**3GPP TSG-RAN2 Meeting #120 *R2-22xxxx***

**Toulouse, France, 14th – 18th Nov, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **3500** | **rev** | **4** | **Current version:** | **17.2.0** |  |
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| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | MBS corrections for RRC |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R2 |
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| ***Work item code:*** | NR\_MBS-Core |  | ***Date:*** | 2022-11-14 |
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| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | 1. The *commonSearchSpaceListExt2-r17* is not included in the field description.
2. When *searchSpaceMTCH-r17* is absent, the UE will use searchSpaceMCCH-r17 for MTCH reception as specified below:

*ID of the search space for MTCH of MBS broadcast. If the field is absent, the UE applies searchSpaceMCCH also for MTCH, (see TS 38.213 [13], clause 10).*However, this is not considered when determining MTCH reception in the following section:*5.9.3.1 General**The broadcast MRB configuration procedure is used by the UE to configure PDCP, RLC, MAC and the physical layer upon starting and/or stopping to receive an broadcast MRB transmitted on MTCH, or upon modification of a configuration of a broadcast MRB received by the UE. The procedure applies to MBS capable UEs interested to or receiving an MBS broadcast service that are in RRC\_IDLE, RRC\_INACTIVE or RRC\_CONNECTED with an active BWP with common search space configured by searchSpaceMTCH.*1. The IE searchSpaceBroadcast doesn’t exsit.
2. MBS broadcast is received by the UE regardless of the RRC state switching and events like T300 expiry, and therefore, broadcast MRBs and configurations should be retained. In present RRC spec, upon timer T300 expiry, UE resets MAC, releases the MAC configuration and re-establishes RLC for all RBs that are established. However, this should exclude broadcast MRBs.
3. MBS broadcast is received by the UE regardless of the RRC state switching and events like abortion of RRC connection, and therefore, broadcast MRBs and configurations should be retained. In present RRC spec, when the UE aborts RRC connection establishment, UE resets MAC, releases the MAC configuration and re-establishes RLC for all RBs that are established. However, this should exclude broadcast MRBs.
4. There is no ASN.1 violation or encoding error handling for NR MCCH.
5. Some new conclusions are made in the offline discussion R2-2210870 in RAN2#119bis-e based on R2-2209654, R2-2209399, R2-2209653, R2-2209547 and R2-2210717.
6. Some new conclusions are made in the offline discussion R2-2213101 in RAN2#120 based on R2-2211359, R2-2211511, R2-2211302, R2-2211303, R2-2211365 and R2-2211869.
7. When the UE is interested in an MBS broadcast service, the UE prioritizes the frequency indicated in SIB21 and the UE acquires the MCCH on that frequency. However, when the UE is outside the MBS service area for that service the UE will not find that service on the MCCH while the UE has spent time and power to acquire the MCCH. The UE also needs to re-select to the old frequency in case the current frequency is not the highest priority frequency.
8. Based on R2-2212272, RAN2#120 agreed：The initialisation of RX\_NEXT and RX\_DELIV for AM/UM MRB during PDCP re-establishment can be made optional and configurable such that they are initialised only if initialRX-DELIV is provided by upper layers TS 38.331
9. Other editorial errors.
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| ***Summary of change:*** | 1. Capture commonSearchSpaceListExt2-r17 in the field description.2. Clarify that the UE is required to receive MTCH in case searchSpaceMTCH is absent but searchSpaceMCCH is present.3. Replace searchSpaceBroadcast by searchSpaceMCCH and searchSpaceMTCH. (Change from R2-2209399)4. In 5.3.3.7, make exception for broadcast MRB when releasing RLC of the RBs. (Change from R2-2210050)5. In 5.3.3.8, make exception for broadcast MRB when releasing RLC of the RBs. 6. Clarify the ASN.1 violation or encoding error handling for NR MCCH, i.e. when receiving an RRC message on the NR MCCH for which the abstract syntax is invalid, UE ignore the message.(Changes from R2-2210576).7.Changes from R2-2209654 and R2-2209399 with updates based on the discussion in R2-2210870In clause 5.3.5.5.4, uptate the NOTE 1 as: NOTE 1: For DRB and SRB, the network does not re-associate an already configured logical channel with another radio bearer. Hence *servedRadioBearer* is not present in this case. For MRB, the network does not re-associate an already configured logical channel with DRB or SRB or another MRB (i.e. MRB with another PDCP entity). Hence *multicastRLC-BearerConfig* is not present in this case.Changes from R2-2209653 with updates based on the discussion in R2-2210870In clause 6.3.6, add a condition to the IE of *mtch-SSB-MappingWindowIndex-r17* in RRC as follows:*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 *searchspaceMTCH* is not set to zero (including the case where searchSpaceMTCH is absent and searchSpaceMCCH is not set to zero). Otherwise, it is absent, Need R.Changes from R2-2209547 with updates based on the discussion in R2-2210870In clause 5.3.2.3, * Add “if in RRC\_IDLE,” at the beginning of “for each TMGI included in pagingGroupList, if any, included in the Paging message”.
* Re-capture the 116bis agreement “When UE in RRC\_INACTIVE simultaneously receives the group paging and CN paging, RRC forwards both the unicast paging information (UE identity and accessType, if present) and the multicast paging information (i.e. TMGI) to upper layers, and transits to RRC\_IDLE.” by adding an “else” case.

In clause 5.3.5.6.1, clarify that the SDAP entities released when they have no associated DRB are SDAP entities established for the PDU sessions. And clarify that the SDAP entities released when they have no associated MRB are SDAP entities established for the MBS multicast sessions.In clause 5.3.5.6.6, delete the description on indication to upper layer for the release of UP resource.In clause 5.9.1.1, clarify that CFR configuration for MCCH/MTCH is not provided on MCCH logical channel.In clause 6.2.2, add SIB20 in the field description of *dedicatedSystemInformationDelivery* in the *RRCReconfiguration* message.Changes from R2-2210717In the clause 5.3.5.11, the SDAP entity that the UE releases should be a SDAP entity associated to a multicast MRB.8.Changes from R2-2211359/R2-2211511 with updates based on the discussion in R2-2213101Correct the field description of *harq-FeedbackEnablerMulticast* based on RAN1 LS [R1-2210703]Changes from R2-2211302In clause 5.3.5.6.7, delete the condition for “associate the established multicast MRB with the corresponding mbs-SessionId” Changes from R2-2211303In clause 5.9.4.2, add “upon RRC connection re-establishment” in the trigger condition for MIIChanges based on the discussion in R2-2213101In clause 5.3.2.3, clarify it is possible to forward mutiple TMGIs to uper layers.Changes from R2-2211365Delete “When the field is absent the UE applies the value as specified in 9.1.1.7.” in the field description of *headerCompression-r17*.Changes from R2-2211869Clarify *sps-ConfigIndex-r16* shall be present when included in *sps-ConfigMulticastToAddModList-r17*9.Add a NOTE to clarify that it is up to UE implementation to use the cell/tracking area list in the USD to avoid acquiring the MCCH outside the MBS service area for the MBS broadcast service. 10.Make initialisation of RX\_NEXT and RX\_DELIV for AM/UM MRB during PDCP re-establishment optional and configurable such that they are initialised only if initialRX-DELIV is provided by upper layers TS 38.331.11.Editorial changes.**Impact analysis**Impacted 5G architecture options:NR standaloneImpacted functionality:MBSInter-operability:1. If the network is implemented according to the CR and the UE is not, some MBS configurations may not be correctly implemented by the UE;2. If the UE is implemented according to the CR and the network is not, some MBS configurations may not be correctly implemented by the UE. |
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| ***Consequences if not approved:*** | 1. Field description of *commonSearchSpaceList* is not complete
2. The description for MTCH reception is wrong when *searchSpaceMTCH-r17* is absent.
3. The IE searchSpaceBroadcast doesn’t exsit.
4. Broadcast MRBs are not retained upon T300 expiry causing MBS service loss to UEs
5. Broadcast MRBs are not retained upon abortion of RRC connection causing MBS service loss to UEs
6. The ASN.1 violation or encoding error handling for NR MCCH will be missing.
7. The conclusions from RAN2#119bis-e are not applied.
8. The conclusions from RAN2#120 are not applied.
9. It is not clear in spec that it is up to UE implementation to use the cell/tracking area list in the USD to avoid acquiring the MCCH outside the MBS service area for the MBS broadcast service.
10. Initialisation of RX\_NEXT and RX\_DELIV can only be performed during MRB establishment.
11. There will be editorial errors in RRC spec.
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| ***Clauses affected:*** | 5.3.2.3, 5.3.3.7, 5.3.3.8, 5.3.5.5.4, 5.3.5.6.7, 5.3.5.8.2, 5.3.5.11, 5.9.2, 5.9.3, 5.9.4, 6.3.2, 6.3.6,10.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

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| START OF 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 each of 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;

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

1> if in RRC\_INACTIVE, for each of 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:

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

NOTE: 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 none of the *ue-Identity* included in any of the *PagingRecord*, if included in the *Paging* message, matches the UE identity allocated by upper layers:

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

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

5> *resumeCause* is set to *mps-PriorityAccess*;

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

5> *resumeCause* is set to *mcs-PriorityAccess*;

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

5> *resumeCause* is set to *highPriorityAccess*;

4> else:

5> resumeCause is set to mt-Access.

2> else:

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;

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| NEXT CHANGE |

#### 5.3.3.7 T300 expiry

The UE shall:

1> if timer T300 expires:

2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established (except broadcast MRBs);

2> if the UE supports RRC Connection Establishment failure with temporary offset and the T300 has expired a consecutive *connEstFailCount* times on the same cell for which *connEstFailureControl* is included in *SIB1*:

3> for a period as indicated by *connEstFailOffsetValidity*:

4> use *connEstFailOffset* for the parameter *Qoffsettemp* for the concerned cell when performing cell selection and reselection according to TS 38.304 [20] and TS 36.304 [27];

NOTE 1: When performing cell selection, if no suitable or acceptable cell can be found, it is up to UE implementation whether to stop using *connEstFailOffset* for the parameter *Qoffsettemp* during *connEstFailOffsetValidity* for the concerned cell.

2> if the UE supports multiple CEF report:

3> if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-identity* stored in *VarConnEstFailReport*; and

3> if the cell identity of current cell is not equal to the cell identity stored in *measResultFailedCell* in *VarConnEstFailReport* and if the *maxCEFReport-r17* has not been reached:

4> append the *VarConnEstFailReport* as a new entry in the *VarConnEstFailReportList*;

2> if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the RPLMN is not equal to *plmn-identity* stored in *VarConnEstFailReport*; or

2> if the cell identity of current cell is not equal to the cell identity stored in *measResultFailedCell* in *VarConnEstFailReport*:

3> reset the *numberOfConnFail* to 0;

2> if the UE supports multiple CEF report and if the UE has connection establishment failure informatoin or connection resume failure information available in *VarConnEstFailReportList* and if the RPLMN is not equal to *plmn-identity* stored in any entry of *VarConnEstFailReportList*:

3> clear the content included in *VarConnEstFailReportList*;

2> clear the content included in *VarConnEstFailReport* except for the *numberOfConnFail*, if any;

2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:

3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityInfoList* in *SIB1*;

3> set the *measResultFailedCell* to include the global cell identity, tracking area code, the cell level and SS/PBCH block level RSRP, and RSRQ, and SS/PBCH block indexes, of the failed cell based on the available SSB measurements collected up to the moment the UE detected connection establishment failure;

3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies per RAT and according to the following:

4> for each neighbour cell included, include the optional fields that are available;

NOTE 2: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 38.133 [14].

3> if available, set the *locationInfo* as follows:

4> if available, set the *commonLocationInfo* to include the detailed location information;

4> if available, set the *bt-LocationInfo* to include the Bluetooth measurement results, in order of decreasing RSSI for Bluetooth beacons;

4> if available, set the *wlan-LocationInfo* to include the WLAN measurement results, in order of decreasing RSSI for WLAN APs;

4> if available, set the *sensor-LocationInfo* to include the sensor measurement results as follows;

5> if available, include the *sensor-MeasurementInformation*;

5> if available, include the *sensor-MotionInformation*;

NOTE 3: Which location information related configuration is used by the UE to make the *locationInfo* available for inclusion in the *VarConnEstFailReport* is left to UE implementation.

3> set *perRAInfoList* to indicate the performed random access procedure related information as specified in 5.7.10.5;

3> if the *numberOfConnFail* is smaller than 8:

4> increment the *numberOfConnFail* by 1;

2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure or connection resume failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the last connection establishment failure is detected.

The L2 U2N Relay UE either indicates to upper layers (to trigger PC5 unicast link release) or sends Notification message to the connected L2 U2N Remote UE(s) in accordance with 5.8.9.10.

#### 5.3.3.8 Abortion of RRC connection establishment

If upper layers abort the RRC connection establishment procedure, due to a NAS procedure being aborted as specified in TS 24.501 [23], while the UE has not yet entered RRC\_CONNECTED, the UE shall:

1> stop timer T300, if running;

1> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established (except broadcast MRBs).

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| NEXT CHANGE |

5.3.5.5.4 RLC bearer addition/modification

For each *RLC-BearerConfig* received in the *rlc-BearerToAddModList* IE the UE shall:

1> if the UE's current configuration contains an RLC bearer with the received *logicalChannelIdentity/LogicalChannelIdentityExt* within the same cell group:

2> if the RLC bearer is associated with an DAPS bearer, or

2> if any DAPS bearer is configured and the RLC bearer is associated with an SRB:

3> reconfigure the RLC entity or entities for the target cell group in accordance with the received *rlc-Config*;

3> reconfigure the logical channel for the target cell group in accordance with the received *mac-LogicalChannelConfig*;

2> else:

3> if *reestablishRLC* is received:

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

3> reconfigure the RLC entity or entities in accordance with the received *rlc-Config*;

3> reconfigure the logical channel in accordance with the received *mac-LogicalChannelConfig*;

3> if *servedMBS-RadioBearer* is received:

4> associate this logical channel with the PDCP entity identified by *servedMBS-RadioBearer*;

NOTE 1: For DRB and SRB, the network does not re-associate an already configured logical channel with another radio bearer. Hence *servedRadioBearer* is not present in this case. For MRB, the network does not re-associate an already configured logical channel with DRB or SRB or another MRB (i.e. MRB with another PDCP entity). Hence *multicastRLC-BearerConfig* is not present in this case.

NOTE 2: In DAPS handover, the UE may perform RLC entity re-establishment (if *reestablishRLC* is set) for an RLC bearer associated with a non-DAPS bearer when indication of successful completion of random access towards target cell is received from lower layers as specified in TS 38.321 [3].

1> else (a logical channel with the given *logicalChannelIdentity/LogicalChannelIdentityExt* is not configured within the same cell group, including the case when full configuration option is used):

2> if the *servedRadioBearer* associates the logical channel with an SRB and *rlc-Config* is not included:

3> establish an RLC entity in accordance with the default configuration defined in 9.2 for the corresponding SRB;

2> else:

3> establish an RLC entity in accordance with the received *rlc-Config*;

2> if the *servedRadioBearer* associates the logical channel with an SRB and if *mac-LogicalChannelConfig* is not included:

3> configure this MAC entity with a logical channel in accordance to the default configuration defined in 9.2 for the corresponding SRB;

2> else:

3> configure this MAC entity with a logical channel in accordance to the received *mac-LogicalChannelConfig*;

2> associate this logical channel with the PDCP entity identified by *servedRadioBearer* or *servedMBS-RadioBearer*.

