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

**Changsha, China, 15th April – 19th April, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **4688** | **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 | **X** | Core Network |  |

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| ***Title:***  | MBS Rapporteur CR for RRC |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon, CATT, Samsung, LG Electronics Inc., CMCC, Xiaomi |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 2024-04-26 |
|  |  |  |  |  |
| ***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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)Rel-20 (Release 20)* |
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| ***Reason for change:*** | 1. Currently, the DCI 4\_0 is used to schedule the Multicast MCCH message. According to TS 38.212 (Clause 7.3.1.5.1), the multicast MCCH change notification field of DCI 4\_0 contains 2 bits. However, the corresponding description of how the 2 bits are used is missing from the RRC spec. We had the following WA in RAN2#122:

Working assumption (to be confirmed by RAN1 via pending reply LS): One bit in the MCCH DCI is used to notify the change of the multicast MCCH. We reuse the bit used for MCCH change indication from Rel-17 MBS broadcast.1. Address the RILs marked as Agreed after the 2nd round of ASN.1 review and the discussion in RAN2#125bis (see the updated RIL list in R2-240xxxx).
2. Other editorials.
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| ***Summary of change:*** | 1. In 5.10.1.3, add description of how the 2 bits in the multicast MCCH change notification field of DCI 4\_0 are used.
2. Address the following RILs marked as Agreed (see the updated RIL list in R2-240xxxx): C151, C152, L010, L011, S735, S736, V523, C148, C150, J010, J011
3. Editorial corrections.
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| ***Consequences if not approved:*** | Rel-18 eMBS feature is not well supported in RRC. |
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| ***Clauses affected:*** | 5.3.1.1, 5.3.2.3, 5.3.7.5, 5.3.8.3, 5.3.13.1d, 5.9.4.1, 5.10.1, 5.10.2, 6.2.2, 6.3.6 |
|  |  |
|  | **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:*** |  |

Start of Change

## 5.3 Connection control

### 5.3.1 Introduction

#### 5.3.1.1 RRC connection control

RRC connection establishment involves the establishment of SRB1. The network completes RRC connection establishment prior to completing the establishment of the NG connection, i.e. prior to receiving the UE context information from the 5GC. Consequently, AS security is not activated during the initial phase of the RRC connection. During this initial phase of the RRC connection, the network may configure the UE to perform measurement reporting, but the UE only sends the corresponding measurement reports after successful AS security activation. However, the UE only accepts a re-configuration with sync message when AS security has been activated.

Upon receiving the UE context from the 5GC, the RAN activates AS security (both ciphering and integrity protection) using the initial AS security activation procedure. The RRC messages to activate AS security (command and successful response) are integrity protected, while ciphering is started only after completion of the procedure. That is, the response to the message used to activate AS security is not ciphered, while the subsequent messages (e.g. used to establish SRB2, DRBs and multicast MRBs) are both integrity protected and ciphered. After having initiated the initial AS security activation procedure, the network may initiate the establishment of SRB2 and DRBs and/or multicast MRBs, i.e. the network may do this prior to receiving the confirmation of the initial AS security activation from the UE. In any case, the network will apply both ciphering and integrity protection for the RRC reconfiguration messages used to establish SRB2, DRBs and/or multicast MRBs. The network should release the RRC connection if the initial AS security activation and/ or the radio bearer establishment fails. A configuration with SRB2 without DRB or multicast MRB, or with DRB or multicast MRB without SRB2 is not supported (i.e., SRB2 and at least one DRB or multicast MRB must be configured in the same RRC Reconfiguration message, and it is not allowed to release all the DRBs and multicast MRBs without releasing the RRC Connection). For IAB-MT and NCR-MT, a configuration with SRB2 without any DRB/MRB is supported.

The release of the RRC connection normally is initiated by the network. The procedure may be used to re-direct the UE to an NR frequency or an E-UTRA carrier frequency.

The suspension of the RRC connection is initiated by the network. When the RRC connection is suspended, the UE stores the UE Inactive AS context and any configuration received from the network, and transits to RRC\_INACTIVE state. The RRC message to suspend the RRC connection is integrity protected and ciphered.

The resumption of a suspended RRC connection is initiated by upper layers when the UE needs to transit from RRC\_INACTIVE state to RRC\_CONNECTED state or by RRC layer to perform a RNA update or by RAN paging from NG-RAN or for SDT or for multicast reception. When the RRC connection is resumed, network configures the UE according to the RRC connection resume procedure based on the stored UE Inactive AS context and any RRC configuration received from the network. The RRC connection resume procedure re-activates AS security and re-establishes SRB(s) and DRB(s) and/or multicast MRB(s), if configured.

Upon initiating the resume procedure for SDT, AS security (both ciphering and integrity protection) is re-activated for SRB2 (if configured for SDT) and for SRB1. In addition, AS security is also re-activated (if security is configured) for all the DRBs configured for SDT. Further, the PDCP entities of SRB1 and PDCP entities of the radio bearers configured for SDT are re-established and resumed whilst the UE remains in RRC\_INACTIVE state. Transmission and reception of data and/or signalling messages over radio bearers configured for SDT can happen whilst the UE is in RRC\_INACTIVE state and SDT procedure is ongoing.

In response to a request to resume the RRC connection or in response to a resume procedure initiated for SDT, the network may resume the suspended RRC connection and send UE to RRC\_CONNECTED, or reject the request to resume and send UE to RRC\_INACTIVE (with a wait timer), or directly re-suspend the RRC connection and send UE to RRC\_INACTIVE, or directly release the RRC connection and send UE to RRC\_IDLE, or instruct the UE to initiate NAS level recovery (in this case the network sends an RRC setup message).

NOTE: In case the UE receives the configurations for NR sidelink communication via the E-UTRA, the configurations for NR sidelink communication in *SIB12* and *sl-ConfigDedicatedNR* within *RRCReconfiguration* used in clause 5.3 are provided by the configurations in *SystemInformationBlockType28* and *sl-ConfigDedicatedForNR* within *RRCConnectionReconfiguration* as specified in TS 36.331[10], respectively.

Next Change

#### 5.3.2.3 Reception of the *Paging* *message* by the UE or *PagingRecord* by the L2 U2N Remote UE

Upon receiving the *Paging* message by the UE or receiving *PagingRecord* from its connected L2 U2N Relay UE by a L2 U2N Remote UE, the UE shall:

1> if in RRC\_IDLE, for each of the *PagingRecord*, if any, included in the *Paging* message, or

1> if in RRC\_IDLE, for the *PagingRecord*, if any, included in the *UuMessageTransferSidelink* message received from the connected L2 U2N Relay UE:

2> if the *ue-Identity* included in the *PagingRecord* matches the UE identity allocated by upper layers:

3> if upper layers indicate the support of paging cause:

4> forward the *ue-Identity,* *accessType* (if present) and paging cause (if determined) to the upper layers;

3> else:

4> forward the *ue-Identity* and *accessType* (if present) to the upper layers;

NOTE 1: If the L2 U2N Relay UE supports the MUSIM feature, it can forward the paging cause to the connected L2 U2N Remote UE.

1> if in RRC\_INACTIVE, for each of the *PagingRecord*, if any, included in the *Paging* message, or

1> if in RRC\_INACTIVE, for the *PagingRecord*, if any, included in the *UuMessageTransferSidelink* message received from the connected L2 U2N Relay UE:

2> if the *ue-Identity* included in the *PagingRecord* matches the UE's stored *fullI-RNTI*:

3> if the UE is configured by upper layers with Access Identity 1:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mps-PriorityAccess*;

3> else if the UE is configured by upper layers with Access Identity 2:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mcs-PriorityAccess*;

3> else if the UE is configured by upper layers with one or more Access Identities equal to 11-15:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *highPriorityAccess*;

3> else if *mt-SDT* indication was included in the paging message and if the conditions for initiating SDT for a resume procedure initiated in response to RAN paging according to 5.3.13.1b are fulfilled:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mt-SDT*:

3> else:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mt-Access*;

NOTE 2: If both conditions for initiating MT-SDT and MO-SDT according to 5.3.13.1b are fulfilled, UE may initiate RRC connection resumption procedure for MT-SDT or MO-SDT based on implementation.

NOTE 3: A MUSIM UE may not initiate the RRC connection resumption procedure, e.g. when it decides not to respond to the *Paging* message due to UE implementation constraints as specified in TS 24.501 [23].

2> else if the *ue-Identity* included in the *PagingRecord* matches the UE identity allocated by upper layers:

3> if upper layers indicate the support of paging cause:

4> forward the *ue-Identity*, *accessType* (if present) and paging cause (if determined) to the upper layers;

3> else:

4> forward the *ue-Identity* and *accessType* (if present) to the upper layers;

3> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause 'other';

1> if in RRC\_IDLE, for each *TMGI* included in *pagingGroupList*, if any, included in the *Paging* message:

2> if the UE has joined an MBS session indicated by the *TMGI* included in the *pagingGroupList*:

3> forward the *TMGI* to the upper layers;

1> if in RRC\_INACTIVE and the UE has joined one or more MBS session(s) indicated by the *TMGI(s)* included in the *pagingGroupList*:

2> if *PagingRecordList* is not included in the *Paging* message; or

2> if none of the *ue-Identity* included in any of the *PagingRecord* matches the UE identity allocated by upper layers or the UE's stored *fullI-RNTI*:

3> if the UE is not configured to receive multicast in RRC\_INACTIVE for at least one of the MBS sessions indicated by the *TMGI(s)* that the UE has joined; or

3> if *inactiveReceptionAllowed* is not included for at least one of the MBS sessions indicated by the *TMGI(s)* that the UE has joined:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set as below:

5> if the UE is configured by upper layers with Access Identity 1:

6> set *resumeCause* to *mps-PriorityAccess*;

5> else if the UE is configured by upper layers with Access Identity 2:

6> set *resumeCause* to *mcs-PriorityAccess*;

5> else if the UE is configured by upper layers with one or more Access Identities equal to 11-15:

6> set *resumeCause* to *highPriorityAcces*s;

5> else:

6> set *resumeCause* to *mt-Access*;

3> else:

4> start monitoring the G-RNTI(s), if configured, corresponding to the *TMGI(s)*;

4> if the UE was notified to stop monitoring the G-RNTI(s) for all the joined multicast sessions that are configured for reception in RRC\_INACTIVE:

5> if multicast MCCH is present:

6> start monitoring the Multicast MCCH-RNTI;

6> acquire the *MBSMulticastConfiguration* message on multicast MCCH;

5> else if the UE selected or re-selected to a cell which is different from the cell where the multicast service(s) was configured to receive in RRC\_CONNECTED:

6> initiate an RRC connection resume procedure for multicast reception as specified in 5.3.13.1d;

4> else if the UE was notified to stop monitoring the G-RNTI for at least one multicast session for which the PTM configuration was not included in *RRCRelease* message:

5> acquire the *MBSMulticastConfiguration* message on multicast MCCH;

2> else if the *ue-Identity* included in any of the *PagingRecord* matches the UE identity allocated by upper layers:

3> forward the *TMGI(s)* to the upper layers;

1> if the UE is acting as a L2 U2N Relay UE, for each of the *PagingRecord*, if any, included in the *Paging* message:

2> if the *ue-Identity* included in the *PagingRecord* in the *Paging* message matches the UE identity in *sl-PagingIdentityRemoteUE* included in *sl-PagingInfo-RemoteUE* received in *RemoteUEInformationSidelink* message from a L2 U2N Remote UE:

3> inititate the Uu Message transfer in sidelink to that UE as specified in 5.8.9.9;

Next Change

#### 5.3.7.5 Reception of the *RRCReestablishment* by the UE

The UE shall:

1> stop timer T301;

1> consider the current cell to be the PCell;

1> update the KgNB key based on the current KgNB key or the NH*,* using the received *nextHopChainingCount* value, as specified in TS 33.501 [11];

1> store the *nextHopChainingCount* value indicated in the *RRCReestablishment* message;

1> derive the KRRCenc and KUPenc keys associated with the previously configured *cipheringAlgorithm,* as specified in TS 33.501 [11];

1> derive the KRRCint and KUPint keys associated with the previously configured *integrityProtAlgorithm,* as specified in TS 33.501 [11].

