**3GPP TSG-RAN WG2 Meeting #125 R2-240XXXX**

**Athens, Greece, Feb. 26th – Mar. 1st, 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.300** | **CR** | **0798** | **rev** | **4** | **Current version:** | **18.0.0** |  |
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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 | **X** | Core Network |  |

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|  |
| ***Title:***  | Corrections to TS 38.300 for MBS |
|  |  |
| ***Source to WG:*** | CMCC, Huawei, Qualcomm Incorporated, CATT, NOKIA, Ericsson, vivo  |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_MBS\_enh-Core |  | ***Date:*** | 2024-03-07 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***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 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. In 7.2, some descriptions for multicast reception in RRC\_INACTIVE are missing.
2. In 7.3.1 of the latest version of TS 38.300, the description of SIB24 is missing.
3. There’s misalignment of the terminology of the RNTI used for multicast MCCH scheduling between TS 38.300 and TS 38.331.
4. In Section 8.1,there’s no clear definition for the RNTI mentioned in (3).
5. The general description of multicast reception in RRC\_INACTIVE state is missing in Section 16.10.1.
6. In clause 16.10.3, multicast reception in RRC\_INACTIVE is not considered.
7. To clarify the case that UE should resumes to RRC\_CONNECTED in 16.10.5.2.
8. The case that UE is required to resume RRC connection to get the PTM configuration due to the new cell not providing multicast MCCH is missing in 16.10.5.3.
9. In clause 16.10.5.7, supporting slot-level repetition for multicast MTCH PDSCH in RRC\_INACTIVE (as mentioned in RAN1 LS R1-2306243) is not captured. To avoid misunderstanding that slot-level repetition is not supported for multicast reception in RRC\_CONNECTED, a general description covering both RRC\_CONNECTED and RRC\_INACTIVE should be added.
10. In 16.10.5.7, the descrption for MIMO layer of MBS multicast scheduling for UEs in the RRC\_INACTIVE state is missing.
11. A capability for broadcast reception from non-serving cell is introduced, while the current description in 16.10.6.3 collides with it.
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| ***Summary of change:*** | 1. Add descriptions for multicast reception in RRC\_INACTIVE in 7.2.
2. Add the description of SIB24 in 7.3.1.
3. Capture the definition of Multicast MCCH RNTI.
4. Same terminology is used in stage 2 and stage 3 spec.
5. Capture general description of multicast reception in RRC\_INACTIVE state.
6. Add descriptions for multicast reception in RRC\_INACTIVE in 16.10.3.
7. Clarify in 16.10.5.2 that the UE resumes the connection and transition to RRC\_CONNECTED from RRC\_INACTIVE state upon reception of the group notification that does not indicate multicast reception in RRC\_INACTIVE.
8. Add in 16.10.5.3.5 that the UE is required to resume RRC connection to get the PTM configuration due to the new cell not providing multicast MCCH.
9. Capture the description of supporting slot-level repetition for multicast MTCH PDSCH in RRC\_INACTIVE in 16.10.5.7.
10. Clarify in 16.10.5.7 that The maximum number of MIMO layers is one for MBS multicast scheduling for UEs in the RRC\_INACTIVE state.
11. Remove the NOTE in 16.10.6.3.
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| ***Consequences if not approved:*** | There are still some ambiguity and editorial errors in the specification. |
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| ***Clauses affected:*** | 7.2, 7.3.1, 8.1, 16.10.1, 16.10.3, 16.10.5.2, 16.10.5.3.5, 16.10.5.7, 16.10.6.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...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 Modified Subclause*

7.2 Protocol States

RRC supports the following states which can be characterised as follows:

**- RRC\_IDLE:**

- PLMN selection;

- Broadcast of system information;

- Cell re-selection mobility;

- Paging for mobile terminated data is initiated by 5GC;

- Transfer of MBS broadcast data to the UE over MRB(s);

- DRX for CN paging configured by NAS.

