**3GPP TSG-RAN WG2 Meeting #119-e *R2-2208869***

**Electronic Meeting, 17th – 29th Aug, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | **3348** | **rev** | **2** | **Current version:** | **17.1.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Miscellaneous corrections on TS 38.331 for SL enhancements | | | | | | | | | |
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| ***Source to WG:*** | Huawei, HiSilicon (Rapporteur) | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_SL\_enh-Core | | | | |  | ***Date:*** | | | 2022-09-02 |
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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 can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | 1. In clause 5.8.3.1, description on UE is configured with sl-ScheduledConfig is missing 2. In clause 5.8.3.2, the description on the initiation condition of one TX UE reporting sidelink DRX configuration reject information is missing. 3. In clause 5.8.3.3, the description on the procedure of one TX UE reporting sidelink DRX configuration reject information and DRX on/off indication are missing. 4. Clarification on definition of field related to higher layer parameters (priorityScheme1CoordInfoExplicit, priorityScheme1CoordInfoCondition and priorityScheme1Request) is needed. 5. Clarification on IUC MAC CE and IUC request MAC CE priority value is needed. 6. In 5.8.3.2, the “3> if the UE is performing NR sidelink groupcast reception and if sl-DRX-ConfigCommonGC-BC is included in SIB12-IEs: 4> initiate transmission of the SidelinkUEInformationNR message to report the Destination Layer-2 ID and sidelink DRX on/off indication for the corresponding destination in accordance with 5.8.3.3;” is under the condition of “if configured by upper layers to receive NR sidelink communication on the frequency included in sl-FreqInfoList in SIB12 of the PCell:”, i.e., the transmission related reporting is under reception-based triggering condition, which is an error. 7. In 5.8.3.3, the reporting of sl-RxInterestedGC-BC-DestList, its field sl-DestinationIdentity is missing. 8. In 5.8.3.3, the description is “4> if configured by upper layers to perform NR sidelink reception and configured with sl-ScheduledConfig: 5> include sl-TxResourceReqList and/or sl-TxResourceReqListCommRelay-r17 and set its fields (if needed) as follows for each destination for which it reports to network:” i.e., the transmission related reporting is under reception-based triggering condition, which is an error. 9. In 6.2.2, the field description of sl-RxInterestedFreqListDisc is missing, and sl-RxInterestedQoS-InfoList is put in the SL-RxDRX-Report, but sl-RxInterestedQoS-InfoList is not an sub-field of SL-RxDRX-Report. 10. In the field description, for sl-DRX-GC-HARQ-RTT-Timer1, sl-DRX-GC-HARQ-RTT-Timer2, it mentions “HARQ enabled / disabled transmission” yet there is no such “HARQ enabled/disabled” but just “feedback enabled/disabled” 11. In the field description of sl-TriggerConditionCoordInfo, it says “Indicates the trigger condition of inter-UE coordination information from UE-A to UE-B”, it is misleading 1) this flag is for condition-based scheme-1 but not request-based scheme-1 IUC, and 2) when it applies to condition-based scheme-1, it is not used directly as the trigger of IUC, but applied as an additional condition/restriction for UE-A to send IUC-information, i.e., the configured trigger condition (e.g., RSRP threshold) is still to be used. As shown in the RAN1 agreement: Agreement made in RAN1#107bis-e: For inter-UE coordination triggered by a condition rather than request reception in Scheme 1, A resource pool level (pre-)configuration can enable one of the following alternatives: Alt 1: it is up to UE-A’s implementation whether or not to trigger the inter-UE coordination information generation. Alt 2: the inter-UE coordination information generation can be triggered only when UE-A has data to be transmitted together with the inter-UE coordination information to UE-B. 12. In the current specification, the introduction of sl-PBPS-CPS-Config-r17 seems applicable to normal and exceptional pool, yet it is not supposed to be applicable to exceptional pool, i.e., partial-sensing is not supposed to be used in exceptional pool. 13. In the current specification, exceptional pool configuration can be present not only in sl-BWP-PoolConfig/sl-BWP-PoolConfigCommon, but also in sl-BWP-PoolConfigPS/sl-BWP-PoolConfigCommonPS, it would cause ambiguity / issue that which pool to use. 14. Due to the change of RP-221563, some change in R2-2206378 is missing. 15. In 5.8.3.2, for the branch of “2> if configured by upper layers to perform NR sidelink reception on the frequency included in sl-FreqInfoList in SIB12 of the PCell”, it missed the condition of sl-DRX-ConfigCommonGC-BC presence, i.e., currently the DRX related reporting is regardless of network capability of SL-DRX, which is against the R2#117 agreement of “For gNB not supporting SL-DRX, Tx-UE does not report assistance information or DRX configuration reject information, and Rx-UE does not report DRX configuration information for UC or QoS information for GC/BC.”. And same issue for the branch of “if configured by upper layers to perform NR sidelink transmission on the frequency included in sl-FreqInfoList in SIB12 of the PCell” 16. For the branch of “2> if configured by upper layers to perform NR sidelink transmission on the frequency included in sl-FreqInfoList in SIB12 of the PCell”, the R2#117 agreement of “3:For gNB supporting SL-DRX, Tx-UE report assistance information only in mode-1.” and “11: For gNB supporting SL-DRX, Tx-UE report DRX configuration reject information only in mode-1.” failed to be captured, i.e., the current procedural text would lead to SUI initiation even in case of mode-2. 17. In clause 6.6.2 for IE "RRCReconfigurationCompleteSidelink", the field " sl-DRX-ConfigReject-r17" was mistakenly made madatory field. 18. In the legacy spec of SUI initiation in clause 5.8.3.2, there are always cases for SUI initiation, i.e., 1) SUI not transmitted before, “3> if the UE did not transmit a SidelinkUEInformationNR message since last entering RRC\_CONNECTED state; or” 2) SUI transmitted but the UE undergo an incapable gNB “3> if since the last time the UE transmitted a SidelinkUEInformationNR message the UE connected to a PCell not providing SIB12 including sl-ConfigCommonNR; or”, 3) SUI content change “3> if the last transmission of the SidelinkUEInformationNR message did not include sl-RxInterestedFreqList; or if the frequency configured by upper layers to receive NR sidelink communication on has changed since the last transmission of the SidelinkUEInformationNR message:”, and 4) UE not interested in the related action any more “2> else: 3> if the last transmission of the SidelinkUEInformationNR message included sl-RxInterestedFreqList:”. These 4 conditions are missing for the reporting initiation of sl-RxDRX-ReportList, sl-RxInterestedGC-BC-DestList. 19. In clause 6.3.5，for field sl-OptionForCondition2-A-1-r17 within IE SL-InterUE-CoordinationScheme2-r17, it is not clearly specified what threshold values to be used when sl-OptionForCondition2-A-1-r17 is "0". The threshold delta value deltaRSRPThresh as specified in TS 38.213 is missing in TS 38.331 for the case when sl-OptionForCondition2-A-1-r17 is "1". 20. RAN1 defined open loop power control parameters are not captured. 21. Various editorial errors. | | | | | | | | |
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| ***Summary of change:*** | | 1. In clause 5.8.3.1, add description on UE is configured with sl-ScheduledConfig 2. Add the description on the condition of one TX UE reporting sidelink DRX configuration reject information. 3. Add the description on the procedure of one TX UE reporting sidelink DRX configuration reject information and DRX On/Off indication. 4. Modified field description related to higher layer parameters (priorityScheme1CoordInfoExplicit, priorityScheme1CoordInfoCondition and priorityScheme1Request) according to RAN1 LS R1-2203042 (R2-2203695). Add clarification on priority value of IUC MAC CE and IUC request MAC CE. 5. In 5.8.3.2, relocate “3> if the UE is performing NR sidelink groupcast transmission and if sl-DRX-ConfigCommonGC-BC is included in SIB12-IEs: 4> initiate transmission of the SidelinkUEInformationNR message to report the Destination Layer-2 ID and sidelink DRX on/off indication for the corresponding destination in accordance with 5.8.3.3;” to the condition of “2> if configured by upper layers to perform NR sidelink transmission on the frequency included in sl-FreqInfoList in SIB12 of the PCell:”, i.e., together with other DRX-related procedural text. 6. In 5.8.3.3, Add the reporting of sl-RxInterestedGC-BC-DestList, its field sl-DestinationIdentity. 7. In 5.8.3.3, correct “3> if the UE is performing NR sidelink groupcast reception and if sl-DRX-ConfigCommonGC-BC is included in SIB12-IEs: 4> initiate transmission of the SidelinkUEInformationNR message to report the Destination Layer-2 ID and sidelink DRX on/off indication for the corresponding destination in accordance with 5.8.3.3;” is under the condition of “if configured by upper layers to receive NR sidelink communication on the frequency included in sl-FreqInfoList in SIB12 of the PCell:” to “3> if the UE is performing NR sidelink groupcast transmission and if sl-DRX-ConfigCommonGC-BC is included in SIB12-IEs: 4> initiate transmission of the SidelinkUEInformationNR message to report the Destination Layer-2 ID and sidelink DRX on/off indication for the corresponding destination in accordance with 5.8.3.3;” is under the condition of “if configured by upper layers to receive NR sidelink communication on the frequency included in sl-FreqInfoList in SIB12 of the PCell:” 8. In 6.2.2, add the field description of sl-RxInterestedFreqListDisc is missing, and put sl-RxInterestedQoS-InfoList as a separate table for SL-RxInterestedGC-BC-Dest. 9. In the field description, for sl-DRX-GC-HARQ-RTT-Timer1, sl-DRX-GC-HARQ-RTT-Timer2, change from “HARQ enabled / disabled Sidelink transmission” to “feedback enabled/disabled Sidelink HARQ transmission” 10. In the field description, indicate this IE is applicable to condition-based scheme-1 IUC only, and clarify the description to align with RAN1 agreement, i.e., “For inter-UE coordination information triggered by a condition rather than request reception in Scheme 1”. 11. In the field description of sl-PBPS-CPS-Config-r17, clarify it is not supposed to be used for exceptional pool. 12. In the field description of sl-BWP-PoolConfigPS/sl-BWP-PoolConfigCommonPS, clarify that the exceptional pool is not to be present as a sub-field. 13. Add back the change in R2-2206378 on top of the change from RP-221563. 14. For the two branches, “2> if configured by upper layers to perform NR sidelink reception on the frequency included in sl-FreqInfoList in SIB12 of the PCell”, and “if configured by upper layers to perform NR sidelink transmission on the frequency included in sl-FreqInfoList in SIB12 of the PCell”, add condition of network support of SL-DRX as “and if sl-DRX-ConfigCommonGC-BC is included in SIB12-IEs”. 15. For the branch of “if configured by upper layers to perform NR sidelink transmission on the frequency included in sl-FreqInfoList in SIB12 of the PCell”, add the condition of “and if the UE is configured with sl-ScheduledConfig” to limit to mode-1. 16. In the current specification, upon reception of the sl-DRX-ConfigReject, TX UE considers no sidelink DRX to be applied for the corresponding sidelink unicast communication. However, the corresponding behaviour of the RX UE upon transmission of the sl-DRX-ConfigReject is missing and should be added. 17. Field " sl-DRX-ConfigReject-r17" is made dummy, a new field " sl-DRX-ConfigReject-v17xy" is created as "optional" field within the extended IE "RRCReconfigurationCompleteSidelink-v17xy-IEs ". 18. Clarify upon transmission of the sl-DRX-ConfigReject, RX UE considers no sidelink DRX to be applied for the corresponding sidelink unicast communication. 19. For the reporting initiation of sl-RxDRX-ReportList, sl-RxInterestedGC-BC-DestList, add the similar conditions of 1) SUI not transmitted before, “3> if the UE did not transmit a SidelinkUEInformationNR message since last entering RRC\_CONNECTED state; or” 2) SUI transmitted but the UE undergo an incapable gNB “3> if since the last time the UE transmitted a SidelinkUEInformationNR message the UE connected to a PCell not providing SIB12 including sl-ConfigCommonNR; or”, 3) SUI content change “3> if the last transmission of the SidelinkUEInformationNR message did not include sl-RxInterestedFreqList; or if the frequency configured by upper layers to receive NR sidelink communication on has changed since the last transmission of the SidelinkUEInformationNR message:”, and 4) UE not interested in the related action any more “2> else: 3> if the last transmission of the SidelinkUEInformationNR message included sl-RxInterestedFreqList:”. 20. Add in FD of "*sl-OptionForCondition2-A-1*", " UE uses thresholds *sl-Thres-RSRP-List*, in its resource pool configuration *sl-UE-SelectedConfigRP*, for *ThresPSSCH-RSRP-List* specified in clause 16.3.0 of TS 38.213 [13]. " for the case when *sl-OptionForCondition2-A-1-r17* is "0"; For the case when *sl-OptionForCondition2-A-1-r17* is "1", a new parameter " *sl-DeltaRSRP-Thresh-v17xy* " is defined. 21. Add open loop power control parameters *dl-P0-PSSCH-PSCCH-r17, sl-P0-PSSCH-PSCCH-r17, dl-P0- PSBCH-r17, dl-P0-PSFCH-r17.* 22. Correct editorial errors including moving FD alphabetic locations, small changes on FDs, minor changes on procedural texts.   **Impact analysis**  **Impacted 5G architecture options:**  NR SA, NR-DC  **Impacted functionality:**  Sidelink  **Inter-operability:**  1. For the change on TX UE reporting DRX configuration reject information  If the network is implemented according to this CR while the UE is not, there is no inter-operability issue.  If the UE is implemented according to this CR while the network is not, there is no inter-operability issue.  If one UE is implemented according to this CR while the other UE is not, there is no inter-operability issue.  2. For the change on TX UE reporting DRX on/off indication  If the network is implemented according to this CR while the UE is not, UE will not report the DRX on/off indication, there will be mismatch of understanding on Tx profile of one certain destination ID between gNB and Tx UE hence inter-operability issue.  If the UE is implemented according to this CR while the network is not, network will not understand the reported DRX on/off indication and there will be inter-operability issue.  If one UE is implemented according to this CR while the other UE is not, there is no inter-operability issue between two UEs.  3. For the change on IUC RSRP thresholds and threshold delta value  If the network is implemented according to this CR while the UE is not, UE will not understand the configured thresholds and threshold delta value and UE IUC behaviour is unspecified.  If the UE is implemented according to this CR while the network is not, network will not configure the threshold delta value, UE IUC behaviour is partially unspecified when the threshold delta value is to be used.  If one UE is implemented according to this CR while the other UE is not, there is no inter-operability issue between two UEs if UE B in IUC is not implemented according to this CR; UE IUC behaviour is unspecified if UE A in IUC is not implemented according to this CR.  4. For other changes, no inter-operability issues found. | | | | | | | | |
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| ***Consequences if not approved:*** | | 1. The procedural texts for TX UE reporting DRX configuration reject information are not captured. 2. IUC function cannot work properly as the threshold values and threshold delta values, with which UE determines preferred and non-preferred resources, are not clearly specified. 3. Ambiguity exists on definition of higher layer parameters (priorityScheme1CoordInfoExplicit, priorityScheme1CoordInfoCondition and priorityScheme1Request) and on priority value of IUC MAC CE and IUC request MAC CE. 4. The UE has to perform transmission-related SUI reporting although only configured to perform reception. 5. Missing part of the SUI field in procedural text, which will cause ambiguity to UE implementation. 6. The UE has to perform transmission-related SUI reporting although only configured to perform reception. 7. Misunderstanding this is to indicate one separate trigger condition for IUC information. 8. The misunderstanding that sl-PBPS-CPS-Config-r17 may be applied to the exceptional pool as well. 9. Confusion to UE about which exception pool to use, either in sl-BWP-PoolConfig/sl-BWP-PoolConfigCommon, or in sl-BWP-PoolConfigPS/sl-BWP-PoolConfigCommonPS. 10. The agreed changes in R2-2206378 are missing. 11. RAN2 agreement failed to be captured. 12. Deviation from the legacy SUI message initiation conditions. 13. IUC function cannot work properly as the threshold values and threshold delta values, with which UE determines preferred and non-preferred resources, are not clearly specified. 14. Rel-17 open loop power control for sidelink may not function properly. 15. Various editorial errors still exist. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.8.3.1, 5.8.3.2, 5.8.3.3, 5.8.9.1.3, 6.2.2, 6.3.1, 6.3.2, 6.3.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## Start of Changes

## 5.8 Sidelink

### 5.8.1 General

NR sidelink communication consists of unicast, groupcast and broadcast. For unicast, the PC5-RRC connection is a logical connection between a pair of a Source Layer-2 ID and a Destination Layer-2 ID in the AS. The PC5-RRC signalling, as specified in clause 5.8.9, can be initiated after its corresponding PC5 unicast link establishment (TS 23.287 [55]). The PC5-RRC connection and the corresponding sidelink SRBs and sidelink DRB(s) are released when the PC5 unicast link is released as indicated by upper layers.

For each PC5-RRC connection of unicast, one sidelink SRB (i.e. SL-SRB0) is used to transmit the PC5-S message(s) before the PC5-S security has been established. One sidelink SRB (i.e. SL-SRB1) is used to transmit the PC5-S messages to establish the PC5-S security. One sidelink SRB (i.e. SL-SRB2) is used to transmit the PC5-S messages after the PC5-S security has been established, which is protected. One sidelink SRB (i.e. SL-SRB3) is used to transmit the PC5-RRC signalling, which is protected and only sent after the PC5-S security has been established. One sidelink SRB (i.e. SL-SRB4) is used to transmit/receive the NR sidelink discovery messages.

For unicast of NR sidelink communication, AS security comprises of integrity protection of PC5 signalling (SL-SRB1, SL-SRB2 and SL-SRB3) and user data (SL-DRBs), and it further comprises of ciphering of PC5 signaling (SL-SRB1 only for the Direct Link Security Mode Complete message as specified in TS 24.587 [57] for V2X service or TS 24.554 [72] for Proximity-services, SL-SRB2 and SL-SRB3) and user data (SL-DRBs). The ciphering and integrity protection algorithms and parameters for a PC5 unicast link are exchanged by PC5-S messages in the upper layers as specified in TS 33.536 [60], and apply to the corresponding PC5-RRC connection in the AS. Once AS security is activated for a PC5 unicast link in the upper layers as specified in TS 33.536 [60], all messages on SL-SRB2 and SL-SRB3 and/or user data on SL-DRBs of the corresponding PC5-RRC connection are integrity protected and/or ciphered by the PDCP.

For unicast of NR sidelink communication, if the change of the key is indicated by the upper layers as specified in TS 24.587 [57], UE re-establishes the PDCP entity of the SL-SRB1, SL-SRB2, SL-SRB3 and SL-DRBs on the corresponding PC5-RRC connection.

NOTE 1: In case the configurations for NR sidelink communication are acquired via the E-UTRA, the configurations for NR sidelink communication in *SIB12* and *sl-ConfigDedicatedNR* within *RRCReconfiguration* used in clause 5.8 are provided by the configurations in *SystemInformationBlockType28* and *sl-ConfigDedicatedForNR* within *RRCConnectionReconfiguration* as specified in TS 36.331 [10], respectively.

NOTE 2: In this release, there is one-to-one correspondence between the PC5-RRC connection and the PC5 unicast link as specified in TS 38.300[2].

NOTE 3: All SL-DRBs related to the same PC5-RRC connection have the same activation/deactivation setting for ciphering and the same activation/deactivation setting for integrity protection as specified in TS 33.536 [60].

NOTE 4: When integrity check failure concerning SL-SRB1 for a specific destination is detected, the UE sends an indication to the upper layers [57].

### 5.8.2 Conditions for NR sidelink communication operation

The UE shall perform NR sidelink communication operation only if the conditions defined in this clause are met:

1> if the UE's serving cell is suitable (RRC\_IDLE or RRC\_INACTIVE or RRC\_CONNECTED); and if either the selected cell on the frequency used for NR sidelink communication operation belongs to the registered or equivalent PLMN as specified in TS 24.587 [57] or the UE is out of coverage on the frequency used for NR sidelink communication operation as defined in TS 38.304 [20] and TS 36.304 [27]; or

1> if the UE's serving cell (RRC\_IDLE or RRC\_CONNECTED) fulfils the conditions to support NR sidelink communication in limited service state as specified in TS 23.287 [55]; and if either the serving cell is on the frequency used for NR sidelink communication operation or the UE is out of coverage on the frequency used for NR sidelink communication operation as defined in TS 38.304 [20] and TS 36.304 [27]; or

1> if the UE has no serving cell (RRC\_IDLE);

### 5.8.3 Sidelink UE information for NR sidelink communication

#### 5.8.3.1 General



Figure 5.8.3.1-1: Sidelink UE information for NR sidelink communication

The purpose of this procedure is to inform the network that the UE:

- is interested or no longer interested to receive or transmit NR sidelink communication,

- is requesting assignment or release of transmission resource for NR sidelink communication,

- is reporting QoS parameters and QoS profile(s) related to NR sidelink communication,

- is reporting that a sidelink radio link failure or sidelink RRC reconfiguration failure has been detected,

- is reporting the sidelink UE capability information of the associated peer UE for unicast communication,

- is reporting the RLC mode information of the sidelink data radio bearer(s) received from the associated peer UE for unicast communication,

- is reporting the accepted sidelink DRX configuration received from the associated peer UE for NR sidelink unicast reception,

- is reporting the sidelink DRX assistance information received from the associated peer UE for NR sidelink unicast transmission, when the UE is configured with *sl-ScheduledConfig*,

- is reporting, for NR sidelink groupcast transmission, the sidelink DRX on/off indication for the associated Destination Layer-2 ID,

- is reporting, for NR sidelink groupcast or broadcast reception, the Destination Layer-2 ID and QoS profile(s) associated with its interested services to which sidelink DRX is applied,

- is reporting DRX configuration reject information from its associated peer UE for NR sidelink unicast transmission, when the UE is configured with *sl-ScheduledConfig*,

- is reporting parameters related to U2N relay operation.

#### 5.8.3.2 Initiation

A UE capable of NR sidelink communication or NR sidelink discovery or NR sidelink U2N relay operation that is in RRC\_CONNECTED may initiate the procedure to indicate it is (interested in) receiving or transmitting NR sidelink communication or NR sidelink discovery or NR sidelink U2N relay operation in several cases including upon successful connection establishment or resuming, upon change of interest, upon changing QoS profiles, upon receiving *UECapabilityInformationSidelink* from the associated peer UE, upon RLC mode information updated from the associated peer UE or upon change to a PCell providing *SIB12* including *sl-ConfigCommonNR*. A UE capable of NR sidelink communication may initiate the procedure to request assignment of dedicated sidelink DRB configuration and transmission resources for NR sidelink communication transmission. A UE capable of NR sidelink communication may initiate the procedure to report to the network that a sidelink radio link failure or sidelink RRC reconfiguration failure has been declared. A UE capable of NR sidelink discovery may initiate the procedure to request assignment of dedicated resources for sidelink discovery transmission or sidelink discovery reception. A UE capable of U2N relay operation may initiate the procedure to report/update parameters for acting as U2N Relay UE or U2N Remote UE (including L2 Remote UE's source L2 ID).

A UE capable of NR sidelink operation that is in RRC\_CONNECTED may initiate the procedure to report the sidelink DRX configuration received from the associated peer UE for NR sidelink unicast reception, upon accepting the sidelink DRX configuration from the associated peer UE. A UE capable of NR sidelink communication that is in RRC\_CONNECTED and is performing sidelink unicast transmission with resource allocation mode 1 may initiate the procedure to report the sidelink DRX assistance information or the sidelink DRX configuration reject information received from the associated peer UE, upon receiving either of them from the associated peer UE. A UE capable of NR sidelink communication that is performing sidelink groupcast transmission may initiate the procedure to report the sidelink DRX on/off indication for the associated Destination Layer-2 ID.

A UE capable of NR sidelink operation that is in RRC\_CONNECTED may initiate the procedure to report the Destination Layer-2 ID and QoS profile associated with its interested services that sidelink DRX is applied, for NR sidelink groupcast or broadcast reception.