1> request lower layers to verify the integrity protection of the *RRCReestablishment* message, using the previously configured algorithm and the KRRCint key;

1> if the integrity protection check of the *RRCReestablishment* message fails:

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11, with release cause 'RRC connection failure', upon which the procedure ends;

1> configure lower layers to resume integrity protection for SRB1 using the previously configured algorithm and the KRRCint key immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;

1> configure lower layers to resume ciphering for SRB1 using the previously configured algorithm and, the KRRCenc key immediately, i.e., ciphering shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;

1> release the measurement gap configuration indicated by the *measGapConfig*, if configured;

1> release the MUSIM gap configuration indicated by the *musim-GapConfig*, if configured;

1> release the FR2 UL gap configuration indicated by the *ul-GapFR2-Config*, if configured;

1> perform the L2 U2N Remote UE configuration procedure in accordance with the received *sl-L2RemoteUE-Config* as specified in 5.3.5.16;

1> for each application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

2> if the RPLMN is not included in *plmn-IdentityList* in *VarAppLayerPLMN-ListConfig*:

3> discard any application layer measurement reports which were not yet fully submitted to lower layers for transmission;

3> forward the *measConfigAppLayerId* and inform upper layers about the release of the application layer measurement configuration;

3> release the application layer measurement configuration including its fields in the UE variables *VarAppLayerIdleConfig* and *VarAppLayerPLMN-ListConfig*;

3> consider itself not to be configured to send application layer measurement reports for the *measConfigAppLayerId*;

1> set the content of *RRCReestablishmentComplete* message as follows:

2> if the UE has logged measurements available for NR and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*; or

2> if the UE has logged measurements available for NR and if the current registered SNPN identity is included in *snpn-ConfigIDList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable* in the *RRCReestablishmentComplete* message;

3> if Bluetooth measurement results are included in the logged measurements the UE has available for NR:

4> include the *logMeasAvailableBT* in the *RRCReestablishmentComplete* message;

3> if WLAN measurement results are included in the logged measurements the UE has available for NR:

4> include the *logMeasAvailableWLAN* in the *RRCReestablishmentComplete* message;

2> if the *sigLoggedMeasType* in *VarLogMeasReport* is included; or

2> if the UE supports the override protection of the signalling based logged MDT for inter-RAT (i.e. LTE to NR), and if the *sigLoggedMeasType* in *VarLogMeasReport* of TS 36.331 [10] is included:

3> if T330 timer is running (associated to the logged measurement configuration for NR or for LTE):

4> set *sigLogMeasConfigAvailable* to *true* in the *RRCReestablishmentComplete* message;

3> else:

4> if the UE has logged measurements in *VarLogMeasReport* or in *VarLogMeasReport* of TS 36.331 [10]:

5> set *sigLogMeasConfigAvailable* to *false* in the *RRCReestablishmentComplete* message;

2> if the UE has connection establishment failure or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport* orin at least one of the entries of *VarConnEstFailReportList*; or

2> if the UE supports multiple CEF report and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the registered SNPN identity is equal to *snpn-identity* in *networkIdentity* stored in *VarConnEstFailReport* or any entry of *VarConnEstFailReportList*:

3> include *connEstFailInfoAvailable* in the *RRCReestablishmentComplete* message;

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*; or

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the UE is capable of cross-RAT RLF reporting and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]; or

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable* in the *RRCReestablishmentComplete* message;

2> if the UE has successful handover information available in *VarSuccessHO-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessHO-Report*; or

2> if the UE has successful handover information available in *VarSuccessHO-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessHO-Report*:

3> include *successHO-InfoAvailable* in the *RRCReestablishmentComplete* message;

2> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessPSCell-Report*; or

2> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessPSCell-Report*:

3> include *successPSCell-InfoAvailable* in the *RRCReestablishmentComplete* message;

2> if the UE has flight path information available:

3> include *flightPathInfoAvailable*;

2> if the UE has at least one stored application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

3> include *measConfigReportAppLayerAvailable* in the *RRCReestablishmentComplete* message;

1> submit the *RRCReestablishmentComplete* message to lower layers for transmission;

1> if *SIB21* is provided by the PCell; or

1> if *nonServingCellMII* is provided in *SIB1* by the PCell:

2> if the UE initiated transmission of an *MBSInterestIndication*message during the last 1 second preceding detection of radio link failure:

3> initiate transmission of an *MBSInterestIndication* message in accordance with 5.9.4;

1> the procedure ends.

Next Change

### 5.3.8 RRC connection release

#### 5.3.8.3 Reception of the *RRCRelease* by the UE

The UE shall:

1> delay the following actions defined in this clause 60 ms from the moment the *RRCRelease* message was received or optionally when lower layers indicate that the receipt of the *RRCRelease* message has been successfully acknowledged, whichever is earlier;

NOTE 0: When the *RRCRelease* message is received on a HARQ process with disabled HARQ feedback, and when STATUS reporting, as defined in TS 38.322 [4], has not been triggered for a logical channel associated with the SRB1, the lower layers can be considered to have indicated that the receipt of the *RRCRelease* message has been successfully acknowledged.

1> stop timer T380, if running;

1> stop timer T320, if running;

1> if timer T316 is running;

2> stop timer T316;

2> if the UE supports RLF-Report for fast MCG recovery procedure as specified in 38.306 [26]:

3> set the *elapsedTimeT316* in the *VarRLF-Report* to the value of the elapsed time of the timer T316;

3> set the *pSCellId* in the *VarRLF-Report* to the global cell identity of the PSCell, if available, otherwise to the physical cell identity and carrier frequency of the PSCell;

2> else:

3> clear the information included in *VarRLF-Report,* if any;

1> stop timer T350, if running;

1> stop timer T346g, if running;

1> stop timer T348, if running;

1> if theAS security is not activated:

2> ignore any field included in *RRCRelease* message except *waitTime*;

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with the release cause 'other' upon which the procedure ends;

1> if the *RRCRelease* message includes *redirectedCarrierInfo* indicating redirection to *eutra*:

2> if *cnType* is included:

3> after the cell selection, indicate the available CN Type(s) and the received *cnType* to upper layers;

NOTE 1: Handling the case if the E-UTRA cell selected after the redirection does not support the core network type specified by the *cnType,* is up to UE implementation.

2> if *voiceFallbackIndication* is included:

3> consider the RRC connection release was for EPS fallback for IMS voice (see TS 23.502 [43]);

1> if the *RRCRelease* message includes the *cellReselectionPriorities*:

2> store the cell reselection priority information provided by the *cellReselectionPriorities*;

2> if the *t320* is included:

3> start timer T320, with the timer value set according to the value of *t320*;

1> else:

2> apply the cell reselection priority information broadcast in the system information;

1> if *deprioritisationReq* is included and the UE supports RRC connection release with deprioritisation:

2> start or restart timer T325 with the timer value set to the *deprioritisationTimer* signalled;

2> store the *deprioritisationReq* until T325 expiry;

NOTE 1a: The UE stores the deprioritisation request irrespective of any cell reselection absolute priority assignments (by dedicated or common signalling) and regardless of RRC connections in NR or other RATs unless specified otherwise.

1> if the *RRCRelease* includes the *measIdleConfig*:

2> if T331 is running:

3> stop timer T331;

3> perform the actions as specified in 5.7.8.3;

2> if the *measIdleConfig* is set to *setup*:

3> store the received *measIdleDuration* in *VarMeasIdleConfig*;

3> start timer T331 with the value set to *measIdleDuration*;

3> if the *measIdleConfig* contains *measIdleCarrierListNR*:

4> store the received *measIdleCarrierListNR* in *VarMeasIdleConfig*;

3> if the *measIdleConfig* contains *measIdleCarrierListEUTRA*:

4> store the received *measIdleCarrierListEUTRA* in *VarMeasIdleConfig*;

3> if the *measIdleConfig* contains *validityAreaList*:

4> store the received *validityAreaList* in *VarMeasIdleConfig*;

3> if the *measIdleConfig* contains *measReselectionCarrierListNR:*

4> store the received *measReselectionCarrierListNR* in *VarMeasReselectionConfig*;

3> if the *measIdleConfig* contains *measReselectionValidityDuration:*

4> store the received *measReselectionValidityDuration* in *VarMeasReselectionConfig*;

3> if the *measIdleConfig* contains *measIdleValidityDuration:*

4> store the received *measReselectionValidityDuration* in *VarEnhMeasIdleConfig*;

1> if the *RRCRelease* includes *suspendConfig*:

2> reset MAC and release the default MAC Cell Group configuration, if any;

2> apply the received *suspendConfig* except the received *nextHopChainingCount*;

2> if the *sdt-Config* is configured:

3> for each of the DRB in the *sdt-DRB-List*:

4> consider the DRB to be configured for SDT;

3> if *sdt-SRB2-Indication* is configured:

4> consider the SRB2 to be configured for SDT;

3> for each RLC bearer (except those associated with broadcast MRBs and multicast MRBs) that is not suspended:

4> re-establish the RLC entity as specified in TS 38.322 [4];

3> for SRB2 (if it is resumed) and for SRB1:

4> trigger the PDCP entity to perform SDU discard as specified in TS 38.323 [5];

3> if *sdt-MAC-PHY-CG-Config* is configured:

4> configure the PCell with the configured grant resources for SDT and instruct the MAC entity to start the *cg-SDT-TimeAlignmentTimer*;

2> if *srs-PosRRC-Inactive* is configured:

3> apply the SRS for positioning configuration in RRC\_INACTIVE and instruct MAC to start the *inactivePosSRS-TimeAlignmentTimer*;

2> if *srs-PosRRC-InactiveValidityAreaNonPreConfig* is configured:

3> apply the SRS for positioning configuration in RRC\_INACTIVE and instruct MAC to start the *inactivePosSRS-ValidityAreaTAT*;

2> if *srs-PosRRC-InactiveValidityAreaPreConfigList* is set to *setup*:

3> store *srs-PosRRC-InactiveValidityAreaConfig* and apply the SRS for positioning configuration in RRC\_INACTIVE when requested by upper layers;2> else if *srs-PosRRC-InactiveValidityAreaPreConfigList* is set to *release*:

3> remove all *srs-PosRRC-InactiveValidityAreaPreConfigList*, if available;

NOTE 1b: The Network should provide full configuration to UE for SRS for Positioning in RRC\_INACTIVE.