**- RRC\_INACTIVE:**

- PLMN selection;

- Broadcast of system information;

- Cell re-selection mobility;

- Paging is initiated by NG-RAN (RAN paging);

- RAN-based notification area (RNA) is managed by NG- RAN;

- DRX for RAN paging configured by NG-RAN;

- 5GC - NG-RAN connection (both C/U-planes) is established for UE;

- The UE Inactive AS context is stored in NG-RAN and the UE;

- NG-RAN knows the RNA which the UE belongs to;

- Transfer of MBS multicast/broadcast data to the UE over MRB(s);

- Transfer of unicast data and/or signalling to/from the UE over radio bearers configured for SDT.

**- RRC\_CONNECTED:**

- 5GC - NG-RAN connection (both C/U-planes) is established for UE;

- The UE AS context is stored in NG-RAN and the UE;

- NG-RAN knows the cell which the UE belongs to;

- Transfer of unicast data to/from the UE;

- Transfer of MBS multicast/broadcast data to the UE over MRB(s);

- Network controlled mobility including measurements.

*Next Modified Subclause*

## 7.3 System Information Handling

### 7.3.1 Overview

System Information (SI) consists of a MIB and a number of SIBs, which are divided into Minimum SI and Other SI:

- **Minimum SI** comprises basic information required for initial access and information for acquiring any other SI. Minimum SI consists of:

- *MIB* contains cell barred status information and essential physical layer information of the cell required to receive further system information, e.g. CORESET#0 configuration. *MIB* is periodically broadcast on BCH.

- *SIB1* defines the scheduling of other system information blocks and contains information required for initial access. SIB1 is also referred to as Remaining Minimum SI (RMSI) and is periodically broadcast on DL-SCH or sent in a dedicated manner on DL-SCH to UEs in RRC\_CONNECTED.

- **Other SI** encompasses all SIBs not broadcast in the Minimum SI. Those SIBs can either be periodically broadcast on DL-SCH, broadcast on-demand on DL-SCH (i.e. upon request from UEs in RRC\_IDLE, RRC\_INACTIVE, or RRC\_CONNECTED), or sent in a dedicated manner on DL-SCH to UEs in RRC\_CONNECTED (i.e., upon request, if configured by the network, from UEs in RRC\_CONNECTED or when the UE has an active BWP with no common search space configured or when the UE configured with inter cell beam management is receiving DL-SCH from a TRP with PCI different from serving cell's PCI). Other SI consists of:

- *SIB2* contains cell re-selection information, mainly related to the serving cell;

- *SIB3* contains information about the serving frequency and intra-frequency neighbouring cells relevant for cell re-selection (including cell re-selection parameters common for a frequency as well as cell specific re-selection parameters);

- *SIB4* contains information about other NR frequencies and inter-frequency neighbouring cells relevant for cell re-selection (including cell re-selection parameters common for a frequency as well as cell specific re-selection parameters), which can also be used for NR idle/inactive measurements;

- *SIB5* contains information about E-UTRA frequencies and E-UTRA neighbouring cells relevant for cell re-selection (including cell re-selection parameters common for a frequency as well as cell specific re-selection parameters);

- *SIB6* contains an ETWS primary notification;

- *SIB7* contains an ETWS secondary notification;

- *SIB8* contains a CMAS warning notification;

- *SIB9* contains information related to GPS time and Coordinated Universal Time (UTC);

- SIB10 contains the Human-Readable Network Names (HRNN) of the NPNs listed in SIB1;

- SIB11 contains information related to idle/inactive measurements;

- SIB15 contains information related to disaster roaming;

- SIB16 contains slice-based cell reselection information;

- SIB17 contains information related to TRS configuration for UEs in RRC\_IDLE/RRC\_INACTIVE;

- SIBpos contains positioning assistance data as defined in TS 37.355 [43] and TS 38.331 [12];

- SIB18 contains information related to the Group IDs for Network selection (GINs) associated with SNPNs listed in SIB1.

- SIB19 in TN contains NTN-specific parameters for NTN neighbour cells as defined in TS 38.331 [12].