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| NEXT CHANGE |

##### 5.3.5.6.7 Multicast MRB addition/modification

The UE shall for each element in the order of entry in the list *mrb-ToAddModList*:

1> if *mrb-Identity* value included in the *mrb-ToAddModList* is part of the UE configuration:

2> if *mrb-Identity* value included in the *mrb-ToAddModList* for which *mrb-IdentityNew* is included (i.e., multicast MRB ID change):

3> update the *mrb-Identity* to the value *mrb-IdentityNew*;

2> if the *reestablishPDCP* is set:

3> if *drb-ContinueROHC* is included in *pdcp-Config*:

4> indicate to lower layer that *drb-ContinueROHC* is configured;

3> if *drb-ContinueEHC-DL* is included in *pdcp-Config*:

4> indicate to lower layer that *drb-ContinueEHC-DL* is configured;

3> re-establish the PDCP entity of this multicast MRB as specified in TS 38.323 [5], clause 5.1.2;

2> else, if the *recoverPDCP* is set:

3> trigger the PDCP entity of this MRB to perform data recovery as specified in TS 38.323 [5];

2> if the *pdcp-Config* is included:

3> reconfigure the PDCP entity in accordance with the received *pdcp-Config*;

1> else if *mrb-Identity* value included in the *mrb-ToAddModList* is not part of the UE configuration (i.e., multicast MRB establishment including the case when full configuration option is used):

2> establish a PDCP entity and configure it in accordance with the received *pdcp-Config*;

2> associate the established multicast MRB with the corresponding mbs-SessionId;

2> if an SDAP entity with the received *mbs-SessionId* does not exist:

3> establish an SDAP entity as specified in TS 37.324 [24] clause 5.1.1;

3> if an SDAP entity with the received *mbs-SessionId* did not exist prior to receiving this reconfiguration:

4> indicate the establishment of the user plane resources for the mbs-SessionId to upper layers.

NOTE 1: When setting the *reestablishPDCP* flag for a radio bearer, the network ensures that the RLC receiver entities do not deliver old PDCP PDUs to the re-established PDCP entity. It does that e.g., by triggering a reconfiguration with sync of the cell group hosting the old RLC entity or by releasing the old RLC entity.

NOTE 2: In this specification, UE configuration refers to the parameters configured by NR RRC unless otherwise stated.

NOTE 3: When updating the *mrb-Identity*, the network ensures new MRBs are listed at the end of the *mrb-ToAddModList* if they have the same MRB ID as in the existing UE configuration.

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| NEXT CHANGE |

##### 5.3.5.8.2 Inability to comply with *RRCReconfiguration*

NOTE 00: The UE behaviour specified in this clause does not apply to the following, and the UE ignores, i.e. does not take an action on and does not store, the fields that it does not support or does not comprehend:

- The fields in *ServingCellConfigCommon* that are defined in Rel-16 and later.

- The fields of *searchSpaceMCCH* and s*earchSpaceMTCH* in *PDCCH-ConfigCommon* that are defined in Rel-17 and later.

The UE shall:

1> if the UE is in (NG)EN-DC:

2> if the UE is unable to comply with (part of) the configuration included in the *RRCReconfiguration* message received over SRB3;

3> if the *RRCReconfiguration* message was received as part of *ConditionalReconfiguration*:

4> continue using the configuration used prior to when the inability to comply with the *RRCReconfiguration* message was detected;

3> else:

4> continue using the configuration used prior to the reception of *RRCReconfiguration* message;

3> if MCG transmission is not suspended:

4> initiate the SCG failure information procedure as specified in clause 5.7.3 to report SCG reconfiguration error, upon which the connection reconfiguration procedure ends;

3> else:

4> initiate the connection re-establishment procedure as specified in TS 36.331 [10], clause 5.3.7, upon which the connection reconfiguration procedure ends;

2> else, if the UE is unable to comply with (part of) the configuration included in the *RRCReconfiguration* message received over SRB1;

3> if the *RRCReconfiguration* message was received as part of *ConditionalReconfiguration*:

4> continue using the configuration used prior to when the inability to comply with the *RRCReconfiguration* message was detected;

3> else:

4> continue using the configuration used prior to the reception of *RRCReconfiguration* message;

3> initiate the connection re-establishment procedure as specified in TS 36.331 [10], clause 5.3.7, upon which the connection reconfiguration procedure ends.

1> else if *RRCReconfiguration* is received via NR (i.e., NR standalone, NE-DC, or NR-DC):

2> if the UE is unable to comply with (part of) the configuration included in the *RRCReconfiguration* message received over SRB3;

NOTE 0: This case does not apply in NE-DC.

3> if the *RRCReconfiguration* message was received as part of *ConditionalReconfiguration*:

4> continue using the configuration used prior to when the inability to comply with the *RRCReconfiguration* message was detected;

3> else:

4> continue using the configuration used prior to the reception of *RRCReconfiguration* message;

3> if MCG transmission is not suspended:

4> initiate the SCG failure information procedure as specified in clause 5.7.3 to report SCG reconfiguration error, upon which the connection reconfiguration procedure ends;

3> else:

4> initiate the connection re-establishment procedure as specified in clause 5.3.7, upon which the connection reconfiguration procedure ends;

2> else if the UE is unable to comply with (part of) the configuration included in the *RRCReconfiguration* message received over the SRB1 or if the upper layers indicate that the *nas-Container* is invalid:

NOTE 0a: The compliance also covers the SCG configuration carried within octet strings e.g. field *mrdc-SecondaryCellGroupConfig*. I.e. the failure behaviour defined also applies in case the UE cannot comply with the embedded SCG configuration or with the combination of (parts of) the MCG and SCG configurations.

NOTE 0b: The compliance also covers the V2X sidelink configuration carried within an octet string, e.g. field *sl-ConfigDedicatedEUTRA*. I.e. the failure behaviour defined also applies in case the UE cannot comply with the embedded V2X sidelink configuration.

3> if the *RRCReconfiguration* message was received as part of *ConditionalReconfiguration*:

4> continue using the configuration used prior to when the inability to comply with the *RRCReconfiguration* message was detected;

3> else:

4> continue using the configuration used prior to the reception of *RRCReconfiguration* message;

3> if AS security has not been activated:

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

3> else if AS security has been activated but SRB2 and at least one DRB or multicast MRB or, for IAB, SRB2, have not been setup:

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

3> else:

4> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the reconfiguration procedure ends;

1> else if *RRCReconfiguration* is received via other RAT (Handover to NR failure):

2> if the UE is unable to comply with any part of the configuration included in the *RRCReconfiguration* message or if the upper layers indicate that the *nas-Container* is invalid:

3> perform the actions defined for this failure case as defined in the specifications applicable for the other RAT.

NOTE 1: The UE may apply above failure handling also in case the *RRCReconfiguration* message causes a protocol error for which the generic error handling as defined in clause 10 specifies that the UE shall ignore the message.

NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/failure.

NOTE 3: It is up to UE implementation whether the compliance check for an *RRCReconfiguration* received as part of *ConditionalReconfiguration* is performed upon the reception of the message or upon CHO, CPA and CPC execution (when the message is required to be applied).

|  |
| --- |
| NEXT CHANGE |

#### 5.3.5.11 Full configuration

The UE shall:

1> release/ clear all current dedicated radio configurations except for the following:

- the MCG C-RNTI;

- the AS security configurations associated with the master key;

- the SRB1/SRB2 configurations and DRB/multicast MRB configurations as configured by *radioBearerConfig* or *radioBearerConfig2*.

NOTE 1: Radio configuration is not just the resource configuration but includes other configurations like *MeasConfig*. Radio configuration also includes the RLC bearer configurations as configured by *RLC-BearerConfig*. In case NR-DC or NE-DC is configured, this also includes the entire NR or E-UTRA SCG configuration which are released according to the MR-DC release procedure as specified in 5.3.5.10.

NOTE 1a: For NR sidelink communication/discovery, the radio configuration includes the sidelink RRC configuration received from the network, but does not include the sidelink RRC reconfiguration and sidelink UE capability received from other UEs via PC5-RRC. In addition, the UE considers the new NR sidelink configurations as full configuration, in case of state transition and change of system information used for NR sidelink communication/discovery.

NOTE 1b: To establish the RLC bearer of SRB(s) after release due to *fullConfig*, the network can include the *srb-Identity* within *srb-ToAddModList* (i.e. the UE applies RLC default configuration) and/or provide *rlc-BearerToAddModList* of concerned SRB(s) explicitly.

- the logged measurement configuration;

1> if the *spCellConfig* in the *masterCellGroup* includes the *reconfigurationWithSync*:

2> release/ clear all current common radio configurations;

2> use the default values specified in 9.2.3 for timers T310, T311 and constants N310, N311;

1> else (full configuration after re-establishment or during RRC resume):

2> if the UE is acting as L2 U2N Remote UE:

3> use value for timer T311, as included in *ue-TimersAndConstants* received in *SIB1*

2> else:

3> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SIB1*;

1> if no *measConfigAppLayerId* is included:

2> inform upper layers about the release of all application layer measurement configurations;

2> discard any received application layer measurement report from upper layers;

2> consider itself not to be configured to send application layer measurement report.

1> apply the default L1 parameter values as specified in corresponding physical layer specifications except for the following:

- parameters for which values are provided in *SIB1*;

1> apply the default MAC Cell Group configuration as specified in 9.2.2;

1> for each *srb-Identity* value included in the *srb-ToAddModList* (SRB reconfiguration):

2> establish an RLC entity for the corresponding SRB;

2> apply the default SRB configuration defined in 9.2.1 for the corresponding SRB;

NOTE 2: This is to get the SRBs (SRB1 and SRB2 for reconfiguration with sync and SRB2 for resume and reconfiguration after re-establishment) to a known state from which the reconfiguration message can do further configuration.

1> for each *pdu-Session* that is part of the current UE configuration:

2> release the SDAP entity (clause 5.1.2 in TS 37.324 [24]);

2> release each DRB associated to the *pdu-Session* as specified in 5.3.5.6.4;

NOTE 3: This will retain the *pdu-Session* but remove the DRBs including *drb-identity* of these bearers from the current UE configuration. Setup of the DRBs within the AS is described in clause 5.3.5.6.5 using the new configuration. The *pdu-Session* acts as the anchor for associating the released and re-setup DRB. In the AS the DRB re-setup is equivalent with a new DRB setup (including new PDCP and logical channel configurations).

1> for each *mbs-SessionId* that is part of the current UE configuration and associated to a multicast MRB:

2> release the SDAP entity (clause 5.1.2 in TS 37.324 [24]);

2> release each multicast MRB associated to the *mbs-SessionId* as specified in 5.3.5.6.6;

NOTE 4: This will retain the *mbs-SessionId* but remove the multicast MRBs including *mrb-identity* of these bearers from the current UE configuration. Setup of the multicast MRBs within the AS is described in clause 5.3.5.6.7 using the new configuration. The *mbs-SessionId* acts as the anchor for associating the released and re-setup multicast MRB. In the AS the multicast MRB re-setup is equivalent with a new multicast MRB setup (including new PDCP and logical channel configurations).

1> for each *pdu-Session* that is part of the current UE configuration but not added with same *pdu-Session* in the *drb-ToAddModList*:

2> if the procedure was triggered due to reconfiguration with sync:

3> indicate the release of the user plane resources for the *pdu-Session* to upper layers after successful reconfiguration with sync;

2> else:

3> indicate the release of the user plane resources for the *pdu-Session* to upper layers immediately;

1> for each *mbs-SessionId* that is part of the current UE configuration but not added with the same *mbs-SessionId* in the *mrb-ToAddModList*:

2> if the procedure was triggered due to reconfiguration with sync:

3> indicate the release of the user plane resources for the *mbs-SessionId* to upper layers after successful reconfiguration with sync;

2> else:

3> indicate the release of the user plane resources for the *mbs-SessionId* to upper layers immediately.

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| NEXT CHANGE |

5.9.2 MCCH information acquisition

5.9.2.1 General

****

**Figure 5.9.2.1-1: MCCH information acquisition**

The UE applies the MCCH information acquisition procedure to acquire the MBS broadcast configuration information broadcasted by the network. The procedure applies to MBS capable UEs interested to receive or that are receiving MBS broadcast services that are in RRC\_IDLE, RRC\_INACTIVE or RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceMCCH*.

5.9.2.2 Initiation

A UE shall apply the MCCH information acquisition procedure upon becoming interested to receive MBS broadcast services. A UE interested to receive MBS broadcast services shall apply the MCCH information acquisition procedure upon entering the cell providing *SIB20* (e.g. upon power on, following UE mobility), upon receiving *SIB20* of an SCell via dedicated signalling and upon receiving a notification that the MCCH information has changed due to the start of new MBS service(s). A UE that is receiving data via broadcast MRB shall apply the MCCH information acquisition procedure upon receiving a notification that the MCCH information has changed due to MCCH information modification other than the change caused by the start of new MBS service(s).

NOTE 1: It is up to UE implementation how to address a possibility of the UE missing an MCCH change notification.

NOTE 2: It is up to UE implementation to use the cell/tracking area list in the USD to avoid acquiring the MCCH when the UE is outside the MBS service area of the MBS broadcast service

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

5.9.2.3 MCCH information acquisition by the UE

An MBS capable UE interested to receive or receiving an MBS broadcast service shall:

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

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

1> if the UE enters a cell broadcasting *SIB20*; or

1> if the UE receives *sCellSIB20*:

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

5.9.2.4 Actions upon reception of the MBSBroadcastConfiguration message

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

### 5.9.3 Broadcast MRB configuration

#### 5.9.3.1 General

The broadcast MRB configuration procedure is used by the UE to configure PDCP, RLC, MAC and the physical layer upon starting and/or stopping to receive a broadcast MRB transmitted on MTCH, or upon modification of a configuration of a broadcast MRB received by the UE. The procedure applies to MBS capable UEs that are interested to receive or that are receiving an MBS broadcast service that are in RRC\_IDLE, RRC\_INACTIVE or RRC\_CONNECTED with an active BWP with common search space configured by *searchSpaceMTCH* or *searchSpaceMCCH*.

NOTE: How to perform a modification of a broadcast MRB which is already configured in the UE is left to UE implementation.

#### 5.9.3.2 Initiation

The UE applies the broadcast MRB establishment procedure to start receiving an MBS session of an MBS broadcast service it is interested in. The procedure may be initiated e.g. upon start of the MBS session, upon entering a cell providing an MBS broadcast service the UE is interested in, upon becoming interested in the ongoing MBS broadcast service, upon removal of the UE capability limitations inhibiting reception of the ongoing MBS broadcast service UE is interested in.

The UE applies the broadcast MRB release procedure to stop receiving a session of an MBS broadcast service. The procedure may be initiated e.g. upon stop of the MBS session, upon leaving the cell broadcasting the MBS service the UE is interested in, upon losing interest in the MBS service, when capability limitations start inhibiting reception of the concerned service.