2> perform the LTM configuration release procedure for the MCG and the SCG as specified in clause 5.3.5.18.7;

2> remove all the entries within the MCG and the SCG *VarConditionalReconfig*, if any;

2> remove the *servingSecurityCellSetId* within the *VarServingSecurityCellSetID*, if any;

2> for each *measId* of the MCG *measConfig* and for each *measId* of the SCG *measConfig*, if configured, if the associated *reportConfig* has a *reportType* set to *condTriggerConfig*:

3> for the associated *reportConfigId*:

4> remove the entry with the matching *reportConfigId* from the *reportConfigList* within the *VarMeasConfig*;

3> if the associated *measObjectId* is only associated to a *reportConfig* with *reportType* set to *condTriggerConfig*:

4> remove the entry with the matching *measObjectId* from the *measObjectList* within the *VarMeasConfig*;

3> remove the entry with the matching *measId* from the *measIdList* within the *VarMeasConfig*;

2> for NCR-MT, if *ncr-FwdConfig* is configured:

3> if the *ncr-FwdConfig* includes periodic forwarding resource configuration:

4> indicate to NCR-Fwd to continue forwarding only in accordance with the configured periodic forwarding resource set(s);

3> else:

4> indicate to NCR-Fwd to cease forwarding;

2> if the UE is acting as L2 U2N Remote UE and is not configured with MP:

3> if the PC5-RRC connection with the U2N Relay UE is determined to be released:

4> indicate upper layers to trigger PC5 unicast link release;

3> else (i.e., maintain the PC5 RRC connection):

4> establish or re-establish (e.g. via release and add) SL RLC entity for SRB1;

2> else:

3> re-establish RLC entities for SRB1;

2> for each application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

3> inform upper layers about the release of the RAN visible application layer measurement configuration;

3> initiate the procedure in 5.5b.1.2;

2> if the *RRCRelease* message with *suspendConfig* was received in response to an *RRCResumeRequest* or an *RRCResumeRequest1*:

3> stop the timer T319 if running;

3> in the stored UE Inactive AS context:

4> replace the KgNB and KRRCint keys with the current KgNB and KRRCint keys;

4> replace the *nextHopChainingCount* with the value of *nextHopChainingCount* received in the *RRCRelease* message*;*

4> replace the *cellIdentity* with the *cellIdentity* of the cell the UE has received the *RRCRelease* message;

4> if the *suspendConfig* contains the *sl-UEIdentityRemote* (i.e. the UE is a L2 U2N Remote UE):

5> replace the C-RNTI with the value of the *sl-UEIdentityRemote*;

5> replace the physical cell identitywith the value of the *sl-PhysCellId* in *sl-ServingCellInfo* contained in the discovery message received from the connected L2 U2N Relay UE;

4> else:

5> replace the C-RNTI with the C-RNTI used in the cell (see TS 38.321 [3]) the UE has received the *RRCRelease* message;

5> replace the physical cell identitywith the physical cell identity of the cell the UE has received the *RRCRelease* message;

3> replace the *nextHopChainingCount* with the value associated with the current KgNB;

3> stop the timer T319a if running and consider SDT procedure is not ongoing;

2> else:

3> store in the UE Inactive AS Context the *nextHopChainingCount* received in the *RRCRelease* message*,* the current KgNB and KRRCint keys, the ROHC state, the EHC context(s), the UDC state, the stored QoS flow to DRB mapping rules, the application layer measurement configuration, the C-RNTI used in the source PCell, the *cellIdentity* and the physical cell identity of the source PCell, the *ncr-FwdConfig* (if configured), the *spCellConfigCommon* within *ReconfigurationWithSync* of the NR PSCell (if configured) and all other parameters configured except for:

- parameters within *ReconfigurationWithSync* of the PCell;

- parameters within *ReconfigurationWithSync* of the NR PSCell, if configured;

- parameters within *MobilityControlInfoSCG* of the E-UTRA PSCell, if configured;

- *servingCellConfigCommonSIB*;

- *sl-L2RelayUE-Config*, if configured;

- *sl-L2RemoteUE-Config*, if configured;

- *aerial-Config*, if configured;

- c*ellDTXDRX-Config*, if configured;

NOTE 1c: *suspendConfig* is not stored as part of UE Inactive AS Context, except for the fields explicitly specified.

3> store any previously or subsequently received application layer measurement report containers for which the successful transmission of the message or at least one segment of the message has not been confirmed by lower layers;

NOTE 2: NR sidelink communication/discovery related configurations and logged measurement configuration are not stored as UE Inactive AS Context, when UE enters RRC\_INACTIVE.

2> suspend all SRB(s) and DRB(s), except SRB0 and broadcast MRBs;

2> suspend all multicast MRB(s) associated with multicast session(s) not configured for reception in RRC\_INACTIVE;

2> indicate PDCP suspend to lower layers of all DRBs and multicast MRBs associated with multicast session(s) not configured for reception in RRC\_INACTIVE;

2> release Uu Relay RLC channel(s), if configured;

2> release PC5 Relay RLC channel(s), if configured;

2> release the SRAP entity, if configured;

NOTE 2a: A L2 U2N Relay UE may re-establish the SL-RLC0, SL-RLC1 and SRAP entity after release.

2> if SL indirect path is configured:

3> release cell identity and relay UE ID configured in *sl-IndirectPathAddChange*;

3> indicate upper layers to trigger PC5 unicast link release of the SL indirect path;

2> if N3C indirect path is configured:

3> release *n3c-IndirectPathAddChange*;

3> consider the non-3GPP connection is not used;

2> if the UE is acting as a N3C relay UE:

3> release *n3c-IndirectPathConfigRelay*;

3> consider the non-3GPP connection is not used;

2> if the *t380* is included:

3> start timer T380, with the timer value set to *t380*;

2> if the *RRCRelease* message is including the *waitTime*:

3> start timer T302 with the value set to the *waitTime*;

3> inform upper layers that access barring is applicable for all access categories except categories '0' and '2';

2> if T390 is running:

3> stop timer T390 for all access categories;

3> perform the actions as specified in 5.3.14.4;

2> indicate the suspension of the RRC connection to upper layers;

2> if the UE is capable of L2 U2N Remote UE:

3> enter RRC\_INACTIVE, and perform either cell selection as specified in TS 38.304 [20], or relay selection as specified in clause 5.8.15.3, or both;

2> else:

3> enter RRC\_INACTIVE and perform cell selection as specified in TS 38.304 [20];

2> if the *suspendConfig* includes *resumeIndication*:

3> perform the actions as if the UE received *Paging* message with the *ue-Identity* included in the *PagingRecord* matching the UE's stored *fullI-RNTI*, as specified in clause 5.3.2.3;

2> if the *multicastConfigInactive* is set to *setup*:

3> if the multicast PTM configuration is provided for at least one multicast session for which the UE is not indicated to stop monitoring the G-RNTI and the UE selects the same cell as the one on which the multicast session was received in RRC\_CONNECTED:

4> apply the multicast PTM configuration as specified in 5.10.3;

4> monitor the Multicast MCCH-RNTI as specified in 5.10.1.2;

1> else:

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11, with the release cause 'other'.

NOTE 3: Whether to release the PC5 unicast link is left to L2 U2N Remote UE's implementation.

NOTE 4: It is left to UE implementation whether to stop T430, if running, when going to RRC\_INACTIVE.

Next Change

#### 5.3.13.1d Conditions for resuming RRC connection for multicast reception

In RRC\_INACTIVE state, if configured with MBS multicast reception in RRC\_INACTIVE, the UE shall:

1> if the RRC connection resume procedure is triggered for multicast reception at reception of *SIB1*, as specified in 5.2.2.4.2; or

1> if the RRC connection resume procedure is triggered for multicast reception at reception of *Paging* message, as specified in 5.3.2.3; or

1> if the PTM configuration is not available in the cell after cell selection or reselection for at least one multicast session that the UE has joined and for which the UE is not indicated to stop monitoring the G-RNTI; or

1> if *mbs-NeighbourCellList* included in *MBSMulticastConfiguration* acquired in the previous cell indicates that at least one multicast session that the UE has joined and for which the UE is not indicated to stop monitoring the G-RNTI, is not provided for RRC\_INACTIVE in the current serving cell; or

1> if either the measured RSRP or RSRQ for serving cell as specified in TS 38.304 [20] is below the corresponding threshold indicated by *thresholdIndex* for a multicast session that the UE has joined and for which the UE is not indicated to stop monitoring the G-RNTI:

2> initiate RRC connection resume procedure as specified in 5.3.13.2 with *resumeCause* set as below:

3> if the UE is configured by upper layers with Access Identity 1:

4> set *resumeCause* to *mps-PriorityAccess*;

3> else if the UE is configured by upper layers with Access Identity 2:

4> set *resumeCause* to *mcs-PriorityAccess*;

3> else if the UE is configured by upper layers with one or more Access Identities equal to 11-15:

4> set *resumeCause* to *highPriorityAccess*;

3> else:

4> set *resumeCause* to *mt-Access*.

Next Change

### 5.9.4 MBS Interest Indication

#### 5.9.4.1 General



Figure 5.9.4.1-1: MBS Interest Indication

The purpose of this procedure is to inform the network that the UE in RRC\_CONNECTED is receiving or is interested to receive MBS broadcast service(s) and/or to inform the network about the priority of MBS broadcast versus unicast and multicast MRB reception. MBS Interest Indication can only be sent after AS security activation.

Next Change

## 5.10 MBS multicast reception in RRC\_INACTIVE

### 5.10.1 Introduction

#### 5.10.1.1 General

A UE configured to receive MBS multicast service(s) in RRC\_INACTIVE that the UE has joined applies MBS multicast procedures described in this clause.

The multicast MCCH information (i.e., *MBSMulticastConfiguration* message) is provided in *RRCRelease* and on multicast MCCH logical channel.

When there is temporarily no data for an active multicast session or when the multicast session is deactivated, the network notifies the UE to stop monitoring the corresponding G-RNTI via *MBSMulticastConfiguration* message. If the UE is notified to stop monitoring the G-RNTI(s) for all the joined multicast sessions, it stops monitoring the Multicast MCCH-RNTI for the cell where it received the notification.

Multicast MCCH carries the *MBSMulticastConfiguration* message which indicates the MBS multicast sessions that are provided in the cell as well as the corresponding scheduling related information for these sessions. Optionally, the *MBSMulticastConfiguration* message may also contain a list of neighbour cells providing the same MBS multicast service(s) for reception in RRC\_INACTIVE as provided in the current cell. The configuration information required by the UE to receive multicast MCCH is provided in *SIB24*.

#### 5.10.1.2 Multicast MCCH scheduling

The multicast MCCH information (if sent over multicast MCCH) is transmitted periodically, using a configurable repetition period and within a configured transmission window. MCCH transmissions (and the associated radio resources and MCS) are indicated via the PDCCH addressed to Multicast MCCH-RNTI. PDCCH monitoring occasion(s) for the multicast MCCH transmission are determined according to the common search space indicated by *searchSpaceMulticastMCCH*. If *searchSpaceMulticastMCCH* is set to zero, PDCCH monitoring occasions for the multicast MCCH message reception in the multicast MCCH transmission window are the same as PDCCH monitoring occasions for *SIB1* where the mapping between PDCCH monitoring occasions and SSBs is specified in TS 38.213 [13]. If *searchSpaceMulticastMCCH* is not set to zero, PDCCH monitoring occasions for the multicast MCCH message are determined based on search space indicated by *searchSpaceMulticastMCCH*. PDCCH monitoring occasions for the multicast MCCH message which are not overlapping with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from one in the multicast MCCH transmission window. The [x×N+K]th PDCCH monitoring occasion for the multicast MCCH message in the multicast MCCH transmission window corresponds to the Kth transmitted SSB, where x = 0, 1, ...X-1, K = 1, 2, …N, N is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is equal to CEIL(number of PDCCH monitoring occasions in multicast MCCH transmission window/N). The actual transmitted SSBs are sequentially numbered from one in ascending order of their SSB indexes. The UE assumes that, in the multicast MCCH transmission window, PDCCH for a multicast MCCH message is transmitted in at least one PDCCH monitoring occasion corresponding to each transmitted SSB and thus the selection of SSB for the reception of multicast MCCH messages is up to UE implementation.

#### 5.10.1.3 Multicast MCCH information validity and notification of changes

Change of multicast MCCH information only occurs at specific radio frames, i.e. the concept of a modification period is used. Within a modification period, the same multicast MCCH information may be transmitted a number of times, as defined by its scheduling (which is based on a repetition period).