For sidelink, Other SI also includes:

- *SIB12* contains information related to NR sidelink communication;

- *SIB13* contains information related to *SystemInformationBlockType21* for V2X sidelink communication as specified in TS 36.331 clause 5.2.2.28 [29];

- *SIB14* contains information related to *SystemInformationBlockType26* for V2X sidelink communication as specified in TS 36.331 clause 5.2.2.33 [29];

- *SIB23* contains information related to ranging and sidelink positioning.

For non-terrestrial network, Other SI also includes:

- *SIB19* contains NTN-specific parameters for serving cell and optionally NTN-specific parameters for neighbour cells as defined in TS 38.331 [12].

- *SIB25* contains TN coverage are information as defined in TS 38.331 [12].

For MBS broadcast, Other SI also includes:

- *SIB20* contains MCCH configuration;

- *SIB21* contains information related to service continuity for MBS broadcast reception.

For MBS multicast reception in RRC\_INACTIVE state, Other SI also includes:

- *SIB24* contains the information required to acquire the multicast MCCH/MTCH configuration as defined in TS 38.331 [12].

For ATG network, Other SI also includes:

- *SIB22* contains ATG-specific parameters for serving cell and optionally ATG-specific parameters for neighbour cells as defined in TS 38.331 [12].

Figure 7.3.1-1 below summarises System Information provisioning.



Figure 7.3.1-1: System Information Provisioning

For a cell/frequency that is considered for camping by the UE, the UE is not required to acquire the contents of the minimum SI of that cell/frequency from another cell/frequency layer. This does not preclude the case that the UE applies stored SI from previously visited cell(s).

If the UE cannot determine the full contents of the minimum SI of a cell by receiving from that cell, the UE shall consider that cell as barred.

In case of BA, the UE only acquires SI on the active BWP.

If the UE is configured with inter cell beam management:

- the UE is not required to acquire the SI from the serving cell while it is receiving DL-SCH from a TRP with PCI different from serving cell's PCI.

*Next Modified Subclause*

# 8 NG Identities

## 8.1 UE Identities

In this clause, the identities used by NR connected to 5GC are listed. For scheduling at cell level, the following identities are used:

- C-RNTI: unique UE identification used as an identifier of the RRC Connection and for scheduling;

- CG-SDT-CS-RNTI: unique UE identification used for Configured Grant-based SDT in the uplink;

- CI-RNTI: identification of cancellation in the uplink;

- CS-RNTI: unique UE identification used for Semi-Persistent Scheduling in the downlink or configured grant in the uplink;

- INT-RNTI: identification of pre-emption in the downlink;

- MCS-C-RNTI: unique UE identification used for indicating an alternative MCS table for PDSCH and PUSCH;

- P-RNTI: identification of Paging and System Information change notification in the downlink;

- SI-RNTI: identification of Broadcast and System Information in the downlink;

- SP-CSI-RNTI: unique UE identification used for semi-persistent CSI reporting on PUSCH.

For power and slot format control, the following identities are used:

- SFI-RNTI: identification of slot format;

- TPC-PUCCH-RNTI: unique UE identification to control the power of PUCCH;

- TPC-PUSCH-RNTI: unique UE identification to control the power of PUSCH;

- TPC-SRS-RNTI: unique UE identification to control the power of SRS.

During the random access procedure, the following identities are also used:

- RA-RNTI: identification of the Random Access Response in the downlink;

- MSGB-RNTI: identification of the Random Access Response for 2-step RA type in the downlink;

- Temporary C-RNTI: UE identification temporarily used for scheduling during the random access procedure;

- Random value for contention resolution: UE identification temporarily used for contention resolution purposes during the random access procedure.

For NR connected to 5GC, the following UE identity is used at NG-RAN level:

- I-RNTI: used to identify the UE context in RRC\_INACTIVE.

For UE power saving purpose, the following identities are used:

- PS-RNTI: used to determine if the UE needs to monitor PDCCH on the next occurrence of the connected mode DRX on-duration;

- PEI-RNTI: used to determine if the UE needs to monitor the associated PO.