#### 5.9.3.3 Broadcast MRB establishment

Upon a broadcast MRB establishment, the UE shall:

1> establish a PDCP entity and an RLC entity in accordance with *MRB-InfoBroadcast* for this broadcast MRB included in the *MBSBroadcastConfiguration* message and the configuration specified in 9.1.1.7;

1> configure the MAC layer in accordance with the *mtch-SchedulingInfo* (if included);

1> configure the physical layer in accordance with the *mbs-SessionInfoList*, *searchSpaceMTCH,* and *pdsch-ConfigMTCH*, applicable for the broadcast MRB;

1> receive DL-SCH on the cell where the *MBSBroadcastConfiguration* message was received for the established broadcast MRB using *g-RNTI* and *mtch-SchedulingInfo* (if included) in this message for this MBS broadcast service;

1> if an SDAP entity with the received *mbs-SessionId* does not exist:

2> establish an SDAP entity as specified in TS 37.324 [24] clause 5.1.1.

2> indicate the establishment of the user plane resources for the *mbs-SessionId* to upper layers.

#### 5.9.3.4 Broadcast MRB release

Upon broadcast MRB release for MBS broadcast service, the UE shall:

1> release the PDCP entity, RLC entity as well as the related MAC and physical layer configuration;

1> if the SDAP entity associated with the corresponding *mbs-SessionId* has no associated MRB:

2> release the SDAP entity, as specified in TS 37.324 [24] clause 5.1.2;

2> indicate the release of the user plane resources for the *mbs-SessionId*to upper layers.

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| 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 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.

#### 5.9.4.2 Initiation

An MBS capable UE in RRC\_CONNECTED may initiate the procedure in several cases including upon successful connection establishment/resume, upon entering or leaving the broadcast service area, upon MBS broadcast session start or stop, upon change of interest, upon change of priority between MBS broadcast reception and unicast/multicast reception, upon change to a PCell providing *SIB21* (i.e. where the *SIB1* scheduling information contains *SIB21*), upon receiving *SIB20* of an SCell via dedicated signalling, upon handover, upon RRC connection re-establishment.

Upon initiating the procedure, the UE shall:

1> if *SIB21* is provided by the PCell:

2> ensure having a valid version of *SIB21* for the PCell;

2> if the UE did not transmit MBS Interest Indication since last entering RRC\_CONNECTED state; or

2> if since the last time the UE transmitted an MBS Interest Indication, the UE connected to a PCell not providing *SIB21*:

3> if the set of MBS broadcast frequencies of interest, determined in accordance with 5.9.4.3, is not empty:

4> set the contents of MBS Interest Indication according to 5.9.4.5 and initiate transmission of the *MBSInterestIndication* message;

2> else:

3> if the set of MBS broadcast frequencies of interest, determined in accordance with 5.9.4.3, is different from *mbs-FreqList* included in the last transmission of the MBS Interest Indication; or

3> if the prioritisation of reception of all indicated MBS broadcast frequencies compared to reception of any of the established unicast bearers and multicast MRBs has changed since the last transmission of the MBS Interest Indication:

4> set the contents of MBS Interest Indication according to 5.9.4.5 and initiate transmission of the *MBSInterestIndication* message;

NOTE: The UE may send MBS Interest Indication even when it is able to receive the MBS services it is interested in i.e., to avoid that the network allocates a configuration inhibiting MBS broadcast reception.

3> else if *SIB20* is provided for the PCell or for the SCell:

4> if since the last time the UE transmitted the MBS Interest Indication, the UE connected to a PCell not providing *SIB20* and the UE was not provided with *SIB20* for an SCell; or

4> if the set of MBS broadcast services of interest determined in accordance with 5.9.4.4 is different from *mbs-ServiceList* included in the last transmission of the MBS Interest Indication:

5> set the contents of MBS Interest Indication according to 5.9.4.5 and initiate the transmission of *MBSInterestIndication* message.

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| NEXT CHANGE |

### 6.3.2 Radio resource control information elements

– *MAC-CellGroupConfig*

The IE *MAC-CellGroupConfig* is used to configure MAC parameters for a cell group, including DRX.

***MAC-CellGroupConfig* information element**

-- ASN1START

-- TAG-MAC-CELLGROUPCONFIG-START

MAC-CellGroupConfig ::= SEQUENCE {

 drx-Config SetupRelease { DRX-Config } OPTIONAL, -- Need M

 schedulingRequestConfig SchedulingRequestConfig OPTIONAL, -- Need M

 bsr-Config BSR-Config OPTIONAL, -- Need M

 tag-Config TAG-Config OPTIONAL, -- Need M

 phr-Config SetupRelease { PHR-Config } OPTIONAL, -- Need M

 skipUplinkTxDynamic BOOLEAN,

 ...,

 [[

 csi-Mask BOOLEAN OPTIONAL, -- Need M

 dataInactivityTimer SetupRelease { DataInactivityTimer } OPTIONAL -- Cond MCG-Only

 ]],

 [[

 usePreBSR-r16 ENUMERATED {true} OPTIONAL, -- Need R

 schedulingRequestID-LBT-SCell-r16 SchedulingRequestId OPTIONAL, -- Need R

 lch-BasedPrioritization-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

 schedulingRequestID-BFR-SCell-r16 SchedulingRequestId OPTIONAL, -- Need R

 drx-ConfigSecondaryGroup-r16 SetupRelease { DRX-ConfigSecondaryGroup-r16 } OPTIONAL -- Need M

 ]],

 [[

 enhancedSkipUplinkTxDynamic-r16 ENUMERATED {true} OPTIONAL, -- Need R

 enhancedSkipUplinkTxConfigured-r16 ENUMERATED {true} OPTIONAL -- Need R

 ]],

 [[

 intraCG-Prioritization-r17 ENUMERATED {enabled} OPTIONAL, -- Cond LCH-PrioWithReTxTimer

 drx-ConfigSL-r17 SetupRelease { DRX-ConfigSL-r17 } OPTIONAL, -- Need M

 drx-ConfigExt-v1700 SetupRelease { DRX-ConfigExt-v1700 } OPTIONAL, -- Need M

 schedulingRequestID-BFR-r17 SchedulingRequestId OPTIONAL, -- Need R

 schedulingRequestID-BFR2-r17 SchedulingRequestId OPTIONAL, -- Need R

 schedulingRequestConfig-v1700 SchedulingRequestConfig-v1700 OPTIONAL, -- Need M

 tar-Config-r17 SetupRelease { TAR-Config-r17 } OPTIONAL, -- Need M

 g-RNTI-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxG-RNTI-r17)) OF MBS-RNTI-SpecificConfig-r17 OPTIONAL, -- Need N

 g-RNTI-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxG-RNTI-r17)) OF MBS-RNTI-SpecificConfigId-r17 OPTIONAL, -- Need N

 g-CS-RNTI-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxG-CS-RNTI-r17)) OF MBS-RNTI-SpecificConfig-r17 OPTIONAL, -- Need N

 g-CS-RNTI-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxG-CS-RNTI-r17)) OF MBS-RNTI-SpecificConfigId-r17 OPTIONAL, -- Need N

 allowCSI-SRS-Tx-MulticastDRX-Active-r17 BOOLEAN OPTIONAL -- Need M

 ]],

 [[

 schedulingRequestID-PosMG-Request-r17 SchedulingRequestId OPTIONAL, -- Need R

 drx-LastTransmissionUL-r17 ENUMERATED {enabled} OPTIONAL -- Need R

 ]]

}

DataInactivityTimer ::= ENUMERATED {s1, s2, s3, s5, s7, s10, s15, s20, s40, s50, s60, s80, s100, s120, s150, s180}

MBS-RNTI-SpecificConfig-r17 ::= SEQUENCE {

 mbs-RNTI-SpecificConfigId-r17 MBS-RNTI-SpecificConfigId-r17,

 groupCommon-RNTI-r17 CHOICE {

 g-RNTI RNTI-Value,

 g-CS-RNTI RNTI-Value

 },

 drx-ConfigPTM-r17 SetupRelease { DRX-ConfigPTM-r17 } OPTIONAL, -- Need M

 harq-FeedbackEnablerMulticast-r17 ENUMERATED {dci-enabler, enabled} OPTIONAL, -- Need S

 harq-FeedbackOptionMulticast-r17 ENUMERATED {ack-nack, nack-only} OPTIONAL, -- Cond HARQFeedback

 pdsch-AggregationFactor-r17 ENUMERATED {n2, n4, n8} OPTIONAL -- Cond G-RNTI

}

MBS-RNTI-SpecificConfigId-r17 ::= INTEGER (0..maxG-RNTI-1-r17)

-- TAG-MAC-CELLGROUPCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***MAC-CellGroupConfig* field descriptions** |
| ***allowCSI-SRS-Tx-MulticastDRX-Active***Used to control the CSI/SRS transmission during MBS multicast DRX ActiveTime, see TS 38.321 [3]. |
| ***csi-Mask***If set to true, the UE limits CSI reports to the on-duration period of the DRX cycle, see TS 38.321 [3]. |
| ***dataInactivityTimer***Releases the RRC connection upon data inactivity as specified in clause 5.3.8.5 and in TS 38.321 [3]. Value *s1* corresponds to 1 second, value s2 corresponds to 2 seconds, and so on. |
| ***drx-Config, drx-ConfigExt***Used to configure DRX as specified in TS 38.321 [3]. Network only configures *drx-ConfigExt* when *drx-Config* is configured. |
| ***drx-ConfigSecondaryGroup***Used to configure DRX related parameters for the second DRX group as specified in TS 38.321 [3]. The network does not configure secondary DRX group with DCP simultaneously nor secondary DRX group with a dormant BWP simultaneously. |
| ***drx-ConfigSL***Used to configure additional DRX parameters for the UE performing sidelink operation with resource allocation mode 1, as specified in TS 38.321 [3]. Network only configures this field if *sl-ScheduledConfig* is configured and *drx-Config* is configured. |
| ***drx-LastTransmissionUL***If this field is present, the start of the *drx-HARQ-RTT-TimerUL* is after the last transmission within a bundle, see TS 38.321 [3]. |
| ***g-RNTI-ConfigToAddModList***List of G-RNTI configurations to add or modify. Up to 8 G-RNTIs can be configured in total in this release based on the UE capability. |
| ***g-RNTI-ConfigToReleaseList***List of G-RNTI configurations to release. |
| ***g-CS-RNTI-ConfigToAddModList***List of G-CS-RNTI configurations to add or modify. Up to 8 G-CS-RNTIs can be configured in total in this release based on the UE capability. |
| ***g-CS-RNTI-ConfigToReleaseList***List of G-CS-RNTI configurations to release. |
| ***intraCG-Prioritization***Used to enable HARQ process ID selection based on LCH-priority for one CG as specified in TS 38.321 [3]. |
| ***lch-BasedPrioritization***If this field is present, the corresponding MAC entity of the UE is configured with prioritization between overlapping grants and between scheduling request and overlapping grants based on LCH priority, see TS 38.321 [3]. The network does not configure *lch-BasedPrioritization* with *enhancedSkipUplinkTxDynamic* simultaneously nor *lch-BasedPrioritization* with *enhancedSkipUplinkTxConfigured* simultaneously. |
| ***schedulingRequestID-BFR-SCell***Indicates the scheduling request configuration applicable for BFR on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR-r17***Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in *schedulingRequestID-BFR* of a serving cell while beam failure is not detected on resources configured in *failureDetectionSet2* of the same serving cell. |
| ***schedulingRequestID-BFR2-r17***Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in *schedulingRequestID-BFR2* of a serving cell while beam failure is not detected on resources configured in *failureDetectionSet1* of the same serving cell. |
| ***schedulingRequestID-LBT-SCell***Indicates the scheduling request configuration applicable for consistent uplink LBT recovery on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-PosMG-Request***Indicates the scheduling request configuration applicable for Positioning Measurement Gap Activation/Deactivation Request, as specified in TS 38.321 [3]. |
| ***skipUplinkTxDynamic, enhancedSkipUplinkTxDynamic, enhancedSkipUplinkTxConfigured***If set to *true*, the UE skips UL transmissions as described in TS 38.321 [3]. If the UE is configured with *enhancedSkipUplinkTxDynamic* or *enhancedSkipUplinkTxConfigured* with value *true*, REPETITION\_NUMBER (as specified in TS 38.321 [3], clause 5.4.2.1) of the corresponding PUSCH transmission of the uplink grant shall be equal to 1. |
| ***tag-Config***The field is used to configure parameters for a time-alignment group. The field is not present if any DAPS bearer is configured. |
| ***usePreBSR***If set to true, the MAC entity of the IAB-MT may use the Pre-emptive BSR, see TS 38.321 [3]. |

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| --- |
| ***MBS-RNTI-SpecificConfig* field descriptions** |
| ***drx-ConfigPTM***Used to configure DRX for PTM transmission as specified in TS 38.321 [3]. |
| ***g-CS-RNTI***Used to scramble the SPS group-common PDSCH and activation/deactivation of SPS group-common PDSCH for one or more MBS multicast services. |
| ***g-RNTI***Used to scramble the scheduling and transmission of PTM for one or more MBS multicast services. |
| ***groupCommon-RNTI***Used to configure g-RNTI or g-CS-RNTI. |
| ***harq-FeedbackEnablerMulticast***Indicates whether the UE shall provide HARQ feedback for MBS multicast. Value *dci-enabler* means that whether the UE shall provide HARQ feedback for MBS multicast is indicated by DCI as specified in TS 38.213 [13]. Value *enabled* means the UE shall always provide HARQ feedback for MBS multicast. When the field is absent, the UE doesn’t provide HARQ feedback for MBS multicast as specifiedin TS 38.213 [13]. |
| ***harq-FeedbackOptionMulticast***Indicates the feedback mode for MBS multicast dynamically scheduled PDSCH or SPS PDSCH. |
| ***mbs-RNTI-SpecificConfigId***An identifier of the RNTI specific configuration for MBS multicast. |
| ***pdsch-AggregationFactor***Number of repetitions for dynamically scheduled MBS multicast data (see TS 38.214 [19], clause 5.1.2.1). When the field is absent and *groupCommon-RNTI* is set to *g-RNTI*, the UE applies the value 1. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *G-RNTI* | This field is optionally present, Need S, if *groupCommon-RNTI* is set to *g-RNTI*. The field is absent when *groupCommon-RNTI* is set to *g-CS-RNTI*. |
| *HARQFeedback* | The field is mandatory present when *harq-FeedbackEnablerMulticast* is present. It is absent otherwise.  |
| *MCG-Only* | This field is optionally present, Need M, for the *MAC-CellGroupConfig* of the MCG. It is absent otherwise. |
| *LCH-PrioWithReTxTimer* | This field is optionally present, Need R, if lch-BasedPrioritization-r16 is configured in this MAC entity and cg-RetransmissionTimer-r16 is configured for any configured grant configuration associated with this MAC entity. It is absent otherwise, Need R. |

-----------text omitted-------------

– *PDCCH-ConfigCommon*

The IE *PDCCH-ConfigCommon* is used to configure cell specific PDCCH parameters provided in SIB as well as in dedicated signalling.