Upon initiating this procedure, the UE shall:

1> if *SIB12* including *sl-ConfigCommonNR* is provided by the PCell:

2> ensure having a valid version of *SIB12* for the PCell;

2> if configured by upper layers to receive NR sidelink communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedFreqList*; or if the frequency configured by upper layers to receive NR sidelink communication on has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink communication reception frequency of interest in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedFreqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in NR sidelink communication reception in accordance with 5.8.3.3;

2> if configured by upper layers to transmit non-relay NR sidelink communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqList*; or if the information carried by the *sl-TxResourceReqList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink communication transmission resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink communication transmission resources in accordance with 5.8.3.3.

2> if configured by upper layer to receive NR sidelink non-relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-NonRelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-NonRelayDiscovery*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedFreqListDisc*; or if the frequency configured by upper layers to receive NR sidelink discovery messages on has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink discovery reception frequency of interest in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedFreqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in NR sidelink discovery messages reception in accordance with 5.8.3.3;

2> if configured by upper layer to receive NR sidelink L2 U2N relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2U2N-Relay*; or if configured by upper layer to receive NR sidelink L3 U2N relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3U2N-RelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-L2U2N-Relay* in case of L2 U2N relay operation or connected to a PCell providing *SIB12* but not including *sl-L3U2N-RelayDiscovery* in case of L3 U2N relay operation; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedFreqListDisc*; or if the frequency configured by upper layers to receive NR sidelink discovery messages on has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> if the UE is capable of U2N Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommon*, and if the U2N Relay UE threshold conditions as specified in 5.8.14.2 are met; or

4> if the UE is selecting a U2N Relay UE / has a selected U2N Relay UE, and if *SIB12* includes *sl-RemoteUE-ConfigCommon*, and if the U2N Remote UE threshold conditions as specified in 5.8.15.2 are met:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink discovery reception frequency of interest in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedFreqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in NR sidelink discovery messages reception in accordance with 5.8.3.3;

2> if configured by upper layer to transmit NR sidelink non-relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-NonRelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-NonRelayDiscovery*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqListDisc*; or if the information carried by the *sl-TxResourceReqListDisc* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink non-relay discovery messages resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink non-relay discovery messages resources in accordance with 5.8.3.3;

2> if configured by upper layer to transmit NR sidelink L2 U2N relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2U2N-Relay*; or if configured by upper layer to transmit NR sidelink L3 U2N relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3U2N-RelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-L2U2N-Relay* in case L2 U2N relay operation or connected to a PCell providing *SIB12* but not including *sl-L3U2N-RelayDiscovery* in case of L3 U2N relay operation; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqListDisc*; or if the information carried by the *sl-TxResourceReqListDisc* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> if the UE is capable of U2N Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommon*, and if the U2N Relay UE threshold conditions as specified in 5.8.14.2 are met; or

4> if the UE is selecting a U2N Relay UE / has a selected U2N Relay UE, and if *SIB12* includes *sl-RemoteUE-ConfigCommon*, and if the U2N Remote UE threshold conditions as specified in 5.8.15.2 are met:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink relay discovery messages resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink relay discovery messages resources in accordance with 5.8.3.3;

2> if configured by upper layer to transmit NR sidelink L2 U2N relay communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2U2N-Relay* or if configured by upper layer to transmit NR sidelink L3 U2N relay communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3U2N-RelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-L2U2N-Relay* in case L2 U2N relay operation or connected to a PCell providing *SIB12* but not including *sl-L3U2N-RelayDiscovery* in case of L3 U2N relay operation; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqL2U2N-Relay*; or if the information carried by the *sl-TxResourceReqL2U2N-Relay* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> if the UE is capable of U2N Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommon*, and if the U2N Relay UE threshold conditions as specified in 5.8.14.2 are met; or

4> if the UE is selecting a U2N Relay UE / has a selected U2N Relay UE, and if *SIB12* includes *sl-RemoteUE-ConfigCommon*, and if the U2N Remote UE threshold conditions as specified in 5.8.15.2 are met:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink relay discovery messages resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink relay discovery messages resources in accordance with 5.8.3.3;

2> if configured by upper layers to perform NR sidelink reception on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell and if *sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs*:

3> if the UE received a sidelink DRX configuration in the *RRCReconfigurationSidelink* message for NR sidelink unicast reception from the associated peer UE and the UE accepted the sidelink DRX configuration:

4> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

4> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-DRX-ConfigCommonGC-BC*; or

4> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxDRX-ReportList*; or if the information carried by *sl-RxDRX-ReportList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

5> initiate transmission of the *SidelinkUEInformationNR* message to report the sidelink DRX configuration in accordance with 5.8.3.3;

3> else:

4> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxDRX-ReportList*:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the sidelink DRX configuration is no longer used in accordance with 5.8.3.3;

3> if the UE is performing NR sidelink groupcast or broadcast reception and is interested in a service that sidelink DRX is applied:

4> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

4> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-DRX-ConfigCommonGC-BC*; or

4> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedGC-BC-DestList*; or if the information carried by *sl-RxInterestedGC-BC-DestList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

5> initiate transmission of the *SidelinkUEInformationNR* message to report the Destination Layer-2 ID and QoS profile associated with the service in accordance with 5.8.3.3;

3> else:

4> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedGC-BC-DestList*:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in the service that sidelink DRX is applied in accordance with 5.8.3.3;

2> if configured by upper layers to perform NR sidelink transmission on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell and *if sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs* andif the UE is configured with *sl-ScheduledConfig*:

3> if the UE received a sidelink DRX assistance information or a sidelink DRX configuration reject information from the associated peer UE for NR sidelink unicast transmission:

4> initiate transmission of the *SidelinkUEInformationNR* message to report the sidelink DRX assistance information or the sidelink DRX configuration reject information in accordance with 5.8.3.3;

3> if the UE is performing NR sidelink groupcast transmission:

4> initiate transmission of the *SidelinkUEInformationNR* message to report sidelink DRX on/off indication for the corresponding destination in accordance with 5.8.3.3;

#### 5.8.3.3 Actions related to transmission of *SidelinkUEInformationNR* message

The UE shall set the contents of the *SidelinkUEInformationNR* message as follows:

1> if the UE initiates the procedure to indicate it is (no more) interested to receive NR sidelink communication or to request (configuration/ release) of NR sidelink communication transmission resources or to report to the network that a sidelink radio link failure or sidelink RRC reconfiguration failure has been declared or to report to the network the sidelink DRX configuration for NR sidelink unicast reception or to report to the network the sidelink DRX assistance information or the sidelink DRX configuration reject information for NR sidelink unicast transmission or to report to the network the Destination Layer-2 ID and QoS profile associated with its interested services that sidelink DRX is applied for NR sidelink groupcast or broadcast reception or to report to the network the Destination Layer-2 ID and the sidelink DRX on/off indication for the corresponding destination for NR sidelink groupcast transmission or to indicate it is (no more) interested to receive NR sidelink discovery messages or to request (configuration/ release) of NR sidelink discovery messages transmission resources or to request (configuration/ release) of NR sidelink U2N relay communication transmission resources (i.e. UE includes all concerned information, irrespective of what triggered the procedure):

2> if *SIB12* including *sl-ConfigCommonNR* is provided by the PCell:

3> if configured by upper layers to receive NR sidelink communication:

4> include *sl-RxInterestedFreqList* and set it to the frequency for NR sidelink communication reception;

3> if configured by upper layers to transmit non-relay NR sidelink communication:

4> include *sl-TxResourceReqList* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink communication resource:

5> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink communication transmission;

5> set *sl-CastType* to the cast type of the associated destination identity configured by the upper layer for the NR sidelink communication transmission;

5> set *sl-RLC-ModeIndication* to include the RLC mode(s) and optionally QoS profile(s) of the sidelink QoS flow(s) of the associated RLC mode(s), if the associated bi-directional sidelink DRB has been established due to the configurationby *RRCReconfigurationSidelink*;

5> set *sl-QoS-InfoList* to include QoS profile(s) of the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink communication transmission;

5> set *sl-InterestedFreqList* to indicate the frequency of the associated destination for NR sidelink communication transmission;

5> set *sl-TypeTxSyncList* to the current synchronization reference type used on the associated *sl-InterestedFreqList* for NR sidelink communication transmission.

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from the associated peer UE.

4> if a sidelink radio link failure or a sidelink RRC reconfiguration failure has been declared, according to clauses 5.8.9.3 and 5.8.9.1.8, respectively;

5> include *sl-FailureList* and set its fields as follows for each destination for which it reports the NR sidelink communication failure:

6> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink communication transmission;

6> if the sidelink RLF is detected as specified in clause 5.8.9.3:

7> set *sl-Failure* as *rlf* for the associated destination for the NR sidelink communication transmission;

6> else if *RRCReconfigurationFailureSidelink* is received:

7> set *sl-Failure* as *configFailure* for the associated destination for the NR sidelink communication transmission;

3> if *SIB12* including *sl-NonRelayDiscovery* and if configured by upper layers to receive NR sidelink non-relay discovery messages, or if *SIB12* including *sl-L2U2N-Relay* and if configured by upper layers to receive NR sidelink L2 U2N relay discovery messages, or if *SIB12* including *sl-L3U2N-RelayDiscovery* and if configured by upper layers to receive NR sidelink L3 U2N relay discovery messages:

4> include *sl-RxInterestedFreqListDisc* and set it to the frequency for NR sidelink discovery messages reception;

4> if the UE is capable of L2 U2N remote UE:

5> include *sl-SourceIdentityRemoteUE* and set it to the source identity configured by upper layer for NR sidelink L2 U2N relay communication transmission;

3> if *SIB12* including *sl-NonRelayDiscovery* and if configured by upper layers to transmit NR sidelink non-relay discovery messages, or if *SIB12* including *sl-L2U2N-Relay* and if configured by upper layers to transmit NR sidelink L2 U2N relay discovery messages, or if *SIB12* including *sl-L3U2N-RelayDiscovery* and if configured by upper layers to transmit NR sidelink L3 U2N relay discovery messages:

4> include *sl-TxResourceReqListDisc* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink discovery messages resource:

5> set *sl-DestinationIdentityDisc* to the destination identity configured by upper layer for NR sidelink discoverymessages transmission;

5> if the UE is acting as L2 U2N Relay UE:

6> set *sl-SourceIdentityRelayUE* to the source identity configured by upper layer for NR sidelink L2 U2N relay discovery messages transmission;

5> set *sl-CastTypeDisc* to the cast type of the associated destination identity configured by the upper layer for the NR sidelink discovery messages transmission;

5> set *sl-TxInterestedFreqListDisc* to indicate the frequency of the associated destination for NR sidelink discovery messages transmission;

5> set *sl-TypeTxSyncListDisc* to the current synchronization reference type used on the associated *sl-InterestedFreqList* for NR sidelink discovery messages transmission;

5> set *sl-DiscoveryType* to the current discovery type of the associated destination identity configured by the upper layer for NR sidelink discovery messages transmission;

3> if *SIB12* including *sl-L2U2N-Relay* and if configured by upper layers to transmit NR sidelink L2 U2N relay communication and the UE is acting as L2 U2N Relay UE:

4> include *sl-TxResourceReqL2U2N-Relay* in *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink L2 U2N relay communication resource:

5> set *sl-DestinationIdentityL2U2N* to the destination identity configured by upper layer for NR sidelink L2 U2N relay communication transmission;

5> set *sl-TxInterestedFreqListL2U2N* to indicate the frequency of the associated destination for NR sidelink L2 U2N relay communication transmission;

5> set *sl-TypeTxSyncListL2U2N* to the current synchronization reference type used on the associated *sl-InterestedFreqListL2U2N* for NR sidelink L2 U2N relay communication transmission;

5> set *sl-LocalID-Request* to request local ID for L2 U2N Remote UE;

5> set *sl-PagingIdentityRemoteUE* to the paging UE ID received from peer L2 U2N Remote UE;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from peer UE.

4> include *ue-Type* and set it to *relayUE*;

3> if *SIB12* including *sl-L2U2N-Relay* and if configured by upper layers to transmit NR sidelink L2 U2N relay communication and the UE has a selected L2 U2N Relay UE:

4> include *sl-TxResourceReqL2U2N-Relay* in *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows to request network to assign NR sidelink L2 U2N relay communication resource:

5> set *sl-TxInterestedFreqListL2U2N* to indicate the frequency of the associated destination for NR sidelink L2 U2N relay communication transmission;

5> set *sl-TypeTxSyncListL2U2N* to the current synchronization reference type used on the associated *sl-InterestedFreqListL2U2N* for NR sidelink L2 U2N relay communication transmission;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from peer UE.

4> include *ue-Type* and set it to *remoteUE*;

3> if *SIB12* including *sl-L3U2N-RelayDiscovery* and if configured by upper layers to transmit NR sidelink L3 U2N relay communication:

4> include *sl-TxResourceReqL3U2N-Relay* in *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink L3 U2N relay communication resource:

5> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink L3 U2N relay communication transmission;

5> set *sl-CastType* to the cast type of the associated destination identity configured by the upper layer for the NR sidelink L3 U2N relay communication transmission;

5> set *sl-RLC-ModeIndication* to include the RLC mode(s) and optionally QoS profile(s) of the sidelink QoS flow(s) of the associated RLC mode(s), if the associated bi-directional sidelink DRB has been established due to the configurationby *RRCReconfigurationSidelink*;

5> set *sl-QoS-InfoList* to include QoS profile(s) of the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink L3 U2N relay communication transmission;

5> set *sl-TxInterestedFreqList* to indicate the frequency of the associated destination for NR sidelink L3 U2N relay communication transmission;

5> set *sl-TypeTxSyncList* to the current synchronization reference type used on the associated *sl-InterestedFreqList* for NR sidelink L3 U2N relay communication transmission.

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from peer UE.

4> include *ue-Type* and set it to *relayUE* if the UE is acting as NR sidelink L3 U2N Relay UE or to *remoteUE* otherwise;

3> if *sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs*:

4> if configured by upper layers to perform NR sidelink reception:

5> include *sl-RxDRX-ReportList* and set its fields (if needed) as follows for each destination for which it reports to network:

6> set *sl-DRX-ConfigFromTx* to include the accepted sidelink DRX configuration of the associated destination for NR sidelink unicast communication, if received from the associated peer UE;

5> include *sl-RxInterestedGC-BC-DestList* and set its fields (if needed) as follows for each Destination Layer-2 ID for which it reports to network:

6> set *sl-RxInterestedQoS-InfoList* to include the QoS profile of its interested service(s) that sidelink DRX is applied for the associated destination for NR sidelink groupcast or broadcast reception;

6> set *sl-DestinationIdentity* to the associated destination identity configured by upper layer for NR sidelink groupcast or broadcast reception;

4> if configured by upper layers to perform NR sidelink transmission and configured with *sl-ScheduledConfig*:

5> include *sl-TxResourceReqList* and/or *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows for each destination for which it reports to network:

6> set *sl-DRX-InfoFromRxList* to include the sidelink DRX assistance information of the associated destination, if any, received from the associated peer UE;

6> if the *RRCReconfigurationCompleteSidelink* message includes the *sl-DRX-ConfigReject*:

7> set *sl-Failure* as *drxReject-v1710* for the associated destination for the NR sidelink communication transmission;

6> set *sl-DRX-Indication* to include the sidelink DRX on/off indication for the associated destination for NR sidelink groupcast transmission;

1> if the UE initiates the procedure while connected to an E-UTRA PCell:

2> submit the *SidelinkUEInformationNR* to lower layers via SRB1, embedded in E-UTRA RRC message *ULInformationTransferIRAT* as specified in TS 36.331 [10], clause 5.6.28;

1> else:

2> submit the *SidelinkUEInformationNR* message to lower layers for transmission.

### 5.8.4 Void

## <<<<Unchanged parts skipped>>>>

### 5.8.9 Sidelink RRC procedure

#### 5.8.9.1 Sidelink RRC reconfiguration

##### 5.8.9.1.1 General



Figure 5.8.9.1.1-1: Sidelink RRC reconfiguration, successful



Figure 5.8.9.1.1-2: Sidelink RRC reconfiguration, failure

The purpose of this procedure is to modify a PC5-RRC connection, e.g. to establish/modify/release sidelink DRBs or PC5 Relay RLC channels, to (re-)configure NR sidelink measurement and reporting, to (re-)configure sidelink CSI reference signal resources, to (re)configure CSI reporting latency bound, to (re)configure sidelink DRX, and to (re-)configure the latency bound of SL Inter-UE coordination report.

The UE may initiate the sidelink RRC reconfiguration procedure and perform the operation in clause 5.8.9.1.2 on the corresponding PC5-RRC connection in following cases:

- the release of sidelink DRBs associated with the peer UE, as specified in clause 5.8.9.1a.1;

- the establishment of sidelink DRBs associated with the peer UE, as specified in clause 5.8.9.1a.2;

- the modification for the parameters included in *SLRB-Config* of sidelink DRBs associated with the peer UE, as specified in clause 5.8.9.1a.2;

- the release of PC5 Relay RLC channels for L2 U2N Relay UE and Remote UE, as specified in clause 5.8.9.7.1;

- the establishment of PC5 Relay RLC channels for L2 U2N Relay UE and Remote UE, as specified in clause 5.8.9.7.2;

- the modification for the parameters included in *SL-RLC-ChannelConfigPC5* of PC5 Relay RLC channels for L2 U2N Relay UE and Remote UE, as specified in clause 5.8.9.7.2;

- the (re-)configuration of the peer UE to perform NR sidelink measurement and report.

- the (re-)configuration of the sidelink CSI reference signal resources and CSI reporting latency bound;

- the (re-)configuration of the peer UE to perform sidelink DRX;

- the (re-)configuration of the latency bound of SL Inter-UE coordination report.

In RRC\_CONNECTED, the UE applies the NR sidelink communications parameters provided in *RRCReconfiguration* (if any). In RRC\_IDLE or RRC\_INACTIVE, the UE applies the NR sidelink communications parameters provided in system information (if any). For other cases, UEs apply the NR sidelink communications parameters provided in *SidelinkPreconfigNR* (if any). When UE performs state transition between above three cases, the UE applies the NR sidelink communications parameters provided in the new state, after acquisition of the new configurations. Before acquisition of the new configurations, UE continues applying the NR sidelink communications parameters provided in the old state.

##### 5.8.9.1.2 Actions related to transmission of *RRCReconfigurationSidelink* message

The UE shall set the contents of *RRCReconfigurationSidelink* message as follows:

1> for each sidelink DRB that is to be released, according to clause 5.8.9.1a.1.1, due to configuration by *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR* or by upper layers:

2> set the *SLRB-PC5-ConfigIndex* included in the *slrb-ConfigToReleaseList* corresponding to the sidelink DRB;

1> for each sidelink DRB that is to be established or modified, according to clause 5.8.9.1a.2.1, due to receiving *sl-ConfigDedicatedNR,* *SIB12* or *SidelinkPreconfigNR*:

2> set the *SLRB-Config* included in the *slrb-ConfigToAddModList*, according to the received *sl-RadioBearerConfig* and *sl-RLC-BearerConfig* corresponding to the sidelink DRB;

1> set the *sl-MeasConfig* as follows:

2> If the frequency used for NR sidelink communication is included in *sl-FreqInfoToAddModList* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or included in *sl-ConfigCommonNR* within SIB12:

3> if UE is in RRC\_CONNECTED:

4> set the *sl-MeasConfig* according to stored NR sidelink measurement configuration information for this destination;

3> if UE is in RRC\_IDLE or RRC\_INACTIVE:

4> set the *sl-MeasConfig* according to stored NR sidelink measurement configuration received from *SIB12*;

2> else:

3> set the *sl-MeasConfig* according to the *sl-MeasPreconfig* in *SidelinkPreconfigNR*;

1> set the *sl-LatencyBoundIUC-Report;*

1> start timer T400 for the destination;

1> set the *sl-CSI-RS-Config*;

1> set the *sl-LatencyBoundCSI-Report*;

NOTE 1: How to set the parameters included in *sl-CSI-RS-Config* and *sl-LatencyBoundCSI-Report* is up to UE implementation.

1> set the *sl-DRX-ConfigUC-PC5* as follows:

2> If the frequency used for NR sidelink communication is included in *sl-FreqInfoToAddModList* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or included in *sl-ConfigCommonNR* within *SIB12*:

3> if UE is in RRC\_CONNECTED and if *sl-ScheduledConfig* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

4> set the *sl-DRX-ConfigUC-PC5* according to stored NR sidelink DRX configuration information for this destination.

NOTE 2: If UE is in RRC\_IDLE or in RRC\_INACTIVE or out of coverage, or in RRC\_CONNECTED and *sl-UE-SelectedConfig* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*, it is up to UE implementation to set the *sl-DRX-ConfigUC-PC5*.

1> for each PC5 Relay RLC channel that is to be released due to configuration by *sl-ConfigDedicatedNR*:

2> set the *SL-RLC-ChannelID* corresponding to the PC5 Relay RLC channel in the *sl-RLC-ChannelToReleaseListPC5*;

1> for each PC5 Relay RLC channel that is to be established or modified due to receiving *sl-ConfigDedicatedNR*:

2> set the *SL-RLC-ChannelConfigPC5* included in the *sl-RLC-ChannelToAddModListPC5*, according to the received *sl-RLC-ChannelConfig* corresponding to the PC5 Relay RLC channel;

The UE shall submit the *RRCReconfigurationSidelink* message to lower layers for transmission.

##### 5.8.9.1.3 Reception of an *RRCReconfigurationSidelink* by the UE

The UE shall perform the following actions upon reception of the *RRCReconfigurationSidelink*:

1> if the *RRCReconfigurationSidelink* includes the *sl-ResetConfig*:

2> perform the sidelink reset configuration procedure as specified in 5.8.9.1.10;

1> if the *RRCReconfigurationSidelink* includes the *slrb-ConfigToReleaseList*:

2> for each *SLRB-PC5-ConfigIndex* value included in the *slrb-ConfigToReleaseList* that is part of the current UE sidelink configuration;

3> perform the sidelink DRB release procedure, according to clause 5.8.9.1a.1;

1> if the *RRCReconfigurationSidelink* includes the *slrb-ConfigToAddModList*:

2> for each *slrb-PC5-ConfigIndex* value included in the *slrb-ConfigToAddModList* that is not part of the current UE sidelink configuration:

3> if *sl-MappedQoS-FlowsToAddList* is included:

4> apply the *SL-PQFI* included in *sl-MappedQoS-FlowsToAddList*;

3> perform the sidelink DRB addition procedure, according to clause 5.8.9.1a.2;

2> for each *slrb-PC5-ConfigIndex* value included in the *slrb-ConfigToAddModList* that is part of the current UE sidelink configuration:

3> if *sl-MappedQoS-FlowsToAddList* is included:

4> add the *SL-PQFI* included in *sl-MappedQoS-FlowsToAddList* to the corresponding sidelink DRB;

3> if *sl-MappedQoS-FlowsToReleaseList* is included:

4> remove the *SL-PQFI* included in *sl-MappedQoS-FlowsToReleaseList* from the corresponding sidelink DRB;

3> if the sidelink DRB release conditions as described in clause 5.8.9.1a.1.1 are met:

4> perform the sidelink DRB release procedure according to clause 5.8.9.1a.1.2;

3> else if the sidelink DRB modification conditions as described in clause 5.8.9.1a.2.1 are met:

4> perform the sidelink DRB modification procedure according to clause 5.8.9.1a.2.2;

1> if the *RRCReconfigurationSidelink* message includes the *sl-MeasConfig*:

2> perform the sidelink measurement configuration procedure as specified in 5.8.10;

1> if the *RRCReconfigurationSidelink* message includes the *sl-CSI-RS-Config*:

2> apply the sidelink CSI-RS configuration;

1> if the *RRCReconfigurationSidelink* message includes the *sl-LatencyBoundCSI-Report*:

2> apply the configured sidelink CSI report latency bound;

1> if the *RRCReconfigurationSidelink* includes the *sl-RLC-ChannelToReleaseListPC5*:

2> for each *SL-RLC-ChannelID* value included in the *sl-RLC-ChannelToReleaseListPC5* that is part of the current UE sidelink configuration;

3> perform the PC5 Relay RLC channel release procedure, according to clause 5.8.9.7.1;

1> if the *RRCReconfigurationSidelink* includes the *sl-RLC-ChannelToAddModListPC5*:

2> for each *sl-RLC-ChannelID-PC5* value included in the *sl-RLC-ChannelToAddModListPC5* that is not part of the current UE sidelink configuration:

3> perform the sidelink RLC channel addition procedure, according to clause 5.8.9.7.2;

2> for each *sl-RLC-ChannelID-PC5* value included in the *sl-RLC-ChannelToAddModListPC5* that is part of the current UE sidelink configuration:

3> perform the PC5 Relay RLC channel modification procedure according to clause 5.8.9.7.2;

1> if the *RRCReconfigurationSidelink* message includes the *sl-DRX-ConfigUC-PC5*, and

1> if the UE accepts the *sl-DRX-ConfigUC-PC5*:

2> configure lower layers to perform sidelink DRX operation according to *sl-DRX-ConfigUC-PC5* for the associated destination as defined in TS 38.321 [3];

1> if the *RRCReconfigurationSidelink* message includes the *sl-LatencyBoundIUC-Report*:

2> apply the configured sidelink IUC report latency bound;

1> if the UE is unable to comply with (part of) the configuration included in the *RRCReconfigurationSidelink* (i.e. sidelink RRC reconfiguration failure):

2> continue using the configuration used prior to the reception of the *RRCReconfigurationSidelink* message;

2> set the content of the *RRCReconfigurationFailureSidelink* message;

3> submit the *RRCReconfigurationFailureSidelink* message to lower layers for transmission;

1> else:

2> set the content of the *RRCReconfigurationCompleteSidelink* message;

3> if the UE rejects the sidelink DRX configuration *sl-DRX-ConfigUC-PC5* received from the peer UE:

4> include the *sl-DRX-ConfigReject* in the *RRCReconfigurationCompleteSidelink* message;

4> consider no sidelink DRX to be applied for the corresponding sidelink unicast communication.

