**3GPP TSG-RAN WG2 Meeting #121 *R2-230xxxx***

**Athens, Greece, February-March, 2023**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.300** | **CR** | **0613** | **rev** | **-** | **Current version:** | **17.3.0** |  |
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| *For* [***HELP***](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 | **x** | Core Network |  |

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| ***Title:***  | MBS corrections for 38.300 |
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| ***Source to WG:*** | ,CBN |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_MBS-Core |  | ***Date:*** | 2022-02-17 |
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| ***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:*** | 1. If the session is in active state when UE joins the session, the gNB may also send RRCReconfiguration message with relevant MBS configuration for the multicast session to the UE. The current text does not cover this case.2. For UE joined multiple sessions, it stops monitoring group notification only when UE leaves all the joined sessions but not just “this multicast session”. The current text in 16.10.5.2 is not correct.3. For the UE in RRC\_INACTIVE state that joined MBS multicast session, if it is camping on the gNB not supporting MBS, the UE may also be notified via paging due to session activation. The current text in 16.10.5.2 does not cover this case.4. According to 38.304, the UE is made aware of which frequency is providing which MBS broadcast services via PTM, through either the combination of SIB21 and USD, or through information in USD only. The text in 16.10.6.5.1 does not cover this case “through information in USD only”.5.when UE reports MII,it should consider both the MBS frequencies/services that UE is interested to receive and the MBS frequencies/services that UE is receiving. The “MBS frequencies/services UE is receiving” is missed in text in 16.10.6.5.2. |
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| ***Summary of change:*** | 1. In sesction 16.10.5.2,add the description that if the session is in active state when UE joins the session, the gNB may send RRCReconfiguration message with relevant MBS configuration for the multicast session to the UE.

**Impact analysis**Impacted 5G architecture options:NR standaloneImpacted functionality:MBSInter-operability:If the UE is implemented according to this CR but the network is not, UE may not be able to recevie the multicast session.If the network is implemented according to this CR but the UE is not, there is no inter-operability issue foreseen. 1. In sesction 16.10.5.2,change to that for UE joined multiple sessions, it stops monitoring group notification only in case that UE leaves all the joined sessions.
2. In sesction 16.10.5.2,add that if the UE in RRC\_INACTIVE state that joined MBS multicast session is camping on the gNB not supporting MBS, the UE may be notified about session activation individually by RAN-initiated paging.
3. In 16.10.6.5.1,add that the UE is also made aware of which frequency is providing which MBS broadcast services via PTM through information in USD only.
4. In 16.10.6.5.2,add the case “MBS frequencies/services UE is receiving” for MII reporting.
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| ***Consequences if not approved:*** | 1. Ambiguity on when gNB sends RRCReconfiguration message with relevant MBS configuration for the multicast session to the UE.2.wrong UE behavior for UE joined multiple multicast sessions.3.the non-MBS gNB behavior on notify session activation to UE via individual paging is not clear. 4. Misalignment between 38.300 and 38.304 about how UE is made aware of which frequency is providing which MBS broadcast services via PTM.5. Misalignment between 38.300 and 38.331 about how UE reports MII. |
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| ***Clauses affected:*** | 16.10.5.2,16.10.6.5.1, 16.10.6.5.2 |
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|  | **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 Modified Subclause*

#### 16.10.5.2 Configuration

A UE can receive data of MBS multicast session only in RRC\_CONNECTED state. If the UE which joined a multicast session is in RRC\_CONNECTED state and the session is active or when the multicast session is activated, the gNB may send *RRCReconfiguration* message with relevant MBS configuration for the multicast session to the UE.