***PDCCH-ConfigCommon* information element**

-- ASN1START

-- TAG-PDCCH-CONFIGCOMMON-START

PDCCH-ConfigCommon ::= SEQUENCE {

 controlResourceSetZero ControlResourceSetZero OPTIONAL, -- Cond InitialBWP-Only

 commonControlResourceSet ControlResourceSet OPTIONAL, -- Need R

 searchSpaceZero SearchSpaceZero OPTIONAL, -- Cond InitialBWP-Only

 commonSearchSpaceList SEQUENCE (SIZE(1..4)) OF SearchSpace OPTIONAL, -- Need R

 searchSpaceSIB1 SearchSpaceId OPTIONAL, -- Need S

 searchSpaceOtherSystemInformation SearchSpaceId OPTIONAL, -- Need S

 pagingSearchSpace SearchSpaceId OPTIONAL, -- Need S

 ra-SearchSpace SearchSpaceId OPTIONAL, -- Need S

 ...,

 [[

 firstPDCCH-MonitoringOccasionOfPO CHOICE {

 sCS15KHZoneT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..139),

 sCS30KHZoneT-SCS15KHZhalfT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..279),

 sCS60KHZoneT-SCS30KHZhalfT-SCS15KHZquarterT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..559),

 sCS120KHZoneT-SCS60KHZhalfT-SCS30KHZquarterT-SCS15KHZoneEighthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..1119),

 sCS120KHZhalfT-SCS60KHZquarterT-SCS30KHZoneEighthT-SCS15KHZoneSixteenthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..2239),

 sCS120KHZquarterT-SCS60KHZoneEighthT-SCS30KHZoneSixteenthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..4479),

 sCS120KHZoneEighthT-SCS60KHZoneSixteenthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..8959),

 sCS120KHZoneSixteenthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..17919)

 } OPTIONAL -- Cond OtherBWP

 ]],

 [[

 commonSearchSpaceListExt-r16 SEQUENCE (SIZE(1..4)) OF SearchSpaceExt-r16 OPTIONAL -- Need R

 ]],

 [[

 sdt-SearchSpace-r17 CHOICE {

 newSearchSpace SearchSpace,

 existingSearchSpace SearchSpaceId

 } OPTIONAL, -- Need R

 searchSpaceMCCH-r17 SearchSpaceId OPTIONAL, -- Need R

 searchSpaceMTCH-r17 SearchSpaceId OPTIONAL, -- Need S

 commonSearchSpaceListExt2-r17 SEQUENCE (SIZE(1..4)) OF SearchSpaceExt-v1700 OPTIONAL, -- Need R

 firstPDCCH-MonitoringOccasionOfPO-v1710 CHOICE {

 sCS480KHZoneEighthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..35839),

 sCS480KHZoneSixteenthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..71679)

 } OPTIONAL, -- Need R

 pei-ConfigBWP-r17 SEQUENCE {

 pei-SearchSpace-r17 SearchSpaceId,

 firstPDCCH-MonitoringOccasionOfPEI-O-r17 CHOICE {

 sCS15KHZoneT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..139),

 sCS30KHZoneT-SCS15KHZhalfT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..279),

 sCS60KHZoneT-SCS30KHZhalfT-SCS15KHZquarterT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..559),

 sCS120KHZoneT-SCS60KHZhalfT-SCS30KHZquarterT-SCS15KHZoneEighthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..1119),

 sCS120KHZhalfT-SCS60KHZquarterT-SCS30KHZoneEighthT-SCS15KHZoneSixteenthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..2239),

 sCS480KHZoneT-SCS120KHZquarterT-SCS60KHZoneEighthT-SCS30KHZoneSixteenthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..4479),

 sCS480KHZhalfT-SCS120KHZoneEighthT-SCS60KHZoneSixteenthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..8959),

 sCS480KHZquarterT-SCS120KHZoneSixteenthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..17919),

 sCS480KHZoneEighthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..35839),

 sCS480KHZoneSixteenthT SEQUENCE (SIZE (1..maxPEI-perPF-r17)) OF INTEGER (0..71679)

 }

 } OPTIONAL -- Cond InitialBWP-Paging

 ]],

 [[

 followUnifiedTCIstate-v1720 ENUMERATED {enabled} OPTIONAL -- Need R

 ]]

}

-- TAG-PDCCH-CONFIGCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| ***PDCCH-ConfigCommon* field descriptions** |
| ***commonControlResourceSet***An additional common control resource set which may be configured and used for any common or UE-specific search space. If the network configures this field, it uses a *ControlResourceSetId* other than 0 for this *ControlResourceSet*. The network configures the *commonControlResourceSet* in *SIB1* so that it is contained in the bandwidth of CORESET#0. If the RedCap-specific initial downlink BWP does not contain the entire CORESET#0, the network configures the *commonControlResourceSet* in *SIB1* for RedCap so that it is not contained in the bandwidth of CORESET#0. |
| ***commonSearchSpaceList, commonSearchSpaceListExt,*** ***commonSearchSpaceListExt2***A list of additional common search spaces. If the network configures this field, it uses the *SearchSpaceId*s other than 0. If the field is included, it replaces any previous list, i.e. all the entries of the list are replaced and each of the *SearchSpace* entries is considered to be newly created and the conditions and Need codes for setup of the entry apply. If the network includes *commonSearchSpaceListExt/commonSearchSpaceListExt2*, it includes the same number of entries, and listed in the same order, as in *commonSearchSpaceList*. |
| ***controlResourceSetZero***Parameters of the common CORESET#0 which can be used in any common or UE-specific search spaces. The values are interpreted like the corresponding bits in *MIB* *pdcch-ConfigSIB1*. Even though this field is only configured in the initial BWP (BWP#0) *controlResourceSetZero* can be used in search spaces configured in other DL BWP(s) than the initial DL BWP if the conditions defined in TS 38.213 [13], clause 10 are satisfied. |
| ***firstPDCCH-MonitoringOccasionOfPEI-O***Offset, in number of symbols, from the start of the reference frame for PEI-O to the start of the first PDCCH monitoring occasion of PEI-O on this BWP, see TS 38.213 [13], clause 10.4A. For the case *po-NumPerPEI* is smaller than Ns, UE applies the (floor(i\_s/po-NumPerPEI)+1)-th value out of (N\_s/po-NumPerPEI) configured values in *firstPDCCH-MonitoringOccasionOfPEI-O* for the symbol-level offset. When *po-NumPerPEI* is one or multiple of Ns, UE applies the first configured value in *firstPDCCH-MonitoringOccasionOfPEI-O* for the symbol-level offset. |
| ***firstPDCCH-MonitoringOccasionOfPO***Indicates the first PDCCH monitoring occasion of each PO of the PF on this BWP, see TS 38.304 [20]. The field *sCS120KHZquarterT-SCS60KHZoneEighthT-SCS30KHZoneSixteenthT*, *sCS120KHZoneEighthT-SCS60KHZoneSixteenthT* and *sCS120KHZoneSixteenthT* can be applied for SCS 480kHz, corresponding to *sCS480KHZoneT-SCS120KHZquarterT-SCS60KHZoneEighthT-SCS30KHZoneSixteenthT*, *sCS480KHZhalfT-SCS120KHZoneEighthT-SCS60KHZoneSixteenthT* and *sCS480KHZquarterT-SCS120KHZoneSixteenthT* in IE *DownlinkConfigCommonSIB* respectively. |
| ***followUnifiedTCIstate***When set to enabled, for PDCCH reception in CORESET #0, the UE applies the "indicated" DL only TCI or joint TCI as specified in TS 38.214 clause 5.1.5. |
| ***pagingSearchSpace***ID of the search space for paging (see TS 38.213 [13], clause 10.1). If the field is absent, the UE does not receive paging in this BWP (see TS 38.213 [13], clause 10). This field is absent for the RedCap-specific initial downlink BWP, if it does not include CD-SSB and the entire CORESET#0. In that case, a RedCap UE shall monitor paging in the initial DL BWP that includes CORESET#0 |
| ***pei-ConfigBWP***Provides the configuration for PEI reception in this BWP. If the field is absent, the UE does not receive PEI in this BWP. |
| ***pei-SearchSpace***ID of dedicated search space for PEI. It can be configured to one of up to 4 common SS sets configured by *commonSearchSpaceList* with *SearchSpaceId* > 0. The CCE aggregation levels and maximum number of PDCCH candidates per CCE aggregation level follows Table 10.1-1 of TS38.213 [13]. *SearchSpaceId* = 0 can be configured for the case of SS/PBCH block and CORESET multiplexing pattern 2 or 3. |
| ***ra-SearchSpace***ID of the Search space for random access procedure (see TS 38.213 [13], clause 10.1). If the field is absent, the UE does not receive RAR in this BWP. This field is mandatory present in the DL BWP(s) if the conditions described in TS 38.321 [3], clause 5.15 are met. |
| ***sdt-SearchSpace***Common search space for CG-SDT and RA-SDT (see TS 38.213 [13]). If an *existingSearchSpace* is used, the network only signals the search space ID of the *ra-SearchSpace*. |
| ***searchSpaceMCCH***ID of the search space for MCCH. If the field is absent, the UE does not receive MCCH in this BWP (see TS 38.213 [13], clause 10). This field is absent for the RedCap-specific initial downlink BWP, if it does not include CD-SSB and the entire CORESET#0. |
| ***searchSpaceMTCH***ID of the search space for MTCH of MBS broadcast. If the field is absent, the UE applies *searchSpaceMCCH* also for MTCH, (see TS 38.213 [13], clause 10). This field is absent for the RedCap-specific initial downlink BWP, if it does not include CD-SSB and the entire CORESET#0. |
| ***searchSpaceOtherSystemInformation***ID of the Search space for other system information, i.e., *SIB2* and beyond (see TS 38.213 [13], clause 10.1) If the field is absent, the UE does not receive other system information in this BWP. This field is absent for the RedCap-specific initial DL BWP, if it does not include CD-SSB and the entire CORESET#0. |
| ***searchSpaceSIB1***ID of the search space for *SIB1* message. In the initial DL BWP of the UE′s PCell, the network sets this field to 0. If the field is absent, the UE does not receive *SIB1* in this BWP. (see TS 38.213 [13], clause 10). This field is absent for the RedCap-specific initial DL BWP, if it does not include CD-SSB and the entire CORESET#0. |
| ***searchSpaceZero***Parameters of the common SearchSpace#0. The values are interpreted like the corresponding bits in *MIB* *pdcch-ConfigSIB1*. Even though this field is only configured in the initial BWP (BWP#0), *searchSpaceZero* can be used in search spaces configured in other DL BWP(s) than the initial DL BWP if the conditions described in TS 38.213 [13], clause 10, are satisfied. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *InitialBWP-Only* | If *SIB1* is broadcast the field is mandatory present in the *PDCCH-ConfigCommon* of the initial BWP (BWP#0) in *ServingCellConfigCommon* except it is the RedCap-specific initial BWP not including CD-SSB and the entire CORESET#0; it is absent in other BWPs and when sent in system information. If SIB1 is not broadcast and there is an SSB associated to the cell, the field is optionally present, Need M, in the *PDCCH-ConfigCommon* of the initial BWP (BWP#0) in *ServingCellConfigCommon* (still with the same setting for all UEs). In other cases, the field is absent. |
| *OtherBWP* | This field is optionally present, Need R, if this BWP is not the *initialDownlinkBWP* and *pagingSearchSpace* is configured in this BWP. Otherwise this field is absent. |
| *InitialBWP-Paging* | This field is optionally present, Need R, if this BWP is the *initialDownlinkBWP* or *initialDownlinkBWP-RedCap* including CD-SSB and the entire CORESET#0, and *pei-Config* is configured in *DownlinkConfigCommonSIB*. Otherwise, this field is absent. |

– *PDCCH-ConfigSIB1*

The IE *PDCCH-ConfigSIB1* is used to configure CORESET#0 and search space#0.

***PDCCH-ConfigSIB1* information element**

-- ASN1START

-- TAG-PDCCH-CONFIGSIB1-START

PDCCH-ConfigSIB1 ::= SEQUENCE {

 controlResourceSetZero ControlResourceSetZero,

 searchSpaceZero SearchSpaceZero

}

-- TAG-PDCCH-CONFIGSIB1-STOP

-- ASN1STOP

|  |
| --- |
| ***PDCCH-ConfigSIB1* field descriptions** |
| ***controlResourceSetZero***Determines a common ControlResourceSet (CORESET) with ID #0, see TS 38.213 [13], clause 13. |
| ***searchSpaceZero***Determines a common search space with ID #0, see TS 38.213 [13], clause 13. |

– *PDCCH-ServingCellConfig*

The IE *PDCCH-ServingCellConfig* is used to configure UE specific PDCCH parameters applicable across all bandwidth parts of a serving cell.

***PDCCH-ServingCellConfig* information element**

-- ASN1START

-- TAG-PDCCH-SERVINGCELLCONFIG-START

PDCCH-ServingCellConfig ::= SEQUENCE {

 slotFormatIndicator SetupRelease { SlotFormatIndicator } OPTIONAL, -- Need M

 ...,

 [[

 availabilityIndicator-r16 SetupRelease {AvailabilityIndicator-r16} OPTIONAL, -- Need M

 searchSpaceSwitchTimer-r16 INTEGER (1..80) OPTIONAL -- Need R

 ]],

 [[

 searchSpaceSwitchTimer-v1710 INTEGER (81..1280) OPTIONAL -- Need R

 ]]

}

-- TAG-PDCCH-SERVINGCELLCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***PDCCH-ServingCellConfig* field descriptions** |
| ***availabilityIndicator***Use to configure monitoring a PDCCH for Availability Indicators (AI). |
| ***searchSpaceSwitchTimer***The value of the timer in slots for monitoring PDCCH in the active DL BWP of the serving cell before moving to the default search space group (see TS 38.213 [13], clause 10.4).For 15 kHz SCS, {1..20} are valid.For 30 kHz SCS, {1..40} are valid.For 60kHz SCS, {1..80} are valid.For 120 kHz SCS, {1..160} are valid.For 480 kHz SCS, {1..640} are valid.For 960 kHz SCS, {1..1280} are valid.The network configures the same value for all serving cells in the same *CellGroupForSwitch*. |
| ***slotFormatIndicator***Configuration of Slot-Format-Indicators to be monitored in the correspondingly configured PDCCHs of this serving cell. |

– *PDCP-Config*

The IE *PDCP-Config* is used to set the configurable PDCP parameters for signalling, MBS multicast and data radio bearers.

***PDCP-Config* information element**

-- ASN1START

-- TAG-PDCP-CONFIG-START

PDCP-Config ::= SEQUENCE {

 drb SEQUENCE {

 discardTimer ENUMERATED {ms10, ms20, ms30, ms40, ms50, ms60, ms75, ms100, ms150, ms200,

 ms250, ms300, ms500, ms750, ms1500, infinity} OPTIONAL, -- Cond Setup

 pdcp-SN-SizeUL ENUMERATED {len12bits, len18bits} OPTIONAL, -- Cond Setup1

 pdcp-SN-SizeDL ENUMERATED {len12bits, len18bits} OPTIONAL, -- Cond Setup2

 headerCompression CHOICE {

 notUsed NULL,

 rohc SEQUENCE {

 maxCID INTEGER (1..16383) DEFAULT 15,

 profiles SEQUENCE {

 profile0x0001 BOOLEAN,

 profile0x0002 BOOLEAN,

 profile0x0003 BOOLEAN,

 profile0x0004 BOOLEAN,

 profile0x0006 BOOLEAN,

 profile0x0101 BOOLEAN,

 profile0x0102 BOOLEAN,

 profile0x0103 BOOLEAN,

 profile0x0104 BOOLEAN

 },

 drb-ContinueROHC ENUMERATED { true } OPTIONAL -- Need N

 },

 uplinkOnlyROHC SEQUENCE {

 maxCID INTEGER (1..16383) DEFAULT 15,

 profiles SEQUENCE {

 profile0x0006 BOOLEAN

 },

 drb-ContinueROHC ENUMERATED { true } OPTIONAL -- Need N

 },

 ...