When the network changes (some of) the multicast MCCH information, it notifies the UEs about the change starting from the beginning of the multicast MCCH modification period via PDCCH which schedules the multicast MCCH in every repetition in that modification period.

Upon receiving a change notification, a UE receiving MBS multicast service(s) in RRC\_INACTIVE acquires the new multicast MCCH information starting from the same slot. The UE applies the previously acquired multicast MCCH information until the UE acquires the new multicast MCCH information. The notification is transmitted with a 2-bit bitmap, see TS 38.212 [17] clause 7.3.1.5.1. The MSB in the 2-bit bitmap is reserved. The LSB in the 2-bit bitmap, when set to '1', indicates modification of multicast MCCH information, e.g. modification of a configuration of an on-going MBS multicast session, stop of G-RNTI monitoring for the corresponding multicast session or neighbouring cell information modification.

### 5.10.2 Multicast MCCH information acquisition

#### 5.10.2.1 General



Figure 5.10.2.1-1: Multicast MCCH information acquisition

The UE applies the multicast MCCH information acquisition procedure to acquire the *MBSMulticastConfiguration* message from the network. The procedure applies to UEs configured to receive MBS multicast services in RRC\_INACTIVE.

#### 5.10.2.2 Initiation

If configured to receive MBS multicast services in RRC\_INACTIVE, a UE applies the multicast MCCH information acquisition procedure for PTM configuration update and upon selection or reselection to a new cell providing *SIB24* (except in case the UE is aware that the multicast sessions that the UE has joined are not available for RRC\_INACTIVE in the new cell). A UE that is receiving MBS multicast data in RRC\_INACTIVE shall apply the multicast MCCH information acquisition procedure upon receiving a notification that the multicast MCCH information has changed.

NOTE: It is up to UE implementation how to address a possibility of the UE missing a multicast MCCH change notification.

Unless explicitly stated otherwise in the procedural specification, the multicast MCCH information acquisition procedure overwrites any stored multicast MCCH information, i.e. delta configuration is not applicable for multicast MCCH information and the UE discontinues using a field if it is absent in multicast MCCH information.

#### 5.10.2.3 Multicast MCCH information acquisition by the UE

A UE configured to receive an MBS multicast service in RRC\_INACTIVE shall:

1> if the procedure is triggered by a multicast MCCH information change notification:

2> start acquiring the *MBSMulticastConfiguration* message on multicast MCCH in the concerned cell from the slot in which the change notification was received;

1> if the UE moves to a different cell providing *SIB24;* or

1> if the UE receives *RRCRelease* configuring the UE to receive MBS multicast in RRC\_INACTIVE which does not include PTM configuration for at least one multicast session for which the UE is not indicated to stop monitoring the G-RNTI:

2> acquire the *MBSMulticastConfiguration* message on multicast MCCH in the concerned cell at the next repetition period.

#### 5.10.2.4 Actions upon reception of the *MBSMulticastConfiguration* message

No UE requirements related to the contents of the *MBSMulticastConfiguration* message apply other than those specified elsewhere, e.g., within the corresponding field descriptions.

Next Change

### 6.2.2 Message definitions

#### *– MBSMulticastConfiguration*

The *MBSMulticastConfiguration* message contains the control information applicable for MBS multicast services transmitted via multicast MRBs for RRC\_INACTIVE UEs.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: multicast MCCH

Direction: Network to UE

*MBSMulticastConfiguration* message

-- ASN1START

-- TAG-MBSMULTICASTCONFIGURATION-START

MBSMulticastConfiguration-r18 ::= SEQUENCE {

 criticalExtensions CHOICE {

 mbsMulticastConfiguration-r18 MBSMulticastConfiguration-r18-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

MBSMulticastConfiguration-r18-IEs ::= SEQUENCE {

 mbs-SessionInfoListMulticast-r18 MBS-SessionInfoListMulticast-r18 OPTIONAL, -- Need R

 mbs-NeighbourCellList-r18 MBS-NeighbourCellList-r17 OPTIONAL, -- Need S

 drx-ConfigPTM-List-r18 SEQUENCE (SIZE (1..maxNrofDRX-ConfigPTM-r17)) OF DRX-ConfigPTM-r17 OPTIONAL, -- Need R

 pdsch-ConfigMTCH-r18 PDSCH-ConfigBroadcast-r17 OPTIONAL, -- Need S

 mtch-SSB-MappingWindowList-r18 MTCH-SSB-MappingWindowList-r17 OPTIONAL, -- Need R

 thresholdMBS-List-r18 SEQUENCE (SIZE (1..maxNrofThresholdMBS-r18)) OF ThresholdMBS-r18 OPTIONAL, -- Need R

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

ThresholdMBS-r18 ::= SEQUENCE {

 rsrp-r18 RSRP-Range OPTIONAL, -- Need R

 rsrq-r18 RSRQ-Range OPTIONAL -- Need R

}

-- TAG-MBSMULTICASTCONFIGURATION-STOP

-- ASN1STOP

| *MBSMulticastConfiguration* field descriptions |
| --- |
| ***mbs-NeighbourCellList***List of neighbour cells providing one or more MBS multicast services for RRC\_INACTIVE that are provided by the current cell. This field is used by the UE together with *mtch-NeighbourCell* field signalled for each MBS session in the corresponding *MBS-SessionInfo*. When an empty *mbs-NeighbourCellList* list is signalled, the UE shall assume that MBS multicast services signalled in *mbs-SessionInfoListMulticast* in the *MBSMulticastConfiguration* message are not provided in any neighbour cell. When a non-empty *mbs-NeighbourCellList* is signalled, the current serving cell does not provide information about MBS multicast services of a neighbour cell that is not included in *mbs-NeighbourCellList*, i.e., the UE cannot determine the presence or absence of an MBS multicast service of a neighbour cell that is absent. When the field *mbs-NeighbourCellList* is absent, the current serving cell does not provide information about MBS multicast services in the neighbouring cells, i.e. the UE cannot determine the presence or absence of an MBS multicast service in neighbouring cells based on the absence of this field. |
| ***mbs-SessionInfoListMulticast***Provides the configuration of MBS multicast session(s) in the current cell.  |
| ***pdsch-ConfigMTCH***Provides parameters for acquiring the PDSCH for multicast MTCH. When this field is absent, the UE shall use parameters in *pdsch-ConfigMCCH* in *SIB24* to acquire the PDSCH for multicast MTCH. |
| ***thresholdMBS-List***List of reception quality thresholds for RRC connection resume for a UE receiving multicast in RRC\_INACTIVE. |

Next Change

#### – *MBS-NeighbourCellList*

The IE *MBS-NeighbourCellList* indicates a list of neighbour cells where ongoing MBS sessions provided via broadcast/multicast MRB in the current cell may also be provided, as indicated in the *mtch-NeighbourCell*.

*MBS-NeighbourCellList* information element

-- ASN1START

-- TAG-MBS-NEIGHBOURCELLLIST-START

MBS-NeighbourCellList-r17 ::= SEQUENCE (SIZE (0..maxNeighCellMBS-r17)) OF MBS-NeighbourCell-r17

MBS-NeighbourCell-r17 ::= SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR OPTIONAL -- Need S

}

-- TAG-MBS-NEIGHBOURCELLLIST-STOP

-- ASN1STOP

| *MBS-NeighbourCellList* field descriptions |
| --- |
| ***carrierFreq***Indicates the frequency of the neighbour cell indicated by *physCellId*. Absence of the IE means that the neighbour cell is on the same frequency as the current cell. |

Next Change

#### – *RRCRelease*

The *RRCRelease* message is used to command the release of an RRC connection or the suspension of the RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCRelease* message

-- ASN1START

-- TAG-RRCRELEASE-START

RRCRelease ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcRelease RRCRelease-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCRelease-IEs ::= SEQUENCE {

 redirectedCarrierInfo RedirectedCarrierInfo OPTIONAL, -- Need N

 cellReselectionPriorities CellReselectionPriorities OPTIONAL, -- Need R

 suspendConfig SuspendConfig OPTIONAL, -- Need R

 deprioritisationReq SEQUENCE {

 deprioritisationType ENUMERATED {frequency, nr},

 deprioritisationTimer ENUMERATED {min5, min10, min15, min30}

 } OPTIONAL, -- Need N

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCRelease-v1540-IEs OPTIONAL

}

RRCRelease-v1540-IEs ::= SEQUENCE {

 waitTime RejectWaitTime OPTIONAL, -- Need N

 nonCriticalExtension RRCRelease-v1610-IEs OPTIONAL

}

RRCRelease-v1610-IEs ::= SEQUENCE {

 voiceFallbackIndication-r16 ENUMERATED {true} OPTIONAL, -- Need N

 measIdleConfig-r16 SetupRelease {MeasIdleConfigDedicated-r16} OPTIONAL, -- Need M

 nonCriticalExtension RRCRelease-v1650-IEs OPTIONAL

}

RRCRelease-v1650-IEs ::= SEQUENCE {

 mpsPriorityIndication-r16 ENUMERATED {true} OPTIONAL, -- Cond Redirection2

 nonCriticalExtension RRCRelease-v1710-IEs OPTIONAL

}

RRCRelease-v1710-IEs ::= SEQUENCE {

 noLastCellUpdate-r17 ENUMERATED {true} OPTIONAL, -- Need S

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

RedirectedCarrierInfo ::= CHOICE {

 nr CarrierInfoNR,

 eutra RedirectedCarrierInfo-EUTRA,

 ...

}

RedirectedCarrierInfo-EUTRA ::= SEQUENCE {

 eutraFrequency ARFCN-ValueEUTRA,

 cnType ENUMERATED {epc,fiveGC} OPTIONAL -- Need N

}

CarrierInfoNR ::= SEQUENCE {

 carrierFreq ARFCN-ValueNR,

 ssbSubcarrierSpacing SubcarrierSpacing,

 smtc SSB-MTC OPTIONAL, -- Need S

 ...

}

SuspendConfig ::= SEQUENCE {

 fullI-RNTI I-RNTI-Value,

 shortI-RNTI ShortI-RNTI-Value,

 ran-PagingCycle PagingCycle,

 ran-NotificationAreaInfo RAN-NotificationAreaInfo OPTIONAL, -- Need M

 t380 PeriodicRNAU-TimerValue OPTIONAL, -- Need R

 nextHopChainingCount NextHopChainingCount,

 ...,

 [[

 sl-UEIdentityRemote-r17 RNTI-Value OPTIONAL, -- Cond L2RemoteUE

 sdt-Config-r17 SetupRelease { SDT-Config-r17 } OPTIONAL, -- Need M

 srs-PosRRC-Inactive-r17 SetupRelease { SRS-PosRRC-Inactive-r17 } OPTIONAL, -- Need M

 ran-ExtendedPagingCycle-r17 ExtendedPagingCycle-r17 OPTIONAL -- Cond RANPaging

 ]],

 [[

 ncd-SSB-RedCapInitialBWP-SDT-r17 SetupRelease {NonCellDefiningSSB-r17} OPTIONAL -- Need M

 ]],

 [[

 resumeIndication-r18 ENUMERATED {true} OPTIONAL, -- Need N

 srs-PosRRC-Inactive-v1800 SetupRelease { SRS-PosRRC-Inactive-v1800 } OPTIONAL, -- Need M

 srs-PosRRC-InactiveValidityAreaPreConfigList-r18 SetupRelease { SRS-PosRRC-InactiveValidityAreaPreConfigList-r18 } OPTIONAL, -- Need M

 srs-PosRRC-InactiveValidityAreaNonPreConfig-r18 SetupRelease { SRS-PosRRC-InactiveValidityAreaConfig-r18 } OPTIONAL, -- Need M

 ran-ExtendedPagingCycleConfig-r18 ExtendedPagingCycleConfig-r18 OPTIONAL, -- Cond RANPaging

 multicastConfigInactive-r18 SetupRelease { MulticastConfigInactive-r18 } OPTIONAL -- Need M

 ]]

}

PeriodicRNAU-TimerValue ::= ENUMERATED { min5, min10, min20, min30, min60, min120, min360, min720}

CellReselectionPriorities ::= SEQUENCE {

 freqPriorityListEUTRA FreqPriorityListEUTRA OPTIONAL, -- Need M

 freqPriorityListNR FreqPriorityListNR OPTIONAL, -- Need M

 t320 ENUMERATED {min5, min10, min20, min30, min60, min120, min180, spare1} OPTIONAL, -- Need R

 ...,

 [[

 freqPriorityListDedicatedSlicing-r17 FreqPriorityListDedicatedSlicing-r17 OPTIONAL -- Need M

 ]]

}

PagingCycle ::= ENUMERATED {rf32, rf64, rf128, rf256}

FreqPriorityListEUTRA ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA

FreqPriorityListNR ::= SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityNR

FreqPriorityEUTRA ::= SEQUENCE {

 carrierFreq ARFCN-ValueEUTRA,

 cellReselectionPriority CellReselectionPriority,

 cellReselectionSubPriority CellReselectionSubPriority OPTIONAL -- Need R

}

FreqPriorityNR ::= SEQUENCE {

 carrierFreq ARFCN-ValueNR,

 cellReselectionPriority CellReselectionPriority,

 cellReselectionSubPriority CellReselectionSubPriority OPTIONAL -- Need R

}

RAN-NotificationAreaInfo ::= CHOICE {

 cellList PLMN-RAN-AreaCellList,

 ran-AreaConfigList PLMN-RAN-AreaConfigList,

 ...

