established at the gNB-DU, establishment of F1-U tunnel resources may be triggered by means of the F1AP Multicast Distribution Setup procedure, which are either established per DU or per cell or, if applicable, per MBS Area Session ID. The decision to establish per cell or per MBS Area Session ID may depend on the joined UEs’ current location.

15.-17. The receiving gNB-CU-CP may need to fetch a gNB side NG-U TNL address information from the gNB-CU-UP by means of a E1AP MC Bearer Context Modification procedure and provide it to the gNB-DU.

NOTE 2: If the gNB-DU decides to establish multiple F1-U tunnels for an MRB then steps 14.-17. are performed multiple times.

On NG-U, in case of location dependent multicast MBS Sessions, multiple shared NG-U transport tunnels may need to be setup, one per Area Session ID served by the gNB.

In case of shared NG-U termination,

- the gNB-CU-UP may provide the gNB-CU-CP at E1 setup or configuration update about established shared NG-U terminations, indicated by one or several MBS Session IDs.

- at establishment of the MC bearer context in the gNB-CU-UP, the gNB-CU-CP may request the gNB-CU-UP to either apply the available MRB configuration of the shared NG-U termination, or to apply the MRB configuration requested by the gNB-CU-CP. The gNB-CU-UP provides the MRB configuration to the gNB-CU-CP if the MRB configuration requested by the gNB-CU-CP and the available MRB configuration of the shared NG-U termination are different.

**The multicast MBS session is activated:**

Figure 8.15.1.2-2: Multicast MBS Session Context establishment -
the multicast MBS session is activated

1. The multicast MBS session is activated by the 5GC.

2./3. If the gNB-CU-CP has already decided to establish the multicast MBS session context at the gNB-DU before the multicast MBS session was activated, as shown in Figure 8.15.1.2-1, the gNB-CU-CP informs the gNB-DU about the new multicast MBS session status by means of the F1AP Multicast MBS Session Modification procedure.

4.-7. If necessary, the gNB-DU triggers the the establishment of F1-U tunnel resources as shown in steps 14.-17. in Figure 8.15.1.2-1. by means of the F1AP Multicast Distribution Setup procedure.

8. Each RRC\_CONNECTED UE that has joined the session is configured with MRB resources.

9. The NGAP MBS Session Activation procedure is successfully completed.

10. The multicast MBS media stream is provided to the UE.

**A UE joins an active multicast MBS Session in a gNB:**

 Figure 8.15.1.2-3: Multicast MBS Session Context establishment -
a UE joins an inactive multicast MBS Session as first UE in a gNB

0. MBS Session Resources have been activated in the gNB for a multicast MBS session due to one or several UEs that have joined the MBS session are served by the gNB, in particular, within radio resources controlled by the gNB-DU depicted in Figure 8.15.1.2-3.

1. The gNB(-CU-CP) receives for a UE within the NGAP PDU Session Modification Request message the information that the UE has joined a multicast MBS session.

NOTE 3: NAS transport related details for PDU Session signalling are not shown in Figure 8.15.1.2-3.

2a/b. The UE Context in the gNB-DU is modified, providing joining related and multicast MRB related information.

3 If necessary, e.g. if the gNB-DU decides to configure ptp MRB resources for the UE, a new multicast F1-U context is established, resulting in issuing the F1AP Multicast Distribution Setup procedure and the E1AP MC Bearer Context Modification procedure.

2c-2f. The UE is configured with MRB resources.

NOTE 2: If the F1AP Distribution Setup procedure (step 3) may be triggered before the F1AP UE Context Modification procedure (step 2) is triggered.

4. The gNB successfully terminates the NGAP PDU Session Modification procedure.

**Change of the MRB type configuration with F1-U ptp retransmission tunnel establishment:**

Figure 8.15.1.2-4: Multicast MBS Session Context establishment -
change of the MRB type configuration with F1-U ptp retransmission tunnel establishment

1. The gNB-DU decides to change the MRB type configuration for a UE and provides the new configuration to the gNB-CU-CP along with a per-MRB MRB type reconfiguration indication and the MRB Reconfigured RLC mode.

2. The gNB-CU-CP confirms the modification request and indicates this to the gNB-DU. The gNB-CU-CP may request the gNB-DU to establish F1-U ptp retransmission resources in order for the UE to perform PDCP Status Report and receive retransmitted PDCP PDUs for the reconfigured MRBs.

4. - 7. If necessary, the gNB-DU requests the establishment of F1-U resources for ptp retransmission by means of triggering the F1AP Multicast Distribution Setup procedure, which in turn triggers the E1AP MC Bearer Context Modification procedure to exchange F1-U tunnel end-point addresses.

8./9. The RRC Reconfiguration procedure is performed

10. PDCP Status Report and PDCP PDU retransmission can take place via the established F1-U ptp retransmission resources.

<<<<<<<<<<<<<<<<<<<< End of Changes >>>>>>>>>>>>>>>>>>>>