3> submit the *RRCReconfigurationCompleteSidelink* message to lower layers for transmission;

NOTE 1: When the same logical channel is configured with different RLC mode by another UE, the UE handles the case as sidelink RRC reconfiguration failure.

NOTE 2: It is up to the UE whether or not to indicate the rejection to the peer UE for a received sidelink DRX configuration.

##### 5.8.9.1.4 Void

##### 5.8.9.1.5 Void

##### 5.8.9.1.6 Void

##### 5.8.9.1.7 Void

##### 5.8.9.1.8 Reception of an *RRCReconfigurationFailureSidelink* by the UE

The UE shall perform the following actions upon reception of the *RRCReconfigurationFailureSidelink*:

1> stop timer T400 for the destination, if running;

1> continue using the configuration used prior to corresponding *RRCReconfigurationSidelink* message;

1> if UE is in RRC\_CONNECTED:

2> perform the sidelink UE information for NR sidelink communication procedure, as specified in 5.8.3.3 or clause 5.10.15 in TS 36.331 [10];

##### 5.8.9.1.9 Reception of an *RRCReconfigurationCompleteSidelink* by the UE

The UE shall perform the following actions upon reception of the *RRCReconfigurationCompleteSidelink*:

1> stop timer T400 for the destination, if running;

1> consider the configurations in the corresponding *RRCReconfigurationSidelink* message to be applied.

2> if the *RRCReconfigurationCompleteSidelink* message includes the *sl-DRX-ConfigReject:*

3> consider no sidelink DRX to be applied for the corresponding sidelink unicast communication.

5.8.9.1.10 Sidelink reset configuration

The UE shall:

1> release/clear current sidelink radio configuration of this destination received in the *RRCReconfigurationSidelink*;

1> release the sidelink DRBs of this destination, in according to clause 5.8.9.1a.1;

1> reset the sidelink specific MAC of this destination.

NOTE 1: Sidelink radio configuration is not just the resource configuration but may include other configurations included in the *RRCReconfigurationSidelink* message except the sidelink DRBs of this destination.

NOTE 2: After the sidelink DRB release procedure, UE may perform the sidelink DRB addition according to the current sidelink configuration of this destination, received in *sl-ConfigDedicatedNR,* *SIB12* and *SidelinkPreconfigNR*, according to clause 5.8.9.1a.2.

#### 5.8.9.1a Sidelink radio bearer management

##### 5.8.9.1a.1 Sidelink DRB release

5.8.9.1a.1.1 Sidelink DRB release conditions

For NR sidelink communication, a sidelink DRB release is initiated in the following cases:

1> for groupcast, broadcast and unicast, if *slrb-Uu-ConfigIndex* (if any) of the sidelink DRB isincluded in *sl-RadioBearerToReleaseList* in *sl-ConfigDedicatedNR*; or

1> for groupcast and broadcast, if no sidelink QoS flow with data indicated by upper layers is mapped to the sidelink DRB for transmission, which is (re)configured by receiving *SIB1*2 or *SidelinkPreconfigNR*; or

1> for groupcast, broadcast and unicast, if *SL-RLC-BearerConfigIndex* (if any) of the sidelink DRB is included in *sl-RLC-BearerToReleaseList* in *sl-ConfigDedicatedNR*; or

1> for unicast, if no sidelink QoS flow with data indicated by upper layers is mapped to the sidelink DRB for transmission, which is (re)configured by receiving *SIB12* or *SidelinkPreconfigNR*, and if no sidelink QoS flow mapped to the sidelink DRB, which is (re)configured by receiving *RRCReconfigurationSidelink*, has data; or

1> for unicast, if *SLRB-PC5-ConfigIndex* (if any) of the sidelink DRB isincluded in *slrb-ConfigToReleaseList* in *RRCReconfigurationSidelink* or if *sl-ResetConfig* is included in *RRCReconfigurationSidelink*; or

1> for unicast, when the corresponding PC5-RRC connection is released due to sidelink RLF being detected, according to clause 5.8.9.3; or

1> for unicast, when the corresponding PC5-RRC connection is released due to upper layer request according to clause 5.8.9.5.

5.8.9.1a.1.2 Sidelink DRB release operations

For each sidelink DRB, whose sidelink DRB release conditions are met as in clause 5.8.9.1a.1.1, the UE capable of NR sidelink communication that is configured by upper layers to perform NR sidelink communication shall:

1> for groupcast and broadcast; or

1> for unicast, if the sidelink DRB release was triggered after the reception of the *RRCReconfigurationSidelink* message; or

1> for unicast, after receiving the *RRCReconfigurationCompleteSidelink* message, if the sidelink DRB release was triggered due to the configuration received within the *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR* or indicated by upper layers:

2> release the PDCP entity for NR sidelink communication associated with the sidelink DRB;

2> if SDAP entity for NR sidelink communication associated with this sidelink DRB is configured:

3> indicate the release of the sidelink DRB to the SDAP entity associated with this sidelink DRB (TS 37.324 [24], clause 5.3.3);

2> release SDAP entities for NR sidelink communication, if any, that have no associated sidelink DRB as specified in TS 37.324 [24] clause 5.1.2;

1> for groupcast and broadcast; or

1> for unicast, after receiving the *RRCReconfigurationCompleteSidelink* message, if the sidelink DRB release was triggered due to the configuration received within the *sl-ConfigDedicatedNR*:

2> for each *sl-RLC-BearerConfigIndex* included in the received *sl-RLC-BearerToReleaseList* that is part of the current UE sidelink configuration:

3> release the RLC entity and the corresponding logical channel for NR sidelink communication, associated with the *sl-RLC-BearerConfigIndex*.

1> for unicast, if the sidelink DRB release was triggered due to the reception of the *RRCReconfigurationSidelink* message; or

1> for unicast, after receiving the *RRCReconfigurationCompleteSidelink* message, if the sidelink DRB release was triggered due to the configuration received within the *SIB12*, *SidelinkPreconfigNR* or indicated by upper layers:

2> release the RLC entity and the corresponding logical channel for NR sidelink communication associated with the sidelink DRB;

2> perform the sidelink UE information procedure in clause 5.8.3 for unicast if needed.

1> if the sidelink radio link failure is detected for a specific destination:

2> release the PDCP entity, RLC entity and the logical channel of the sidelink DRB for the specific destination.

##### 5.8.9.1a.2 Sidelink DRB addition/modification

5.8.9.1a.2.1 Sidelink DRB addition/modification conditions

For NR sidelink communication, a sidelink DRB addition is initiated only in the following cases:

1> if any sidelink QoS flow is (re)configured by *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR* and is to be mapped to one sidelink DRB*,* which is not established; or

1> if any sidelink QoS flow is (re)configured by *RRCReconfigurationSidelink* and isto be mapped to a sidelink DRB, which is not established;

For NR sidelink communication, a sidelink DRB modification is initiated only in the following cases:

1> if any of the sidelink DRB related parameters is changed by *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR* or *RRCReconfigurationSidelink* for one sidelink DRB*,* which is established;

5.8.9.1a.2.2 Sidelink DRB addition/modification operations

For the sidelink DRB, whose sidelink DRB addition conditions are met as in clause 5.8.9.1a.2.1, the UE capable of NR sidelink communication that is configured by upper layers to perform NR sidelink communication shall:

1> for groupcast and broadcast; or

1> for unicast, if the sidelink DRB addition was trigggered due to the reception of the *RRCReconfigurationSidelink* message; or

1> for unicast, after receiving the *RRCReconfigurationCompleteSidelink* message, if the sidelink DRB addition was triggered due to the configuration received within the *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR* or indicated by upper layers:

2> if an SDAP entity for NR sidelink communication associated with the destination and the cast type of the sidelink DRB does not exist:

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

2> (re)configure the SDAP entity in accordance with the *sl-SDAP-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-SDAP-Config* received in *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR*, associated with the sidelink DRB;

2> establish a PDCP entity for NR sidelink communication and configure it in accordance with the *sl-PDCP-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-PDCP-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, associated with the sidelink DRB;

2> establish a RLC entity for NR sidelink communication and configure it in accordance with the *sl-RLC-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-RLC-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, associated with sidelink DRB;

2> if this procedure was due to the reception of a *RRCReconfigurationSidelink* message:

3> configure the MAC entity with a logical channel in accordance with the *sl-MAC-LogicalChannelConfigPC5* received in the *RRCReconfigurationSidelink* associated with the sidelink DRB, and perform the sidelink UE information procedure in clause 5.8.3 for unicast if need;

2> else:

3> configure the MAC entity with a logical channel associated with the sidelink DRB, by assigning a new logical channel identity, in accordance with the *sl-MAC-LogicalChannelConfig* received in the *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR*.

NOTE 1: When a sidelink DRB addition is due to the configurationby *RRCReconfigurationSidelink*, it is up to UE implementation to select the sidelink DRB configuration as necessary transmitting parameters for the sidelink DRB, from the received *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED), *SIB12* (if in RRC\_IDLE/INACTIVE), *SidelinkPreconfigNR* (if out of coverage) with the same RLC mode as the one configured in *RRCReconfigurationSidelink*.

For the sidelink DRB, whose sidelink DRB modification conditions are met as in clause 5.8.9.1a.2.1, the UE capable of NR sidelink communication that is configured by upper layers to perform NR sidelink communication shall:

1> for groupcast and broadcast; or

1> for unicast, if the sidelink DRB modification was triggered due to the reception of the *RRCReconfigurationSidelink* message; or

1> for unicast, after receiving the *RRCReconfigurationCompleteSidelink* message, if the sidelink DRB modification was triggered due to the configuration received within the *sl-ConfigDedicatedNR,* *SIB12* or *SidelinkPreconfigNR*:

2> reconfigure the SDAP entity of the sidelink DRB, in accordance with the *sl-SDAP-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-SDAP-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, if included;

2> reconfigure the PDCP entity of the sidelink DRB, in accordance with the *sl-PDCP-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-PDCP-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, if included;

2> reconfigure the RLC entity of the sidelink DRB, in accordance with the *sl-RLC-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-RLC-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, if included;

2> reconfigure the logical channel of the sidelink DRB, in accordance with the *sl-MAC-LogicalChannelConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-MAC-LogicalChannelConfig* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, if included.

##### 5.8.9.1a.3 Sidelink SRB release

The UE shall:

1> if a PC5-RRC connection release for a specific destination is requested by upper layers or AS layer; or

1> if the sidelink radio link failure is detected for a specific destination:

2> release the PDCP entity, RLC entity and the logical channel of the sidelink SRB for PC5-RRC message of the specific destination;

2> consider the PC5-RRC connection is released for the destination.

1> if PC5-S transmission for a specific destination is terminated in upper layers:

2> release the PDCP entity, RLC entity and the logical channel of the sidelink SRB(s) for PC5-S message of the specific destination;

1> if discovery transmission for a specific destination is terminated in upper layers:

2> release the PDCP entity, RLC entity and the logical channel of the sidelink SRB4 for discovery message of the specific destination;

##### 5.8.9.1a.4 Sidelink SRB addition

The UE shall:

1> if transmission of PC5-S message for a specific destination is requested by upper layers for sidelink SRB:

2> establish PDCP entity, RLC entity and the logical channel of a sidelink SRB for PC5-S message, as specified in clause 9.1.1.4;

1> if transmission of discovery message for a specific destination is requested by upper layers for sidelink SRB:

2> establish PDCP entity, RLC entity and the logical channel of a sidelink SRB4 for discovery message, as specified in clause 9.1.1.4;

1> if a PC5-RRC connection establishment for a specific destination is indicated by upper layers:

2> establish PDCP entity, RLC entity and the logical channel of a sidelink SRB for PC5-RRC message of the specific destination, as specified in clause 9.1.1.4;

2> consider the PC5-RRC connection is established for the destination.

## <<<<Unchanged parts skipped>>>>

### 6.2.2 Message definitions

#### – *CounterCheck*

The *CounterCheck* message is used by the network to indicate the current COUNT MSB values associated to each DRB and to request the UE to compare these to its COUNT MSB values and to report the comparison results to the network.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*CounterCheck message*

-- ASN1START

-- TAG-COUNTERCHECK-START

CounterCheck ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

counterCheck CounterCheck-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

CounterCheck-IEs ::= SEQUENCE {

drb-CountMSB-InfoList DRB-CountMSB-InfoList,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

DRB-CountMSB-InfoList ::= SEQUENCE (SIZE (1..maxDRB)) OF DRB-CountMSB-Info

DRB-CountMSB-Info ::= SEQUENCE {

drb-Identity DRB-Identity,

countMSB-Uplink INTEGER(0..33554431),

countMSB-Downlink INTEGER(0..33554431)

}

-- TAG-COUNTERCHECK-STOP

-- ASN1STOP

|  |
| --- |
| *CounterCheck-IEs* field descriptions |
| ***drb-CountMSB-InfoList***  Indicates the MSBs of the COUNT values of the DRBs. |

|  |
| --- |
| *DRB-CountMSB-Info* field descriptions |
| ***countMSB-Downlink***  Indicates the value of 25 MSBs from RX\_NEXT – 1 (specified in TS 38.323 [5]) associated to this DRB. |
| ***countMSB-Uplink***  Indicates the value of 25 MSBs from TX\_NEXT – 1 (specified in TS 38.323 [5]) associated to this DRB. |

#### – *CounterCheckResponse*

The *CounterCheckResponse* message is used by the UE to respond to a *CounterCheck* message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*CounterCheckResponse message*

-- ASN1START

-- TAG-COUNTERCHECKRESPONSE-START

CounterCheckResponse ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

counterCheckResponse CounterCheckResponse-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

CounterCheckResponse-IEs ::= SEQUENCE {

drb-CountInfoList DRB-CountInfoList,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

DRB-CountInfoList ::= SEQUENCE (SIZE (0..maxDRB)) OF DRB-CountInfo

DRB-CountInfo ::= SEQUENCE {

drb-Identity DRB-Identity,

count-Uplink INTEGER(0..4294967295),

count-Downlink INTEGER(0..4294967295)

}

-- TAG-COUNTERCHECKRESPONSE-STOP

-- ASN1STOP

|  |
| --- |
| *CounterCheckResponse-IEs* field descriptions |
| ***drb-CountInfoList***  Indicates the COUNT values of the DRBs. |

|  |
| --- |
| *DRB-CountInfo* field descriptions |
| ***count-Downlink***  Indicates the value of RX\_NEXT – 1 (specified in TS 38.323 [5]) associated to this DRB. |
| ***count-Uplink***  Indicates the value of TX\_NEXT – 1 (specified in TS 38.323 [5]) associated to this DRB. |

#### – *DedicatedSIBRequest*

The *DedicatedSIBRequest* message is used to request SIB(s) required by the UE in RRC\_CONNECTED as specified in clause 5.2.2.3.5.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*DedicatedSIBRequest message*

-- ASN1START

-- TAG-DEDICATEDSIBREQUEST-START

DedicatedSIBRequest-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

dedicatedSIBRequest-r16 DedicatedSIBRequest-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

DedicatedSIBRequest-r16-IEs ::= SEQUENCE {

onDemandSIB-RequestList-r16 SEQUENCE {

requestedSIB-List-r16 SEQUENCE (SIZE (1..maxOnDemandSIB-r16)) OF SIB-ReqInfo-r16 OPTIONAL,

requestedPosSIB-List-r16 SEQUENCE (SIZE (1..maxOnDemandPosSIB-r16)) OF PosSIB-ReqInfo-r16 OPTIONAL

} OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SIB-ReqInfo-r16 ::= ENUMERATED { sib12, sib13, sib14, sib20-v1700, sib21-v1700, spare3, spare2, spare1 }

PosSIB-ReqInfo-r16 ::= SEQUENCE {

gnss-id-r16 GNSS-ID-r16 OPTIONAL,

sbas-id-r16 SBAS-ID-r16 OPTIONAL,

posSibType-r16 ENUMERATED { posSibType1-1, posSibType1-2, posSibType1-3, posSibType1-4, posSibType1-5, posSibType1-6,

posSibType1-7, posSibType1-8, posSibType2-1, posSibType2-2, posSibType2-3, posSibType2-4,

posSibType2-5, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9, posSibType2-10,

posSibType2-11, posSibType2-12, posSibType2-13, posSibType2-14, posSibType2-15,

posSibType2-16, posSibType2-17, posSibType2-18, posSibType2-19, posSibType2-20,

posSibType2-21, posSibType2-22, posSibType2-23, posSibType3-1, posSibType4-1,

posSibType5-1, posSibType6-1, posSibType6-2, posSibType6-3,..., posSibType1-9-v1710,

posSibType1-10-v1710, posSibType2-24-v1710, posSibType2-25-v1710,

posSibType6-4-v1710, posSibType6-5-v1710, posSibType6-6-v1710 }

}

-- TAG-DEDICATEDSIBREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *DedicatedSIBRequest field descriptions* |
| ***requestedSIB-List***  Contains a list of SIB(s) the UE requests while in RRC\_CONNECTED. |
| ***requestedPosSIB-List***  Contains a list of posSIB(s) the UE requests while in RRC\_CONNECTED. |

|  |
| --- |
| *PosSIB-ReqInfo* field descriptions |
| ***gnss-id***  The presence of this field indicates that the request positioning SIB type is for a specific GNSS. Indicates a specific GNSS (see also TS 37.355 [49]) |
| ***sbas-id***  The presence of this field indicates that the request positioning SIB type is for a specific SBAS. Indicates a specific SBAS (see also TS 37.355 [49]). |

#### – *DLDedicatedMessageSegment*

The *DLDedicatedMessageSegment* message is used to transfer one segment of the *RRCResume* or *RRCReconfiguration* messages.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*DLDedicatedMessageSegment message*

-- ASN1START

-- TAG-DLDEDICATEDMESSAGESEGMENT-START

DLDedicatedMessageSegment-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

dlDedicatedMessageSegment-r16 DLDedicatedMessageSegment-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

DLDedicatedMessageSegment-r16-IEs ::= SEQUENCE {

segmentNumber-r16 INTEGER(0..4),

rrc-MessageSegmentContainer-r16 OCTET STRING,

rrc-MessageSegmentType-r16 ENUMERATED {notLastSegment, lastSegment},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-DLDEDICATEDMESSAGESEGMENT-STOP

-- ASN1STOP

|  |
| --- |
| *DLDedicatedMessageSegment* field descriptions |
| ***segmentNumber***  Identifies the sequence number of a segment within the encoded DL DCCH message. The network transmits the segments with continuously increasing *segmentNumber* order so that the UE's RRC layer may expect to obtain them from lower layers in the correct order. Hence, the UE is not required to perform segment re-ordering on RRC level. |
| ***rrc-MessageSegmentContainer***  Includes a segment of the encoded DL DCCH message. The size of the included segment in this container should be small enough so the resulting encoded RRC message PDU is less than or equal to the PDCP SDU size limit. |
| ***rrc-MessageSegmentType***  Indicates whether the included DL DCCH message segment is the last segment of the message or not. |

#### – *DLInformationTransfer*

The *DLInformationTransfer* message is used for the downlink transfer of NAS dedicated information, timing information for the 5G internal system clock, or IAB-DU specific F1-C related information.

Signalling radio bearer: SRB2 or SRB1 (only if SRB2 not established yet. If SRB2 is suspended, the network does not send this message until SRB2 is resumed. If only *dedicatedInfoF1c* is included, SRB2 is used).

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*DLInformationTransfer* message

-- ASN1START

-- TAG-DLINFORMATIONTRANSFER-START

DLInformationTransfer ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

dlInformationTransfer DLInformationTransfer-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

DLInformationTransfer-IEs ::= SEQUENCE {

dedicatedNAS-Message DedicatedNAS-Message OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension DLInformationTransfer-v1610-IEs OPTIONAL

}

DLInformationTransfer-v1610-IEs ::= SEQUENCE {

referenceTimeInfo-r16 ReferenceTimeInfo-r16 OPTIONAL, -- Need N

nonCriticalExtension DLInformationTransfer-v1700-IEs OPTIONAL

}

DLInformationTransfer-v1700-IEs ::= SEQUENCE {

dedicatedInfoF1c-r17 DedicatedInfoF1c-r17 OPTIONAL, -- Need N

rxTxTimeDiff-gNB-r17 RxTxTimeDiff-r17 OPTIONAL, -- Need N

ta-PDC-r17 ENUMERATED {activate,deactivate} OPTIONAL, -- Need N

sib9Fallback-r17 ENUMERATED {true} OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-DLINFORMATIONTRANSFER-STOP

-- ASN1STOP

|  |
| --- |
| *DLInformationTransfer* field descriptions |
| ***rxTxTimeDiff-gNB***  Indicates the Rx-Tx time difference measurement at the gNB (see clause 5.2.3, TS 38.215 [9]). Upon receiving this field, the UE calculates the propagation delay based on the RTT-method. The network does not configure this field, if the UE is configured with *ta-PDC* with value *activate*. |
| ***sib9Fallback***  Indicates that the UE fallbacks to receive *referenceTimeInfo* in SIB9. |
| ***ta-PDC***  Indicates whether the UE-side TA-based propagation delay compensation (PDC) is activated or de-activated. The network does not configure this field with *activate,* if the field *rxTxTimeDiff-gNB* is configured. |

#### *– DLInformationTransferMRDC*

The *DLInformationTransferMRDC* message is used for the downlink transfer of RRC messages during fast MCG link recovery.