 },

 integrityProtection ENUMERATED { enabled } OPTIONAL, -- Cond ConnectedTo5GC1

 statusReportRequired ENUMERATED { true } OPTIONAL, -- Cond Rlc-AM-UM

 outOfOrderDelivery ENUMERATED { true } OPTIONAL -- Need R

 } OPTIONAL, -- Cond DRB

 moreThanOneRLC SEQUENCE {

 primaryPath SEQUENCE {

 cellGroup CellGroupId OPTIONAL, -- Need R

 logicalChannel LogicalChannelIdentity OPTIONAL -- Need R

 },

 ul-DataSplitThreshold UL-DataSplitThreshold OPTIONAL, -- Cond SplitBearer

 pdcp-Duplication BOOLEAN OPTIONAL -- Need R

 } OPTIONAL, -- Cond MoreThanOneRLC

 t-Reordering ENUMERATED {

 ms0, ms1, ms2, ms4, ms5, ms8, ms10, ms15, ms20, ms30, ms40,

 ms50, ms60, ms80, ms100, ms120, ms140, ms160, ms180, ms200, ms220,

 ms240, ms260, ms280, ms300, ms500, ms750, ms1000, ms1250,

 ms1500, ms1750, ms2000, ms2250, ms2500, ms2750,

 ms3000, spare28, spare27, spare26, spare25, spare24,

 spare23, spare22, spare21, spare20,

 spare19, spare18, spare17, spare16, spare15, spare14,

 spare13, spare12, spare11, spare10, spare09,

 spare08, spare07, spare06, spare05, spare04, spare03,

 spare02, spare01 } OPTIONAL, -- Need S

 ...,

 [[

 cipheringDisabled ENUMERATED {true} OPTIONAL -- Cond ConnectedTo5GC

 ]],

 [[

 discardTimerExt-r16 SetupRelease { DiscardTimerExt-r16 } OPTIONAL, -- Cond DRB2

 moreThanTwoRLC-DRB-r16 SEQUENCE {

 splitSecondaryPath-r16 LogicalChannelIdentity OPTIONAL, -- Cond SplitBearer2

 duplicationState-r16 SEQUENCE (SIZE (3)) OF BOOLEAN OPTIONAL -- Need S

 } OPTIONAL, -- Cond MoreThanTwoRLC-DRB

 ethernetHeaderCompression-r16 SetupRelease { EthernetHeaderCompression-r16 } OPTIONAL -- Need M

 ]],

 [[

 survivalTimeStateSupport-r17 ENUMERATED {true} OPTIONAL, -- Cond Drb-Duplication

 uplinkDataCompression-r17 SetupRelease { UplinkDataCompression-r17 } OPTIONAL, -- Cond Rlc-AM

 discardTimerExt2-r17 SetupRelease { DiscardTimerExt2-r17 } OPTIONAL, -- Need M

 initialRX-DELIV-r17 BIT STRING (SIZE (32)) OPTIONAL -- Cond MRB-Initialization

 ]]

}

EthernetHeaderCompression-r16 ::= SEQUENCE {

 ehc-Common-r16 SEQUENCE {

 ehc-CID-Length-r16 ENUMERATED { bits7, bits15 },

 ...

 },

 ehc-Downlink-r16 SEQUENCE {

 drb-ContinueEHC-DL-r16 ENUMERATED { true } OPTIONAL, -- Need N

 ...

 } OPTIONAL, -- Need M

 ehc-Uplink-r16 SEQUENCE {

 maxCID-EHC-UL-r16 INTEGER (1..32767),

 drb-ContinueEHC-UL-r16 ENUMERATED { true } OPTIONAL, -- Need N

 ...

 } OPTIONAL -- Need M

}

UL-DataSplitThreshold ::= ENUMERATED {

 b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800, b25600, b51200, b102400, b204800,

 b409600, b819200, b1228800, b1638400, b2457600, b3276800, b4096000, b4915200, b5734400,

 b6553600, infinity, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1}

DiscardTimerExt-r16 ::= ENUMERATED {ms0dot5, ms1, ms2, ms4, ms6, ms8, spare2, spare1}

DiscardTimerExt2-r17 ::= ENUMERATED {ms2000, spare3, spare2, spare1}

UplinkDataCompression-r17 ::= CHOICE {

 newSetup SEQUENCE {

 bufferSize-r17 ENUMERATED {kbyte2, kbyte4, kbyte8, spare1},

 dictionary-r17 ENUMERATED {sip-SDP, operator} OPTIONAL -- Need N

 },

 drb-ContinueUDC NULL

}

-- TAG-PDCP-CONFIG-STOP

-- ASN1STOP

| ***PDCP-Config* field descriptions** |
| --- |
| ***cipheringDisabled***If included, ciphering is disabled for this DRB regardless of which ciphering algorithm is configured for the SRB/DRBs. The field may only be included if the UE is connected to 5GC. Otherwise the field is absent. The network configures all DRBs with the same PDU-session ID with same value for this field. The value for this field cannot be changed after the DRB is set up. |
| ***discardTimer***Value in ms of *discardTimer* specified in TS 38.323 [5]. Value *ms10* corresponds to 10 ms, value *ms20* corresponds to 20 ms and so on. The value for this field cannot be changed in case of reconfiguration with sync, if the bearer is configured as DAPS bearer. |
| ***discardTimerExt***Value in ms of *discardTimer* specified in TS 38.323 [5]. Value *ms0dot5* corresponds to 0.5 ms, value *ms1* corresponds to 1ms and so on. If this field is present, the field *discardTimer* is ignored and *discardTimerExt* is used instead. |
| ***discardTimerExt2***Value in ms of *discardTimerExt* specified in TS 38.323 [5]. Value *ms2000* corresponds to 2000 ms. If this field is present, the field *discardTimer* and *discardTimerExt* are ignored and *discardTimerExt2* is used instead. |
| ***drb-ContinueROHC***Indicates whether the PDCP entity continues or resets the ROHC header compression protocol during PDCP re-establishment, as specified in TS 38.323 [5]. This field is configured only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. The network does not include the field if the bearer is configured as DAPS bearer. This field can be configured for both DRB and multicast MRB. |
| ***duplicationState***This field indicates the uplink PDCP duplication state for the associated RLC entities at the time of receiving this IE. If set to *true,* the PDCP duplication state is activated for the associated RLC entity. The index for the indication is determined by ascending order of logical channel ID of all RLC entities other than the primary RLC entityindicated by *primaryPath* in the order of MCG and SCG, as in clause 6.1.3.32 of TS 38.321 [3]. If the number of associated RLC entities other than the primary RLC entity is two, UE ignores the value in the largest index of this field. If the field is absent, the PDCP duplication states are deactivated for all associated RLC entities.  |
| ***ethernetHeaderCompression***This fields configures Ethernet Header Compression. This field can only be configured for a bi-directional DRB or a bi-directional multicast MRB. The network reconfigures *ethernetHeaderCompression* only upon reconfiguration involving PDCP re-establishment and with neither *drb-ContinueEHC-DL* nor *drb-ContinueEHC-UL* configured. Network only configures this field when *uplinkDataCompression* is not configured. |
| ***headerCompression***If rohc is configured, the UE shall apply the configured ROHC profile(s) in both uplink and downlink. If *uplinkOnlyROHC* is configured, the UE shall apply the configured ROHC profile(s) in uplink (there is no header compression in downlink). ROHC can be configured for any bearer type. ROHC and EHC can be both configured simultaneously for a DRB or a multicast MRB. The network reconfigures *headerCompression* only upon reconfiguration involving PDCP re-establishment or involving PDCP entity reconfiguration to configure DAPS bearer(s), and without any *drb-ContinueROHC*. Network configures *headerCompression* to *notUsed* when *outOfOrderDelivery* is configured. Network only configures this field when *uplinkDataCompression* is not configured. |
| ***initialRX-DELIV***Indicates the initial value of RX\_DELIV during PDCP window initialization for multicast MRB as specified in TS 38.323 [5]. |
| ***integrityProtection***Indicates whether or not integrity protection is configured for this radio bearer. The network configures all DRBs with the same PDU-session ID with same value for this field. The value for this field cannot be changed after the DRB is set up. |
| ***maxCID***Indicates the value of the MAX\_CID parameter as specified in TS 38.323 [5].The total value of MAX\_CIDs across all bearers for the UE should be less than or equal to the value of *maxNumberROHC-ContextSessions* parameter as indicated by the UE. |
| ***moreThanOneRLC***This field configures UL data transmission when more than one RLC entity is associated with the PDCP entity. This field is not present if the bearer is configured as DAPS bearer. |
| ***moreThanTwoRLC-DRB***This field configures UL data transmission when more than two RLC entities are associated with the PDCP entity for DRBs. |
| ***outOfOrderDelivery***Indicates whether or not *outOfOrderDelivery* specified in TS 38.323 [5] is configured. This field should be either always present or always absent, after the radio bearer is established. |
| ***pdcp-Duplication***Indicates whether or not uplink duplication status at the time of receiving this IE is configured and activated as specified in TS 38.323 [5]. The presence of this field indicates that duplication is configured. PDCP duplication is not configured for CA packet duplication of LTE RLC bearer. The value of this field, when the field is present, indicates the state of the duplication at the time of receiving this IE. If set to *true*, duplication is activated. The value of this field is always *true*, when configured for a SRB. For PDCP entity with more than two associated RLC entities for UL transmission, this field is always present. If the field *moreThanTwoRLC-DRB* is present, the value of this field is ignored and the state of the duplication is indicated by *duplicationState*. For PDCP entity with more than two associated RLC entities, only NR RLC bearer is supported. |
| ***pdcp-SN-SizeDL***PDCP sequence number size for downlink, 12 or 18 bits, as specified in TS 38.323 [5]. For SRBs only the value *len12bits* is applicable. The value for this field cannot be changed in case of reconfiguration with sync, if the bearer is configured as DAPS bearer. |
| ***pdcp-SN-SizeUL***PDCP sequence number size for uplink, 12 or 18 bits, as specified in TS 38.323 [5]. For SRBs only the value *len12bits* is applicable. The value for this field cannot be changed in case of reconfiguration with sync, if the bearer is configured as DAPS bearer. |
| ***primaryPath***Indicates the cell group ID and LCID of the primary RLC entity as specified in TS 38.323 [5], clause 5.2.1 for UL data transmission when more than one RLC entity is associated with the PDCP entity. In this version of the specification, only cell group ID corresponding to MCG is supported for SRBs, except for the split SRB2 of the IAB-MT, and, when the SCG is deactivated, for DRBs. The NW indicates *cellGroup* for split bearers using logical channels in different cell groups. The NW always indicates *logicalChannel* if CA based PDCP duplication is configured in the cell group indicated by *cellGroup* of this field. |
| ***splitSecondaryPath***Indicates the LCID of the split secondary RLC entity as specified in TS 38.323 [5] for fallback to split bearer operation when UL data transmission with more than two RLC entities is associated with the PDCP entity. This RLC entity belongs to a cell group that is different from the cell group indicated by *cellGroup* in the field *primaryPath.* |
| ***statusReportRequired***For AM DRBs, AM MRBs and DAPS UM DRBs, indicates whether the DRB or the multicast MRB is configured to send a PDCP status report in the uplink, as specified in TS 38.323 [5]. For DAPS AM DRBs, it also indicates whether the DRB is configured to send a second PDCP status report in the uplink, as specified in TS 38.323 [5]. |
| ***survivalTimeStateSupport***Indicates whether the DRB associated with this PDCP entity has survival time state support. If this field is configured to be true, all associated RLC entities are activated for PDCP duplication upon reception of a retransmission grant addressed to CS-RNTI, as specified in TS 38.321 [3]. |
| ***t-Reordering***Value in ms of t-Reordering specified in TS 38.323 [5]. Value *ms0* corresponds to 0 ms, value *ms20* corresponds to 20 ms, value *ms40* corresponds to 40 ms, and so on. When the field is absent the UE applies the value *infinity*. The value for this field cannot be changed in case of reconfiguration with sync, if the bearer is configured as DAPS bearer. |
| ***ul-DataSplitThreshold***Parameter specified in TS 38.323 [5]. Value *b0* corresponds to 0 bytes, value *b100* corresponds to 100 bytes, value *b200* corresponds to 200 bytes, and so on. The network sets this field to *infinity* for UEs not supporting *splitDRB-withUL-Both-MCG-SCG* and when the SCG is deactivated. If the field is absent when the split bearer is configured for the radio bearer first time, then the default value *infinity* is applied. |
| ***uplinkDataCompression***Indicates the UDC configuration that the UE shall apply. Network does not configure *uplinkDataCompression* for a DRB, if *headerCompression* or *ethernetHeaderCompression* is already configured or *outOfOrderDelivery* or DAPS is configured for the DRB. The maximum number of DRBs where *uplinkDataCompression* can be applied is two. The network reconfigures *uplinkDataCompression* only upon reconfiguration involving PDCP re-establishment. If the field is set to *drb-ContinueUDC*, the PDCP entity continues the uplink data compression protocol during PDCP re-establishment, as specified in TS 38.323 [5]. The field is set to *drb-ContinueUDC* only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. |

|  |
| --- |
| ***EthernetHeaderCompression field descriptions*** |
| ***drb-ContinueEHC-DL***Indicates whether the PDCP entity continues or resets the downlink EHC header compression protocol during PDCP re-establishment, as specified in TS 38.323 [5]. The field is configured only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. |
| ***drb-ContinueEHC-UL***Indicates whether the PDCP entity continues or resets the uplink EHC header compression protocol during PDCP re-establishment, as specified in TS 38.323 [5]. The field is configured only in case of resuming an RRC connection or reconfiguration with sync, where the PDCP termination point is not changed and the *fullConfig* is not indicated. |
| ***ehc-CID-Length***Indicates the length of the CID field for EHC packet. The value *bits7* indicates the length is 7 bits, and the value *bits15* indicates the length is 15 bits. Once the field *ethernetHeaderCompression-r16* is configured for a DRB or a multicast MRB, the value of the field *ehc-CID-Length* for this DRB or multicast MRB is not reconfigured to a different value. |
| ***ehc-Common***Indicates the configurations that apply for both downlink and uplink. |
| ***ehc-Downlink***Indicates the configurations that apply for only downlink. If the field is configured, then Ethernet header compression is configured for downlink. Otherwise, it is not configured for downlink. |
| ***ehc-Uplink***Indicates the configurations that apply for only uplink. If the field is configured, then Ethernet header compression is configured for uplnik. Otherwise, it is not configured for uplink. |
| ***maxCID-EHC-UL***Indicates the value of the MAX\_CID\_EHC\_UL parameter as specified in TS 38.323 [5]. The total value of MAX\_CID\_EHC\_UL across all bearers for the UE should be less than or equal to the value of *maxNumberEHC-Contexts* parameter as indicated by the UE. |