}

PLMN-RAN-AreaCellList ::= SEQUENCE (SIZE (1.. maxPLMNIdentities)) OF PLMN-RAN-AreaCell

PLMN-RAN-AreaCell ::= SEQUENCE {

 plmn-Identity PLMN-Identity OPTIONAL, -- Need S

 ran-AreaCells SEQUENCE (SIZE (1..32)) OF CellIdentity

}

PLMN-RAN-AreaConfigList ::= SEQUENCE (SIZE (1..maxPLMNIdentities)) OF PLMN-RAN-AreaConfig

PLMN-RAN-AreaConfig ::= SEQUENCE {

 plmn-Identity PLMN-Identity OPTIONAL, -- Need S

 ran-Area SEQUENCE (SIZE (1..16)) OF RAN-AreaConfig

}

RAN-AreaConfig ::= SEQUENCE {

 trackingAreaCode TrackingAreaCode,

 ran-AreaCodeList SEQUENCE (SIZE (1..32)) OF RAN-AreaCode OPTIONAL -- Need R

}

SDT-Config-r17 ::= SEQUENCE {

 sdt-DRB-List-r17 SEQUENCE (SIZE (0..maxDRB)) OF DRB-Identity OPTIONAL, -- Need M

 sdt-SRB2-Indication-r17 ENUMERATED {allowed} OPTIONAL, -- Need R

 sdt-MAC-PHY-CG-Config-r17 SetupRelease {SDT-CG-Config-r17} OPTIONAL, -- Need M

 sdt-DRB-ContinueROHC-r17 ENUMERATED { cell, rna } OPTIONAL -- Need S

}

SDT-CG-Config-r17 ::= OCTET STRING (CONTAINING SDT-MAC-PHY-CG-Config-r17)

SDT-MAC-PHY-CG-Config-r17 ::= SEQUENCE {

 -- CG-SDT specific configuration

 cg-SDT-ConfigLCH-RestrictionToAddModList-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF CG-SDT-ConfigLCH-Restriction-r17 OPTIONAL, -- Need N

 cg-SDT-ConfigLCH-RestrictionToReleaseList-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity OPTIONAL, -- Need N

 cg-SDT-ConfigInitialBWP-NUL-r17 SetupRelease {BWP-UplinkDedicatedSDT-r17} OPTIONAL, -- Need M

 cg-SDT-ConfigInitialBWP-SUL-r17 SetupRelease {BWP-UplinkDedicatedSDT-r17} OPTIONAL, -- Need M

 cg-SDT-ConfigInitialBWP-DL-r17 BWP-DownlinkDedicatedSDT-r17 OPTIONAL, -- Need M

 cg-SDT-TimeAlignmentTimer-r17 TimeAlignmentTimer OPTIONAL, -- Need M

 cg-SDT-RSRP-ThresholdSSB-r17 RSRP-Range OPTIONAL, -- Need M

 cg-SDT-TA-ValidationConfig-r17 SetupRelease { CG-SDT-TA-ValidationConfig-r17 } OPTIONAL, -- Need M

 cg-SDT-CS-RNTI-r17 RNTI-Value OPTIONAL, -- Need M

 ...,

 [[

 cg-SDT-ConfigLCH-RestrictionToAddModListExt-v1800 SEQUENCE (SIZE(1..maxLC-ID)) OF CG-SDT-ConfigLCH-Restriction-v1800

 OPTIONAL, -- Need N

 cg-MT-SDT-MaxDurationToNext-CG-Occasion-r18 ENUMERATED {

 ms10, ms100, sec1, sec10, sec60, sec100, sec300, sec600,

 sec1200, sec1800, sec3600,

 spare5, spare4, spare3, spare2, spare1} OPTIONAL -- Need R

 ]]

}

CG-SDT-TA-ValidationConfig-r17 ::= SEQUENCE {

 cg-SDT-RSRP-ChangeThreshold-r17 ENUMERATED { dB2, dB4, dB6, dB8, dB10, dB14, dB18, dB22,

 dB26, dB30, dB34, spare5, spare4, spare3, spare2, spare1}

}

BWP-DownlinkDedicatedSDT-r17 ::= SEQUENCE {

 pdcch-Config-r17 SetupRelease { PDCCH-Config } OPTIONAL, -- Need M

 pdsch-Config-r17 SetupRelease { PDSCH-Config } OPTIONAL, -- Need M

 ...

}

BWP-UplinkDedicatedSDT-r17 ::= SEQUENCE {

 pusch-Config-r17 SetupRelease { PUSCH-Config } OPTIONAL, -- Need M

 configuredGrantConfigToAddModList-r17 ConfiguredGrantConfigToAddModList-r16 OPTIONAL, -- Need N

 configuredGrantConfigToReleaseList-r17 ConfiguredGrantConfigToReleaseList-r16 OPTIONAL, -- Need N

 ...

}

CG-SDT-ConfigLCH-Restriction-r17 ::= SEQUENCE {

 logicalChannelIdentity-r17 LogicalChannelIdentity,

 configuredGrantType1Allowed-r17 ENUMERATED {true} OPTIONAL, -- Need R

 allowedCG-List-r17 SEQUENCE (SIZE (0.. maxNrofConfiguredGrantConfigMAC-1-r16)) OF ConfiguredGrantConfigIndexMAC-r16

 OPTIONAL -- Need R

}

CG-SDT-ConfigLCH-Restriction-v1800 ::= SEQUENCE {

 cg-SDT-MaxDurationToNext-CG-Occasion-r18 ENUMERATED {

 ms10, ms100, sec1, sec10, sec60, sec100, sec300, sec600,

 sec1200, sec1800, sec3600,

 spare5, spare4, spare3, spare2, spare1} OPTIONAL -- Need R

}

SRS-PosRRC-Inactive-r17 ::= OCTET STRING (CONTAINING SRS-PosRRC-InactiveConfig-r17)

SRS-PosRRC-InactiveConfig-r17 ::= SEQUENCE {

 srs-PosConfigNUL-r17 SRS-PosConfig-r17 OPTIONAL, -- Need R

 srs-PosConfigSUL-r17 SRS-PosConfig-r17 OPTIONAL, -- Need R

 bwp-NUL-r17 BWP OPTIONAL, -- Need S

 bwp-SUL-r17 BWP OPTIONAL, -- Need S

 inactivePosSRS-TimeAlignmentTimer-r17 TimeAlignmentTimer OPTIONAL, -- Need M

 inactivePosSRS-RSRP-ChangeThreshold-r17 RSRP-ChangeThreshold-r17 OPTIONAL -- Need M

}

RSRP-ChangeThreshold-r17 ::= ENUMERATED {dB4, dB6, dB8, dB10, dB14, dB18, dB22, dB26, dB30, dB34, spare6, spare5, spare4, spare3, spare2, spare1}

SRS-PosConfig-r17 ::= SEQUENCE {

 srs-PosResourceSetToReleaseList-r17 SEQUENCE (SIZE(1..maxNrofSRS-PosResourceSets-r16)) OF SRS-PosResourceSetId-r16 OPTIONAL,-- Need N

 srs-PosResourceSetToAddModList-r17 SEQUENCE (SIZE(1..maxNrofSRS-PosResourceSets-r16)) OF SRS-PosResourceSet-r16 OPTIONAL,-- Need N

 srs-PosResourceToReleaseList-r17 SEQUENCE (SIZE(1..maxNrofSRS-PosResources-r16)) OF SRS-PosResourceId-r16 OPTIONAL,-- Need N

 srs-PosResourceToAddModList-r17 SEQUENCE (SIZE(1..maxNrofSRS-PosResources-r16)) OF SRS-PosResource-r16 OPTIONAL -- Need N

}

SRS-PosRRC-Inactive-v1800 ::= SEQUENCE {

 srs-PosRRC-AggBW-InactiveConfigList-r18 SetupRelease { SRS-PosRRC-AggBW-InactiveConfigList-r18 } OPTIONAL, -- Need M

 srs-PosTx-Hopping-r18 SetupRelease { SRS-PosTx-Hopping-r18 } OPTIONAL, -- Need M

 ...

}

SRS-PosRRC-InactiveValidityAreaPreConfigList-r18 ::= SEQUENCE (SIZE(1..maxNrOfVA-r18)) OF SRS-PosRRC-InactiveValidityAreaConfig-r18

SRS-PosRRC-InactiveValidityAreaConfig-r18 ::= SEQUENCE {

 srs-PosConfigValidityArea-r18 SEQUENCE (SIZE(1..maxNrOfCellsInVA-r18)) OF CellIdentity,

 srs-PosConfigNUL-r18 SRS-PosConfig-r17 OPTIONAL, -- Need R

 srs-PosConfigSUL-r18 SRS-PosConfig-r17 OPTIONAL, -- Need R

 bwp-NUL-r18 BWP OPTIONAL, -- Need S

 bwp-SUL-r18 BWP OPTIONAL, -- Need S

 areaValidityTA-Config-r18 AreaValidityTA-Config-r18 OPTIONAL, -- Need R

 ...