Signalling radio bearer: SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*DLInformationTransferMRDC message*

-- ASN1START

-- TAG-DLINFORMATIONTRANSFERMRDC-START

DLInformationTransferMRDC-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

dlInformationTransferMRDC-r16 DLInformationTransferMRDC-r16-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

DLInformationTransferMRDC-r16-IEs::= SEQUENCE {

dl-DCCH-MessageNR-r16 OCTET STRING OPTIONAL, -- Need N

dl-DCCH-MessageEUTRA-r16 OCTET STRING OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-DLINFORMATIONTRANSFERMRDC-STOP

-- ASN1STOP

| *DLInformationTransferMRDC* field descriptions |
| --- |
| ***dl-DCCH-MessageNR***  Includes the *DL-DCCH-Message*. In this version of the specification, the field is only used to transfer the NR *RRCReconfiguration,* *RRCRelease,* and *MobilityFromNRCommand* messages. |
| ***dl-DCCH-MessageEUTRA***  Includes the *DL-DCCH-Message*. In this version of the specification, the field is only used to transfer the E-UTRA *RRCConnectionReconfiguration,* *RRCConnectionRelease*, and *MobilityFromEUTRACommand* messages as specified in TS 36.331 [10]. |

#### – *FailureInformation*

The *FailureInformation* message is used to inform the network about a failure detected by the UE.

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*FailureInformation message*

-- ASN1START

-- TAG-FAILUREINFORMATION-START

FailureInformation ::= SEQUENCE {

criticalExtensions CHOICE {

failureInformation FailureInformation-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

FailureInformation-IEs ::= SEQUENCE {

failureInfoRLC-Bearer FailureInfoRLC-Bearer OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension FailureInformation-v1610-IEs OPTIONAL

}

FailureInfoRLC-Bearer ::= SEQUENCE {

cellGroupId CellGroupId,

logicalChannelIdentity LogicalChannelIdentity,

failureType ENUMERATED {rlc-failure, spare3, spare2, spare1}

}

FailureInformation-v1610-IEs ::= SEQUENCE {

failureInfoDAPS-r16 FailureInfoDAPS-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureInfoDAPS-r16 ::= SEQUENCE {

failureType-r16 ENUMERATED {daps-failure, spare3, spare2, spare1}

}

-- TAG-FAILUREINFORMATION-STOP

-- ASN1STOP

#### – *IABOtherInformation*

The *IABOtherInformation* message is used by IAB-MT to request the network to allocate IP addresses for the collocated IAB-DU or inform the network about IP addresses allocated to the collocated IAB-DU.

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: IAB-MT to Network

*IABOtherInformation* message

-- ASN1START

-- TAG-IABOTHERINFORMATION-START

IABOtherInformation-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

iabOtherInformation-r16 IABOtherInformation-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

IABOtherInformation-r16-IEs ::= SEQUENCE {

ip-InfoType-r16 CHOICE {

iab-IP-Request-r16 SEQUENCE {

iab-IPv4-AddressNumReq-r16 IAB-IP-AddressNumReq-r16 OPTIONAL,

iab-IPv6-AddressReq-r16 CHOICE {

iab-IPv6-AddressNumReq-r16 IAB-IP-AddressNumReq-r16,

iab-IPv6-AddressPrefixReq-r16 IAB-IP-AddressPrefixReq-r16,

...

} OPTIONAL

},

iab-IP-Report-r16 SEQUENCE {

iab-IPv4-AddressReport-r16 IAB-IP-AddressAndTraffic-r16 OPTIONAL,

iab-IPv6-Report-r16 CHOICE {

iab-IPv6-AddressReport-r16 IAB-IP-AddressAndTraffic-r16,

iab-IPv6-PrefixReport-r16 IAB-IP-PrefixAndTraffic-r16,

...

} OPTIONAL

},

...

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

IAB-IP-AddressNumReq-r16 ::= SEQUENCE {

all-Traffic-NumReq-r16 INTEGER (1..8) OPTIONAL,

f1-C-Traffic-NumReq-r16 INTEGER (1..8) OPTIONAL,

f1-U-Traffic-NumReq-r16 INTEGER (1..8) OPTIONAL,

non-F1-Traffic-NumReq-r16 INTEGER (1..8) OPTIONAL,

...

}

IAB-IP-AddressPrefixReq-r16 ::= SEQUENCE {

all-Traffic-PrefixReq-r16 ENUMERATED {true} OPTIONAL,

f1-C-Traffic-PrefixReq-r16 ENUMERATED {true} OPTIONAL,

f1-U-Traffic-PrefixReq-r16 ENUMERATED {true} OPTIONAL,

non-F1-Traffic-PrefixReq-r16 ENUMERATED {true} OPTIONAL,

...

}

IAB-IP-AddressAndTraffic-r16 ::= SEQUENCE {

all-Traffic-IAB-IP-Address-r16 SEQUENCE (SIZE(1..8)) OF IAB-IP-Address-r16 OPTIONAL,

f1-C-Traffic-IP-Address-r16 SEQUENCE (SIZE(1..8)) OF IAB-IP-Address-r16 OPTIONAL,

f1-U-Traffic-IP-Address-r16 SEQUENCE (SIZE(1..8)) OF IAB-IP-Address-r16 OPTIONAL,

non-F1-Traffic-IP-Address-r16 SEQUENCE (SIZE(1..8)) OF IAB-IP-Address-r16 OPTIONAL

}

IAB-IP-PrefixAndTraffic-r16 ::= SEQUENCE {

all-Traffic-IAB-IP-Address-r16 IAB-IP-Address-r16 OPTIONAL,

f1-C-Traffic-IP-Address-r16 IAB-IP-Address-r16 OPTIONAL,

f1-U-Traffic-IP-Address-r16 IAB-IP-Address-r16 OPTIONAL,

non-F1-Traffic-IP-Address-r16 IAB-IP-Address-r16 OPTIONAL

}

-- TAG-IABOTHERINFORMATION-STOP

-- ASN1STOP

|  |
| --- |
| *IABOtherInformation-IEs* field descriptions |
| ***iab-IPv4-AddressNumReq***  This field is used to request the numbers of IPv4 address per specific usage. The specific usages include F1-C traffic, F1-U traffic, non-F1 traffic and all traffic. |
| ***iab-IPv4-AddressReport***  This field is used to report the IPv4 address per specific usage assigned by OAM for IAB-DU. The specific usages include F1-C traffic, F1-U traffic, non-F1 traffic and all traffic. |
| ***iab-IPv6-AddressNumReq***  This field is used to request the numbers of IPv6 address per specific usage. The specific usages include F1-C traffic, F1-U traffic, non-F1 traffic and all traffic. |
| ***iab-IPv6-AddressPrefixReq***  This field is used to request the prefix of IPv6 address per specific usage. The specific usages include F1-C traffic, F1-U traffic, non-F1 traffic and all traffic. |
| ***iab-IPv6-AddressReport***  This field is used to report the IPv6 address per specific usage assigned by OAM for IAB-DU. The specific usages include F1-C traffic, F1-U traffic, non-F1 traffic and all traffic. |
| ***iab-IPv6-PrefixReport***  This field is used to report the prefix of IPv6 address per specific usage assigned by OAM for IAB-DU. The specific usages include F1-C traffic, F1-U traffic, non-F1 traffic and all traffic. |

|  |
| --- |
| *IAB-IP-AddressNumReq-IEs field descriptions* |
| ***all-Traffic-NumReq***  This field is used to request the numbers of IP address for all traffic. |
| ***f1-C-Traffic-NumReq***  This field is used to request the numbers of IP address for F1-C traffic. |
| ***f1-U-Traffic-NumReq***  This field is used to request the numbers of IP address for F1-U traffic. |
| ***non-F1-Traffic-NumReq***  This field is used to request the numbers of IP address for non-F1 traffic. |

|  |
| --- |
| *IAB-IP-AddressPrefixReq-IEs field descriptions* |
| ***all-Traffic-PrefixReq***  This field is used to request the IPv6 address prefix for all traffic. The length of allocated IPv6 prefix is fixed to 64. |
| ***f1-C-Traffic-PrefixReq***  This field is used to request the IPv6 address prefix for F1-C traffic. The length of allocated IPv6 prefix is fixed to 64. |
| ***f1-U-Traffic-PrefixReq***  This field is used to request the IPv6 address prefix for F1-U traffic. The length of allocated IPv6 prefix is fixed to 64. |
| ***non-F1-Traffic-PrefixReq***  This field is used to request the IPv6 address prefix for non-F1 traffic. The length of allocated IPv6 prefix is fixed to 64. |

|  |
| --- |
| *IAB-IP-AddressAndTraffic-IEs field descriptions* |
| ***all-Traffic-IAB-IP-Address***  This field is used to report to IAB-donor-CU the IP address(es) or IPv6 address prefix for all traffic. |
| ***f1-C-Traffic-IP-Address***  This field is used to report to IAB-donor-CU the IP address(es) or IPv6 address prefix for F1-C traffic. |
| ***f1-U-Traffic-IP-Address***  This field is used to report to IAB-donor-CU the IP address(es) or IPv6 address prefix for F1-U traffic. |
| ***non-F1-Traffic-IP-Address***  This field is used to report to IAB-donor-CU the IP address(es) or IPv6 address prefix for non-F1 traffic. |

#### – *LocationMeasurementIndication*

The *LocationMeasurementIndication* message is used to indicate that the UE is going to either start or stop location related measurement which requires measurement gaps.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*LocationMeasurementIndication message*

-- ASN1START

-- TAG-LOCATIONMEASUREMENTINDICATION-START

LocationMeasurementIndication ::= SEQUENCE {

criticalExtensions CHOICE {

locationMeasurementIndication LocationMeasurementIndication-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

LocationMeasurementIndication-IEs ::= SEQUENCE {

measurementIndication SetupRelease {LocationMeasurementInfo},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-LOCATIONMEASUREMENTINDICATION-STOP

-- ASN1STOP

#### – *LoggedMeasurementConfiguration*

The *LoggedMeasurementConfiguration* message is used to perform logging of measurement results while in RRC\_IDLE or RRC\_INACTIVE. It is used to transfer the logged measurement configuration for network performance optimisation.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*LoggedMeasurementConfiguration message*

-- ASN1START

-- TAG-LOGGEDMEASUREMENTCONFIGURATION-START

LoggedMeasurementConfiguration-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

loggedMeasurementConfiguration-r16 LoggedMeasurementConfiguration-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

LoggedMeasurementConfiguration-r16-IEs ::= SEQUENCE {

traceReference-r16 TraceReference-r16,

traceRecordingSessionRef-r16 OCTET STRING (SIZE (2)),

tce-Id-r16 OCTET STRING (SIZE (1)),

absoluteTimeInfo-r16 AbsoluteTimeInfo-r16,

areaConfiguration-r16 AreaConfiguration-r16 OPTIONAL, --Need R

plmn-IdentityList-r16 PLMN-IdentityList2-r16 OPTIONAL, --Need R

bt-NameList-r16 SetupRelease {BT-NameList-r16} OPTIONAL, --Need M

wlan-NameList-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, --Need M

sensor-NameList-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL, --Need M

loggingDuration-r16 LoggingDuration-r16,

reportType CHOICE {

periodical LoggedPeriodicalReportConfig-r16,

eventTriggered LoggedEventTriggerConfig-r16,

...

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension LoggedMeasurementConfiguration-v1700-IEs OPTIONAL

}

LoggedMeasurementConfiguration-v1700-IEs ::= SEQUENCE {

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

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

areaConfiguration-v1700 AreaConfiguration-v1700 OPTIONAL, --Need R

nonCriticalExtension SEQUENCE {} OPTIONAL

}

LoggedPeriodicalReportConfig-r16 ::= SEQUENCE {

loggingInterval-r16 LoggingInterval-r16,

...

}

LoggedEventTriggerConfig-r16 ::= SEQUENCE {

eventType-r16 EventType-r16,

loggingInterval-r16 LoggingInterval-r16,

...

}

EventType-r16 ::= CHOICE {

outOfCoverage NULL,

eventL1 SEQUENCE {

l1-Threshold MeasTriggerQuantity,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

...

}

-- TAG-LOGGEDMEASUREMENTCONFIGURATION-STOP

-- ASN1STOP

| *LoggedMeasurementConfiguration* field descriptions |
| --- |
| ***absoluteTimeInfo***  Indicates the absolute time in the current cell. |
| ***areaConfiguration***  Used to restrict the area in which the UE performs measurement logging to cells broadcasting either one of the included cell identities or one of the included tracking area codes/ frequencies. |
| ***earlyMeasIndication***  If included, the field indicates the UE is allowed to log measurements on early measurement related frequencies in logged measurements. |
| ***eventType***  The value outOfCoverage indicates the UE to perform logging of measurements when the UE enters any cell selection state, and the value eventL1 indicates the UE to perform logging of measurements when the triggering condition (similar as event A2 as specified in 5.5.4.3) as configured in the event is met for the camping cell in camped normally state. |
| ***plmn-IdentityList***  Indicates a set of PLMNs defining when the UE performs measurement logging as well as the associated status indication and information retrieval i.e. the UE performs these actions when the RPLMN is part of this set of PLMNs. |
| ***sigLoggedMeasType***  If included, the field indicates a signalling based logged measurements (See TS 37.320 [61]). |
| ***tce-Id***  Parameter Trace Collection Entity Id: See TS 32.422 [52]. |
| ***traceRecordingSessionRef***  Parameter Trace Recording Session Reference: See TS 32.422 [52]. |
| ***reportType***  Parameter configures the type of MDT configuration, specifically Periodic MDT configuration or Event Triggerd MDT configuration. |

#### *– MBSBroadcastConfiguration*

The *MBSBroadcastConfiguration* message contains the control information applicable for MBS broadcast services transmitted via broadcast MRB.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH

Direction: Network to UE

*MBSBroadcastConfiguration message*

-- ASN1START

-- TAG-MBSBROADCASTCONFIGURATION-START

MBSBroadcastConfiguration-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

mbsBroadcastConfiguration-r17 MBSBroadcastConfiguration-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MBSBroadcastConfiguration-r17-IEs ::= SEQUENCE {

mbs-SessionInfoList-r17 MBS-SessionInfoList-r17 OPTIONAL, -- Need R

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

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

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

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-MBSBROADCASTCONFIGURATION-STOP

-- ASN1STOP

| *MBSBroadcastConfiguration* field descriptions |
| --- |
| ***pdsch-ConfigMTCH***  Provides parameters for acquiring the PDSCH for MTCH. When this field is absent, the UE shall use parameters in *pdsch-ConfigMCCH* to acquire the PDSCH for MTCH. |
| ***mbs-SessionInfoList***  Provides the configuration of each MBS session provided by MBS broadcast in the current cell. |
| ***mbs-NeighbourCellList***  List of neighbour cells providing MBS broadcast services via broadcast MRB. This field is used by the UE together with *mtch-NeighbourCell* field signalled for each MBS session in the corresponding *MBS-SessionInfo*. When an empty *mbs-NeighbourCellList* list is signalled, the UE shall assume that MBS broadcast services signalled in *mbs-SessionInfoList* in the *MBSBroadcastConfiguration* message are not provided in any neighbour cell. When the field *mbs-NeighbourCellList* is absent, the current serving cell does not provide information about MBS broadcast services in the neighbouring cells, i.e. the UE cannot determine the presence or absence of an MBS service in neighbouring cells based on the absence of this field. |

#### *– MBSInterestIndication*

The *MBSInterestIndication* message is used to inform network that the UE is receiving/ interested to receive or no longer receiving/ interested to receive MBS broadcast service(s) via a broadcast MRB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*MBSInterestIndication message*

-- ASN1START

-- TAG-MBSINTERESTINDICATION-START

MBSInterestIndication-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

mbsInterestIndication-r17 MBSInterestIndication-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MBSInterestIndication-r17-IEs ::= SEQUENCE {

mbs-FreqList-r17 CarrierFreqListMBS-r17 OPTIONAL,

mbs-Priority-r17 ENUMERATED {true} OPTIONAL,

mbs-ServiceList-r17 MBS-ServiceList-r17 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-MBSINTERESTINDICATION-STOP

-- ASN1STOP

| *MBSInterestIndication* field descriptions |
| --- |
| ***mbs-FreqList***  List of MBS frequencies on which the UE is receiving or interested to receive MBS broadcast service via a broadcast MRB. |
| ***mbs-Priority***  Indicates whether the UE prioritises MBS broadcast reception above unicast and MBS multicast reception. The field is present (i.e. value *true*), if the UE prioritises reception of broadcast services, on frequencies indicated in *mbs-FreqLis*t, above a reception of any of the unicast bearers and multicast MRBs. Otherwise the field is absent. |
| ***mbs-ServiceList***  List of MBS broadcast services which the UE is receiving or interested to receive. |

#### *– MCGFailureInformation*

The *MCGFailureInformation* message is used to provide information regarding NR MCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*MCGFailureInformation* message

-- ASN1START

-- TAG-MCGFAILUREINFORMATION-START

MCGFailureInformation-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

mcgFailureInformation-r16 MCGFailureInformation-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MCGFailureInformation-r16-IEs ::= SEQUENCE {

failureReportMCG-r16 FailureReportMCG-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportMCG-r16 ::= SEQUENCE {

failureType-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

t312-Expiry-r16, lbt-Failure-r16, beamFailureRecoveryFailure-r16,

bh-RLF-r16, spare1} OPTIONAL,

measResultFreqList-r16 MeasResultList2NR OPTIONAL,

measResultFreqListEUTRA-r16 MeasResultList2EUTRA OPTIONAL,

measResultSCG-r16 OCTET STRING (CONTAINING MeasResultSCG-Failure) OPTIONAL,

measResultSCG-EUTRA-r16 OCTET STRING OPTIONAL,

measResultFreqListUTRA-FDD-r16 MeasResultList2UTRA OPTIONAL,

...

}

MeasResultList2UTRA ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2UTRA-FDD-r16

MeasResult2UTRA-FDD-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueUTRA-FDD-r16,

measResultNeighCellList-r16 MeasResultListUTRA-FDD-r16

}

MeasResultList2EUTRA ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-r16

-- TAG-MCGFAILUREINFORMATION-STOP

-- ASN1STOP

| *MCGFailureInformation field descriptions* |
| --- |
| ***measResultFreqList***  The field contains available results of measurements on NR frequencies the UE is configured to measure by the *measConfig* associated with the MCG. |
| ***measResultFreqListEUTRA***  The field contains available results of measurements on E-UTRA frequencies the UE is configured to measure by *measConfig* associated with the MCG. |
| ***measResultFreqListUTRA-FDD***  The field contains available results of measurements on UTRA FDD frequencies the UE is configured to measure by measConfig associated with the MCG. |
| ***measResultSCG***  The field contains the *MeasResultSCG-Failure* IE which includes available measurement results on NR frequencies the UE is configured to measure by the *measConfig* associated with the SCG. |
| ***measResultSCG-EUTRA***  The field contains the EUTRA *MeasResultSCG-FailureMRDC* IE which includes available results of measurements on E-UTRA frequencies the UE is configured to measure by the E-UTRA *RRCConnectionReconfiguration* message as specified in TS 36.331 [10]. |

#### – *MeasurementReport*

The *MeasurementReport* message is used for the indication of measurement results.

Signalling radio bearer: SRB1, SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*MeasurementReport message*

-- ASN1START

-- TAG-MEASUREMENTREPORT-START

MeasurementReport ::= SEQUENCE {

criticalExtensions CHOICE {

measurementReport MeasurementReport-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MeasurementReport-IEs ::= SEQUENCE {

measResults MeasResults,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-MEASUREMENTREPORT-STOP

-- ASN1STOP

#### – *MeasurementReportAppLayer*

The *MeasurementReportAppLayer* message is used for sending application layer measurement report.

Signalling radio bearer: SRB4

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*MeasurementReportAppLayer message*

-- ASN1START

-- TAG-MEASUREMENTREPORTAPPLAYER-START

MeasurementReportAppLayer-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

measurementReportAppLayer-r17 MeasurementReportAppLayer-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MeasurementReportAppLayer-r17-IEs ::= SEQUENCE {

measurementReportAppLayerList-r17 MeasurementReportAppLayerList-r17,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

MeasurementReportAppLayerList-r17 ::= SEQUENCE (SIZE (1..maxNrofAppLayerMeas-r17)) OF MeasReportAppLayer-r17

MeasReportAppLayer-r17 ::= SEQUENCE {

measConfigAppLayerId-r17 MeasConfigAppLayerId-r17,

measReportAppLayerContainer-r17 OCTET STRING OPTIONAL,

appLayerSessionStatus-r17 ENUMERATED {started, stopped} OPTIONAL,

ran-VisibleMeasurements-r17 RAN-VisibleMeasurements-r17 OPTIONAL

}

RAN-VisibleMeasurements-r17 ::= SEQUENCE {

appLayerBufferLevelList-r17 SEQUENCE (SIZE (1..8)) OF AppLayerBufferLevel-r17 OPTIONAL,

playoutDelayForMediaStartup-r17 INTEGER (0..30000) OPTIONAL,

pdu-SessionIdList-r17 SEQUENCE (SIZE (1..maxNrofPDU-Sessions-r17)) OF PDU-SessionID OPTIONAL,

...