For IAB the following identity is used:

- AI-RNTI: identification of the DCI carrying availability indication for soft symbols of an IAB-DU.

For Network-Controlled Repeater the following identity is used:

- NCR-RNTI: identification of the DCI carrying side control information.

For MBS, the following identities are used:

- G-RNTI: Identifies dynamically scheduled PTM transmissions of MTCH(s);

- G-CS-RNTI: Identifies configured scheduled PTM transmissions of MTCH(s) scheduled with configured grant;

- MCCH-RNTI: Identifies transmissions of MCCH and MCCH change notification for broadcast reception.

- Multicast MCCH-RNTI: Identifies transmissions of MCCH and MCCH change notification for multicast reception in RRC\_INACTIVE state.

For sidelink, the following identities are used:

- SL-RNTI: unique UE identification used for NR sidelink communication scheduling;

- SL-CS-RNTI: unique UE identification used for configured sidelink grant for NR sidelink communication;

- SL Semi-Persistent Scheduling V-RNTI: unique UE identification used for semi-persistent scheduling for V2X sidelink communication;

- SL-PRS-RNTI: unique UE identification used for SL-PRS transmission scheduling on dedicated SL-PRS resource pool;

- SL-PRS-CS-RNTI: unique UE identification used for configured sidelink grant for SL-PRS transmission on dedicated SL-PRS resource pool.

*Next Modified Subclause*

## 16.10 Multicast and Broadcast Services

### 16.10.1 General

NR system enables resource efficient delivery of multicast/broadcast services (MBS).

For broadcast communication service, the same service and the same specific content data are provided simultaneously to all UEs in a geographical area (i.e., all UEs in the broadcast service area as defined in TS 23.247 [45] are authorized to receive the data). A broadcast communication service is delivered to the UEs using a broadcast session. A UE can receive a broadcast communication service in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED state.

For multicast communication service, the same service and the same specific content data are provided simultaneously to a dedicated set of UEs (i.e., not all UEs in the MBS service area as defined in TS 23.247 [45] are authorized to receive the data). A multicast communication service is delivered to the UEs using a multicast session. A UE can receive a multicast communication service in RRC\_CONNECTED state with mechanisms such as PTP and/or PTM delivery and/or in RRC\_INACTIVE state with PTM delivery, as defined in clause 16.10.5.4. HARQ feedback/retransmission can be applied to both PTP and PTM in RRC\_CONNECTED state.

*Next Modified Subclause*

### 16.10.3 Protocol Architecture

Figures 16.10.3-1 and 16.10.3-2 depict the downlink Layer 2 architecture for multicast session and broadcast session respectively, where MBS protocol stack comprises the same layer 2 sublayers as described in clause 6 with the following differences:

- SDAP sublayer provides only the following functionalities:

- Mapping between an MBS QoS flow and an MRB;

- Transfer of user plane data.

- PDCP sublayer provides only the following functionalities:

- Transfer of user plane data;

- Maintenance of PDCP SNs;

- Header compression and decompression using the ROHC protocol or EHC protocol;

- Reordering and in-order delivery;

- Duplicate discarding.

- For a multicast session, gNB provides one or more of the following multicast MRB configuration(s) to the UE in RRC\_CONNECTED state via dedicated RRC signalling:

- Multicast MRB with DL only RLC-UM or bidirectional RLC-UM configuration for PTP transmission;

- Multicast MRB with RLC-AM entity configuration for PTP transmission;

- Multicast MRB with DL only RLC-UM entity for PTM transmission;

- Multicast MRB with two RLC-UM entities, one DL only RLC-UM entity for PTP transmission and the other DL only RLC-UM entity for PTM transmission;

- Multicast MRB with three RLC-UM entities, one DL RLC-UM entity and one UL RLC-UM entity for PTP transmission and the other DL only RLC-UM entity for PTM transmission;

- Multicast MRB with two RLC entities, one RLC-AM entity for PTP transmission and the other DL only RLC-UM entity for PTM transmission.