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| ***UplinkDataCompression field descriptions*** |
| ***bufferSize***This field indicates the buffer size applied for UDC as specified in TS 38.323 [5]. Value *kbyte2* means 2048 bytes, *kbyte4* means 4096 bytes and so on. |
| ***dictionary***This field indicates which pre-defined dictionary is used for UDC as specified in TS 38.323 [5]. The value *sip-SDP* means that UE shall prefill the buffer with standard dictionary for SIP and SDP defined in TS 38.323 [5], and the value *operator* means that UE shall prefill the buffer with operator-defined dictionary. |

| **Conditional presence** | **Explanation** |
| --- | --- |
| *DRB* | This field is mandatory present when the corresponding DRB/multicast MRB is being set up, absent for SRBs. Otherwise this field is optionally present, need M. |
| *DRB2* | This field is optionally present in case of DRB, need M. Otherwise, it is absent for SRBs and MRBs. |
| *Drb-Duplication* | For SRBs, this field is absent. For DRBs, this field is absent if duplication is not configured. Otherwise, this field is optional, need R. |
| *MoreThanOneRLC* | This field is mandatory present upon RRC reconfiguration with setup of a PDCP entity for a radio bearer with more than one associated logical channel and upon RRC reconfiguration with the association of additional logical channels to the PDCP entity.The field is also mandatory present in case the field *moreThanTwoRLC-DRB* is included in *PDCP-Config*.Upon RRC reconfiguration when a PDCP entity is associated with multiple logical channels, this field is optionally present need M. Otherwise, this field is absent. Need R. |
| *MoreThanTwoRLC-DRB* | For SRBs, this field is absent.For DRBs, this field is mandatory present upon RRC reconfiguration with setup of a PDCP entity for a radio bearer with more than two associated logical channels and upon RRC reconfiguration with the association of one or more additional logical channel(s) to the PDCP entity so that the PDCP entity has more than two associated logical channels.Upon RRC reconfiguration when a PDCP entity is associated with more than two logical channels, this field is optionally present, Need M. Otherwise, the field is absent, Need R. |
| *Rlc-AM* | For RLC AM, the field is optionally present, need M. Otherwise, the field is absent. |
| *Rlc-AM-UM* | In case of DRB, for RLC UM (if the UE supports DAPS handover) or RLC AM, the field is optionally present, need R. In case of multicast MRB, if multicast MRB is associated with at least one RLC AM entity, the field is optionally present, need R. Otherwise, the field is absent. |
| *Setup* | The field is mandatory present in case of SRB or DRB setup. Otherwise the field is optionally present, need M. |
| *SplitBearer* | The field is absent for SRBs. Otherwise, the field is optional present, need M, in case of radio bearer with more than one associated RLC mapped to different cell groups. |
| *SplitBearer2* | The field is mandatory present, in case of a split bearer. Otherwise the field is absent. |
| *ConnectedTo5GC* | The field is optionally present, need R, if the UE is connected to 5GC. Otherwise the field is absent. |
| *ConnectedTo5GC1* | The field is optionally present, need R, if the UE is connected to NR/5GC or if the UE supports user plane integrity protection when connected to E-UTRA/EPC (as specified in TS 33.401 [30]). Otherwise the field is absent. |
| *Setup1* | This field is mandatory present in case of SRB and DRB setup for RLC-AM and RLC-UM. Otherwise, this field is absent, Need M. |
| *Setup2* | This field is mandatory present in case for radio bearer setup for RLC-AM and RLC-UM. Otherwise, this field is absent, Need M. |
| *MRB-Initialization* | This field is mandatory present in case of multicast MRB setup. In case of PDCP re-establishment for UM and AM multicast MRB, this field is optionally present, Need N. Otherwise, this field is absent, Need N. |

|  |
| --- |
| NEXT CHANGE |

– *SearchSpace*

The IE *SearchSpace* defines how/where to search for PDCCH candidates. Each search space is associated with one *ControlResourceSet*. For a scheduled SCell in the case of cross carrier scheduling, except for *nrofCandidates*, all the optional fields are absent (regardless of their presence conditions). For a scheduled SpCell in the case of the cross carrier scheduling, if the search space is linked to another search space in the scheduling SCell, all the optional fields of this search space in the scheduled SpCell are absent (regardless of their presence conditions) except for *nrofCandidates*.

***SearchSpace* information element**

-- ASN1START

-- TAG-SEARCHSPACE-START

SearchSpace ::= SEQUENCE {

 searchSpaceId SearchSpaceId,

 controlResourceSetId ControlResourceSetId OPTIONAL, -- Cond SetupOnly

 monitoringSlotPeriodicityAndOffset CHOICE {

 sl1 NULL,

 sl2 INTEGER (0..1),

 sl4 INTEGER (0..3),

 sl5 INTEGER (0..4),

 sl8 INTEGER (0..7),

 sl10 INTEGER (0..9),

 sl16 INTEGER (0..15),

 sl20 INTEGER (0..19),

 sl40 INTEGER (0..39),

 sl80 INTEGER (0..79),

 sl160 INTEGER (0..159),

 sl320 INTEGER (0..319),

 sl640 INTEGER (0..639),

 sl1280 INTEGER (0..1279),

 sl2560 INTEGER (0..2559)

 } OPTIONAL, -- Cond Setup4

 duration INTEGER (2..2559) OPTIONAL, -- Need S

 monitoringSymbolsWithinSlot BIT STRING (SIZE (14)) OPTIONAL, -- Cond Setup

 nrofCandidates SEQUENCE {

 aggregationLevel1 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8},

 aggregationLevel2 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8},

 aggregationLevel4 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8},

 aggregationLevel8 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8},

 aggregationLevel16 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8}

 } OPTIONAL, -- Cond Setup

 searchSpaceType CHOICE {

 common SEQUENCE {

 dci-Format0-0-AndFormat1-0 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format2-0 SEQUENCE {

 nrofCandidates-SFI SEQUENCE {

 aggregationLevel1 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel2 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel4 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel8 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel16 ENUMERATED {n1, n2} OPTIONAL -- Need R

 },

 ...

 } OPTIONAL, -- Need R

 dci-Format2-1 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format2-2 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format2-3 SEQUENCE {

 dummy1 ENUMERATED {sl1, sl2, sl4, sl5, sl8, sl10, sl16, sl20} OPTIONAL, -- Cond Setup

 dummy2 ENUMERATED {n1, n2},

 ...

 } OPTIONAL -- Need R

 },

 ue-Specific SEQUENCE {

 dci-Formats ENUMERATED {formats0-0-And-1-0, formats0-1-And-1-1},

 ...,

 [[

 dci-Formats-MT-r16 ENUMERATED {formats2-5} OPTIONAL, -- Need R

 dci-FormatsSL-r16 ENUMERATED {formats0-0-And-1-0, formats0-1-And-1-1, formats3-0, formats3-1,

 formats3-0-And-3-1} OPTIONAL, -- Need R

 dci-FormatsExt-r16 ENUMERATED {formats0-2-And-1-2, formats0-1-And-1-1And-0-2-And-1-2}

 OPTIONAL -- Need R

 ]]

 }

 } OPTIONAL -- Cond Setup2

}

SearchSpaceExt-r16 ::= SEQUENCE {

 controlResourceSetId-r16 ControlResourceSetId-r16 OPTIONAL, -- Cond SetupOnly2

 searchSpaceType-r16 SEQUENCE {

 common-r16 SEQUENCE {

 dci-Format2-4-r16 SEQUENCE {

 nrofCandidates-CI-r16 SEQUENCE {

 aggregationLevel1-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel2-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel4-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel8-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel16-r16 ENUMERATED {n1, n2} OPTIONAL -- Need R

 },

 ...

 } OPTIONAL, -- Need R

 dci-Format2-5-r16 SEQUENCE {

 nrofCandidates-IAB-r16 SEQUENCE {

 aggregationLevel1-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel2-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel4-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel8-r16 ENUMERATED {n1, n2} OPTIONAL, -- Need R

 aggregationLevel16-r16 ENUMERATED {n1, n2} OPTIONAL -- Need R

 },

 ...

 } OPTIONAL, -- Need R

 dci-Format2-6-r16 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 ...

 }

 } OPTIONAL, -- Cond Setup3

 searchSpaceGroupIdList-r16 SEQUENCE (SIZE (1.. 2)) OF INTEGER (0..1) OPTIONAL, -- Need R

 freqMonitorLocations-r16 BIT STRING (SIZE (5)) OPTIONAL -- Need R

}

SearchSpaceExt-v1700 ::= SEQUENCE {

 monitoringSlotPeriodicityAndOffset-v1710 CHOICE {

 sl32 INTEGER (0..31),

 sl64 INTEGER (0..63),

 sl128 INTEGER (0..127),

 sl5120 INTEGER (0..5119),

 sl10240 INTEGER (0..10239),

 sl20480 INTEGER (0..20479)

 } OPTIONAL, -- Cond Setup5

 monitoringSlotsWithinSlotGroup-r17 CHOICE {

 slotGroupLength4-r17 BIT STRING (SIZE (4)),

 slotGroupLength8-r17 BIT STRING (SIZE (8))

 } OPTIONAL, -- Need R

 duration-r17 INTEGER (4..20476) OPTIONAL, -- Need R

 searchSpaceType-r17 SEQUENCE{

 common-r17 SEQUENCE {

 dci-Format4-0-r17 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format4-1-r17 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format4-2-r17 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format4-1-AndFormat4-2-r17 SEQUENCE {

 ...

 } OPTIONAL, -- Need R

 dci-Format2-7-r17 SEQUENCE {

 nrofCandidates-PEI-r17 SEQUENCE {

 aggregationLevel4-r17 ENUMERATED {n0, n1, n2, n3, n4} OPTIONAL, -- Need R

 aggregationLevel8-r17 ENUMERATED {n0, n1, n2} OPTIONAL, -- Need R

 aggregationLevel16-r17 ENUMERATED {n0, n1} OPTIONAL -- Need R

 },

 ...

 } OPTIONAL -- Need R

 }

 } OPTIONAL, -- Need R

 searchSpaceGroupIdList-r17 SEQUENCE (SIZE (1.. 3)) OF INTEGER (0.. maxNrofSearchSpaceGroups-1-r17) OPTIONAL, -- Cond DedicatedOnly

 searchSpaceLinkingId-r17 INTEGER (0..maxNrofSearchSpacesLinks-1-r17) OPTIONAL -- Cond DedicatedOnly