}

AppLayerBufferLevel-r17 ::= INTEGER (0..30000)

-- TAG-MEASUREMENTREPORTAPPLAYER-STOP

-- ASN1STOP

|  |
| --- |
| *MeasurementReportAppLayer* field descriptions |
| ***appLayerBufferLevelList***  The field indicates a list of application layer buffer levels, and each *AppLayerBufferLevel* indicates the application layer buffer level in ms. Value 0 corresponds to 0ms, value 1 corresponds to 10ms, value 2 corresponds to 20 ms and so on. If the buffer level is larger than the maximum value of 30000 (5 minutes), the UE reports 30000. |
| ***appLayerSessionStatus***  Indicates that an application layer measurement session in the application layer starts or ends. |
| ***playoutDelayForMediaStartup***  Indicates the application layer playout delay for media start-up in ms. Value 0 corresponds to 0ms, value 1 corresponds to 1ms, value 2 corresponds to 2 ms and so on. If the playout delay for media start-up is larger than the maximum value of 30000ms, the UE reports 30000. |
| ***measReportAppLayerContainer***  The field contains application layer measurement report, see Annex L (normative) in TS 26.247 [68], clause 16.5 in TS 26.114 [69] and TS 26.118 [70]. |
| ***pdu-SessionIdList***  Contains the identity of the PDU session, or the identities of the PDU sessions, used for application data flows subject to the RAN visible application layer measurements. |

#### – *MIB*

The *MIB* includes the system information transmitted on BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: Network to UE

*MIB*

-- ASN1START

-- TAG-MIB-START

MIB ::= SEQUENCE {

systemFrameNumber BIT STRING (SIZE (6)),

subCarrierSpacingCommon ENUMERATED {scs15or60, scs30or120},

ssb-SubcarrierOffset INTEGER (0..15),

dmrs-TypeA-Position ENUMERATED {pos2, pos3},

pdcch-ConfigSIB1 PDCCH-ConfigSIB1,

cellBarred ENUMERATED {barred, notBarred},

intraFreqReselection ENUMERATED {allowed, notAllowed},

spare BIT STRING (SIZE (1))

}

-- TAG-MIB-STOP

-- ASN1STOP

|  |
| --- |
| *MIB* field descriptions |
| ***cellBarred***  Value *barred* means that the cell is barred, as defined in TS 38.304 [20]. This field is ignored by IAB-MT. This field is ignored for connectivity to NTN. |
| ***dmrs-TypeA-Position***  Position of (first) DM-RS for downlink (see TS 38.211 [16], clause 7.4.1.1.2) and uplink (see TS 38.211 [16], clause 6.4.1.1.3). |
| ***intraFreqReselection***  Controls cell selection/reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by the UE, as specified in TS 38.304 [20]. This field is ignored by IAB-MT. |
| ***pdcch-ConfigSIB1***  Determines a common *ControlResourceSet* (CORESET), a common search space and necessary PDCCH parameters. If the field *ssb-SubcarrierOffset* indicates that *SIB1* is absent, the field *pdcch-ConfigSIB1* indicates the frequency positions where the UE may find SS/PBCH block with *SIB1* or the frequency range where the network does not provide SS/PBCH block with *SIB1* (see TS 38.213 [13], clause 13). |
| ***ssb-SubcarrierOffset***  Corresponds to kSSB (see TS 38.213 [13]), which is the frequency domain offset between SSB and the overall resource block grid in number of subcarriers. (See TS 38.211 [16], clause 7.4.3.1). For operation with shared spectrum channel access (see 37.213 [48]), this field corresponds to , and kSSB is obtained from (see TS 38.211 [16], clause 7.4.3.1); the LSB of this field is used also for deriving the QCL relation between SS/PBCH blocks as specified in TS 38.213 [13], clause 4.1.  The value range of this field may be extended by an additional most significant bit encoded within PBCH as specified in TS 38.213 [13].  This field may indicate that this cell does not provide *SIB1* and that there is hence no CORESET#0 configured in *MIB* (see TS 38.213 [13], clause 13). In this case, the field *pdcch-ConfigSIB1* may indicate the frequency positions where the UE may (not) find a SS/PBCH with a control resource set and search space for *SIB1* (see TS 38.213 [13], clause 13). |
| ***subCarrierSpacingCommon***  Subcarrier spacing for *SIB1*, Msg.2/4 and MsgB for initial access, paging and broadcast SI-messages. If the UE acquires this *MIB* on an FR1 carrier frequency, the value *scs15or60* corresponds to 15 kHz and the value *scs30or120* corresponds to 30 kHz. If the UE acquires this *MIB* on an FR2 carrier frequency, the value *scs15or60* corresponds to 60 kHz and the value *scs30or120* corresponds to 120 kHz. For operation with shared spectrum channel access in FR1 (see 37.213 [48]) and for operation in FR2-2, the subcarrier spacing for *SIB1*, Msg.2/4 and MsgB for initial access, paging and broadcast SI-messages is same as that for the corresponding SSB. For operation with shared spectrum channel access, this field instead is used for deriving the QCL relation between SS/PBCH blocks as specified in TS 38.213 [13], clause 4.1. |
| ***systemFrameNumber***  The 6 most significant bits (MSB) of the 10-bit System Frame Number (SFN). The 4 LSB of the SFN are conveyed in the PBCH transport block as part of channel coding (i.e. outside the *MIB* encoding), as defined in clause 7.1 in TS 38.212 [17]. |

#### – *MobilityFromNRCommand*

The *MobilityFromNRCommand* message is used to command handover from NR to E-UTRA/EPC, E-UTRA/5GC or UTRA-FDD.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*MobilityFromNRCommand* message

-- ASN1START

-- TAG-MOBILITYFROMNRCOMMAND-START

MobilityFromNRCommand ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

mobilityFromNRCommand MobilityFromNRCommand-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MobilityFromNRCommand-IEs ::= SEQUENCE {

targetRAT-Type ENUMERATED { eutra, utra-fdd-v1610, spare2, spare1, ...},

targetRAT-MessageContainer OCTET STRING,

nas-SecurityParamFromNR OCTET STRING OPTIONAL, -- Cond HO-ToEPCUTRAN

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension MobilityFromNRCommand-v1610-IEs OPTIONAL

}

MobilityFromNRCommand-v1610-IEs ::= SEQUENCE {

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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-MOBILITYFROMNRCOMMAND-STOP

-- ASN1STOP

|  |
| --- |
| *MobilityFromNRCommand-IEs* field descriptions |
| ***nas-SecurityParamFromNR***  If *targetRAT-Type* is *eutra*, this field is used to deliver the key synchronisation and Key freshness for the NR to LTE/EPC handovers and a part of the downlink NAS COUNT as specified in TS 33.501 [11]. If *targetRAT-Type* is *utra-fdd*, this field is used to deliver the key synchronisation and Key freshness for the NR to FDD UTRAN handover and a part of the downlink NAS COUNT as specified in TS 33.501 [11]. |
| ***targetRAT-MessageContainer***  The field contains a message specified in another standard, as indicated by the *targetRAT-Type*, and carries information about the target cell identifier(s) and radio parameters relevant for the target radio access technology. A complete message is included, as specified in the other standard. See NOTE 1 |
| ***targetRAT-Type***  Indicates the target RAT type. |
| ***voiceFallbackIndication***  Indicates the handover is triggered by EPS fallback for IMS voice as specified in TS 23.502 [43]. |

NOTE 1: The correspondence between the value of the *targetRAT-Type*, the standard to apply, and the message contained within the *targetRAT-MessageContainer* is shown in the table below:

|  |  |  |
| --- | --- | --- |
| targetRAT-Type | Standard to apply | targetRAT-MessageContainer |
| *eutra* | TS 36.331 [10] (clause 5.4.2) | *DL-DCCH-Message* including the *RRCConnectionReconfiguration* |
| *utra-fdd* | TS 25.331 [45] (clause 10.2.16a) | *Handover TO UTRAN command* |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *HO-ToEPCUTRAN* | This field is mandatory present in case of inter system handover to "EPC" or "FDD UTRAN". Otherwise it is absent. |

#### – *Paging*

The *Paging* message is used for the notification of one or more UEs.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: PCCH

Direction: Network to UE

*Paging* message

-- ASN1START

-- TAG-PAGING-START

Paging ::= SEQUENCE {

pagingRecordList PagingRecordList OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension Paging-v1700-IEs OPTIONAL

}

Paging-v1700-IEs ::= SEQUENCE {

pagingRecordList-v1700 PagingRecordList-v1700 OPTIONAL, -- Need N

pagingGroupList-r17 PagingGroupList-r17 OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

PagingRecordList ::= SEQUENCE (SIZE(1..maxNrofPageRec)) OF PagingRecord

PagingRecordList-v1700 ::= SEQUENCE (SIZE(1..maxNrofPageRec)) OF PagingRecord-v1700

PagingGroupList-r17 ::= SEQUENCE (SIZE(1..maxNrofPageGroup-r17)) OF TMGI-r17

PagingRecord ::= SEQUENCE {

ue-Identity PagingUE-Identity,

accessType ENUMERATED {non3GPP} OPTIONAL, -- Need N

...

}

PagingRecord-v1700 ::= SEQUENCE {

pagingCause-r17 ENUMERATED {voice} OPTIONAL -- Need N

}

PagingUE-Identity ::= CHOICE {

ng-5G-S-TMSI NG-5G-S-TMSI,

fullI-RNTI I-RNTI-Value,

...

}

-- TAG-PAGING-STOP

-- ASN1STOP

|  |
| --- |
| *PagingRecord* field descriptions |
| ***accessType***  Indicates whether the *Paging* message is originated due to the PDU sessions from the non-3GPP access. |
| ***pagingRecordList***  If the network includes pagingRecordList-v1700, it includes the same number of entries, and listed in the same order, as in pagingRecordList (i.e. without suffix). |
| ***pagingCause***  Indicates whether the Paging message is originated due to IMS voice. If this field is present, it implies that the corresponding paging entry is for IMS voice. If upper layers indicate the support of paging cause and if this field is not present but pagingRecordList-v1700 is present, it implies that the corresponding paging entry is for a service other than IMS voice. Otherwise, paging cause is undetermined. |

#### – *RRCReestablishment*

The *RRCReestablishment* message is used to re-establish SRB1.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCReestablishment* message

-- ASN1START

-- TAG-RRCREESTABLISHMENT-START

RRCReestablishment ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReestablishment RRCReestablishment-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReestablishment-IEs ::= SEQUENCE {

nextHopChainingCount NextHopChainingCount,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReestablishment-v1700-IEs OPTIONAL

}

RRCReestablishment-v1700-IEs ::= SEQUENCE {

sl-L2RemoteUE-Config-r17 SetupRelease {SL-L2RemoteUE-Config-r17} OPTIONAL, -- Cond L2RemoteUE

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCREESTABLISHMENT-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReestablishment-IEs* field descriptions |
| ***sl-L2RemoteUE-Config***  Contains dedicated configurations used for L2 U2N relay related operation. The network configures only the SRAP configuration used for the SRB1. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE; otherwise it is absent. |

#### – *RRCReestablishmentComplete*

The *RRCReestablishmentComplete* message is used to confirm the successful completion of an RRC connection re-establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*RRCReestablishmentComplete* message

-- ASN1START

-- TAG-RRCREESTABLISHMENTCOMPLETE-START

RRCReestablishmentComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReestablishmentComplete RRCReestablishmentComplete-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReestablishmentComplete-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReestablishmentComplete-v1610-IEs OPTIONAL

}

RRCReestablishmentComplete-v1610-IEs ::= SEQUENCE {

ue-MeasurementsAvailable-r16 UE-MeasurementsAvailable-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCREESTABLISHMENTCOMPLETE-STOP

-- ASN1STOP

#### – *RRCReestablishmentRequest*

The *RRCReestablishmentRequest* message is used to request the reestablishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to Network

*RRCReestablishmentRequest* message

-- ASN1START

-- TAG-RRCREESTABLISHMENTREQUEST-START

RRCReestablishmentRequest ::= SEQUENCE {

rrcReestablishmentRequest RRCReestablishmentRequest-IEs

}

RRCReestablishmentRequest-IEs ::= SEQUENCE {

ue-Identity ReestabUE-Identity,

reestablishmentCause ReestablishmentCause,

spare BIT STRING (SIZE (1))

}

ReestabUE-Identity ::= SEQUENCE {

c-RNTI RNTI-Value,

physCellId PhysCellId,

shortMAC-I ShortMAC-I

}

ReestablishmentCause ::= ENUMERATED {reconfigurationFailure, handoverFailure, otherFailure, spare1}

-- TAG-RRCREESTABLISHMENTREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *ReestabUE-Identity* field descriptions |
| ***physCellId***  The Physical Cell Identity of the PCell the UE was connected to prior to the failure. |

|  |
| --- |
| *RRCReestablishmentRequest-IEs* field descriptions |
| ***reestablishmentCause***  Indicates the failure cause that triggered the re-establishment procedure. gNB is not expected to reject a *RRCReestablishmentRequest* due to unknown cause value being used by the UE. |
| ***ue-Identity***  UE identity included to retrieve UE context and to facilitate contention resolution by lower layers. |

#### – *RRCReconfiguration*

The *RRCReconfiguration* message is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, radio resource configuration (including RBs, MAC main configuration and physical channel configuration) and AS security configuration.

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCReconfiguration message*

-- ASN1START

-- TAG-RRCRECONFIGURATION-START

RRCReconfiguration ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfiguration RRCReconfiguration-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfiguration-IEs ::= SEQUENCE {

radioBearerConfig RadioBearerConfig OPTIONAL, -- Need M

secondaryCellGroup OCTET STRING (CONTAINING CellGroupConfig) OPTIONAL, -- Cond SCG

measConfig MeasConfig OPTIONAL, -- Need M

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReconfiguration-v1530-IEs OPTIONAL

}

RRCReconfiguration-v1530-IEs ::= SEQUENCE {

masterCellGroup OCTET STRING (CONTAINING CellGroupConfig) OPTIONAL, -- Need M

fullConfig ENUMERATED {true} OPTIONAL, -- Cond FullConfig

dedicatedNAS-MessageList SEQUENCE (SIZE(1..maxDRB)) OF DedicatedNAS-Message OPTIONAL, -- Cond nonHO

masterKeyUpdate MasterKeyUpdate OPTIONAL, -- Cond MasterKeyChange

dedicatedSIB1-Delivery OCTET STRING (CONTAINING SIB1) OPTIONAL, -- Need N

dedicatedSystemInformationDelivery OCTET STRING (CONTAINING SystemInformation) OPTIONAL, -- Need N

otherConfig OtherConfig OPTIONAL, -- Need M

nonCriticalExtension RRCReconfiguration-v1540-IEs OPTIONAL

}

RRCReconfiguration-v1540-IEs ::= SEQUENCE {

otherConfig-v1540 OtherConfig-v1540 OPTIONAL, -- Need M

nonCriticalExtension RRCReconfiguration-v1560-IEs OPTIONAL

}

RRCReconfiguration-v1560-IEs ::= SEQUENCE {

mrdc-SecondaryCellGroupConfig SetupRelease { MRDC-SecondaryCellGroupConfig } OPTIONAL, -- Need M

radioBearerConfig2 OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL, -- Need M

sk-Counter SK-Counter OPTIONAL, -- Need N

nonCriticalExtension RRCReconfiguration-v1610-IEs OPTIONAL

}

RRCReconfiguration-v1610-IEs ::= SEQUENCE {

otherConfig-v1610 OtherConfig-v1610 OPTIONAL, -- Need M

bap-Config-r16 SetupRelease { BAP-Config-r16 } OPTIONAL, -- Need M

iab-IP-AddressConfigurationList-r16 IAB-IP-AddressConfigurationList-r16 OPTIONAL, -- Need M

conditionalReconfiguration-r16 ConditionalReconfiguration-r16 OPTIONAL, -- Need M

daps-SourceRelease-r16 ENUMERATED{true} OPTIONAL, -- Need N

t316-r16 SetupRelease {T316-r16} OPTIONAL, -- Need M

needForGapsConfigNR-r16 SetupRelease {NeedForGapsConfigNR-r16} OPTIONAL, -- Need M

onDemandSIB-Request-r16 SetupRelease { OnDemandSIB-Request-r16 } OPTIONAL, -- Need M

dedicatedPosSysInfoDelivery-r16 OCTET STRING (CONTAINING PosSystemInformation-r16-IEs) OPTIONAL, -- Need N

sl-ConfigDedicatedNR-r16 SetupRelease {SL-ConfigDedicatedNR-r16} OPTIONAL, -- Need M

sl-ConfigDedicatedEUTRA-Info-r16 SetupRelease {SL-ConfigDedicatedEUTRA-Info-r16} OPTIONAL, -- Need M

targetCellSMTC-SCG-r16 SSB-MTC OPTIONAL, -- Need S

nonCriticalExtension RRCReconfiguration-v1700-IEs OPTIONAL

}

RRCReconfiguration-v1700-IEs ::= SEQUENCE {

otherConfig-v1700 OtherConfig-v1700 OPTIONAL, -- Need M

sl-L2RelayUE-Config-r17 SetupRelease { SL-L2RelayUE-Config-r17 } OPTIONAL, -- Need M

sl-L2RemoteUE-Config-r17 SetupRelease { SL-L2RemoteUE-Config-r17 } OPTIONAL, -- Need M

dedicatedPagingDelivery-r17 OCTET STRING (CONTAINING Paging) OPTIONAL, -- Cond PagingRelay

needForGapNCSG-ConfigNR-r17 SetupRelease {NeedForGapNCSG-ConfigNR-r17} OPTIONAL, -- Need M

needForGapNCSG-ConfigEUTRA-r17 SetupRelease {NeedForGapNCSG-ConfigEUTRA-r17} OPTIONAL, -- Need M

musim-GapConfig-r17 SetupRelease {MUSIM-GapConfig-r17} OPTIONAL, -- Need M

ul-GapFR2-Config-r17 SetupRelease { UL-GapFR2-Config-r17 } OPTIONAL, -- Need M

scg-State-r17 ENUMERATED { deactivated } OPTIONAL, -- Need N

appLayerMeasConfig-r17 AppLayerMeasConfig-r17 OPTIONAL, -- Need M

ue-TxTEG-RequestUL-TDOA-Config-r17 SetupRelease {UE-TxTEG-RequestUL-TDOA-Config-r17} OPTIONAL, -- Need M

nonCriticalExtension SEQUENCE {} OPTIONAL

}

MRDC-SecondaryCellGroupConfig ::= SEQUENCE {

mrdc-ReleaseAndAdd ENUMERATED {true} OPTIONAL, -- Need N

mrdc-SecondaryCellGroup CHOICE {

nr-SCG OCTET STRING (CONTAINING RRCReconfiguration),

eutra-SCG OCTET STRING

}

}

BAP-Config-r16 ::= SEQUENCE {

bap-Address-r16 BIT STRING (SIZE (10)) OPTIONAL, -- Need M

defaultUL-BAP-RoutingID-r16 BAP-RoutingID-r16 OPTIONAL, -- Need M

defaultUL-BH-RLC-Channel-r16 BH-RLC-ChannelID-r16 OPTIONAL, -- Need M

flowControlFeedbackType-r16 ENUMERATED {perBH-RLC-Channel, perRoutingID, both} OPTIONAL, -- Need R

...

}

MasterKeyUpdate ::= SEQUENCE {

keySetChangeIndicator BOOLEAN,

nextHopChainingCount NextHopChainingCount,

nas-Container OCTET STRING OPTIONAL, -- Cond securityNASC

...

}

OnDemandSIB-Request-r16 ::= SEQUENCE {

onDemandSIB-RequestProhibitTimer-r16 ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, s30}

}

T316-r16 ::= ENUMERATED {ms50, ms100, ms200, ms300, ms400, ms500, ms600, ms1000, ms1500, ms2000}

IAB-IP-AddressConfigurationList-r16 ::= SEQUENCE {

iab-IP-AddressToAddModList-r16 SEQUENCE (SIZE(1..maxIAB-IP-Address-r16)) OF IAB-IP-AddressConfiguration-r16 OPTIONAL, -- Need N

iab-IP-AddressToReleaseList-r16 SEQUENCE (SIZE(1..maxIAB-IP-Address-r16)) OF IAB-IP-AddressIndex-r16 OPTIONAL, -- Need N

...

}

IAB-IP-AddressConfiguration-r16 ::= SEQUENCE {

iab-IP-AddressIndex-r16 IAB-IP-AddressIndex-r16,

iab-IP-Address-r16 IAB-IP-Address-r16 OPTIONAL, -- Need M

iab-IP-Usage-r16 IAB-IP-Usage-r16 OPTIONAL, -- Need M

iab-donor-DU-BAP-Address-r16 BIT STRING (SIZE(10)) OPTIONAL, -- Need M

...

}

SL-ConfigDedicatedEUTRA-Info-r16 ::= SEQUENCE {

sl-ConfigDedicatedEUTRA-r16 OCTET STRING OPTIONAL, -- Need M

sl-TimeOffsetEUTRA-List-r16 SEQUENCE (SIZE (8)) OF SL-TimeOffsetEUTRA-r16 OPTIONAL -- Need M

}

SL-TimeOffsetEUTRA-r16 ::= ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625, ms0dot75, ms1, ms1dot25, ms1dot5, ms1dot75,

ms2, ms2dot5, ms3, ms4, ms5, ms6, ms8, ms10, ms20}

UE-TxTEG-RequestUL-TDOA-Config-r17 ::= CHOICE {

oneShot-r17 NULL,

periodicReporting-r17 ENUMERATED { ms160, ms320, ms1280, ms2560, ms61440, ms81920, ms368640, ms737280 }