When there is temporarily no data to be sent to the UEs for a multicast session that is active, the gNB may move the UE to RRC\_INACTIVE state. When an MBS multicast session is deactivated, the gNB may move the UE to RRC\_IDLE or RRC\_INACTIVE state. gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC\_IDLE or RRC\_INACTIVE state when a multicast session has been activated by the CN. gNBs supporting MBS use a group notification mechanism to notify the UEs in RRC\_INACTIVE state when the session is already activated and the gNB has multicast session data to deliver. Upon reception of the group notification, the UEs reconnect to the network or resume the connection and transition to RRC\_CONNECTED state. The group notification is addressed with P-RNTI on PDCCH, and the paging channels are monitored by the UE as described in clause 9.2.5. Paging message for group notification contains MBS session ID which is utilized to page all UEs in RRC\_IDLE and RRC\_INACTIVE states that joined the associated MBS multicast session, i.e., UEs are not paged individually. The UE stops monitoring for group notifications related to a specific multicast session, i.e., stops checking for the MBS session ID in the Paging message, when the UE enters RRC\_CONNECTED state. The UE does not monitor for group notifications for these cases, i.e., once this UE leaves all the joined multicast session(s) or the network requests the UE to leave, or the network releases the multicast session.

If the UE in RRC\_IDLE state that joined an MBS multicast session is camping on the gNB not supporting MBS, the UE may be notified by CN-initiated paging where CN pages each UE individually due to session activation or data availability, as described in clause 9.2.5. If the UE in RRC\_INACTIVE state that joined MBS multicast session is camping on the gNB not supporting MBS, the UE may be notified individually by RAN-initiated paging due to session activation or data availability, as described in clause 9.2.5.

*Next Modified Subclause*

#### 16.10.6.5 Service Continuity

##### 16.10.6.5.0 General

Mobility principles build on existing functionality including functions described in clause 9.2.

NR MBS supports MBS frequency layer prioritization for MBS broadcast sessions. The gNBs may be configured with the MBS FSA ID(s) supported by each of their cells. The gNBs may exchange this information with their neighbours within Xn Setup messages and subsequent Xn Configuration Update messages to help with frequency layer prioritization.

##### 16.10.6.5.1 Service Continuity in RRC\_IDLE or RRC\_INACTIVE

Mobility procedures for MBS reception allow the UE to start or continue receiving MBS service(s) when changing cells. The gNB may indicate in the MCCH the list of neighbour cells providing the same MBS broadcast service(s) as provided in the serving cell. This allows the UE, e.g., to request unicast reception of the service before moving to a cell not providing the MBS broadcast service(s) using PTM transmission. To avoid the need to read MBS broadcast related system information and potentially MCCH on neighbour frequencies, the UE is made aware of which frequency is providing which MBS broadcast services via PTM, through User Service Description (USD), as defined in TS 26.346 [46], or the combination of the following:

- USD, as defined in TS 26.346 [46];

- SIB21, as defined in clause 7.3.1.

NOTE: UE can request unicast reception of the service after moving to a cell not providing the MBS broadcast service(s) using PTM transmission.

In RRC\_IDLE and RRC\_INACTIVE, the UE applies the normal cell reselection rules with the following modifications:

- the UE which is receiving or interested to receive MBS broadcast service(s) via PTM and can only receive these MBS broadcast service(s) via PTM while camping on the frequency providing these MBS broadcast service(s) is allowed to make this frequency highest priority when the conditions described in TS 38.304 [10] are met;

- when the MBS broadcast service(s) which the UE is interested in are no longer available (after the end of the session) or the UE is no longer interested in receiving the service(s), the UE no longer prioritises the frequency providing these MBS broadcast service(s).

##### 16.10.6.5.2 Service Continuity in RRC\_CONNECTED

To ensure service continuity of MBS broadcast, the UE in RRC\_CONNECTED state may send MBS Interest Indication to the gNB, consisting of the following information:

- List of MBS frequencies UE is receiving or interested to receive, sorted in decreasing order of interest;

- Priority between the reception of all listed MBS frequencies and the reception of any unicast bearer and multicast MRB;

- List of MBS broadcast services the UE is receiving or interested to receive, in case SIB20 is provided for PCell or SCell.

MBS Interest Indication information reporting can be implicitly enabled/disabled by the presence of SIB21.

The gNB may use this information, together with the information about the UE's capabilities (e.g., supported band combinations), when providing an RRC configuration and/or downlink assignments to the UE or to release DRBs/multicast MRBs, to allow the UE to receive the MBS services the UE is interested in. MBS Interest Indication information can be exchanged between source gNB and target gNB during handover.

*End of Modification*