}

-- TAG-SEARCHSPACE-STOP

-- ASN1STOP

|  |
| --- |
| ***SearchSpace* field descriptions** |
| ***common***Configures this search space as common search space (CSS) and DCI formats to monitor. |
| ***controlResourceSetId***The CORESET applicable for this SearchSpace. Value 0 identifies the common CORESET#0 configured in MIB and in *ServingCellConfigCommon*. Values 1..*maxNrofControlResourceSets-1* identify CORESETs configured in System Information or by dedicated signalling. The CORESETs with *non-zero controlResourceSetId* are configured in the same BWP as this *SearchSpace* except *commonControlResourceSetExt* which is configured by SIB20. If the field *controlResourceSetId-r16* is present, UE shall ignore the *controlResourceSetId* (without suffix). |
| ***dummy1, dummy2***This field is not used in the specification. If received it shall be ignored by the UE. |
| ***dci-Format0-0-AndFormat1-0***If configured, the UE monitors the DCI formats 0\_0 and 1\_0 according to TS 38.213 [13], clause 10.1. |
| ***dci-Format2-0***If configured, UE monitors the DCI format 2\_0 according to TS 38.213 [13], clause 10.1, 11.1.1. |
| ***dci-Format2-1***If configured, UE monitors the DCI format 2\_1 according to TS 38.213 [13], clause 10.1, 11.2. |
| ***dci-Format2-2***If configured, UE monitors the DCI format 2\_2 according to TS 38.213 [13], clause 10.1, 11.3. |
| ***dci-Format2-3***If configured, UE monitors the DCI format 2\_3 according to TS 38.213 [13], clause 10.1, 11.4 |
| ***dci-Format2-4***If configured, UE monitors the DCI format 2\_4 according to TS 38.213 [13], clause 11.2A. |
| ***dci-Format2-5***If configured, IAB-MT monitors the DCI format 2\_5 according to TS 38.213 [13], clause 14. |
| ***dci-Format2-6***If configured, UE monitors the DCI format 2\_6 according to TS 38.213 [13], clause 10.1, 10.3. DCI format 2\_6 can only be configured on the SpCell. |
| ***dci-Format2-7***If configured, UE monitors the DCI format 2\_7 according to TS 38.213 [13], clause 10.1, 10.4A. |
| ***dci-Format4-0***If configured, the UE monitors the DCI format 4\_0 with CRC scrambled by MCCH-RNTI/G-RNTI according to TS 38.213 [13], clause [10.1]. |
| ***dci-Format4-1-AndFormat4-2***If configured, the UE monitors the DCI format 4\_1 and 4\_2 with CRC scrambled by G-RNTI/G-CS-RNTI according to TS 38.213 [13], clause [11.1]. |
| ***dci-Format4-1***If configured, the UE monitors the DCI format 4\_1 with CRC scrambled by G-RNTI/G-CS-RNTI according to TS 38.213 [13], clause [10.1]. |
| ***dci-Format4-2***If configured, the UE monitors the DCI format 4\_2 with CRC scrambled by G-RNTI/G-CS-RNTI according to TS 38.213 [13], clause [10.1]. |
| ***dci-Formats***Indicates whether the UE monitors in this USS for DCI formats 0-0 and 1-0 or for formats 0-1 and 1-1. |
| ***dci-FormatsExt***If this field is present, the field *dci-Formats* is ignored and *dci-FormatsExt* is used instead to indicate whether the UE monitors in this USS for DCI format 0\_2 and 1\_2 or formats 0\_1 and 1\_1 and 0\_2 and 1\_2 (see TS 38.212 [17], clause 7.3.1 and TS 38.213 [13], clause 10.1). This field is not configured for operation with shared spectrum channel access in this release*.* |
| ***dci-Formats-MT***Indicates whether the IAB-MT monitors the DCI formats 2-5 according to TS 38.213 [13], clause 14. |
| ***dci-FormatsSL***Indicates whether the UE monitors in this USS for DCI formats 0-0 and 1-0 or for formats 0-1 and 1-1 or for format 3-0 or for format 3-1 or for formats 3-0 and 3-1. If this field is present, the field *dci-Formats* is ignored and *dci-FormatsSL* is used. |
| ***duration***Number of consecutive slots that a SearchSpace lasts in every occasion, i.e., upon every period as given in the *periodicityAndOffset*. If the field is absent, the UE applies the value 1 slot, except for DCI format 2\_0. The UE ignores this field for DCI format 2\_0. The maximum valid duration is periodicity-1 (periodicity as given in the *monitoringSlotPeriodicityAndOffset*).For SCS 480 kHz and SCS 960 kHz, duration-r17 is used, and the configured duration is restricted to be an integer multiple of L slots and smaller than periodicity, where L is the configured length of the bitmap *monitoringSlotsWithinSlotGroup-r17*. If *duration-r17* is absent, the UE assumes the duration in slots is equal to L. The maximum valid duration is periodicity-L.For IAB-MT, duration indicates number of consecutive slots that a SearchSpace lasts in every occasion, i.e., upon every period as given in the *periodicityAndOffset*. If the field is absent, the IAB-MT applies the value 1 slot, except for DCI format 2\_0 and DCI format 2\_5. The IAB-MT ignores this field for DCI format 2\_0 and DCI format 2\_5. The maximum valid duration is periodicity-1 (periodicity as given in the *monitoringSlotPeriodicityAndOffset*). |
| ***freqMonitorLocations***Defines an association of the search space to multiple monitoring locations in the frequency domain and indicates whether the pattern configured in the associated CORESET is replicated to a specific RB set, see TS 38.213, clause 10.1. Each bit in the bitmap corresponds to one RB set, and the leftmost (most significant) bit corresponds to RB set 0 in the BWP. A bit set to 1 indicates that a frequency domain resource allocation replicated from the pattern configured in the associated CORESET is mapped to the RB set. |
| ***monitoringSlotPeriodicityAndOffset***Slots for PDCCH Monitoring configured as periodicity and offset.For SCS 15, 30, 60, and 120 kHz and if the UE is configured to monitor:- DCI format 2\_1, only the values 'sl1', 'sl2' or 'sl4' are applicable.- DCI format 2\_0, only the values ′sl1′, ′sl2′, ′sl4′, ′sl5′, ′sl8′, ′sl10′, ′sl16′, and ′sl20′ are applicable (see TS 38.213 [13], clause 10).- DCI format 2\_4, only the values 'sl1', 'sl2', 'sl4', 'sl5', 'sl8' and 'sl10' are applicable.For SCS 480 kHz and if the UE is configured to monitor:- DCI format 2\_0, only the values 'sl4', 'sl8', 'sl16', 'sl20', 'sl32', 'sl40', 'sl64', and 'sl80' are applicable.- DCI format 2\_1, only the values ′sl4′, ′sl8′, and ′sl16′ are applicable.- DCI format 2\_4, only the values 'sl4', 'sl8', 'sl16', 'sl20', 'sl32', 'sl40' are applicable.For SCS 960 kHz and if the UE is configured to monitor:- DCI format 2\_0, only the values 'sl4', 'sl8', 'sl16', 'sl20', 'sl32', 'sl40', 'sl64', and 'sl80' are applicable.- DCI format 2\_1, only the values ′sl4′, ′sl8′, and ′sl16′ are applicable.- DCI format 2\_4, only the values 'sl8', 'sl16', 'sl32', 'sl40', 'sl64', 'sl80' are applicable.For SCS 480 kHz and SCS 960 kHz, and the configured periodicity and offset are restricted to be an integer multiple of L slots, where L is the configured length of the bitmap provided by *monitoringSlotsWithinSlotGroup-r17*, i.e. for a given periodicity, the offset has a range of {0, L, 2\*L, …, L\*FLOOR(1/L\*(periodicity-1))}.For IAB-MT, If the IAB-MT is configured to monitor DCI format 2\_1, only the values 'sl1', 'sl2' or 'sl4' are applicable. If the IAB-MT is configured to monitor DCI format 2\_0 or DCI format 2\_5, only the values ′sl1′, ′sl2′, ′sl4′, ′sl5′, ′sl8′, ′sl10′, ′sl16′, and ′sl20′ are applicable (see TS 38.213, clause 10).If *monitoringSlotPeriodicityAndOffset-r17* is present, any previously configured *monitoringSlotPeriodicityAndOffset* is released, and if *monitoringSlotPeriodicityAndOffset* is present, any previously configured *monitoringSlotPeriodicityAndOffset-r17* is released. |
| ***monitoringSlotsWithinSlotGroup***Indicates which slot(s) within a slot group are configured for multi-slot PDCCH monitoring. The first (leftmost, most significant) bit represents the first slot in the slot group, the second bit represents the second slot in the slot group, and so on. A bit set to '1' indicates that the corresponding slot is configured for multi-slot PDCCH monitoring (see TS 38.213 [13], clause 10). The number of slots for multi-slot PDCCH monitoring is configured according to clause 10 in TS 38.213 [13]. |
| ***monitoringSymbolsWithinSlot***The first symbol(s) for PDCCH monitoring in the slots configured for (multi-slot) PDCCH monitoring (see *monitoringSlotPeriodicityAndOffset* and *duration*). The most significant (left) bit represents the first OFDM in a slot, and the second most significant (left) bit represents the second OFDM symbol in a slot and so on. The bit(s) set to one identify the first OFDM symbol(s) of the control resource set within a slot. If the cyclic prefix of the BWP is set to extended CP, the last two bits within the bit string shall be ignored by the UE or IAB-MT.For DCI format 2\_0, the first one symbol applies if the *duration* of CORESET (in the IE *ControlResourceSet*) identified by *controlResourceSetId* indicates 3 symbols, the first two symbols apply if the *duration* of CORESET identified by *controlResourceSetId* indicates 2 symbols, and the first three symbols apply if the *duration* of CORESET identified by *controlResourceSetId* indicates 1 symbol.See TS 38.213 [13], clause 10.For IAB-MT: For DCI format 2\_0 or DCI format 2\_5, the first one symbol applies if the duration of CORESET (in the IE *ControlResourceSet*) identified by *controlResourceSetId* indicates 3 symbols, the first two symbols apply if the *duration* of CORESET identified by *controlResourceSetId* indicates 2 symbols, and the first three symbols apply if the *duration* of CORESET identified by *controlResourceSetId* indicates 1 symbol.See TS 38.213 [13], clause 10. |
| ***nrofCandidates-CI***The number of PDCCH candidates specifically for format 2-4 for the configured aggregation level. If an aggregation level is absent, the UE does not search for any candidates with that aggregation level. The network configures only one aggregationLevel and the corresponding number of candidates (see TS 38.213 [13], clause 10.1). |
| ***nrofCandidates-PEI***The number of PDCCH candidates specifically for format 2-7 for the configured aggregation level. |
| ***nrofCandidates-SFI***The number of PDCCH candidates specifically for format 2-0 for the configured aggregation level. If an aggregation level is absent, the UE does not search for any candidates with that aggregation level. The network configures only one aggregationLevel and the corresponding number of candidates (see TS 38.213 [13], clause 11.1.1). For a search space configured with *freqMonitorLocations-r16*, only value ′n1′ is valid. |
| ***nrofCandidates***Number of PDCCH candidates per aggregation level. The number of candidates and aggregation levels configured here applies to all formats unless a particular value is specified or a format-specific value is provided (see inside *searchSpaceType*). If configured in the *SearchSpace* of a cross carrier scheduled cell, this field determines the number of candidates and aggregation levels to be used on the linked scheduling cell (see TS 38.213 [13], clause 10). |
| ***searchSpaceGroupIdList-r16, searchSpaceGroupIdList-r17***List of search space group IDs which the search space is associated with. The network configures at most 2 search space groups per BWP where the group ID is either 0 or 1 if *searchSpaceGroupIdList-r16* is included. The network configures at most 3 search space groups per BWP where the group ID is either 0, 1 or 2 if *searchSpaceGroupIdList-r17* is included. And if *searchSpaceGroupIdList-r17* is included, *searchSpaceGroupIdList-r16* is ignored. |
| ***searchSpaceId***Identity of the search space. SearchSpaceId = 0 identifies the *searchSpaceZero* configured via PBCH (MIB) or *ServingCellConfigCommon* and may hence not be used in the *SearchSpace* IE. The *searchSpaceId* is unique among the BWPs of a Serving Cell. In case of cross carrier scheduling, search spaces with the same *searchSpaceId* in scheduled cell and scheduling cell are linked to each other. The UE applies the search space for the scheduled cell only if the DL BWPs in which the linked search spaces are configured in scheduling cell and scheduled cell are both active.For an IAB-MT, the search space defines how/where to search for PDCCH candidates for an IAB-MT where each search space is associated with one ControlResearchSet and for a scheduled cell in the case of cross carrier scheduling, except for nrofCandidates, all the optional fields are absent. |
| ***SearchSpaceLinkingId***This parameter is used to link two search spaces of same type in the same BWP. If two search spaces have the same SearchSpaceLinkingId UE assumes these search spaces are linked to PDCCH repetition REF. When PDCCH repetition is monitored in two linked search space (SS) sets, the UE does not expect a third monitored SS set to be linked with any of the two linked SS sets. The two linked SS sets have the same SS set type (USS/CSS). The two linked SS sets have the same DCI formats to monitor. For intra-slot PDCCH repetition: The two SS sets should have the same periodicity and offset (monitoringSlotPeriodicityAndOffset), and the same duration. For linking monitoring occasions across the two SS sets that exist in the same slot: The two SS sets have the same number of monitoring occasions within a slot and n-th monitoring occasion of one SS set is linked to n-th monitoring occasion of the other SS set. The following SS sets cannot be linked with another SS set for PDCCH repetition: SS set 0, *searchSpaceSIB1*, *searchSpaceOtherSystemInformation*, *pagingSearchSpace*, *ra-SearchSpace*, *searchSpaceMCCH*, *searchSpaceMTCH*, *peiSearchSpace*, and *sdt-SearchSpace*. SS set configured by *recoverySearchSpaceId* cannot be linked to another SS set for PDCCH repetition. When a scheduled serving cell is configured to be cross-carrier scheduled by a scheduling serving cell, two PDCCH candidates (with the same AL and candidate index associated with the scheduled serving cell) are linked only if the corresponding two SS sets in the scheduling serving cell are linked and two SS sets in the scheduled serving cell with the same SS set IDs are also linked. |
| ***searchSpaceType***Indicates whether this is a common search space (present) or a UE specific search space as well as DCI formats to monitor for. |
| ***ue-Specific***Configures this search space as UE specific search space (USS). The UE monitors the DCI format with CRC scrambled by C-RNTI, CS-RNTI (if configured), and SP-CSI-RNTI (if configured) |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *DedicatedOnly* | In PDCCH-Config, the field is optionally present, Need R. Otherwise it is absent, Need R. |
| *Setup* | This field is mandatory present upon creation of a new *SearchSpace*. It is optionally present, Need M, otherwise. |
| *Setup2* | This field is mandatory present when a new *SearchSpace* is set up, if the same *SearchSpace* ID is not included in *searchSpacesToAddModListExt-r16* of the parent IE with the field *searchSpaceType-r16* or *searchSpaceType-r17* included. Otherwise it is optionally present, Need M. |
| *Setup3* | This field is mandatory present when a new *SearchSpace* is set up, if the same *SearchSpace* ID is not included in *searchSpacesToAddModListExt* (without suffix) of the parent IE with the field *searchSpaceType* (without suffix) included. Otherwise it is optionally present, Need M. |
| *Setup4* | This field is mandatory present upon creation of a new *SearchSpace* if *monitoringSlotPeriodicityAndOffset-r17* is not included. It is optionally present, Need M, otherwise. |
| *Setup5* | This field is mandatory present upon creation of a new *SearchSpace* if *monitoringSlotPeriodicityAndOffset* (without suffix) is not included. It is optionally present, Need M, otherwise. |
| *SetupOnly* | This field is mandatory present upon creation of a new *SearchSpace*. It is absent, Need M, otherwise. |
| *SetupOnly2* | In PDCCH-Config, the field is optionally present upon creation of a new SearchSpace and absent, Need M upon reconfiguration of an existing SearchSpace.In PDCCH-ConfigCommon, the field is absent. |

|  |
| --- |
| NEXT CHANGE |

6.3.6 MBS information elements

– *CarrierFreqListMBS*

The IE *CarrierFreqListMBS* is used to inform network of the frequencies on which the UE is receiving or interested to receive MBS broadcast service via a broadcast MRB.

***CarrierFreqListMBS* information element**

-- ASN1START

-- TAG-CARRIERFREQLISTMBS-START

CarrierFreqListMBS-r17 ::= SEQUENCE (SIZE (1..maxFreqMBS-r17)) OF ARFCN-ValueNR

-- TAG-CARRIERFREQLISTMBS-STOP

-- ASN1STOP

– *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 *locationAndBandwidthBroadcast*. |
| ***locationAndBandwidthBroadcast***Indicates starting PRB and the number of PRBs of CFR used for MCCH and MTCH reception.Value *sameAsSib1ConfiguredLocationAndBW* means the CFR for broadcast has the same location and size as the *locationAndBandwidth* for initial BWP 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 and CORESET#0 configured in SIB1.If the field is absent, the CFR for broadcast has the same location and size as CORESET0. |
| ***pdsch-ConfigMCCH***Indicates PDSCH parameters used for MCCH transmission. If the field is absent, PDSCH paramers 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. |

– *DRX-ConfigPTM*

The IE *DRX-Config-PTM* is used to configure DRX related parameters for PTM transmission as specified in TS 38.321 [3].

***DRX-Config-PTM* information element**

-- ASN1START

-- TAG-DRX-CONFIGPTM-START

DRX-ConfigPTM-r17 ::= SEQUENCE {

 drx-onDurationTimerPTM-r17 CHOICE {

 subMilliSeconds INTEGER (1..31),

 milliSeconds ENUMERATED {

 ms1, ms2, ms3, ms4, ms5, ms6, ms8, ms10, ms20, ms30, ms40, ms50, ms60,

 ms80, ms100, ms200, ms300, ms400, ms500, ms600, ms800, ms1000, ms1200,

 ms1600, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1

 }

 },

 drx-InactivityTimerPTM-r17 ENUMERATED {

 ms0, ms1, ms2, ms3, ms4, ms5, ms6, ms8, ms10, ms20, ms30, ms40, ms50, ms60, ms80,

 ms100, ms200, ms300, ms500, ms750, ms1280, ms1920, ms2560, spare9, spare8,

 spare7, spare6, spare5, spare4, spare3, spare2, spare1

 },

 drx-HARQ-RTT-TimerDL-PTM-r17 INTEGER (0..56) OPTIONAL, -- Cond HARQFeedback

 drx-RetransmissionTimerDL-PTM-r17 ENUMERATED {

 sl0, sl1, sl2, sl4, sl6, sl8, sl16, sl24, sl33, sl40, sl64, sl80, sl96, sl112, sl128,

 sl160, sl320, spare15, spare14, spare13, spare12, spare11, spare10, spare9,

 spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1

 } OPTIONAL, -- Cond HARQFeedback

 drx-LongCycleStartOffsetPTM-r17 CHOICE {

 ms10 INTEGER(0..9),

 ms20 INTEGER(0..19),

 ms32 INTEGER(0..31),

 ms40 INTEGER(0..39),

 ms60 INTEGER(0..59),

 ms64 INTEGER(0..63),

 ms70 INTEGER(0..69),

 ms80 INTEGER(0..79),

 ms128 INTEGER(0..127),

 ms160 INTEGER(0..159),

 ms256 INTEGER(0..255),

 ms320 INTEGER(0..319),

 ms512 INTEGER(0..511),

 ms640 INTEGER(0..639),

 ms1024 INTEGER(0..1023),

 ms1280 INTEGER(0..1279),

 ms2048 INTEGER(0..2047),

 ms2560 INTEGER(0..2559),

 ms5120 INTEGER(0..5119),

 ms10240 INTEGER(0..10239)

 },

 drx-SlotOffsetPTM-r17 INTEGER (0..31)

}

-- TAG-DRX-CONFIGPTM-STOP

-- ASN1STOP

|  |
| --- |
| ***DRX-Config-PTM* field descriptions** |
| ***drx-HARQ-RTT-Timer-DL-PTM***Value in number of symbols of the CFR where the transport block was received. |
| ***drx-InactivityTimerPTM***Value in multiple integers of 1 ms. *ms0* corresponds to 0, *ms1* corresponds to 1 ms, *ms2* corresponds to 2 ms, and so on. |
| ***drx-LongCycleStartOffsetPTM****drx-LongCycle-PTM* in ms and *drx-StartOffset-PTM* in multiples of 1 ms. |
| ***drx-onDurationTimerPTM***Value in multiples of 1/32 ms (subMilliSeconds) or in ms (milliSecond). For the latter, value *ms1* corresponds to 1 ms, value *ms2* corresponds to 2 ms, and so on. |
| ***drx-RetransmissionTimer-DL-PTM***Value in number of slot lengths of the CFR where the transport block was received. value *sl0* corresponds to 0 slots, *sl1* corresponds to 1 slot, *sl2* corresponds to 2 slots, and so on. |
| ***drx-SlotOffsetPTM***Value in 1/32 ms. Value 0 corresponds to 0 ms, value 1 corresponds to 1/32 ms, value 2 corresponds to 2/32 ms, and so on. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *HARQFeedback* | The field is mandatory present if HARQ feedback is enabled for a G-RNTI/G-CS-RNTI associated with this DRX configuration. It is absent otherwise.  |

– *MBS-NeighbourCellList*

The IE *MBS-NeighbourCellList* indicates a list of neighbour cells where ongoing MBS sessions provided via broadcast MRB in the current cell are also provided.