}

AreaValidityTA-Config-r18 ::= SEQUENCE {

 inactivePosSRS-ValidityAreaTAT-r18 ENUMERATED {ms1280, ms1920, ms2560, ms5120, ms10240, ms20480, ms40960, infinity},

 inactivePosSRS-ValidityAreaRSRP-r18 RSRP-ChangeThreshold-r17 OPTIONAL, -- Need R

 autonomousTA-AdjustmentEnabled-r18 ENUMERATED {true} OPTIONAL -- Need R

}

SRS-PosRRC-AggBW-InactiveConfigList-r18 ::= SEQUENCE (SIZE (1..2)) OF SRS-PosResourceSetLinkedForAggBW-r18

ExtendedPagingCycle-r17 ::= ENUMERATED {rf256, rf512, rf1024, spare1}

ExtendedPagingCycleConfig-r18 ::= SEQUENCE {

 extendedPagingCycle-r18 ENUMERATED {hf2, hf4, hf8, hf16, hf32, hf64, hf128,hf256, hf512, hf1024,

 spare6, spare5, spare4, spare3, spare2, spare1},

 pagingPTWLength-r18 ENUMERATED {ms1280, ms2560, ms3840, ms5120, ms6400, ms7680, ms8960, ms10240, ms11520,

 ms12800, ms14080, ms15360, ms16640, ms17920, ms19200, ms20480, ms21760,

 ms23040, ms24320, ms25600, ms26880, ms28160, ms29440, ms30720, ms32000,

 ms33280, ms34560, ms35840, ms37120, ms38400, ms39680, ms40960}

}

MulticastConfigInactive-r18::= SEQUENCE {

 inactivePTM-Config-r18 OCTET STRING (CONTAINING MBSMulticastConfiguration-r18) OPTIONAL, -- Need S

 inactiveMCCH-Config-r18 OCTET STRING (CONTAINING SystemInformation) OPTIONAL -- Need N

}

-- TAG-RRCRELEASE-STOP

-- ASN1STOP

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| *RRCRelease-IEs* field descriptions |
| ***cellReselectionPriorities***Dedicated priorities to be used for cell reselection as specified in TS 38.304 [20]*.* The maximum number of NR carrier frequencies that the network can configure through *FreqPriorityListNR* and *FreqPriorityListDedicatedSlicing* together is eight. If the same frequency is configured in both *FreqPriorityListNR* and *FreqPriorityListDedicatedSlicing*, the frequency is only counted once. |
| ***cnType***Indicate that the UE is redirected to EPC or 5GC. |
| ***deprioritisationReq***Indicates whether the current frequency or RAT is to be de-prioritised. |
| ***deprioritisationTimer***Indicates the period for which either the current carrier frequency or NR is deprioritised. Value *minN* corresponds to N minutes. |
| ***measIdleConfig***Indicates measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |
| ***mpsPriorityIndication***Indicates the UE can set the establishment cause to *mps-PriorityAccess* for a new connection following a redirect to NR or set the resume cause to *mps-PriorityAccess* for a resume following a redirect to NR. If the target RAT is E-UTRA, see TS 36.331 [10]. The gNB sets the indication only for UEs authorized to receive MPS treatment as indicated by ARP and/or QoS characteristics at the gNB, and it is applicable only for this instance of release with redirection to carrier/RAT included in the *redirectedCarrierInfo* field in the *RRCRelease* message. |
| ***multicastConfigInactive***Indicates whether the UE is configured to receive multicast in RRC\_INACTIVE. The presence of this field indicates the UE is configured to receive MBS multicast in RRC\_INACTIVE; otherwise, the UE is not configured to receive MBS multicast in RRC\_INACTIVE. |
| ***noLastCellUpdate***Presence of the field indicates that the last used cell for PEI shall not be updated. When the field is absent, the PEI-capable UE shall update its last used cell with the current cell. The UE shall not update its last used cell with the current cell if the AS security is not activated. |
| ***redirectedCarrierInfo***Indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to an NR or an inter-RAT carrier frequency, by means of cell selection at transition to RRC\_IDLE or RRC\_INACTIVE as specified in TS 38.304 [20]. Based on UE capability, the network may include *redirectedCarrierInfo* in *RRCRelease* message with *suspendConfig* if this message is sent in response to an *RRCResumeRequest* or an *RRCResumeRequest1* which is triggered by the NAS layer (see 5.3.1.4 in TS 24.501 [23]). |
| ***srs-PosRRC-Inactive***SRS for positioning configuration during RRC\_INACTIVE state. The configuration also includes bandwidth aggregation and frequency hopping. |
| ***srs-PosRRC-InactiveValidityAreaNonPreConfig***Contains the SRS for positioning configuration to be applied immediately and which is valid across a number of cells comprising a validity area during RRC\_INACTIVE state. |
| ***srs-PosRRC-InactiveValidityAreaPreConfigList***Contains the SRS for positioning configurations to be applied when a trigger for an event is met and which is valid across a number of cells comprising a validity area during RRC\_INACTIVE state. For each validity area, the UE is preconfigured with only one SRS for positioning configuration.The below fields for the respective IEs are configured commonly in the validity area when *srs-PosRRC-InactiveValidityAreaPreConfigList/ srs-PosRRC-InactiveValidityAreaNonPreConfig* is configured:*IE SRS-PosReseourceSet: srs-PosResourceSetId, srs-PosResourceSetIdList, srs-PosResourceIdList, resourceType, alpha, p0**IE SRS-PosResource: srs-PosResourceId, transmissionComb, resourceMapping, freqDomainShift, freqHopping, resourceType, groupOrSequenceHopping, sequenceID* |
| ***srs-PosTx-Hopping***Contains configuration related to the SRS for Positioning with frequency hopping for RRC\_INACTIVE state. |
| ***suspendConfig***Indicates configuration for the RRC\_INACTIVE state. The network does not configure *suspendConfig* when the network redirect the UE to an inter-RAT carrier frequency or if the UE is configured with a DAPS bearer. |
| ***voiceFallbackIndication***Indicates the RRC release is triggered by EPS fallback for IMS voice as specified in TS 23.502 [43]. |

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| *CarrierInfoNR* field descriptions |
| ***carrierFreq***Indicates the redirected NR frequency. |
| ***ssbSubcarrierSpacing***Subcarrier spacing of SSB in the redirected SSB frequency.Only the following values are applicable depending on the used frequency:FR1: 15 or 30 kHzFR2-1: 120 or 240 kHzFR2-2: 120, 480, or 960 kHz |
| ***smtc***The SSB periodicity/offset/duration configuration for the redirected SSB frequency. It is based on timing reference of PCell. If the field is absent, the UE uses the SMTC configured in the measObjectNR having the same SSB frequency and subcarrier spacing. |

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| *RAN-NotificationAreaInfo* field descriptions |
| ***cellList***A list of cells configured as RAN area. |
| ***ran-AreaConfigList***A list of RAN area codes or RA code(s) as RAN area. |

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| *PLMN-RAN-AreaConfig* field descriptions |
| ***plmn-Identity***PLMN Identity to which the cells in *ran-Area* belong. If the field is absent the UE not in SNPN access mode uses the ID of the registered PLMN. This field is not included for UE in SNPN access mode (for UE in SNPN access mode the *ran-Area* always belongs to the registered SNPN). |
| ***ran-AreaCodeList***The total number of RAN-AreaCodes of all PLMNs does not exceed 32. |
| ***ran-Area***Indicates whether TA code(s) or RAN area code(s) are used for the RAN notification area. The network uses only TA code(s) or both TA code(s) and RAN area code(s) to configure a UE. The total number of TACs across all PLMNs does not exceed 16. |

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| *PLMN-RAN-AreaCell* field descriptions |
| ***plmn-Identity***PLMN Identity to which the cells in *ran-AreaCells* belong. If the field is absent the UE not in SNPN access mode uses the ID of the registered PLMN. This field is not included for UE in SNPN access mode (for UE in SNPN access mode the *ran-AreaCells* always belongs to the registered SNPN). |
| ***ran-AreaCells***The total number of cells of all PLMNs does not exceed 32. |

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| *SDT-Config* field descriptions |
| ***sdt-DRB-ContinueROHC***Indicates whether the PDCP entity of the radio bearers configured for SDT continues or resets the ROHC header compression protocol during PDCP re-establishment during SDT procedure, as specified in TS 38.323 [5]. Value *cell* indicates that ROHC header compression continues when the UE resumes for SDT in the same cell as the PCell when the RRCRelease message was received. Value *rna* indicates that ROHC header compression continues when the UE resumes for SDT in a cell belonging to the same RNA as the PCell where the RRCRelease message was received. If the field is absent, the UE releases any stored value for this field and the PDCP entity of the radio bearers configured for SDT always resets the ROHC header compression protocol during PDCP re-establishment when SDT procedure is initiated, as specified in TS 38.323 [5]. |
| ***sdt-DRB-List***Indicates the ID(s) of the DRB(s) that are configured for SDT. If size of the sequence is zero, then the UE assumes that none of the DRBs are configured for SDT. The network only configures MN terminated MCG bearers for SDT. |
| ***sdt-SRB2-Indication***Indiates whether SRB2 is configured for SDT or not. |

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| *SDT-MAC-PHY-CG-Config* field descriptions |
| ***cg-MT-SDT-MaxDurationToNext-CG-Occasion***The maximum duration until the next CG-SDT occasion as specified in TS 38.321 [3] for MT-SDT. If configured, the CG-SDT resource can only be used for the initial CG-SDT transmission if the duration between the initiation of the CG-SDT procedure and the next CG-SDT occasion is less than the value configured by this field. |
| ***cg-SDT-ConfigInitialBWP-DL***Downlink BWP configuration for CG-SDT. If a UE is an (e)RedCap UE and if the *initialDownlinkBWP-RedCap* is configured in *downlinkConfigCommon* in *SIB1*, this field is configured for *initialDownlinkBWP-RedCap*, otherwise it is configured for *initialDownlinkBWP*. |
| ***cg-SDT-ConfigInitialBWP-NUL***UL BWP configuration for CG-SDT on NUL carrier. If a UE is an (e)RedCap UE and if the *initialUplinkBWP-RedCap* is configured in *uplinkConfigCommon* in *SIB1*, this field is configured for *initialUplinkBWP-RedCap*, otherwise it is configured for *initialUplinkBWP* for NUL. |
| ***cg-SDT-ConfigInitialBWP-SUL***UL BWP configuration for CG-SDT on SUL carrier configured for the *initialUplinkBWP* for SUL. |
| ***cg-SDT-ConfigLCH-RestrictionToAddModList, cg-SDT-ConfigLCH-RestrictionToAddModListExt, cg-SDT-ConfigLCH-RestrictionToReleaseList***Lists for adding and releasing logical channel mapping restrictions for CG-SDT. If the network includes *cg-SDT-ConfigLCH-RestrictionToAddModListExt*, it includes the same number of entries, and listed in the same order, as in *cg-SDT-ConfigLCH-RestrictionToAddModList*. |
| ***cg-SDT-CS-RNTI***The CS-RNTI value for CG-SDT as specified in TS 38.321 [3]. |
| ***cg-SDT-RSRP-ThresholdSSB***An RSRP threshold configured for SSB selection for CG-SDT as specified in TS 38.321 [3]. |
| ***cg-SDT-TA-ValidationConfig***Configuration for the RSRP based TA validation. If this field is not configured, then the UE does not perform RSRP based TA validation. |
| ***cg-SDT-timeAlignmentTimer***TAT value for CG-SDT as specified in TS 38.321 [3]. The network always configures this field when *sdt-MAC-PHY-CG-Config* is configured. |

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| *CG-SDT-ConfigLCH-Restriction* field descriptions |
| ***allowedCG-List***This restriction applies only when the UL grant is a configured grant for CG-SDT. If present, UL MAC SDUs from this logical channel can only be mapped to the indicated CG-SDT configured grant configuration. If the size of the sequence is zero, then UL MAC SDUs from this logical channel cannot be mapped to any CG-SDT configured grant configurations. If the field is not present, UL MAC SDUs from this logical channel can be mapped to any CG-SDT configured grant configurations. If the field *configuredGrantType1Allowed* is present, only those CG-SDT configured grant type 1 configurations indicated in this sequence are allowed for use by this logical channel; otherwise, this sequence shall not include any CG-SDT configured grant type 1 configuration. Corresponds to "*allowedCG*-*List*" as specified in TS 38.321 [3]. |
| ***cg-SDT-MaxDurationToNext-CG-Occasion***The maximum duration until the next CG-SDT occasion for the logical channel identified by the *logicalChannelIdentity* as specified in TS 38.321 [3]. If configured, the CG-SDT resource can only be used for the initial CG-SDT transmission if the duration between the initiation of the CG-SDT procedure and the next CG-SDT occasion is less than the value configured by this field as specified in TS 38.321 [3]. |
| ***configuredGrantType1Allowed***If present, or if the capability *lcp-Restriction* as specified in TS 38.306 [26] is not supported, UL MAC SDUs from this logical channel can be transmitted on a configured grant type 1 for CG-SDT. Otherwise, UL MAC SDUs from this logical channel cannot be transmitted on a configured grant type 1 for CG-SDT. Corresponds to "*configuredGrantType1Allowed*" in TS 38.321 [3]. |
| ***logicalChannelIdentity***ID used commonly for the MAC logical channel and for the RLC bearer associated with a *servedRadioBearer* configured for SDT. |