}

-- TAG-RRCRECONFIGURATION-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReconfiguration-IEs* field descriptions |
| ***bap-Config***  This field is used to configure the BAP entity for IAB nodes. |
| ***bap-Address***  Indicates the BAP address of an IAB-node. The BAP address of an IAB-node cannot be changed once configured for the cell group to the BAP entity. |
| ***conditionalReconfiguration***  Configuration of candidate target SpCell(s) and execution condition(s) for conditional handover, conditional PSCell addition or conditional PSCell change. The field is absent if any DAPS bearer is configured or if the *masterCellGroup* includes *ReconfigurationWithSync* or if the *sl-L2RemoteUE-Config* or *sl-L2RelayUE-Config* is configured. For conditional PSCell change, the field is absent if the *secondaryCellGroup* includes *ReconfigurationWithSync*. The *RRCReconfiguration* message contained in *DLInformationTransferMRDC* cannot contain the field *conditionalReconfiguration* for conditional PSCell change or for conditional PSCell addition. |
| ***daps-SourceRelease***  Indicates to UE that the source cell part of DAPS operation is to be stopped and the source cell part of DAPS configuration is to be released. |
| ***dedicatedNAS-MessageList***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list. |
| ***dedicatedPagingDelivery***  This field is used to transfer *Paging* message for the associated L2 U2N Remote UE to the L2 U2N Relay UE in RRC\_CONNECTED. |
| ***dedicatedPosSysInfoDelivery***  This field is used to transfer *SIBPos* to the UE in RRC\_CONNECTED. |
| ***dedicatedSIB1-Delivery***  This field is used to transfer *SIB1* to the UE (including L2 U2N Remote UE). The field has the same values as the corresponding configuration in *servingCellConfigCommon*. |
| ***dedicatedSystemInformationDelivery***  This field is used to transfer *SIB6*, *SIB7*, *SIB8, SIB19* to the UE with an active BWP with no common search space configured or the L2 U2N Remote UE in RRC\_CONNECTED. For UEs in RRC\_CONNECTED (including L2 U2N Remote UE), this field is used to transfer the SIBs requested on-demand. |
| ***defaultUL-BAP-RoutingID***  This field is used for IAB-node to configure the default uplink Routing ID, which is used by IAB-node during IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment for *F1-C* and *non-F1* traffic. The *defaultUL-BAP-RoutingID* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes. This field is mandatory only for IAB-node bootstrapping. |
| ***defaultUL-BH-RLC-Channel***  This field is used for IAB-nodes to configure the default uplink BH RLC channel*,* which is used by IAB-nodeduring IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment *for F1-C and non-F1 traffic*. The *defaultUL-BH-RLC-Channel* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes, and the new IP address is anchored at a different IAB-donor-DU. This field is mandatory for IAB-node bootstrapping. If the IAB-MT is operating in EN-DC, the default uplink BH RLC channel is referring to an RLC channel on the SCG; Otherwise, it is referring to an RLC channel either on the MCG or on the SCG depending on whether the MN or the SN configures this field. |
| ***flowControlFeedbackType***  This field is only used for IAB-node that support hop-by-hop flow control to configure the type of flow control feedback. Value *perBH-RLC-Channel* indicates that the IAB-node shall provide flow control feedback per BH RLC channel, value *perRoutingID* indicates that the IAB-node shall provide flow control feedback per routing ID, and value *both* indicates that the IAB-node shall provide flow control feedback both per BH RLC channel and per routing ID. |
| ***fullConfig***  Indicates that the full configuration option is applicable for the *RRCReconfiguration* message for intra-system intra-RAT HO. For inter-RAT HO from E-UTRA to NR, *fullConfig* indicates whether or not delta signalling of SDAP/PDCP from source RAT is applicable. This field is absent if any DAPS bearer is configured or when the *RRCReconfiguration* message is transmitted on SRB3, and in an *RRCReconfiguration* message for SCG contained in another *RRCReconfiguration* message (or *RRCConnectionReconfiguration* message, see TS 36.331 [10]) transmitted on SRB1. |
| ***iab-IP-Address***  This field is used to provide the IP address information for IAB-node. |
| ***iab-IP-AddressIndex***  This field is used to identify a configuration of an IP address. |
| ***iab-IP-AddressToAddModList***  List of IP addresses allocated for IAB-node to be added and modified. |
| ***iab-IP-AddressToReleaseList***  List of IP address allocated for IAB-node to be released. |
| ***iab-IP-Usage***  This field is used to indicate the usage of the assigned IP address. If this field is not configured, the assigned IP address is used for all traffic. |
| ***iab-donor-DU-BAP-Address***  This field is used to indicate the BAP address of the IAB-donor-DU where the IP address is anchored. |
| ***keySetChangeIndicator***  Indicates whether UE shall derive a new KgNB. If *reconfigurationWithSync* is included, value *true* indicates that a KgNB key is derived from a KAMF key taken into use through the latest successful NAS SMC procedure, or N2 handover procedure with KAMF change, as described in TS 33.501 [11] for KgNB re-keying. Value *false* indicates that the new KgNB key is obtained from the current KgNB key or from the NH as described in TS 33.501 [11]. |
| ***masterCellGroup***  Configuration of master cell group. |
| ***mrdc-ReleaseAndAdd***  This field indicates that the current SCG configuration is released and a new SCG is added at the same time. |
| ***mrdc-SecondaryCellGroup***  Includes an RRC message for SCG configuration in NR-DC or NE-DC. For NR-DC (nr-SCG), *mrdc-SecondaryCellGroup* contains the *RRCReconfiguration* message as generated (entirely) by SN gNB. In this version of the specification, the RRC message can only include fields *secondaryCellGroup, otherConfig, conditionalReconfiguration,* *measConfig,* *bap-Config* and *IAB-IP-AddressConfigurationList*.  For NE-DC (eutra-SCG), *mrdc-SecondaryCellGroup* includes the E-UTRA *RRCConnectionReconfiguration* message as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA RRC message can only include the field *scg-Configuration*. |
| ***musim-GapConfig***  Indicates the MUSIM gap configuration and controls setup/release of MUSIM gaps. |
| ***nas-Container***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this field, although it affects activation of AS security after inter-system handover to NR. The content is defined in TS 24.501 [23]. |
| ***needForGapsConfigNR***  Configuration for the UE to report measurement gap requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigEUTRA***  Configuration for the UE to report measurement gap and NCSG requirement information of E‑UTRA target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigNR***  Configuration for the UE to report measurement gap and NCSG requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***nextHopChainingCount***  Parameter NCC: See TS 33.501 [11] |
| ***onDemandSIB-Request***  If the field is present, the UE is allowed to request SIB(s) on-demand while in RRC\_CONNECTED according to clause 5.2.2.3.5. |
| ***onDemandSIB-RequestProhibitTimer***  Prohibit timer for requesting SIB(s) on-demand while in RRC\_CONNECTED according to clause 5.2.2.3.5. Value in seconds. Value s0 means prohibit timer is set to 0 seconds, value s0dot5 means prohibit timer is set to 0.5 seconds, value s1 means prohibit timer is set to 1 second and so on. |
| ***otherConfig***  Contains configuration related to other configurations. When configured for the SCG, only fields *drx-PreferenceConfig, maxBW-PreferenceConfig, maxBW-PreferenceConfigFR2-2, maxCC-PreferenceConfig, maxMIMO-LayerPreferenceConfig*, *maxMIMO-LayerPreferenceConfigFR2-2*, *minSchedulingOffsetPreferenceConfig, minSchedulingOffsetPreferenceConfigExt, btNameList, wlanNameList, sensorNameList* and *obtainCommonLocation* can be included. |
| ***radioBearerConfig***  Configuration of Radio Bearers (DRBs, SRBs, multicast MRBs) including SDAP/PDCP. In EN-DC this field may only be present if the *RRCReconfiguration* is transmitted over SRB3. |
| ***radioBearerConfig2***  Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. This field can only be used if the UE supports NR-DC or NE-DC. |
| ***scg-State***  Indicates that the SCG is in deactivated state. This field is not used in an *RRCReconfiguration* message received within *mrdc-SecondaryCellGroup*, E-UTRA *RRCConnectionReconfiguration* or E-UTRA *RRCConnectionResume* message or received via SRB3. The field is absent if CPA or CPC is configured for the UE, or if the *RRCReconfiguration* message is contained in *CondRRCReconfig*. |
| ***sl-L2RelayUE-Config***  Contains L2 U2N relay operation related configurations used by a UE acting as or to be acting as a L2 U2N Relay UE. The field is absent if *conditionalReconfiguration* is configured for CHO. |
| ***sl-L2RemoteUE-Config***  Contains L2 U2N relay operation related configurations used by a UE acting as or to be acting as a L2 U2N Remote UE. The field is absent if *conditionalReconfiguration* is configured for CHO. |
| ***secondaryCellGroup***  Configuration of secondary cell group ((NG)EN-DC or NR-DC). |
| ***sk-Counter***  A counter used upon initial configuration of S-KgNB or S-KeNB, as well as upon refresh of S-KgNB or S-KeNB. This field is always included either upon initial configuration of an NR SCG or upon configuration of the first RB with *keyToUse* set to *secondary*, whichever happens first. This field is absent if there is neither any NR SCG nor any RB with *keyToUse* set to *secondary*. |
| ***sl-ConfigDedicatedNR***  This field is used to provide the dedicated configurations for NR sidelink communication/discovery. |
| ***sl-ConfigDedicatedEUTRA-Info***  This field includes the E-UTRA *RRCConnectionReconfiguration* as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA *RRCConnectionReconfiguration* can only includes sidelink related fields for V2X sidelink communication, i.e. *sl-V2X-ConfigDedicated*, *sl-V2X-SPS-Config*, *measConfig* and/or *otherConfig*. |
| ***sl-TimeOffsetEUTRA***  This field indicates the possible time offset to (de)activation of V2X sidelink transmission after receiving DCI format 3\_1 used for scheduling V2X sidelink communication. Value *ms0dpt75* corresponds to 0.75ms, *ms1* corresponds to 1ms and so on. The network includes this field only when *sl-ConfigDedicatedEUTRA* is configured. |
| ***targetCellSMTC-SCG***  The SSB periodicity/offset/duration configuration of target cell for NR PSCell addition and SN change. When UE receives this field, UE applies the configuration based on the timing reference of NR PCell for PSCell addition and PSCell change for the case of no reconfiguration with sync of MCG, and UE applies the configuration based on the timing reference of target NR PCell for the case of reconfiguration with sync of MCG. If both this field and the *smtc* in *secondaryCellGroup* -> *SpCellConfig* -> *reconfigurationWithSync* are absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |
| ***t316***  Indicates the value for timer T316 as described in clause 7.1. Value *ms50* corresponds to 50 ms, value *ms100* corresponds to 100 ms and so on. This field can be configured only if the UE is configured with split SRB1 or SRB3. |
| ***ue-TxTEG-RequestUL-TDOA-Config***  Configures the periodicity of UE reporting for the association between Tx TEG and SRS Positioning resources. When configured with *oneShot* UE reports the association only one time. When configured with *periodicReporting* UE reports the association periodically and the *periodicReporting* indicates the periodicity. Value *ms160* corresponds to 160ms, value *ms320* corresponds to 320ms and so on. |
| ***ul-GapFR2-Config***  Indicates the FR2 UL gap configuration to UE. In EN-DC and NGEN-DC, the SN decides and configures the FR2 UL gap pattern. In NE-DC, the MN decides and configures the FR2 UL gap pattern. In NR-DC without FR2-FR2 band combination, the network entity which is configured with FR2 serving cell(s) decides and configures the FR2 UL gap pattern. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *nonHO* | The field is absent in case of reconfiguration with sync within NR or to NR; otherwise it is optionally present, need N. |
| *securityNASC* | This field is mandatory present in case of inter system handover. Otherwise the field is optionally present, need N. |
| *MasterKeyChange* | This field is mandatory present in case *masterCellGroup* includes *ReconfigurationWithSync* and *RadioBearerConfig* includes *SecurityConfig* with *SecurityAlgorithmConfig*, indicating a change of the AS security algorithms associated to the master key. If *ReconfigurationWithSync* is included for other cases, this field is optionally present, need N. Otherwise the field is absent. |
| *FullConfig* | The field is mandatory present in case of inter-system handover from E-UTRA/EPC to NR. It is optionally present, Need N, during reconfiguration with sync and also in first reconfiguration after reestablishment; or for intra-system handover from E-UTRA/5GC to NR. It is absent otherwise. |
| *SCG* | The field is mandatory present in:  - an *RRCReconfiguration* message contained in an *RRCResume* message (or in an *RRCConnectionResume* message, see TS 36.331 [10]),  - an *RRCReconfiguration* message contained in an *RRCConnectionReconfiguration* message, see TS 36.331 [10], which is contained in *DLInformationTransferMRDC* transmitted on SRB3 (as a response to *ULInformationTransferMRDC* including an *MCGFailureInformation*).  The field is optional present, Need M, in:  - an *RRCReconfiguration* message transmitted on SRB3,  - an *RRCReconfiguration* message contained in another *RRCReconfiguration* message (or in an *RRCConnectionReconfiguration* message, see TS 36.331 [10]) transmitted on SRB1  - an *RRCReconfiguration* message contained in another *RRCReconfiguration* message which is contained in *DLInformationTransferMRDC* transmitted on SRB3 (as a response to *ULInformationTransferMRDC* including an *MCGFailureInformation*)  Otherwise, the field is absent |
| *PagingRelay* | For L2 U2N Relay UE, the field is optionally present, Need N. Otherwise, it is absent. |

#### *– RRCReconfigurationComplete*

The *RRCReconfigurationComplete* message is used to confirm the successful completion of an RRC connection reconfiguration.

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*RRCReconfigurationComplete message*

-- ASN1START

-- TAG-RRCRECONFIGURATIONCOMPLETE-START

RRCReconfigurationComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfigurationComplete RRCReconfigurationComplete-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfigurationComplete-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReconfigurationComplete-v1530-IEs OPTIONAL

}

RRCReconfigurationComplete-v1530-IEs ::= SEQUENCE {

uplinkTxDirectCurrentList UplinkTxDirectCurrentList OPTIONAL,

nonCriticalExtension RRCReconfigurationComplete-v1560-IEs OPTIONAL

}

RRCReconfigurationComplete-v1560-IEs ::= SEQUENCE {

scg-Response CHOICE {

nr-SCG-Response OCTET STRING (CONTAINING RRCReconfigurationComplete),

eutra-SCG-Response OCTET STRING

} OPTIONAL,

nonCriticalExtension RRCReconfigurationComplete-v1610-IEs OPTIONAL

}

RRCReconfigurationComplete-v1610-IEs ::= SEQUENCE {

ue-MeasurementsAvailable-r16 UE-MeasurementsAvailable-r16 OPTIONAL,

needForGapsInfoNR-r16 NeedForGapsInfoNR-r16 OPTIONAL,

nonCriticalExtension RRCReconfigurationComplete-v1640-IEs OPTIONAL

}

RRCReconfigurationComplete-v1640-IEs ::= SEQUENCE {

uplinkTxDirectCurrentTwoCarrierList-r16 UplinkTxDirectCurrentTwoCarrierList-r16 OPTIONAL,

nonCriticalExtension RRCReconfigurationComplete-v1700-IEs OPTIONAL

}

RRCReconfigurationComplete-v1700-IEs ::= SEQUENCE {

needForGapNCSG-InfoNR-r17 NeedForGapNCSG-InfoNR-r17 OPTIONAL,

needForGapNCSG-InfoEUTRA-r17 NeedForGapNCSG-InfoEUTRA-r17 OPTIONAL,

selectedCondRRCReconfig-r17 CondReconfigId-r16 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRECONFIGURATIONCOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReconfigurationComplete-IEs* field descriptions |
| ***needForGapsInfoNR***  This field is used to indicate the measurement gap requirement information of the UE for NR target bands. |
| ***needForGapNCSG-InfoEUTRA***  This field is used to indicate the measurement gap and NCSG requirement information of the UE for E‑UTRA target bands. |
| ***needForGapNCSG-InfoNR***  This field is used to indicate the measurement gap and NCSG requirement information of the UE for NR target bands. |
| ***scg-Response***  In case of NR-DC (*nr-SCG-Response*), this field includes the *RRCReconfigurationComplete* message. In case of NE-DC (*eutra-SCG-Response*), this field includes the E-UTRA *RRCConnectionReconfigurationComplete* message as specified in TS 36.331 [10]*.* |
| ***selectedCondRRCReconfig***  This field indicates the ID of the selected conditional reconfiguration the UE applied upon the execution of CPA or inter-SN CPC. |
| ***uplinkTxDirectCurrentList***  The Tx Direct Current locations for the configured serving cells and BWPs if requested by the NW (see *reportUplinkTxDirectCurrent* in *CellGroupConfig*). |
| ***uplinkTxDirectCurrentTwoCarrierList***  The Tx Direct Current locations for the configured uplink intra-band CA with two carriers if requested by the NW (see *reportUplinkTxDirectCurrentTwoCarrier-r16* in *CellGroupConfig*). |

#### – *RRCReject*

The *RRCReject* message is used to reject an RRC connection establishment or an RRC connection resumption.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: Network to UE

*RRCReject* message

-- ASN1START

-- TAG-RRCREJECT-START

RRCReject ::= SEQUENCE {

criticalExtensions CHOICE {

rrcReject RRCReject-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReject-IEs ::= SEQUENCE {

waitTime RejectWaitTime OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-RRCREJECT-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReject-IEs* field descriptions |
| ***waitTime***  Wait time value in seconds. The field is always included. |

#### – *RRCRelease*

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

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCRelease* message

-- ASN1START

-- TAG-RRCRELEASE-START

RRCRelease ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcRelease RRCRelease-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCRelease-IEs ::= SEQUENCE {

redirectedCarrierInfo RedirectedCarrierInfo OPTIONAL, -- Need N

cellReselectionPriorities CellReselectionPriorities OPTIONAL, -- Need R

suspendConfig SuspendConfig OPTIONAL, -- Need R

deprioritisationReq SEQUENCE {

deprioritisationType ENUMERATED {frequency, nr},

deprioritisationTimer ENUMERATED {min5, min10, min15, min30}

} OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCRelease-v1540-IEs OPTIONAL

}

RRCRelease-v1540-IEs ::= SEQUENCE {

waitTime RejectWaitTime OPTIONAL, -- Need N

nonCriticalExtension RRCRelease-v1610-IEs OPTIONAL

}

RRCRelease-v1610-IEs ::= SEQUENCE {

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

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

nonCriticalExtension RRCRelease-v1650-IEs OPTIONAL

}

RRCRelease-v1650-IEs ::= SEQUENCE {

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

nonCriticalExtension RRCRelease-v1710-IEs OPTIONAL

}

RRCRelease-v1710-IEs ::= SEQUENCE {

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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

RedirectedCarrierInfo ::= CHOICE {

nr CarrierInfoNR,

eutra RedirectedCarrierInfo-EUTRA,

...

}

RedirectedCarrierInfo-EUTRA ::= SEQUENCE {

eutraFrequency ARFCN-ValueEUTRA,

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

}

CarrierInfoNR ::= SEQUENCE {

carrierFreq ARFCN-ValueNR,

ssbSubcarrierSpacing SubcarrierSpacing,

smtc SSB-MTC OPTIONAL, -- Need S

...

}

SuspendConfig ::= SEQUENCE {

fullI-RNTI I-RNTI-Value,

shortI-RNTI ShortI-RNTI-Value,

ran-PagingCycle PagingCycle,

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

t380 PeriodicRNAU-TimerValue OPTIONAL, -- Need R

nextHopChainingCount NextHopChainingCount,

...,

[[

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

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

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

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

]]

}

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

CellReselectionPriorities ::= SEQUENCE {

freqPriorityListEUTRA FreqPriorityListEUTRA OPTIONAL, -- Need M

freqPriorityListNR FreqPriorityListNR OPTIONAL, -- Need M

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

...,

[[

freqPriorityListDedicatedSlicing-r17 FreqPriorityListDedicatedSlicing-r17 OPTIONAL -- Need M

]]

}

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

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

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

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

FreqPriorityEUTRA ::= SEQUENCE {

carrierFreq ARFCN-ValueEUTRA,

cellReselectionPriority CellReselectionPriority,

cellReselectionSubPriority CellReselectionSubPriority OPTIONAL -- Need R

}

FreqPriorityNR ::= SEQUENCE {

carrierFreq ARFCN-ValueNR,

cellReselectionPriority CellReselectionPriority,

cellReselectionSubPriority CellReselectionSubPriority OPTIONAL -- Need R

}

RAN-NotificationAreaInfo ::= CHOICE {

cellList PLMN-RAN-AreaCellList,

ran-AreaConfigList PLMN-RAN-AreaConfigList,

...

}

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

PLMN-RAN-AreaCell ::= SEQUENCE {

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

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

}

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

PLMN-RAN-AreaConfig ::= SEQUENCE {

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

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

}

RAN-AreaConfig ::= SEQUENCE {

trackingAreaCode TrackingAreaCode,

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

}

SDT-Config-r17 ::= SEQUENCE {

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

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

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

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

}

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

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

-- CG-SDT specific configuration

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

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

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

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

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

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

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

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

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

...

}

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

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

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

}

BWP-DownlinkDedicatedSDT-r17 ::= SEQUENCE {

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

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

...

}

BWP-UplinkDedicatedSDT-r17 ::= SEQUENCE {

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

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

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

...

}

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

logicalChannelIdentity-r17 LogicalChannelIdentity,

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

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

OPTIONAL -- Need R

}

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

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

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

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

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

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

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

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

}

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

SRS-PosConfig-r17 ::= SEQUENCE {

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

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

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

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

}

-- TAG-RRCRELEASE-STOP

-- ASN1STOP

|  |
| --- |
| *RRCRelease-IEs* field descriptions |
| ***cnType***  Indicate that the UE is redirected to EPC or 5GC. |
| ***deprioritisationReq***  Indicates whether the current frequency or RAT is to be de-prioritised. |
| ***deprioritisationTimer***  Indicates the period for which either the current carrier frequency or NR is deprioritised. Value *minN* corresponds to N minutes. |
| ***measIdleConfig***  Indicates measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |
| ***mpsPriorityIndication***  Indicates the UE can set the establishment cause to mps-PriorityAccess for a new connection to a new RAT following a redirect to NR. If the target RAT is E-UTRA, see TS 36.331 [10]. The gNB sets the indication only for UEs authorized to receive MPS treatment as indicated by ARP and/or QoS characteristics at the gNB, and it is applicable only for this instance of release with redirection to carrier/RAT included in the *redirectedCarrierInfo* field in the *RRCRelease* message. |
| ***noLastCellUpdate***  Presence of the field indicates that the last used cell for PEI shall not be updated. When the field is absent, the UE shall update its last used cell with the current cell. |
| ***srs-PosRRCInactiveConfig***  SRS for positioning confifuration during RRC\_INACTIVE State. |
| ***suspendConfig***  Indicates configuration for the RRC\_INACTIVE state. The network does not configure *suspendConfig* when the network redirect the UE to an inter-RAT carrier frequency or if the UE is configured with a DAPS bearer. |
| ***redirectedCarrierInfo***  Indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to an NR or an inter-RAT carrier frequency, by means of cell selection at transition to RRC\_IDLE or RRC\_INACTIVE as specified in TS 38.304 [20]. Based on UE capability, the network may include *redirectedCarrierInfo* in *RRCRelease* message with *suspendConfig* if this message is sent in response to an *RRCResumeRequest* or an *RRCResumeRequest1* which is triggered by the NAS layer (see 5.3.1.4 in TS 24.501 [23]). |
| ***voiceFallbackIndication***  Indicates the RRC release is triggered by EPS fallback for IMS voice as specified in TS 23.502 [43]. |

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| --- |
| *CarrierInfoNR* field descriptions |
| ***carrierFreq***  Indicates the redirected NR frequency. |
| ***ssbSubcarrierSpacing***  Subcarrier spacing of SSB in the redirected SSB frequency.  Only the following values are applicable depending on the used frequency:  FR1: 15 or 30 kHz  FR2-1: 120 or 240 kHz  FR2-2: 120, 480, or 960 kHz |
| ***smtc***  The SSB periodicity/offset/duration configuration for the redirected SSB frequency. It is based on timing reference of PCell. If the field is absent, the UE uses the SMTC configured in the measObjectNR having the same SSB frequency and subcarrier spacing. |

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

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

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

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

|  |
| --- |
| *SDT-MAC-PHY-CG-Config* field descriptions |
| ***cg-SDT-CS-RNTI***  The CS-RNTI value for CG-SDT as specified in TS 38.321 [3]. |
| ***cg-SDT-RSRP-ThresholdSSB***  An RSRP threshold configured for SSB selection for CG-SDT as specified in TS 38.321 [3]. |
| ***cg-SDT-TA-ValidationConfig***  Configuration for the RSRP based TA validation. If this field is not configured, then the UE does not perform RSRP based TA validation. |
| ***cg-SDT-timeAlignmentTimer***  TAT value for CG-SDT as specified in TS 38.321 [3]. The network always configures this when *sdt-MAC-PHY-CG-Config* is configured. |

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

|  |
| --- |
| *SRS-PosRRC-InactiveConfig* field descriptions |
| ***bwp-NUL***  BWP configuration for SRS for Positioning during the RRC\_INACTIVE state in Normal Uplink Carrier. If the field is absent UE is configured with an SRS for Positioning associated with the initial UL BWP and transmitted, during the RRC\_INACTIVE state, inside the initial UL BWP with the same CP and SCS as configured for initial UL BWP. |
| ***bwp-SUL***  BWP configuration for SRS for Positioning during the RRC\_INACTIVE state in Supplementary Uplink Carrier. If the field is absent UE is configured with an SRS for Positioning associated with the initial UL BWP and transmitted, during the RRC\_INACTIVE state, inside the initial UL BWP with the same CP and SCS as configured for initial UL BWP. |
| ***inactivePosSRS-RSRP-changeThreshold***  RSRP threshold for the increase/decrease of RSRP for time alignment validation as specified in TS 38.321 [3]. |
| ***inactivePosSRS-TimeAlignmentTimer***  TAT value for SRS for positioning transmission during RRC\_INACTIVE State as specified in TS 38.321 [3]. |
| ***srs-PosConfig-NUL***  SRS for Positioning configuration in RRC\_INACTIVE state in Normal Uplink Carrier. |
| ***srs-PosConfig-SUL***  SRS for Positioning configuration in RRC\_INACTIVE state in Supplementary Uplink Carrier. |

|  |  |
| --- | --- |
| *SuspendConfig* field descriptions | |
| ***ran-ExtendedPagingCycle***  The extended DRX (eDRX) cycle for RAN-initiated paging to be applied by the UE. Value *rf256* corresponds to 256 radio frames, value *rf512* corresponds to 512 radio frames and so on. Value of the field indicates an eDRX cycle which is shorter or equal to the IDLE mode eDRX cycle configured for the UE. |
| ***ran-NotificationAreaInfo***  Network ensures that the UE in RRC\_INACTIVE always has a valid *ran-NotificationAreaInfo*. | |
| ***ran-PagingCycle***  Refers to the UE specific cycle for RAN-initiated paging. Value *rf32* corresponds to 32 radio frames, value *rf64* corresponds to 64 radio frames and so on. | |
| ***sl-UEIdentityRemote***  Indicates the C-RNTI to the L2 U2N Remote UE. | |
| ***t380***  Refers to the timer that triggers the periodic RNAU procedure in UE. Value *min5* corresponds to 5 minutes, value *min10* corresponds to 10 minutes and so on. | |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE's RNAU; otherwise it is absent. |
| *RANPaging* | This field is optionally present, Need R, if the UE is configured with eDRX in IDLE mode, see TS 24.401 [23]; otherwise the field is not present. |
| *Redirection2* | The field is optionally present, Need R, if *redirectedCarrierInfo* is included; otherwise the field is not present. |

#### – *RRCResume*

The *RRCResume* message is used to resume the suspended RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCResume* message

-- ASN1START

-- TAG-RRCRESUME-START

RRCResume ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcResume RRCResume-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCResume-IEs ::= SEQUENCE {

radioBearerConfig RadioBearerConfig OPTIONAL, -- Need M

masterCellGroup OCTET STRING (CONTAINING CellGroupConfig) OPTIONAL, -- Need M

measConfig MeasConfig OPTIONAL, -- Need M

fullConfig ENUMERATED {true} OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCResume-v1560-IEs OPTIONAL