***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. |

– *MBS-ServiceList*

The IE *MBS-* *ServiceList* is used to inform the network of the MBS services that the UE is receiving or interested to receive.

***MBS-ServiceList* information element**

-- ASN1START

-- TAG-MBS-SERVICELIST-START

MBS-ServiceList-r17 ::= SEQUENCE (SIZE (1..maxNrofMBS-ServiceListPerUE-r17)) OF MBS-ServiceInfo-r17

MBS-ServiceInfo-r17 ::= SEQUENCE {

 tmgi-r17 TMGI-r17

}

-- TAG-MBS-SERVICELIST-STOP

-- ASN1STOP

– *MBS-SessionInfoList*

The IE *MBS-SessionInfoList* provides the list of ongoing MBS broadcast sessions transmitted via broadcast MRB and, for each MBS broadcast session, the associated G-RNTI and scheduling information.

***MBS-SessionInfoList* information element**

-- ASN1START

-- TAG-MBS-SESSIONINFOLIST-START

MBS-SessionInfoList-r17 ::= SEQUENCE (SIZE (1..maxNrofMBS-Session-r17)) OF MBS-SessionInfo-r17

MBS-SessionInfo-r17 ::= SEQUENCE {

 mbs-SessionId-r17 TMGI-r17,

 g-RNTI-r17 RNTI-Value,

 mrb-ListBroadcast-r17 MRB-ListBroadcast-r17,

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

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

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

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

}

DRX-ConfigPTM-Index-r17 ::= INTEGER (0..maxNrofDRX-ConfigPTM-1-r17)

PDSCH-ConfigIndex-r17 ::= INTEGER (0..maxNrofPDSCH-ConfigPTM-1-r17)

MTCH-SSB-MappingWindowIndex-r17 ::= INTEGER (0..maxNrofMTCH-SSB-MappingWindow-1-r17)

MRB-ListBroadcast-r17 ::= SEQUENCE (SIZE (1..maxNrofMRB-Broadcast-r17)) OF MRB-InfoBroadcast-r17

MRB-InfoBroadcast-r17 ::= SEQUENCE {

 pdcp-Config-r17 MRB-PDCP-ConfigBroadcast-r17,

 rlc-Config-r17 MRB-RLC-ConfigBroadcast-r17,

 ...

}

MRB-PDCP-ConfigBroadcast-r17 ::= SEQUENCE {

 pdcp-SN-SizeDL-r17 ENUMERATED {len12bits} OPTIONAL, -- Need S

 headerCompression-r17 CHOICE {

 notUsed NULL,

 rohc SEQUENCE {

 maxCID-r17 INTEGER (1..16) DEFAULT 15,

 profiles-r17 SEQUENCE {

 profile0x0000-r17 BOOLEAN,

 profile0x0001-r17 BOOLEAN,

 profile0x0002-r17 BOOLEAN

 }

 }

 },

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

}

MRB-RLC-ConfigBroadcast-r17 ::= SEQUENCE {

 logicalChannelIdentity-r17 LogicalChannelIdentity,

 sn-FieldLength-r17 ENUMERATED {size6} OPTIONAL, -- Need S

 t-Reassembly-r17 T-Reassembly OPTIONAL -- Need S

}

-- TAG-MBS-SESSIONINFOLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***MBS-SessionInfoList* field descriptions** |
| ***g-RNTI***G-RNTI used to scramble the scheduling and transmission of MTCH. |
| ***headerCompression***If *rohc* is configured, the UE shall apply the configured ROHC profile(s) in downlink.  |
| ***mbs-SessionId***Indicates an identifier of the MBS session provided by the MTCH. |
| ***mrb-listBroadcast***A list of broadcast MRBs to which the associated broadcast MBS session is mapped to. |
| ***mtch-neighbourCell***Indicates neighbour cells which provide this service on MTCH. 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. If this field is absent, 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. |
| ***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 [see TS 38.213 [13], clause 10.1]. |
| ***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 that PDCP sequence number size of 12 bits is used, as specified in TS 38.323 [5]. When the field is absent the UE applies the value as specified in 9.1.1.7. |
| ***pdschConfigIndex***Indicates the index of PDSCH configuration entry in *pdschConfigList* for MTCH. Value 0 corresponds to the first entry in *pdschConfigList*, the value 1 corresponds to the second entry in *pdschConfigList* and so on. When the field is absent the UE applies the first entry in pdschConfigList for MTCH. |
| ***sn-FieldLength***Indicates that the RLC SN field size of 6 bits is used, see TS 38.322 [4]. When the field is absent the UE applies the value as specified in 9.1.1.7. |
| ***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. When the field is absent the UE applies the value in specified in 9.1.1.7. |
| ***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. When the field is absent the UE applies the value as specified in 9.1.1.7. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *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 *searchspaceMTCH* is not set to zero (including the case where *searchSpaceMTCH* is absent and *searchSpaceMCCH* is not set to zero). Otherwise, it is absent, Need R. |

– *MTCH-SSB-MappingWindowList*

The IE *MTCH-SSB-MappingWindowList* is used to configure MTCH PDCCH ocassions to SSB mapping window related periodic and offset parameters.

***MTCH-SSB-MappingWindowList* information element**

-- ASN1START

-- TAG-MTCH-SSB-MAPPINGWINDOWLIST-START

MTCH-SSB-MappingWindowList-r17 ::= SEQUENCE (SIZE (1..maxNrofMTCH-SSB-MappingWindow-r17)) OF MTCH-SSB-MappingWindowCycleOffset-r17

MTCH-SSB-MappingWindowCycleOffset-r17 ::= CHOICE {

 ms10 INTEGER(0..9),

 ms20 INTEGER(0..19),

 ms32 INTEGER(0..31),

 ms64 INTEGER(0..63),

 ms128 INTEGER(0..127),

 ms256 INTEGER(0..255)

}

-- TAG-MTCH-SSB-MAPPINGWINDOWLIST-STOP

-- ASN1STOP

|  |
| --- |
| ***MTCH-SSB-MappingWindowList* field descriptions** |
| ***MTCH-SSB-MappingWindowCycleOffset***Indicates the *cycle* and *offset* for MTCH PDCCH ocassions to SSB mapping. Values in unit of ms. *ms10* corresponds to cycle of 10 ms with corresponding offset between 0 and 9 ms, value *ms20* corresponds to cycle of 20 ms with corresponding offset between 0 and 19 ms, and so on. The mapping window starts at a subframe in a SFN where [(SFN number × 10) + subframe number] modulo (*cycle*) = *offset.*PDCCH monitoring occasions for MTCH in a mapping window which are not overlapping with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered starting from 1 in the maping window. The [x×N+K]th PDCCH monitoring occasion for MTCH in this mapping 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 MTCH to SSB mapping transmission window/N). The actual transmitted SSBs are sequentially numbered from one in ascending order of their SSB indexes. |

– *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 entity is allowed to be configured if included in SIB20. |
| ***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 (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. |

– *SPS-Config*

The IE *SPS-Config* is used to configure downlink semi-persistent transmission. Multiple Downlink SPS configurations may be configured in one BWP of a serving cell.

***SPS-Config* information element**

-- ASN1START

-- TAG-SPS-CONFIG-START

SPS-Config ::= SEQUENCE {

 periodicity ENUMERATED {ms10, ms20, ms32, ms40, ms64, ms80, ms128, ms160, ms320, ms640,

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

 nrofHARQ-Processes INTEGER (1..8),

 n1PUCCH-AN PUCCH-ResourceId OPTIONAL, -- Need M

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

 ...,

 [[

 sps-ConfigIndex-r16 SPS-ConfigIndex-r16 OPTIONAL, -- Cond SPS-List

 harq-ProcID-Offset-r16 INTEGER (0..15) OPTIONAL, -- Need R

 periodicityExt-r16 INTEGER (1..5120) OPTIONAL, -- Need R

 harq-CodebookID-r16 INTEGER (1..2) OPTIONAL, -- Need R

 pdsch-AggregationFactor-r16 ENUMERATED {n1, n2, n4, n8 } OPTIONAL -- Need S

 ]],

 [[

 sps-HARQ-Deferral-r17 INTEGER (1..32) OPTIONAL, -- Need R

 n1PUCCH-AN-PUCCHsSCell-r17 PUCCH-ResourceId OPTIONAL, -- Need R

 periodicityExt-r17 INTEGER (1..40960) OPTIONAL, -- Need R

 nrofHARQ-Processes-v1710 INTEGER(9..32) OPTIONAL, -- Need R

 harq-ProcID-Offset-v1700 INTEGER (16..31) OPTIONAL -- Need R

 ]]

}

-- TAG-SPS-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***SPS-Config* field descriptions** |
| ***harq-CodebookID***Indicates the HARQ-ACK codebook index for the corresponding HARQ-ACK codebook for SPS PDSCH and ACK for SPS PDSCH release. |
| ***harq-ProcID-Offset***Indicates the offset used in deriving the HARQ process IDs, see TS 38.321 [3], clause 5.3.1. |
| ***mcs-Table***Indicates the MCS table the UE shall use for DL SPS (see TS 38.214 [19],clause 5.1.3.1. If present, the UE shall use the MCS table of low-SE 64QAM table indicated in Table 5.1.3.1-3 of TS 38.214 [19]. If this field is absent and field mcs-table in PDSCH-Config is set to 'qam256' and the activating DCI is of format 1\_1, the UE applies the 256QAM table indicated in Table 5.1.3.1-2 of TS 38.214 [19]. If this field is absent and the field *mcs-Table-r17* in *PDSCH-Config* is set to 'qam1024' and the activating DCI is format 1\_1, the UE applies the 1024QAM table indicated in Table 5.1.3.1-4 of TS 38.214 [19]. Otherwise, the UE applies the non-low-SE 64QAM table indicated in Table 5.1.3.1-1 of TS 38.214 [19]. |
| ***n1PUCCH-AN***HARQ resource for PUCCH for DL SPS. The network configures the resource either as format0 or format1. The actual *PUCCH-Resource* is configured in *PUCCH-Config* and referred to by its ID. See TS 38.213 [13], clause 9.2.3. |
| ***n1PUCCH-AN-PUCCHsSCell***HARQ resource for PUCCH on PUCCH switching SCell (sSCell) for DL SPS. The network configures the resource either as format 0 or format 1. The actual PUCCH-Resource is configured in PUCCH-Config of the PUCCH sSCell and referred to by its ID. See TS 38.213 [13], clause 9.2.3. |
| ***nrofHARQ-Processes***Number of configured HARQ processes for SPS DL (see TS 38.321 [3], clause 5.8.1). If UE is configured with *nrofHARQ-Processes-v1710* UE shall ignore *nrofHARQ-Processes (without suffix)*. |
| ***pdsch-AggregationFactor***Number of repetitions for SPS PDSCH (see TS 38.214 [19], clause 5.1.2.1). When the field is absent, the UE applies PDSCH aggregation factor of PDSCH-Config. |
| ***periodicity***Periodicity for DL SPS (see TS 38.214 [19] and TS 38.321 [3], clause 5.8.1). |
| ***periodicityExt***This field is used to calculate the periodicity for DL SPS (see TS 38.214 [19] and see TS 38.321 [3], clause 5,8.1). If this field is present, the field *periodicity* is ignored.The following periodicities are supported depending on the configured subcarrier spacing [ms]:15 kHz: *periodicityExt*, where *periodicityExt* has a value between 1 and 640.30 kHz: 0.5 x *periodicityExt*, where *periodicityExt* has a value between 1 and 1280.60 kHz with normal CP. 0.25 x *periodicityExt*, where *periodicityExt* has a value between 1 and 2560.60 kHz with ECP: 0.25 x *periodicityExt*, where *periodicityExt* has a value between 1 and 2560.120 kHz: 0.125 x *periodicityExt*, where *periodicityExt* has a value between 1 and 5120.480 kHz: 0.0625 x periodicityExt, where periodicityExt has a value between 1 and 20480.960 kHz: 0.03125 x periodicityExt, where periodicityExt has a value between 1 and 40960.*periodicityExt-r17* is only applicable for SCS 480 kHz and 960 kHz. |
| ***sps-ConfigIndex***Indicates the index of one of multiple SPS configurations. |
| ***sps-HARQ-Deferral***Indicates the maximum number of slots or subslots the transmission of DL SPS HARQ-ACK in a slot or subslot can be deferred (see TS 38.213 [13], clause 9.2.5.4). |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *SPS-List* | The field is mandatory present when included in *sps-ConfigToAddModList-r16*or *sps-ConfigMulticastToAddModList-r17*, otherwise the field is absent. |

– *TMGI*

The IE *TMGI* is used to identify the MBS session.

***TMGI* information element**

-- ASN1START

-- TAG-TMGI-START

TMGI-r17 ::= SEQUENCE {

 plmn-Id-r17 CHOICE {

 plmn-Index INTEGER (1..maxPLMN),

 explicitValue PLMN-Identity

 },

 serviceId-r17 OCTET STRING (SIZE (3))

}

-- TAG-TMGI-STOP

-- ASN1STOP

|  |
| --- |
| ***TMGI* field descriptions** |
| ***serviceId***Uniquely identifies the identity of an MBS service within a PLMN. The field contains octet 3- 5 of the IE Temporary Mobile Group Identity (TMGI) as defined in TS 24.008 [38]. The first octet contains the third octet of the TMGI, the second octet contains the fourth octet of the TMGI and so on. |

|  |
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| NEXT CHANGE |

10.2 ASN.1 violation or encoding error

The UE shall:

1> when receiving an RRC message on the BCCH, CCCH, PCCH or MCCH or a PC5 RRC message on SBCCH for which the abstract syntax is invalid [6]:

2> ignore the message.

NOTE: This clause applies in case one or more fields is set to a value, other than a spare, reserved or extended value, not defined in this version of the transfer syntax. E.g. in the case the UE receives value 12 for a field defined as INTEGER (1..11). In cases like this, it may not be possible to reliably detect which field is in the error hence the error handling is at the message level.

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| END OF CHANGE |