- For a multicast session, gNB may change the MRB type for the UE in RRC\_CONNECTED state using RRC signalling.

- For a multicast session, gNB provides the following multicast MRB configuration to the UE in RRC\_INACTIVE state via broadcast RRC signalling and/or dedicated RRC signalling:

- Multicast MRB with DL only RLC-UM entity for PTM transmission.



Figure 16.10.3-1: Downlink Layer 2 Architecture for Multicast Session

- For broadcast session, gNB provides the following broadcast MRB configuration to the UE using broadcast RRC signalling:

- Broadcast MRB with one DL only RLC-UM entity for PTM transmission.



Figure 16.10.3-2: Downlink Layer 2 Architecture for Broadcast Session

*Next Modified Subclause*

#### 16.10.5.2 Configuration

A UE can be configured to receive data of MBS multicast session only in RRC\_CONNECTED state or RRC\_INACTIVE state. To receive the multicast service, the UE needs to perform MBS Session Join procedure as specified in TS 23.247 [45]. It is up to gNB to decide whether the UE receives data of MBS multicast session in RRC\_CONNECTED state or RRC\_ INACTIVE state. The gNB moves the UE from RRC\_CONNECTED state to RRC\_INACTIVE state via *RRCRelease* message, and moves the UE from RRC\_INACTIVE state to RRC\_CONNECTED state via group notification or UE-specific paging.

If the UE which joined a multicast session is in RRC\_CONNECTED state and when the multicast session is activated, the gNB may send *RRCReconfiguration* message with relevant MBS configuration for the multicast session to the UE.

If the gNB configures the UE to receive the MBS multicast session in RRC\_INACTIVE state, the gNB may provide the PTM configuration via *RRCRelease* message for the MBS multicast session as well as information about which multicast service(s) can be continued to be received in RRC\_INACTIVE state. The UE does not suspend MRBs of the multicast session indicated to be continued to be received in RRC\_INACTIVE state. Multicast MCCH is used in case a cell supports updating PTM configuration or providing PTM configuration to UEs in RRC\_INACTIVE state moved from other cells. Otherwise, multicast MCCH can be optionally present.

A notification mechanism is used to announce the change of the multicast MCCH contents due to multicast session modification or session deactivation or due to neighbouring cell information modification. The scheduling information for multicast MCCH reception is provided via *SIB24* and optionally via *RRCRelease* message.

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 in RRC\_CONNECTED state to RRC\_IDLE or RRC\_INACTIVE state. For UEs receiving data of MBS multicast session in RRC\_INACTIVE state, the gNB notifies the UE to stop monitoring PDCCH addressed by corresponding G-RNTI via *RRCRelease message* or multicast MCCH when there is temporarily no data to be sent or when the session is deactivated. 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. If the UE receiving data of MBS multicast session in RRC\_INACTIVE state in a cell is notified to stop monitoring PDCCH addressed by G-RNTI for all the joined multicast sessions, the UE does not monitor PDCCH addressed by Multicast MCCH-RNTI until the group notification is received. Upon reception of the group notification that does not indicate multicast reception in RRC\_INACTIVE state, the UEs reconnect to the network or resume the connection and transition to RRC\_CONNECTED state from either RRC\_IDLE state or RRC\_INACTIVE state. Upon reception of the group notification that indicates to allow the multicast reception in RRC\_INACTIVE state, the UE stays in RRC\_INACTIVE state and behaves as specified in TS 38.331 [12]. If the UE is notified by both group notification and the UE-specific paging, the UE follows the UE-specific paging and goes 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 this multicast session or the network requests the UE to leave, or the network releases the multicast session.

NOTE: The gNB's decision to keep a UE in RRC\_CONNECTED state (e.g., to meet latency requirements for mission critical service) or move the UE to RRC\_INACTIVE or RRC\_IDLE state (e.g., when there is temporarily no data to be sent to the UE or to address congestion in the cell) may consider 5QI value(s) or other QoS parameters for mission critical and non-mission critical UEs.