}

RRCResume-v1560-IEs ::= SEQUENCE {

radioBearerConfig2 OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL, -- Need M

sk-Counter SK-Counter OPTIONAL, -- Need N

nonCriticalExtension RRCResume-v1610-IEs OPTIONAL

}

RRCResume-v1610-IEs ::= SEQUENCE {

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

restoreMCG-SCells-r16 ENUMERATED {true} OPTIONAL, -- Need N

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

mrdc-SecondaryCellGroup-r16 CHOICE {

nr-SCG-r16 OCTET STRING (CONTAINING RRCReconfiguration),

eutra-SCG-r16 OCTET STRING

} OPTIONAL, -- Cond RestoreSCG

needForGapsConfigNR-r16 SetupRelease {NeedForGapsConfigNR-r16} OPTIONAL, -- Need M

nonCriticalExtension RRCResume-v1700-IEs OPTIONAL

}

RRCResume-v1700-IEs ::= SEQUENCE {

sl-ConfigDedicatedNR-r17 SetupRelease {SL-ConfigDedicatedNR-r16} OPTIONAL, -- Cond L2RemoteUE

sl-L2RemoteUE-Config-r17 SetupRelease {SL-L2RemoteUE-Config-r17} OPTIONAL, -- Cond L2RemoteUE

needForGapNCSG-ConfigNR-r17 SetupRelease {NeedForGapNCSG-ConfigNR-r17} OPTIONAL, -- Need M

needForGapNCSG-ConfigEUTRA-r17 SetupRelease {NeedForGapNCSG-ConfigEUTRA-r17} OPTIONAL, -- Need M

scg-State-r17 ENUMERATED {deactivated} OPTIONAL, -- Need S

appLayerMeasConfig-r17 AppLayerMeasConfig-r17 OPTIONAL, -- Need M

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRESUME-STOP

-- ASN1STOP

|  |
| --- |
| *RRCResume-IEs* field descriptions |
| ***idleModeMeasurementReq***  This field indicates that the UE shall report the idle/inactive measurements, if available, to the network in the *RRCResumeComplete* message |
| ***masterCellGroup***  Configuration of the master cell group. |
| ***mrdc-SecondaryCellGroup***  Includes an RRC message for SCG configuration in NR-DC or NE-DC.  For NR-DC (*nr-SCG*), *mrdc-SecondaryCellGroup* contains the *RRCReconfiguration* message as generated (entirely) by SN gNB. In this version of the specification, the RRC message can only include fields *secondaryCellGroup* (with at least *reconfigurationWithSync*)*,* *otherConfig* and *measConfig*.  For NE-DC (*eutra-SCG*), *mrdc-SecondaryCellGroup* includes the E-UTRA *RRCConnectionReconfiguration* message as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA RRC message only include the field *scg-Configuration* with at least *mobilityControlInfoSCG*. |
| ***needForGapsConfigNR***  Configuration for the UE to report measurement gap requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigEUTRA***  Configuration for the UE to report measurement gap and NCSG requirement information of E‑UTRA target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigNR***  Configuration for the UE to report measurement gap and NCSG requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***radioBearerConfig***  Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. |
| ***radioBearerConfig2***  Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. This field can only be used if the UE supports NR-DC or NE-DC. |
| ***restoreMCG-SCells***  Indicates that the UE shall restore the MCG SCells from the UE Inactive AS Context, if stored. |
| ***restoreSCG***  Indicates that the UE shall restore the SCG configurations from the UE Inactive AS Context, if stored. |
| ***scg-State***  Indicates that the SCG is in deactivated state. |
| ***sk-Counter***  A counter used to derive S-KgNB or S-KeNB based on the newly derived KgNB during RRC Resume. The field is only included when there is one or more RB with *keyToUse* set to *secondary* *or mrdc-SecondaryCellGroup* is included. |
| ***sl-ConfigDedicatedNR***  This field is used to provide the dedicated configurations for NR sidelink communication/discovery used by L2 U2N Remote UE. |
| ***sl-L2RemoteUE-Config***  Contains L2 U2N relay operation related configurations used by L2 U2N Remote UE. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE; otherwise it is absent. |
| *RestoreSCG* | The field is mandatory present if *restoreSCG* is included. It is optionally present, Need M, otherwise. |

#### – *RRCResumeComplete*

The *RRCResumeComplete* message is used to confirm the successful completion of an RRC connection resumption.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*RRCResumeComplete* message

-- ASN1START

-- TAG-RRCRESUMECOMPLETE-START

RRCResumeComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcResumeComplete RRCResumeComplete-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCResumeComplete-IEs ::= SEQUENCE {

dedicatedNAS-Message DedicatedNAS-Message OPTIONAL,

selectedPLMN-Identity INTEGER (1..maxPLMN) OPTIONAL,

uplinkTxDirectCurrentList UplinkTxDirectCurrentList OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCResumeComplete-v1610-IEs OPTIONAL

}

RRCResumeComplete-v1610-IEs ::= SEQUENCE {

idleMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

scg-Response-r16 CHOICE {

nr-SCG-Response OCTET STRING (CONTAINING RRCReconfigurationComplete),

eutra-SCG-Response OCTET STRING

} OPTIONAL,

ue-MeasurementsAvailable-r16 UE-MeasurementsAvailable-r16 OPTIONAL,

mobilityHistoryAvail-r16 ENUMERATED {true} OPTIONAL,

mobilityState-r16 ENUMERATED {normal, medium, high, spare} OPTIONAL,

needForGapsInfoNR-r16 NeedForGapsInfoNR-r16 OPTIONAL,

nonCriticalExtension RRCResumeComplete-v1640-IEs OPTIONAL

}

RRCResumeComplete-v1640-IEs ::= SEQUENCE {

uplinkTxDirectCurrentTwoCarrierList-r16 UplinkTxDirectCurrentTwoCarrierList-r16 OPTIONAL,

nonCriticalExtension RRCResumeComplete-v1700-IEs OPTIONAL

}

RRCResumeComplete-v1700-IEs ::= SEQUENCE {

needForGapNCSG-InfoNR-r17 NeedForGapNCSG-InfoNR-r17 OPTIONAL,

needForGapNCSG-InfoEUTRA-r17 NeedForGapNCSG-InfoEUTRA-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRESUMECOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| *RRCResumeComplete-IEs* field descriptions |
| ***idleMeasAvailable***  Indication that the UE has idle/inactive measurement report available. |
| ***measResultIdleEUTRA***  EUTRA measurement results performed during RRC\_INACTIVE. |
| ***measResultIdleNR***  NR measurement results performed during RRC\_INACTIVE. |
| ***needForGapsInfoNR***  This field is used to indicate the measurement gap requirement information of the UE for NR target bands. |
| ***needForGapNCSG-InfoEUTRA***  This field is used to indicate the measurement gap and NCSG requirement information of the UE for E‑UTRA target bands |
| ***needForGapNCSG-InfoNR***  This field is used to indicate the measurement gap and NCSG requirement information of the UE for NR target bands |
| ***selectedPLMN-Identity***  Index of the PLMN selected by the UE from the *plmn-IdentityInfoList* or *npn-IdentityInfoList* fields included in *SIB1*. |
| ***uplinkTxDirectCurrentList***  The Tx Direct Current locations for the configured serving cells and BWPs if requested by the NW (see *reportUplinkTxDirectCurrent* in *CellGroupConfig*). |
| ***uplinkTxDirectCurrentTwoCarrierList***  The Tx Direct Current locations for the configured uplink intra-band CA with two carriers if requested by the NW (see *reportUplinkTxDirectCurrentTwoCarrier-r16* in *CellGroupConfig*). |

#### – *RRCResumeRequest*

The *RRCResumeRequest* message is used to request the resumption of a suspended RRC connection or perform an RNA update.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to Network

*RRCResumeRequest* message

-- ASN1START

-- TAG-RRCRESUMEREQUEST-START

RRCResumeRequest ::= SEQUENCE {

rrcResumeRequest RRCResumeRequest-IEs

}

RRCResumeRequest-IEs ::= SEQUENCE {

resumeIdentity ShortI-RNTI-Value,

resumeMAC-I BIT STRING (SIZE (16)),

resumeCause ResumeCause,

spare BIT STRING (SIZE (1))

}

-- TAG-RRCRESUMEREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *RRCResumeRequest-IEs* field descriptions |
| ***resumeCause***  Provides the resume cause for the RRC connection resume request as provided by the upper layers or RRC. The network is not expected to reject an *RRCResumeRequest* due to unknown cause value being used by the UE. |
| ***resumeIdentity***  UE identity to facilitate UE context retrieval at gNB. |
| ***resumeMAC-I***  Authentication token to facilitate UE authentication at gNB. The 16 least significant bits of the MAC-I calculated using the AS security configuration as specified in 5.3.13.3. |

#### – *RRCResumeRequest1*

The *RRCResumeRequest1* message is used to request the resumption of a suspended RRC connection or perform an RNA update.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH1

Direction: UE to Network

*RRCResumeRequest1* message

-- ASN1START

-- TAG-RRCRESUMEREQUEST1-START

RRCResumeRequest1 ::= SEQUENCE {

rrcResumeRequest1 RRCResumeRequest1-IEs

}

RRCResumeRequest1-IEs ::= SEQUENCE {

resumeIdentity I-RNTI-Value,

resumeMAC-I BIT STRING (SIZE (16)),

resumeCause ResumeCause,

spare BIT STRING (SIZE (1))

}

-- TAG-RRCRESUMEREQUEST1-STOP

-- ASN1STOP

|  |
| --- |
| *RRCResumeRequest1-IEs* field descriptions |
| ***resumeCause***  Provides the resume cause for the *RRCResumeRequest1* as provided by the upper layers or RRC. A gNB is not expected to reject an *RRCResumeRequest1* due to unknown cause value being used by the UE. |
| ***resumeIdentity***  UE identity to facilitate UE context retrieval at gNB. |
| ***resumeMAC-I***  Authentication token to facilitate UE authentication at gNB. The 16 least significant bits of the MAC-I calculated using the AS security configuration as specified in 5.3.13.3. |

#### – *RRCSetup*

The *RRCSetup* message is used to establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: Network to UE

*RRCSetup* message

-- ASN1START

-- TAG-RRCSETUP-START

RRCSetup ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcSetup RRCSetup-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCSetup-IEs ::= SEQUENCE {

radioBearerConfig RadioBearerConfig,

masterCellGroup OCTET STRING (CONTAINING CellGroupConfig),

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCSetup-v1700-IEs OPTIONAL

}

RRCSetup-v1700-IEs ::= SEQUENCE {

sl-ConfigDedicatedNR-r17 SL-ConfigDedicatedNR-r16 OPTIONAL, -- Cond L2RemoteUE

sl-L2RemoteUE-Config-r17 SL-L2RemoteUE-Config-r17 OPTIONAL, -- Cond L2RemoteUE

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCSETUP-STOP

-- ASN1STOP

|  |
| --- |
| *RRCSetup-IEs* field descriptions |
| ***masterCellGroup***  The network configures only the RLC bearer for the SRB1, *mac-CellGroupConfig*, *physicalCellGroupConfig* and *spCellConfig*. |
| ***radioBearerConfig***  Only SRB1 can be configured in RRC setup. |
| ***sl-ConfigDedicatedNR***  Contains dedicated configurations for NR sidelink communication. The network configures only the PC5 Relay RLC channel and *sl-PHY-MAC-RLC-Config* used for the SRB1. |
| ***sl-L2RemoteUE-Config***  Contains dedicated configurations used for L2 U2N relay related operation. The network configures only the SRAP configuration used for the SRB1. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE; otherwise it is absent. |

#### – *RRCSetupComplete*

The *RRCSetupComplete* message is used to confirm the successful completion of an RRC connection establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*RRCSetupComplete* message

-- ASN1START

-- TAG-RRCSETUPCOMPLETE-START

RRCSetupComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcSetupComplete RRCSetupComplete-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCSetupComplete-IEs ::= SEQUENCE {

selectedPLMN-Identity INTEGER (1..maxPLMN),

registeredAMF RegisteredAMF OPTIONAL,

guami-Type ENUMERATED {native, mapped} OPTIONAL,

s-NSSAI-List SEQUENCE (SIZE (1..maxNrofS-NSSAI)) OF S-NSSAI OPTIONAL,

dedicatedNAS-Message DedicatedNAS-Message,

ng-5G-S-TMSI-Value CHOICE {

ng-5G-S-TMSI NG-5G-S-TMSI,

ng-5G-S-TMSI-Part2 BIT STRING (SIZE (9))

} OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCSetupComplete-v1610-IEs OPTIONAL

}

RRCSetupComplete-v1610-IEs ::= SEQUENCE {

iab-NodeIndication-r16 ENUMERATED {true} OPTIONAL,

idleMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

ue-MeasurementsAvailable-r16 UE-MeasurementsAvailable-r16 OPTIONAL,

mobilityHistoryAvail-r16 ENUMERATED {true} OPTIONAL,

mobilityState-r16 ENUMERATED {normal, medium, high, spare} OPTIONAL,

nonCriticalExtension RRCSetupComplete-v1690-IEs OPTIONAL

}

RRCSetupComplete-v1690-IEs ::= SEQUENCE {

ul-RRC-Segmentation-r16 ENUMERATED {true} OPTIONAL,

nonCriticalExtension RRCSetupComplete-v1700-IEs OPTIONAL

}

RRCSetupComplete-v1700-IEs ::= SEQUENCE {

onboardingRequest-r17 ENUMERATED {true} OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

RegisteredAMF ::= SEQUENCE {

plmn-Identity PLMN-Identity OPTIONAL,

amf-Identifier AMF-Identifier

}

-- TAG-RRCSETUPCOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| *RRCSetupComplete-IEs* field descriptions |
| ***guami-Type***  This field is used to indicate whether the GUAMI included is native (derived from native 5G-GUTI) or mapped (from EPS, derived from EPS GUTI) as specified in TS 24.501 [23]. |
| ***iab-NodeIndication***  This field is used to indicate that the connection is being established by an IAB-node as specified in TS 38.300 [2]. |
| ***idleMeasAvailable***  Indication that the UE has idle/inactive measurement report available. |
| ***mobilityState***  This field indicates the UE mobility state (as defined in TS 38.304 [20], clause 5.2.4.3) just prior to UE going into RRC\_CONNECTED state. The UE indicates the value of *medium* and *high* when being in Medium-mobility and High-mobility states respectively. Otherwise the UE indicates the value *normal*. |
| ***ng-5G-S-TMSI-Part2***  The leftmost 9 bits of 5G-S-TMSI. |
| ***onboardingRequest***  This field indicates that the connection is being established for UE onboarding in the selected onboarding SNPN, see TS 23.501 [32]. |
| ***registeredAMF***  This field is used to transfer the GUAMI of the AMF where the UE is registered, as provided by upper layers, see TS 23.003 [21]. |
| ***selectedPLMN-Identity***  Index of the PLMN or SNPN selected by the UE from the *plmn-IdentityInfoList* or *npn-IdentityInfoList* fields included in SIB1. |
| ***ul-RRC-Segmentation***  This field indicates the UE supports uplink RRC segmentation of *UECapabilityInformation.* |

#### *– RRCSetupRequest*

The *RRCSetupRequest* message is used to request the establishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to Network

*RRCSetupRequest message*

-- ASN1START

-- TAG-RRCSETUPREQUEST-START

RRCSetupRequest ::= SEQUENCE {

rrcSetupRequest RRCSetupRequest-IEs

}

RRCSetupRequest-IEs ::= SEQUENCE {

ue-Identity InitialUE-Identity,

establishmentCause EstablishmentCause,

spare BIT STRING (SIZE (1))

}

InitialUE-Identity ::= CHOICE {

ng-5G-S-TMSI-Part1 BIT STRING (SIZE (39)),

randomValue BIT STRING (SIZE (39))

}

EstablishmentCause ::= ENUMERATED {

emergency, highPriorityAccess, mt-Access, mo-Signalling,

mo-Data, mo-VoiceCall, mo-VideoCall, mo-SMS, mps-PriorityAccess, mcs-PriorityAccess,

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

-- TAG-RRCSETUPREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *RRCSetupRequest-IEs* field descriptions |
| ***establishmentCause***  Provides the establishment cause for the *RRCSetupRequest* in accordance with the information received from upper layers. gNB is not expected to reject an *RRCSetupRequest* due to unknown cause value being used by the UE. |
| ***ue-Identity***  UE identity included to facilitate contention resolution by lower layers. |

|  |
| --- |
| *InitialUE-Identity* field descriptions |
| ***ng-5G-S-TMSI-Part1***  The rightmost 39 bits of 5G-S-TMSI. |
| ***randomValue***  Integer value in the range 0 to 239 – 1. |

#### – *RRCSystemInfoRequest*

The *RRCSystemInfoRequest* message is used to request SI message(s) required by the UE as specified in clause 5.2.2.3.3.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to Network

*RRCSystemInfoRequest message*

-- ASN1START

-- TAG-RRCSYSTEMINFOREQUEST-START

RRCSystemInfoRequest ::= SEQUENCE {

criticalExtensions CHOICE {

rrcSystemInfoRequest RRCSystemInfoRequest-IEs,

criticalExtensionsFuture-r16 CHOICE {

rrcPosSystemInfoRequest-r16 RRC-PosSystemInfoRequest-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

RRCSystemInfoRequest-IEs ::= SEQUENCE {

requested-SI-List BIT STRING (SIZE (maxSI-Message)), --32bits

spare BIT STRING (SIZE (12))

}

RRC-PosSystemInfoRequest-r16-IEs ::= SEQUENCE {

requestedPosSI-List BIT STRING (SIZE (maxSI-Message)), --32bits

spare BIT STRING (SIZE (11))

}

-- TAG-RRCSYSTEMINFOREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *RRCSystemInfoRequest-IEs* field descriptions |
| ***requested-SI-List***  Contains a list of requested SI messages. According to the order of entry in the list of SI messages configured by *schedulingInfoList* in si-*SchedulingInfo* in *SIB1*, first bit corresponds to first/leftmost listed SI message, second bit corresponds to second listed SI message, and so on. |
| ***requestedPosSI-List***  Contains a list of requested SI messages. According to the order of entry in the list of SI messages configured by *pos*S*chedulingInfoList* in *posSI*-*SchedulingInfo* in *SIB1*, first bit corresponds to first/leftmost listed SI message, second bit corresponds to second listed SI message, and so on. |

#### *– SCGFailureInformation*

The *SCGFailureInformation* message is used to provide information regarding NR SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SCGFailureInformation* message

-- ASN1START

-- TAG-SCGFAILUREINFORMATION-START

SCGFailureInformation ::= SEQUENCE {

criticalExtensions CHOICE {

scgFailureInformation SCGFailureInformation-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SCGFailureInformation-IEs ::= SEQUENCE {

failureReportSCG FailureReportSCG OPTIONAL,

nonCriticalExtension SCGFailureInformation-v1590-IEs OPTIONAL

}

SCGFailureInformation-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportSCG ::= SEQUENCE {

failureType ENUMERATED {

t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx,

synchReconfigFailureSCG, scg-ReconfigFailure,

srb3-IntegrityFailure, other-r16, spare1},

measResultFreqList MeasResultFreqList OPTIONAL,

measResultSCG-Failure OCTET STRING (CONTAINING MeasResultSCG-Failure) OPTIONAL,

...,

[[

locationInfo-r16 LocationInfo-r16 OPTIONAL,

failureType-v1610 ENUMERATED {scg-lbtFailure-r16, beamFailureRecoveryFailure-r16,

t312-Expiry-r16, bh-RLF-r16, beamFailure-r17, spare3, spare2, spare1} OPTIONAL

]],

[[

previousPSCellId-r17 SEQUENCE {

physCellId-r17 PhysCellId,

carrierFreq-r17 ARFCN-ValueNR

} OPTIONAL,

failedPSCellId-r17 SEQUENCE {

physCellId-r17 PhysCellId,

carrierFreq-r17 ARFCN-ValueNR

} OPTIONAL,

timeSCGFailure-r17 INTEGER (0..1023) OPTIONAL,

perRAInfoList-r17 PerRAInfoList-r16 OPTIONAL

]]

}

MeasResultFreqList ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2NR

-- TAG-SCGFAILUREINFORMATION-STOP

-- ASN1STOP

| *SCGFailureInformation field descriptions* |
| --- |
| ***measResultFreqList***  The field contains available results of measurements on NR frequencies the UE is configured to measure by *measConfig*. |
| ***measResultSCG-Failure***  The field contains the *MeasResultSCG-Failure* IE which includes available results of measurements on NR frequencies the UE is configured to measure by the NR SCG *RRCReconfiguration* message. |
| ***previousPSCellId***  This field indicates the physical cell id and carrier frequency of the cell that is the source PSCell of the last PSCell change. |
| ***failedPSCellId***  This field indicates the physical cell id and carrier frequency of the cell in which SCG failure is detected or the target PSCell of the failed PSCell change or failed PSCell addition. |
| ***timeSCGFailure***  This field is used to indicate the time elapsed since the last execution of *RRCReconfiguration* with *reconfigurationWithSync* for the SCG until the SCG failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |

#### *– SCGFailureInformationEUTRA*

The *SCGFailureInformationEUTRA* message is used to provide information regarding E-UTRA SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SCGFailureInformationEUTRA* message

-- ASN1START

-- TAG-SCGFAILUREINFORMATIONEUTRA-START

SCGFailureInformationEUTRA ::= SEQUENCE {

criticalExtensions CHOICE {

scgFailureInformationEUTRA SCGFailureInformationEUTRA-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SCGFailureInformationEUTRA-IEs ::= SEQUENCE {

failureReportSCG-EUTRA FailureReportSCG-EUTRA OPTIONAL,

nonCriticalExtension SCGFailureInformationEUTRA-v1590-IEs OPTIONAL

}

SCGFailureInformationEUTRA-v1590-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportSCG-EUTRA ::= SEQUENCE {

failureType ENUMERATED {

t313-Expiry, randomAccessProblem,rlc-MaxNumRetx,

scg-ChangeFailure, spare4,

spare3, spare2, spare1},

measResultFreqListMRDC MeasResultFreqListFailMRDC OPTIONAL,

measResultSCG-FailureMRDC OCTET STRING OPTIONAL,

...,

[[

locationInfo-r16 LocationInfo-r16 OPTIONAL

]]

}

MeasResultFreqListFailMRDC ::= SEQUENCE (SIZE (1.. maxFreq)) OF MeasResult2EUTRA

-- TAG-SCGFAILUREINFORMATIONEUTRA-STOP

-- ASN1STOP

| *SCGFailureInformationEUTRA field descriptions* |
| --- |
| ***measResultFreqListMRDC***  The field contains available results of measurements on E-UTRA frequencies the UE is configured to measure by *measConfig*. |
| ***measResultSCG-FailureMRDC***  Includes the E-UTRA *MeasResultSCG-FailureMRDC* IE as specified in TS 36.331 [10]. The field contains available results of measurements on E-UTRA frequencies the UE is configured to measure by the E-UTRA *RRCConnectionReconfiguration* message. |

#### – *SecurityModeCommand*

The *SecurityModeCommand* message is used to command the activation of AS security.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*SecurityModeCommand* message

-- ASN1START

-- TAG-SECURITYMODECOMMAND-START

SecurityModeCommand ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

securityModeCommand SecurityModeCommand-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SecurityModeCommand-IEs ::= SEQUENCE {

securityConfigSMC SecurityConfigSMC,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

SecurityConfigSMC ::= SEQUENCE {

securityAlgorithmConfig SecurityAlgorithmConfig,

...