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| *CG-SDT-TA-ValidationConfig* field descriptions |
| ***cg-SDT-RSRP-ChangeThreshold***The RSRP threshold for TA validation for CG-SDT as specified in TS 38.321 [3]. Value *dB2* corresponds to 2 dB, value *dB4* corresponds to 4 dB and so on. |

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| *SRS-PosRRC-InactiveConfig* field descriptions |
| ***bwp-NUL***BWP configuration for SRS for Positioning during the RRC\_INACTIVE state in Normal Uplink Carrier. If the field is absent UE is configured with an SRS for Positioning associated with the initial UL BWP and transmitted, during the RRC\_INACTIVE state, inside the initial UL BWP with the same CP and SCS as configured for initial UL BWP. |
| ***bwp-SUL***BWP configuration for SRS for Positioning during the RRC\_INACTIVE state in Supplementary Uplink Carrier. If the field is absent UE is configured with an SRS for Positioning associated with the initial UL BWP and transmitted, during the RRC\_INACTIVE state, inside the initial UL BWP with the same CP and SCS as configured for initial UL BWP. |
| ***inactivePosSRS-RSRP-ChangeThreshold***RSRP threshold for the increase/decrease of RSRP for time alignment validation as specified in TS 38.321 [3]. |
| ***inactivePosSRS-TimeAlignmentTimer***TAT value for SRS for positioning transmission during RRC\_INACTIVE state as specified in TS 38.321 [3]. The network always configures this field when *srs-PosRRC-Inactive* is configured. |
| ***srs-PosConfigNUL***SRS for Positioning configuration in RRC\_INACTIVE state in Normal Uplink Carrier. |
| ***srs-PosConfigSUL***SRS for Positioning configuration in RRC\_INACTIVE state in Supplementary Uplink Carrier. |
| ***srs-PosResSetLinkedForAggBWInactiveList***This field indicates the SRS resource sets across carriers which are linked for SRS bandwidth aggregation in RRC\_INACTIVE state as defined in clause 6.2.1.4 of TS 38.214 [19]. |
| ***srs-PosRRC-AggBW-InactiveConfigList***SRS for positioning configuration with additional one or two carrier(s) configuration where the primary carrier is provided by *srs-PosRRC-Inactive-r17* for bandwidth aggregation and to be used in RRC\_INACTIVE state. |

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| *SRS-PosRRC-InactiveValidityAreaConfig* field descriptions |
| ***autonomousTA-AdjustmentEnabled***This field indicates that UE may adjust the TA value and stored RSRP autonomously after cell reselection within a validity area, if configured. |
| ***bwp-NUL***BWP configuration for SRS for Positioning during the RRC\_INACTIVE state in Normal Uplink Carrier. If the field is absent UE is configured with an SRS for Positioning associated with the initial UL BWP and transmitted, during the RRC\_INACTIVE state, inside the initial UL BWP with the same CP and SCS as configured for initial UL BWP. |
| ***bwp-SUL***BWP configuration for SRS for Positioning during the RRC\_INACTIVE state in Supplementary Uplink Carrier. If the field is absent UE is configured with an SRS for Positioning associated with the initial UL BWP and transmitted, during the RRC\_INACTIVE state, inside the initial UL BWP with the same CP and SCS as configured for initial UL BWP. |
| ***srs-PosRRC-InactiveValidityArea***Provides a list of cells where SRS Positioning Configuration in RRC\_INACTIVE state is valid. |
| ***inactivePosSRS-ValidityAreaTAT***Time alignment timer value for SRS for positioning transmission during RRC\_INACTIVE state which is applicable in a validity area. |
| ***inactivePosSRS-ValidityAreaRSRP***RSRP threshold for the increase/decrease of RSRP for validity area time alignment validation as specified in TS 38.321 [3]. |

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| *SuspendConfig* field descriptions |
| ***ncd-SSB-RedCapInitialBWP-SDT***Indicates that the UE uses the RedCap-specific initial DL BWP associated with the NCD-SSB for SDT. The network configures this field if an (e)RedCap UE is configured with SDT in the RedCap-specific initial DL BWP not associated with CD-SSB. If configured, the NCD-SSB indicated by this field can only be used during the SDT procedure for CG-SDT or RA-SDT. In the MIB associated with this NCD-SSB, the *systemFrameNumber* field indicates the frame boundary and frame number of the NCD-SSB. The *subCarrierSpacingCommon* and *dmrs-TypeA-Position* field in the MIBs associated with CD-SSB and NCD-SSB in the same cell are configured with the same values, respectively. |
| ***ran-ExtendedPagingCycle***The extended DRX (eDRX) cycle for RAN-initiated paging to be applied by the UE as defined in TS 38.304 [20]. Value *rf256* corresponds to 256 radio frames, value *rf512* corresponds to 512 radio frames and so on. Value of the field indicates an eDRX cycle which is shorter or equal to the IDLE mode eDRX cycle configured for the UE. |
| ***ran-ExtendedPagingCycleConfig***The extended DRX (eDRX) configuraiton for RAN-initiated paging to be applied by the UE when the eDRX cycle for RAN-initiated paging is longer than 10.24s. |
| ***ran-NotificationAreaInfo***Network ensures that the UE in RRC\_INACTIVE always has a valid *ran-NotificationAreaInfo*. |
| ***ran-PagingCycle***Refers to the UE specific cycle for RAN-initiated paging. Value *rf32* corresponds to 32 radio frames, value *rf64* corresponds to 64 radio frames and so on. |
| ***resumeIndication***Indicates that the UE shall trigger the RRC connection resume procedure after receiving this *RRCRelease* message, as specified in clause 5.3.8.3. The network only includes this field in the *RRCRelease* message used to terminate an ongoing SDT procedure. |
| ***sl-UEIdentityRemote***Indicates the C-RNTI to the L2 U2N Remote UE. |
| ***t380***Refers to the timer that triggers the periodic RNAU procedure in UE. Value *min5* corresponds to 5 minutes, value *min10* corresponds to 10 minutes and so on. |

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| *MulticastConfigInactive* field descriptions |
| ***inactivePTM-Config***Indicates the multicast session(s) that can be received in RRC\_INACTIVE and optionally the corresponding PTM configuration (as indicated by the optional fields in the *MBS-SessionInfoMulticast*) for the cell where the multicast session(s) was received in RRC\_CONNECTED. If absent, UE considers that all joined multicast sessions can be received in RRC\_INACTIVE. |
| ***inactiveMCCH-Config***Indicates multicast MCCH/MTCH configuration for MBS multicast reception in RRC\_INACTIVE in the serving cell. Only *SIB24* is allowed to be included. |

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| *ExtendedPagingCycleConfig* field descriptions |
| ***extendedPagingCycle***The eDRX cycle longer than 10.24 s for RAN-initiated paging to be applied by the UE. Value hf2 corresponds to 2 hyper frames, value hf4 corresponds to 4 hyper frames and so on. Value of the field is shorter than or equal to the IDLE mode eDRX cycle configured for the UE. |
| ***pagingPTWLength***The length of paging transmission window for RAN-initiated paging to be applied by the UE as defined in TS 38.304 [20]. Value ms1280 corresponds to 1280 miliseconds, value ms2560 corresponds to 2560 miliseconds and so on. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE's RNAU; otherwise it is absent. |
| *RANPaging* | This field is optionally present, Need R, if the UE is configured with IDLE eDRX, see TS 24.501 [23]; otherwise the field is not present. |
| *Redirection2* | The field is optionally present, Need R, if *redirectedCarrierInfo* is included; otherwise the field is not present. |

Next Change

### 6.3.6 MBS information elements

#### – *CFR-ConfigMCCH-MTCH*

The IE *CFR-ConfigMCCH-MTCH* is used to configure the common frequency resource used for MCCH and MTCH reception.

*CFR-ConfigMCCH-MTCH* information element

-- ASN1START

-- TAG-CFR-CONFIGMCCH-MTCH-START

CFR-ConfigMCCH-MTCH-r17 ::= SEQUENCE {

 locationAndBandwidthBroadcast-r17 LocationAndBandwidthBroadcast-r17 OPTIONAL, -- Need S

 pdsch-ConfigMCCH-r17 PDSCH-ConfigBroadcast-r17 OPTIONAL, -- Need S

 commonControlResourceSetExt-r17 ControlResourceSet OPTIONAL -- Cond NotSIB1CommonControlResource

}

LocationAndBandwidthBroadcast-r17 ::= CHOICE {

 sameAsSib1ConfiguredLocationAndBW NULL,

 locationAndBandwidth INTEGER (0..37949)

}

-- TAG-CFR-CONFIGMCCH-MTCH-STOP

-- ASN1STOP

| *CFR-ConfigMCCH-MTCH* field descriptions |
| --- |
| ***commonControlResourceSetExt***An additional common control resource set which may be configured and used for *searchSpaceMCCH*/*searchSpaceMTCH* or UE-specific search space in the BWP where *searchSpaceMCCH* is configured. It is contained in the bandwidth of the CFR for broadcast and larger than CORESET#0. |
| ***locationAndBandwidthBroadcast***Indicates starting PRB and the number of PRBs of CFR used for MCCH and MTCH reception.Value *sameAsSib1ConfiguredLocationAndBW* means the CFR for broadcast or multicast has the same location and size as the *locationAndBandwidth* for initial BWP (for (e)RedCap UEs: *initialDownlinkBWP-RedCap* if it is configured and includes CD-SSB and the entire CORESET#0) configured in *SIB1*.Value *locationAndBandwidth* is used to configure CFR with bandwidth that is larger than and fully contains the bandwidth for the initial DL BWP (for (e)RedCap UEs: *initialDownlinkBWP-RedCap* if it is configured and includes CD-SSB and the entire CORESET#0) configured in *SIB1* and CORESET#0. The value of the field shall be interpreted as defined in TS 38.214 [19] with assumptions as described in TS 38.213 [13].This field is not included in *cfr-ConfigMCCH-MTCH-RedCap* if *initialDownlinkBWP-RedCap* in *SIB1* is configured but does not include CD-SSB and the entire CORESET#0.If the field is absent, the CFR for broadcast or multicast has the same location and size as CORESET#0. |
| ***pdsch-ConfigMCCH***Indicates PDSCH parameters used for MCCH transmission. If the field is absent, PDSCH parameters used for MCCH are the same as those of PDSCH configuration provided in *initialDownlinkBWP* in *SIB1*. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *NotSIB1CommonControlResource* | The field is optional present in case *commonControlResourceSet* is not configured in SIB1, Need R, otherwise it is absent. |

#### – *MBS-SessionInfoListMulticast*

The IE *MBS-SessionInfoListMulticast* provides a list of MBS multicast sessions transmitted via multicast MRB for RRC\_INACTIVE UEs and, for each MBS multicast session, the associated G-RNTI and scheduling information.