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*

##### 16.10.5.3.5 Service Continuity in RRC\_INACTIVE

Mobility procedures for multicast reception allow the UE in RRC\_INACTIVE state to continue receiving MBS service(s) when changing cells without resuming RRC connection if the PTM configuration of the new cell can be acquired by the UE from the multicast MCCH after cell reselection. During an active MBS multicast session, the UE is required to resume RRC connection to get the PTM configuration if the PTM configuration or multicast MCCHis not provided in the new cell. Even if the UE in RRC\_INACTIVE state received indication to stop monitoring PDCCH addressed by G-RNTI for an MBS multicast session in the source cell, the UE acquires multicast MCCH in the reselected cell after cell reselection.

The gNB may indicate in the multicast MCCH the list of neighbour cells providing the same MBS multicast service(s) for UEs in RRC\_INACTIVE state as provided in the serving cell. This allows the UE, e.g., to resume RRC connection without reading *SIB24* and multicast MCCH of the neighbour cell, if the interested service which is activated is not available to the UE in RRC\_INACTIVE state.

The gNB may provide an indication on cell PDCP COUNT synchronization for an MBS session with PTM configuration in *RRCRelease* message. If indicated by the gNB, all cells within the RNA are synchronized in terms of PDCP COUNT value to the MRBs of the corresponding MBS service, and the order of MRBs within the list of multicast MRB configuration for the same MBS multicast session in the multicast MCCH message of the last serving cell and (re)selected cell within the RNA should be consistent. Upon reselection to a cell indicated as synchronized in terms of PDCP COUNT value, the UE does not initialize the PDCP state variables. Otherwise, the UE initializes the PDCP state variables as defined in TS 38.323 [8].

The UE may be configured with dedicated frequency priorities in *RRCRelease* message which the UE applies during cell reselection while receiving data of MBS multicast session in RRC\_INACTIVE state.

The UE receiving multicast session(s) in RRC\_INACTIVE state triggers RRC connection resumption if the latest measured RSRP or RSRQ of the serving cell becomes lower than the threshold configured by the network. The threshold can be configured per MBS session via *RRCRelease* message or multicast MCCH.

*Next Modified Subclause*

#### 16.10.5.7 Physical Layer

A CFR configured by *RRCReconfiguration* message is defined for multicast scheduling as an 'MBS frequency region' with a number of contiguous PRBs confined within and with the same numerology as the DL BWP, and multicast scheduling may have specific characteristics (e.g., PDCCH, PDSCH and SPS configurations). The CFR for the multicast reception in RRC\_INACTIVE state and the CFR for broadcast can be configured differently. If one CFR is not completely contained within the other CFR, the UE in RRC\_INACTIVE state is not required to receive both broadcast and multicast simultaneously.

Slot-level repetition is supported for multicast reception in RRC\_INACTIVE state. The maximum number of MIMO layers is one for MBS multicast scheduling for UEs in the RRC\_INACTIVE state.

Two HARQ-ACK reporting modes are defined for MBS:

- For the first HARQ-ACK reporting mode, the UE generates HARQ-ACK information with ACK value when a UE correctly decodes a transport block or detects a DCI format indicating an SPS PDSCH release; otherwise, the UE generates HARQ-ACK information with NACK value.

- For the second HARQ-ACK reporting mode, the UE does not transmit a PUCCH that would include only HARQ-ACK information with ACK values.

HARQ-ACK feedback for multicast can be enabled or disabled by higher layer configuration per G-RNTI or per G-CS-RNTI and/or indication in the DCI scheduling multicast transmission.

HARQ feedback is not supported for MBS multicast session data reception for UEs in RRC\_INACTIVE state.

*Next Modified Subclause*

#### 16.10.6.3 Support of CA

UE can be configured to receive MBS broadcast data and MCCH either from a PCell or a single SCell at a time. Meanwhile, dedicated RRC signalling is used for providing SIB20 of the SCell i.e., while in RRC\_CONNECTED state, UEs need not acquire broadcast SIB20 directly from the SCells.

End of Changes