*MBS-SessionInfoListMulticast* information element

-- ASN1START

-- TAG-MBS-SESSIONINFOLISTMULTICAST-START

MBS-SessionInfoListMulticast-r18 ::= SEQUENCE (SIZE (1..maxNrofMBS-Session-r17)) OF MBS-SessionInfoMulticast-r18

MBS-SessionInfoMulticast-r18 ::= SEQUENCE {

 mbs-SessionId-r18 TMGI-r17,

 g-RNTI-r18 RNTI-Value OPTIONAL, -- Need R

 mrb-ListMulticast-r18 MRB-ListMulticast-r18 OPTIONAL, -- Need R

 mtch-SchedulingInfo-r18 DRX-ConfigPTM-Index-r17 OPTIONAL, -- Need S

 mtch-NeighbourCell-r18 BIT STRING (SIZE(maxNeighCellMBS-r17)) OPTIONAL, -- Need S

 pdsch-ConfigIndex-r18 PDSCH-ConfigIndex-r17 OPTIONAL, -- Need S

 mtch-SSB-MappingWindowIndex-r18 MTCH-SSB-MappingWindowIndex-r17 OPTIONAL, -- Cond MTCH-Mapping

 thresholdIndex-r18 INTEGER (0..maxNrofThresholdMBS-1-r18) OPTIONAL, -- Need R

 pdcp-SyncIndicator-r18 ENUMERATED {true} OPTIONAL, -- Cond RRCRelease

 stopMonitoringRNTI-r18 ENUMERATED {true} OPTIONAL, -- Cond G-RNTI

 ...

}

MRB-ListMulticast-r18 ::= SEQUENCE (SIZE (1.. maxMRB-r17)) OF MRB-InfoMulticast-r18

MRB-InfoMulticast-r18 ::= SEQUENCE {

 pdcp-Config-r18 MRB-PDCP-ConfigMulticast-r18,

 rlc-Config-r18 MRB-RLC-ConfigMulticast-r18,

 ...

}

MRB-PDCP-ConfigMulticast-r18 ::= SEQUENCE {

 pdcp-SN-SizeDL-r18 ENUMERATED {len12bits, len18bits},

 headerCompression-r18 CHOICE {

 notUsed NULL,

 rohc SEQUENCE {

 maxCID-r18 INTEGER (1..16) DEFAULT 15,

 profiles-r18 SEQUENCE {

 profile0x0000-r18 BOOLEAN,

 profile0x0001-r18 BOOLEAN,

 profile0x0002-r18 BOOLEAN

 }

 }

 },

 t-Reordering-r17 ENUMERATED {ms1, ms10, ms40, ms160, ms500, ms1000, ms1250, ms2750} OPTIONAL -- Need R

}

MRB-RLC-ConfigMulticast-r18 ::= SEQUENCE {

 logicalChannelIdentity-r18 CHOICE {

 logicalChannelIdentitymulticast-r18 LogicalChannelIdentity,

 logicalChannelIdentityExt-r18 LogicalChannelIdentityExt-r17

 },

 sn-FieldLength-r18 ENUMERATED {size6, size12},

 t-Reassembly-r18 T-Reassembly OPTIONAL -- Need R

}

-- TAG-MBS-SESSIONINFOLISTMULTICAST-STOP

-- ASN1STOP

|  |
| --- |
| *MBS-SessionInfoListMulticast* field descriptions |
| ***g-RNTI***G-RNTI used to scramble the scheduling and transmission of multicast MTCH.  |
| ***mbs-SessionId***Indicates an identifier of the MBS session to be received by the UE in RRC\_INACTIVE. |
| ***mrb-ListMulticast***A list of multicast MRBs to which the associated MBS multicast session is mapped to. |
| ***mtch-NeighbourCell***Indicates neighbour cells which provide this service on MTCH for RRC\_INACTIVE. The first bit is set to 1 if the service is provided on MTCH in the first cell in *mbs-NeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on MTCH in the second cell in *mbs-NeighbourCellList*, and so on. If the service is not available in any neighbouring cell and *mbs-NeighbourCellList* is signalled, the network sets all bits in this field to 0. The field is absent when *mbs-NeighbourCellList* is absent or an empty *mbs-NeighbourCellList* is signalled. If this field is absent when *mbs-NeighbourCellList* is absent or a non-empty *mbs-NeighbourCellList* is signalled, the related service may or may not be available in any neighbouring cell, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. If this field is absent and an empty *mbs-NeighbourCellList* is signalled, then the UE shall assume that MBS multicast services signalled in *mbs-SessionInfoListMulticast* in the *MBSMulticastConfiguration* message are not provided in any neighbour cell. |
| ***mtch-SchedulingInfo***Indicates the index of DRX configuration entry in *drx-ConfigPTM-List* that is used for scheduling the MTCH. The value 0 corresponds to the first entry in *drx-ConfigPTM-List*, the value 1 corresponds to the second entry in *drx-ConfigPTM-List* and so on. In case *mtch-schedulingInfo* is absent for a G-RNTI (i.e. no PTM DRX), the UE shall monitor for PDCCH scrambled with G-RNTI in any slot according to the search space configured for MTCH. |
| ***mtch-SSB-MappingWindowIndex***Indicates the index of *MTCH-SSB-MappingWindowCycleOffset* configuration entry in *MTCH-SSB-MappingWindowList*. The value 0 corresponds to the first entry in *MTCH-SSB-MappingWindowList*, the value 1 corresponds to the second entry in *MTCH-SSB-MappingWindowList* and so on. This field is set to the same value for all MBS sessions mapped to the same G-RNTI. |
| ***pdcp-SN-SizeDL***Indicates PDCP sequence number size of 12 or 18 bits, as specified in TS 38.323 [5]. |
| ***pdsch-ConfigIndex***Indicates the index of PDSCH configuration entry in *pdsch-ConfigList* for MTCH. Value 0 corresponds to the first entry in *pdsch-ConfigList*, the value 1 corresponds to the second entry in *pdsch-ConfigList* and so on. When the field is absent the UE applies the first entry in *pdsch-ConfigList* for MTCH. |
| ***pdcp-SyncIndicator***Indicates the PDCP COUNT of the corresponding multicast session is synchronized in the RNA, i.e. the cells in the RNA follow a common QoS flow to MRB mapping rule and at the same time PDCP COUNT is set according to the MBS QoS Flow SN. |
| ***sn-FieldLength***Indicates RLC SN field size of 6 or12 bits, as specified in TS 38.322 [4]. |
| ***stopMonitoringRNTI***Indicates the UE to stop monitoring the G-RNTI for the corresponding multicast session. |
| ***t-Reassembly***Timer for reassembly in TS 38.322 [4], in milliseconds. Value ms0 means 0 ms, value ms5 means 5 ms and so on. |
| ***t-Reordering***Value in ms of *t-Reordering* specified in TS 38.323 [5]. Value ms1 corresponds to 1 ms, value ms10 corresponds to 10 ms, and so on. |
| ***thresholdIndex***Indicates the index of *thresholdMBS* entry in *thresholdMBS-List* that is used for RRC connection resume for a UE receiving the corresponding multicast session in RRC\_INACTIVE. Value 0 corresponds to the first entry in *thresholdMBS-List*, the value 1 corresponds to the second entry in *thresholdMBS-List* and so on. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *G-RNTI* | The field is optionally present, Need R, if *g-RNTI* is included. Otherwise, it is absent. |
| *MTCH-Mapping* | The field is mandatory present if the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in SIB1 is more than 1, and *searchSpaceMulticastMTCH* is not set to zero (including the case where *searchSpaceMulticastMTCH* is absent and *searchSpaceMulticastMCCH* is not set to zero). Otherwise, it is absent, Need R. |
| *RRCRelease* | The field is optionally present, Need R, if *mbs-SessionInfoListMulticast* is included in *RRCRelease* message. Otherwise, it is absent. |

Next Change

#### – *PDSCH-ConfigBroadcast*

The IE *PDSCH-ConfigBroadcast* is used to configure parameters for acquiring the PDSCH for MCCH and MTCH.

*PDSCH-ConfigBroadcast* information element

-- ASN1START

-- TAG-PDSCH-CONFIGBROADCAST-START

PDSCH-ConfigBroadcast-r17 ::= SEQUENCE {

 pdschConfigList-r17 SEQUENCE (SIZE (1..maxNrofPDSCH-ConfigPTM-r17) ) OF PDSCH-ConfigPTM-r17,

 pdsch-TimeDomainAllocationList-r17 PDSCH-TimeDomainResourceAllocationList-r16 OPTIONAL, -- Need R

 rateMatchPatternToAddModList-r17 SEQUENCE (SIZE (1..maxNrofRateMatchPatterns)) OF RateMatchPattern OPTIONAL, -- Need R

 lte-CRS-ToMatchAround-r17 RateMatchPatternLTE-CRS OPTIONAL, -- Need R

 mcs-Table-r17 ENUMERATED {qam256, qam64LowSE} OPTIONAL, -- Need S

 xOverhead-r17 ENUMERATED {xOh6, xOh12, xOh18} OPTIONAL -- Need S

}

PDSCH-ConfigPTM-r17 ::= SEQUENCE {

 dataScramblingIdentityPDSCH-r17 INTEGER (0..1023) OPTIONAL, -- Need S

 dmrs-ScramblingID0-r17 INTEGER (0..65535) OPTIONAL, -- Need S

 pdsch-AggregationFactor-r17 ENUMERATED {n2, n4, n8} OPTIONAL -- Need S

}

-- TAG-PDSCH-CONFIGBROADCAST-STOP

-- ASN1STOP

|  |
| --- |
| *PDSCH-ConfigBroadcast* field descriptions |
| ***lte-CRS-ToMatchAround***Parameters to determine an LTE CRS pattern that the UE shall rate match around. |
| ***pdschConfigList***List of PDSCH parameters which can be configured per G-RNTI. Only one entry is allowed to be configured if included in *SIB20* or *SIB24*. |
| ***pdsch-TimeDomainAllocationList***List of time-domain configurations for timing of DL assignment to DL data.The field *pdsch-TimeDomainAllocationList* applies to DCI format 4\_0 (see table 5.1.2.1.1-1 in TS 38.214 [19]). When the field is absent, the UE follows PDSCH time domain resource allocation determination rule as specified in TS 38.214 [19], clause 5.1.2.1.1. |
| ***rateMatchPatternToAddModList***Resources patterns which the UE should rate match PDSCH around. The UE rate matches around the union of all resources indicated in the rate match patterns (see TS 38.214 [19], clause 5.1.4.1). |
| ***mcs-Table***Indicates which MCS table the UE shall use for PDSCH. If the field is absent the UE applies the value 64QAM. The field *mcs-Table* applies to DCI format 4\_0 with CRC scrambled by MCCH-RNTI/G-RNTI for MBS broadcast or by Multicast MCCH-RNTI for MBS multicast in RRC\_INACTIVE (see TS 38.214 [19], clause 5.1.3.1). |
| ***xOverhead***Accounts for an overhead from CSI-RS, CORESET, etc. If the field is absent, the UE applies value xOh0 (see TS 38.214 [19], clause 5.1.3.2). |

|  |
| --- |
| *PDSCH-ConfigPTM* field descriptions |
| ***dataScramblingIdentityPDSCH***Identifier(s) used to initialize data scrambling (c\_init) for PDSCH as specified in TS 38.211 [16], clause 7.3.1.1. When the field is absent the UE applies the value physCellId configured for this serving cell. |
| ***dmrs-ScramblingID0***DL DMRS scrambling initialization (see TS 38.211 [16], clause 7.4.1.1.1). When the field is absent the UE applies the value *physCellId* configured for this serving cell. |
| ***pdsch-AggregationFactor***Number of repetitions for dynamic scheduling of MBS broadcast data for MTCH PDSCH (see TS 38.214 [19], clause 5.1.2.1). When the field is absent the UE applies the value 1. |

End of Change