}

-- TAG-SECURITYMODECOMMAND-STOP

-- ASN1STOP

#### – *SecurityModeComplete*

The *SecurityModeComplete* message is used to confirm the successful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SecurityModeComplete* message

-- ASN1START

-- TAG-SECURITYMODECOMPLETE-START

SecurityModeComplete ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

securityModeComplete SecurityModeComplete-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SecurityModeComplete-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-SECURITYMODECOMPLETE-STOP

-- ASN1STOP

#### – *SecurityModeFailure*

The *SecurityModeFailure* message is used to indicate an unsuccessful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SecurityModeFailure* message

-- ASN1START

-- TAG-SECURITYMODEFAILURE-START

SecurityModeFailure ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

securityModeFailure SecurityModeFailure-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SecurityModeFailure-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-SECURITYMODEFAILURE-STOP

-- ASN1STOP

#### – *SIB1*

*SIB1* contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information.It also contains radio resource configuration information that is common for all UEs and barring information applied to the unified access control.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH

Direction: Network to UE

*SIB1* message

-- ASN1START

-- TAG-SIB1-START

SIB1 ::= SEQUENCE {

cellSelectionInfo SEQUENCE {

q-RxLevMin Q-RxLevMin,

q-RxLevMinOffset INTEGER (1..8) OPTIONAL, -- Need S

q-RxLevMinSUL Q-RxLevMin OPTIONAL, -- Need R

q-QualMin Q-QualMin OPTIONAL, -- Need S

q-QualMinOffset INTEGER (1..8) OPTIONAL -- Need S

} OPTIONAL, -- Cond Standalone

cellAccessRelatedInfo CellAccessRelatedInfo,

connEstFailureControl ConnEstFailureControl OPTIONAL, -- Need R

si-SchedulingInfo SI-SchedulingInfo OPTIONAL, -- Need R

servingCellConfigCommon ServingCellConfigCommonSIB OPTIONAL, -- Need R

ims-EmergencySupport ENUMERATED {true} OPTIONAL, -- Need R

eCallOverIMS-Support ENUMERATED {true} OPTIONAL, -- Need R

ue-TimersAndConstants UE-TimersAndConstants OPTIONAL, -- Need R

uac-BarringInfo SEQUENCE {

uac-BarringForCommon UAC-BarringPerCatList OPTIONAL, -- Need S

uac-BarringPerPLMN-List UAC-BarringPerPLMN-List OPTIONAL, -- Need S

uac-BarringInfoSetList UAC-BarringInfoSetList,

uac-AccessCategory1-SelectionAssistanceInfo CHOICE {

plmnCommon UAC-AccessCategory1-SelectionAssistanceInfo,

individualPLMNList SEQUENCE (SIZE (2..maxPLMN)) OF UAC-AccessCategory1-SelectionAssistanceInfo

} OPTIONAL -- Need S

} OPTIONAL, -- Need R

useFullResumeID ENUMERATED {true} OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SIB1-v1610-IEs OPTIONAL

}

SIB1-v1610-IEs ::= SEQUENCE {

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

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

posSI-SchedulingInfo-r16 PosSI-SchedulingInfo-r16 OPTIONAL, -- Need R

nonCriticalExtension SIB1-v1630-IEs OPTIONAL

}

SIB1-v1630-IEs ::= SEQUENCE {

uac-BarringInfo-v1630 SEQUENCE {

uac-AC1-SelectAssistInfo-r16 SEQUENCE (SIZE (2..maxPLMN)) OF UAC-AC1-SelectAssistInfo-r16

} OPTIONAL, -- Need R

nonCriticalExtension SIB1-v1700-IEs OPTIONAL

}

SIB1-v1700-IEs ::= SEQUENCE {

hsdn-Cell-r17 ENUMERATED {true} OPTIONAL, -- Need R

uac-BarringInfo-v1700 SEQUENCE {

uac-BarringInfoSetList-v1700 UAC-BarringInfoSetList-v1700

} OPTIONAL, -- Cond MINT

sdt-ConfigCommon-r17 SDT-ConfigCommonSIB-r17 OPTIONAL, -- Need R

redCap-ConfigCommon-r17 RedCap-ConfigCommonSIB-r17 OPTIONAL, -- Need R

featurePriorities-r17 SEQUENCE {

redCapPriority-r17 FeaturePriority-r17 OPTIONAL, -- Need R

slicingPriority-r17 FeaturePriority-r17 OPTIONAL, -- Need R

msg3-Repetitions-Priority-r17 FeaturePriority-r17 OPTIONAL, -- Need R

sdt-Priority-r17 FeaturePriority-r17 OPTIONAL -- Need R

} OPTIONAL, -- Need R

si-SchedulingInfo-v1700 SI-SchedulingInfo-v1700 OPTIONAL, -- Need R

hyperSFN-r17 BIT STRING (SIZE (10)) OPTIONAL, -- Need R

eDRX-AllowedIdle-r17 ENUMERATED {true} OPTIONAL, -- Need R

eDRX-AllowedInactive-r17 ENUMERATED {true} OPTIONAL, -- Cond EDRX-RC

intraFreqReselectionRedCap-r17 ENUMERATED {allowed, notAllowed} OPTIONAL, -- Need S

cellBarredNTN-r17 ENUMERATED {barred, notBarred} OPTIONAL, -- Need S

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UAC-AccessCategory1-SelectionAssistanceInfo ::= ENUMERATED {a, b, c}

UAC-AC1-SelectAssistInfo-r16 ::= ENUMERATED {a, b, c, notConfigured}

SDT-ConfigCommonSIB-r17 ::= SEQUENCE {

sdt-RSRP-Threshold-r17 RSRP-Range OPTIONAL, -- Need R

sdt-LogicalChannelSR-DelayTimer-r17 ENUMERATED { sf20, sf40, sf64, sf128, sf512, sf1024, sf2560, spare1} OPTIONAL, -- Need R

sdt-DataVolumeThreshold-r17 ENUMERATED {byte32, byte100, byte200, byte400, byte600, byte800, byte1000, byte2000, byte4000,

byte8000, byte9000, byte10000, byte12000, byte24000, byte48000, byte96000},

t319a-r17 ENUMERATED { ms100, ms200, ms300, ms400, ms600, ms1000, ms2000,

ms3000, ms4000, spare7, spare6, spare5, spare4, spare3, spare2, spare1}

}

RedCap-ConfigCommonSIB-r17 ::= SEQUENCE {

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

cellBarredRedCap-r17 SEQUENCE {

cellBarredRedCap1Rx-r17 ENUMERATED {barred, notBarred},

cellBarredRedCap2Rx-r17 ENUMERATED {barred, notBarred}

} OPTIONAL, -- Need R

...

}

FeaturePriority-r17 ::= INTEGER (0..7)

-- TAG-SIB1-STOP

-- ASN1STOP

|  |
| --- |
| *SIB1* field descriptions |
| ***cellBarredNTN***  Value *barred* means that the cell is barred for connectivity to NTN, as defined in TS 38.304 [20]. Value *notBarred* means that the cell is allowed for connectivity to NTN. If not present, the UE considers the cell is not allowed for connectivity to NTN, as defined in TS 38.304 [20]. This field is only applicable to NTN-capable UEs. |
| ***cellBarredRedCap1Rx***  Value *barred* means that the cell is barred for a RedCap UE with 1 Rx branch, as defined in TS 38.304 [20]. This field is ignored by non-RedCap UEs. |
| ***cellBarredRedCap2Rx***  Value *barred* means that the cell is barred for a RedCap UE with 2 Rx branches, as defined in TS 38.304 [20]. This field is ignored by non-RedCap UEs. |
| ***cellSelectionInfo***  Parameters for cell selection related to the serving cell. |
| ***eCallOverIMS-Support***  Indicates whether the cell supports eCall over IMS services as defined in TS 23.501 [32]. If absent, eCall over IMS is not supported by the network in the cell. |
| ***eDRX-AllowedIdle***  The presence of this field indicates that extended DRX is allowed in the cell for UEs in RRC\_IDLE. The UE shall stop using extended DRX in RRC\_IDLE if *eDRX-AllowedIdle* is not present. |
| ***eDRX-AllowedInactive***  The presence of this field indicates that extended DRX is allowed in the cell for UEs in RRC\_INACTIVE. The UE shall stop using extended DRX in RRC\_INACTIVE if *eDRX-AllowedInactive* is not present. |
| ***featurePriorities***  Indicates priorities for features, such as RedCap, Slicing, SDT and MSG3-Repetitions for Coverage Enhancements. These priorities are used to determine which *FeatureCombinationPreambles* the UE shall use when a feature maps to more than one *FeatureCombinationPreambles*, as specified in TS 38.321 [3]. A lower value means a higher priority. The network does not signal the same priority for more than one feature. The network signals a priority for all feature that map to at least one *FeatureCombinationPreambles*. |
| ***halfDuplexRedCap-Allowed***  The presence of this field indicates whether the cell supports half-duplex FDD RedCap UEs. |
| ***hsdn-Cell***  This field indicates this is a HSDN cell as specified in TS 38.304 [20]. |
| ***hyperSFN***  Indicates hyper SFN which increments by one when the SFN wraps around. |
| ***idleModeMeasurementsEUTRA***  This field indicates that a UE that is configured for EUTRA idle/inactive measurements shall perform the measurements while camping in this cell and report availability of these measurements when establishing or resuming a connection in this cell. If absent, a UE is not required to perform EUTRA idle/inactive measurements. |
| ***idleModeMeasurementsNR***  This field indicates that a UE that is configured for NR idle/inactive measurements shall perform the measurements while camping in this cell and report availability of these measurements when establishing or resuming a connection in this cell. If absent, a UE is not required to perform NR idle/inactive measurements. |
| ***ims-EmergencySupport***  Indicates whether the cell supports IMS emergency bearer services for UEs in limited service mode. If absent, IMS emergency call is not supported by the network in the cell for UEs in limited service mode. |
| ***intraFreqReselectionRedCap***  Controls cell selection/reselection to intra-frequency cells for RedCap UEs when this cell is barred, or treated as barred by the RedCap UE, as specified in TS 38.304 [20]. If not present, a RedCap UE treats the cell as barred, i.e.,the UE considers that the cell does not support RedCap. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 38.304 [20], applicable for serving cell. If the field is absent, the UE applies the (default) value of negative infinity for Qqualmin. |
| ***q-QualMinOffset***  Parameter "Qqualminoffset" in TS 38.304 [20]. Actual value Qqualminoffset = field value [dB]. If the field is absent, the UE applies the (default) value of 0 dB for Qqualminoffset.Affects the minimum required quality level in the cell. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 38.304 [20], applicable for serving cell. |
| ***q-RxLevMinOffset***  Parameter "Qrxlevminoffset" in TS 38.304 [20]. Actual value Qrxlevminoffset = field value \* 2 [dB]. If absent, the UE applies the (default) value of 0 dB for Qrxlevminoffset*.* Affects the minimum required Rx level in the cell. |
| ***q-RxLevMinSUL***  Parameter "Qrxlevmin" in TS 38.304 [20], applicable for serving cell. |
| ***sdt-RSRP-Threshold***  RSRP threshold used to determine whether SDT procedure can be initiated, as specified in TS 38.321 [3]. |
| ***sdt-DataVolumeThreshold***  Data volume threshold used to determine whether SDT can be initiated, as specified in TS 38.321 [3]. Value *byte32* corresponds to 32 bytes, value *byte100* corresponds to 100 bytes, and so on. |
| ***sdt-LogicalChannelSR-DelayTimer***  The value of *logicalChannelSR-DelayTimer* applied during SDT for logical channels configured with SDT, as specified in TS 38.321 [3]. Value in number of subframes. Value *sf20* corresponds to 20 subframes, *sf40* corresponds to 40 subframes, and so on. If this field is not configured, then logicalChannelSR-DelayTimer is not applied for SDT logical channels. |
| ***servingCellConfigCommon***  Configuration of the serving cell. |
| ***t319a***  Initial value of the timer T319a. Value *ms100* corresponds to 100 milliseconds, value *ms200* corresponds to 200 milliseconds and so on. |
| ***uac-AccessCategory1-SelectionAssistanceInfo***  Information used to determine whether Access Category 1 applies to the UE, as defined in TS 22.261 [25]. If *plmnCommon* is chosen, the *UAC-AccessCategory1-SelectionAssistanceInfo* is applicable to all the PLMNs and SNPNs in *plmn-IdentityInfoList* and *npn-IdentityInfoList*. If *individualPLMNList* is chosen, the 1st entry in the list corresponds to the first network within all of the PLMNs and SNPNs across the *plmn-IdentityList* and the *npn-IdentityInfoList*, the 2nd entry in the list corresponds to the second network within all of the PLMNs and SNPNs across the *plmn-IdentityList* and the *npn-IdentityInfoList* and so on. If *uac-AC1-SelectAssistInfo-r16* is present, the UE shall ignore the *uac-AccessCategory1-SelectionAssistanceInfo*. |
| ***uac-AC1-SelectAssistInfo***  Information used to determine whether Access Category 1 applies to the UE, as defined in TS 22.261 [25]. The 1st entry in the list corresponds to the first network within all of the PLMNs and SNPNs across the *plmn-IdentityList* and *npn-IdentityInfoList*, the 2nd entry in the list corresponds to the second network within all of the PLMNs and SNPNs across the *plmn-IdentityList* and the *npn-IdentityInfoList* and so on. Value *notConfigured* indicates that Access Category1 is not configured for the corresponding PLMN/SNPN. |
| ***uac-BarringForCommon***  Common access control parameters for each access category. Common values are used for all PLMNs/SNPNs, unless overwritten by the PLMN/SNPN specific configuration provided in *uac-BarringPerPLMN-List*. The parameters are specified by providing an index to the set of configurations (*uac-BarringInfoSetList*). UE behaviour upon absence of this field is specified in clause 5.3.14.2. |
| ***ue-TimersAndConstants***  Timer and constant values to be used by the UE. The cell operating as PCell always provides this field. |
| ***useFullResumeID***  Indicates which resume identifier and Resume request message should be used. UE uses *fullI-RNTI* and *RRCResumeRequest1* if the field is present, or *shortI-RNTI* and *RRCResumeRequest* if the field is absent. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *EDRX-RC* | The field is optionally present, Need R, in a cell that enables *eDRX-AllowedIdle*, otherwise it is absent. |
| *MINT* | The field is optionally present, Need R, in a cell that provides a configuration for disaster roaming, otherwise it is absent, Need R. |
| *Standalone* | The field is mandatory present in a cell that supports standalone operation, otherwise it is absent. |

#### – *SidelinkUEInformationNR*

The *SidelinkUEinformationNR* message is used for the indication of NR sidelink UE information to the network.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SidelinkUEInformationNR* message

-- ASN1START

-- TAG-SIDELINKUEINFORMATIONNR-START

SidelinkUEInformationNR-r16::= SEQUENCE {

criticalExtensions CHOICE {

sidelinkUEInformationNR-r16 SidelinkUEInformationNR-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

SidelinkUEInformationNR-r16-IEs ::= SEQUENCE {

sl-RxInterestedFreqList-r16 SL-InterestedFreqList-r16 OPTIONAL,

sl-TxResourceReqList-r16 SL-TxResourceReqList-r16 OPTIONAL,

sl-FailureList-r16 SL-FailureList-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SidelinkUEInformationNR-v1700-IEs OPTIONAL

}

SidelinkUEInformationNR-v1700-IEs ::= SEQUENCE {

sl-TxResourceReqList-v1700 SL-TxResourceReqList-v1700 OPTIONAL,

sl-RxDRX-ReportList-v1700 SL-RxDRX-ReportList-v1700 OPTIONAL,

sl-RxInterestedGC-BC-DestList-r17 SL-RxInterestedGC-BC-DestList-r17 OPTIONAL,

sl-RxInterestedFreqListDisc-r17 SL-InterestedFreqList-r16 OPTIONAL,

sl-TxResourceReqListDisc-r17 SL-TxResourceReqListDisc-r17 OPTIONAL,

sl-TxResourceReqListCommRelay-r17 SL-TxResourceReqListCommRelay-r17 OPTIONAL,

ue-Type-r17 ENUMERATED {relayUE, remoteUE} OPTIONAL,

sl-SourceIdentityRemoteUE-r17 SL-SourceIdentity-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SL-InterestedFreqList-r16 ::= SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF INTEGER (1..maxNrofFreqSL-r16)

SL-TxResourceReqList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-TxResourceReq-r16

SL-TxResourceReq-r16 ::= SEQUENCE {

sl-DestinationIdentity-r16 SL-DestinationIdentity-r16,

sl-CastType-r16 ENUMERATED {broadcast, groupcast, unicast, spare1},

sl-RLC-ModeIndicationList-r16 SEQUENCE (SIZE (1.. maxNrofSLRB-r16)) OF SL-RLC-ModeIndication-r16 OPTIONAL,

sl-QoS-InfoList-r16 SEQUENCE (SIZE (1..maxNrofSL-QFIsPerDest-r16)) OF SL-QoS-Info-r16 OPTIONAL,

sl-TypeTxSyncList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-TypeTxSync-r16 OPTIONAL,

sl-TxInterestedFreqList-r16 SL-TxInterestedFreqList-r16 OPTIONAL,

sl-CapabilityInformationSidelink-r16 OCTET STRING OPTIONAL

}

SL-TxResourceReqList-v1700 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-TxResourceReq-v1700

SL-RxDRX-ReportList-v1700 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-RxDRX-Report-v1700

SL-TxResourceReq-v1700 ::= SEQUENCE {

sl-DRX-InfoFromRxList-r17 SEQUENCE (SIZE (1..maxNrofSL-RxInfoSet-r17)) OF SL-DRX-ConfigUC-SemiStatic-r17 OPTIONAL,

sl-DRX-Indication-r17 ENUMERATED {on, off} OPTIONAL,

...

}

SL-RxDRX-Report-v1700 ::= SEQUENCE {

sl-DRX-ConfigFromTx-r17 SL-DRX-ConfigUC-SemiStatic-r17,

...}

SL-RxInterestedGC-BC-DestList-r17 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-RxInterestedGC-BC-Dest-r17

SL-RxInterestedGC-BC-Dest-r17 ::= SEQUENCE {

sl-RxInterestedQoS-InfoList-r17 SEQUENCE (SIZE (1..maxNrofSL-QFIsPerDest-r16)) OF SL-QoS-Info-r16,

sl-DestinationIdentity-r16 SL-DestinationIdentity-r16

}

SL-TxResourceReqListDisc-r17 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-TxResourceReqDisc-r17

SL-TxResourceReqDisc-r17 ::= SEQUENCE {

sl-DestinationIdentityDisc-r17 SL-DestinationIdentity-r16,

sl-SourceIdentityRelayUE-r17 SL-SourceIdentity-r17 OPTIONAL,

sl-CastTypeDisc-r17 ENUMERATED {broadcast, groupcast, unicast, spare1},

sl-TxInterestedFreqListDisc-r17 SL-TxInterestedFreqList-r16,

sl-TypeTxSyncListDisc-r17 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-TypeTxSync-r16,

sl-DiscoveryType-r17 ENUMERATED {relay, non-Relay},

...

}

SL-TxResourceReqListCommRelay-r17 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-TxResourceReqCommRelayInfo-r17

SL-TxResourceReqCommRelayInfo-r17 ::= SEQUENCE {

sl-RelayDRXConfig-r17 SL-TxResourceReq-v1700 OPTIONAL,

sl-TxResourceReqCommRelay-r17 SL-TxResourceReqCommRelay-r17

}

SL-TxResourceReqCommRelay-r17 ::= CHOICE {

sl-TxResourceReqL2U2N-Relay-r17 SL-TxResourceReqL2U2N-Relay-r17,

sl-TxResourceReqL3U2N-Relay-r17 SL-TxResourceReq-r16

}

SL-TxResourceReqL2U2N-Relay-r17 ::= SEQUENCE {

sl-DestinationIdentityL2U2N-r17 SL-DestinationIdentity-r16 OPTIONAL,

sl-TxInterestedFreqListL2U2N-r17 SL-TxInterestedFreqList-r16,

sl-TypeTxSyncListL2U2N-r17 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-TypeTxSync-r16,

sl-LocalID-Request-r17 ENUMERATED {true} OPTIONAL,

sl-PagingIdentityRemoteUE-r17 SL-PagingIdentityRemoteUE-r17 OPTIONAL,

sl-CapabilityInformationSidelink-r17 OCTET STRING OPTIONAL,

...

}

SL-TxInterestedFreqList-r16 ::= SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF INTEGER (1..maxNrofFreqSL-r16)

SL-QoS-Info-r16 ::= SEQUENCE {

sl-QoS-FlowIdentity-r16 SL-QoS-FlowIdentity-r16,

sl-QoS-Profile-r16 SL-QoS-Profile-r16 OPTIONAL

}

SL-RLC-ModeIndication-r16 ::= SEQUENCE {

sl-Mode-r16 CHOICE {

sl-AM-Mode-r16 NULL,

sl-UM-Mode-r16 NULL

},

sl-QoS-InfoList-r16 SEQUENCE (SIZE (1..maxNrofSL-QFIsPerDest-r16)) OF SL-QoS-Info-r16

}

SL-FailureList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-Failure-r16

SL-Failure-r16 ::= SEQUENCE {

sl-DestinationIdentity-r16 SL-DestinationIdentity-r16,

sl-Failure-r16 ENUMERATED {rlf,configFailure, drxReject-v1710, spare5, spare4, spare3, spare2, spare1}

}

-- TAG-SIDELINKUEINFORMATIONNR-STOP

-- ASN1STOP

| *SidelinkUEinformationNR* field descriptions |
| --- |
| ***sl-RxDRX-ReportList***  Indicates the accepted DRX configuration that is received from the peer UE and reported to the network for NR sidelink unicast communication. |
| ***sl-RxInterestedFreqList***  Indicates the index of frequency on which the UE is interested to receive NR sidelink communication. The value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in *SIB12*, the value 2 corresponds to the frequency of second entry in *sl-FreqInfoList* broadcast in *SIB12* and so on. In this release, only value 1 can be included in the interested frequency list. |
| ***sl-RxInterestedGC-BC-DestList***  Indicates the reported QoS profile and associated destination for which UE is interested in reception to the network for NR sidelink groupcast and broadcast communication. |
| ***sl-SourceIdentityRemoteUE***  This field is used to indicate the Source Layer-2 ID to be used to establish PC5 link with the target L2 U2N Relay UE for path switch. |
| ***sl-TxResourceReq***  Parameters to request the transmission resources for NR sidelink communication to the network in the Sidelink UE Information report. |
| ***sl-TxResourceReqList***  List of parameters to request the transmission resources for NR sidelink communication for the associated destination. If *sl-TxResourceReqList-v1700* is present, it shall contain the same number of entries, listed in the same order as in *sl-TxResourceReqList* (without suffix). |
| ***ue-Type***  Indicates the UE is acting as U2N Relay UE or U2N Remote UE. |

| *SL-TxResourceReq* field descriptions |
| --- |
| ***sl-CapabilityInformationSidelink***  Includes the *UECapabilityInformationSidelink* message (which can be also included in *ueCapabilityInformationSidelink-r16* in *UECapabilityEnquirySidelink* from peer UE) received from the peer UE. |
| ***sl-CastType***  Indicates the cast type for the corresponding destination for which to request the resource. |
| ***sl-DestinationIdentity***  Indicates the destination for which the TX resource request and allocation from the network are concerned. |
| ***sl-DRX-Indication***  Indicates the sidelink DRX is applied (value *on*) or not applied (value *off*) for the associated destination. This field is only valid for NR sidelink groupcast communication. |
| ***sl-DRX-InfoFromRxList***  Indicates list of the sidelink DRX configurations as assistance information received from the peer UE for NR sidelink unicast communication. |
| ***sl-QoS-InfoList***  Includes the QoS profile of the sidelink QoS flow as specified in TS 23.287 [55]. |
| ***sl-QoS-FlowIdentity***  This identity uniquely identifies one sidelink QoS flow between the UE and the network in the scope of UE, which is unique for different destination and cast type. |
| ***sl-RLC-ModeIndication***  This field indicates the RLC mode and optionally the related QoS profiles for the sidelink radio bearer, which has not been configured by the network and is initiated by another UE in unicast. The RLC mode for one sidelink radio bearer is aligned between UE and NW by the *sl-QoS-FlowIdentity*. |
| ***sl-TxInterestedFreqList***  Each entry of this field indicates the index of frequency on which the UE is interested to transmit NR sidelink communication. The value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in *SIB12*, the value 2 corresponds to the frequency of second entry in *sl-FreqInfoList broadcast* in *SIB12* and so on. In this release, only value 1 can be included in the interested frequency list. In this release, only one entry can be included in the list. |
| ***sl-TypeTxSyncList***  A list of synchronization reference used by the UE. The UE shall include the same number of entries, listed in the same order, as in *sl-TxInterestedFreqList*, i.e. one for each carrier frequency included in *sl-TxInterestedFreqList*. |

| *SL-Failure* field descriptions |
| --- |
| ***sl-DestinationIdentity***  Indicates the destination for which the SL failure is reporting for unicast. |
| ***sl-Failure***  Indicates the sidelink cause for the sidelink RLF (value *rlf*), sidelink AS configuration failure (value *configFailure*) and the rejection of sidelink DRX configuration (value *drxReject-v1710*) for the associated destination for unicast. |

| *SL-RxDRX-Report* field descriptions |
| --- |
| ***sl-DRX-ConfigFromTx***  Indicates the sidelink DRX configuration received from the peer UE for NR sidelink unicast communication. |
|  |

| ***SL-RxInterestedGC-BC-Dest* field descriptions** |
| --- |
| ***sl-RxInterestedQoS-InfoList***  Indicates the QoS profile for which UE reports its interested service to which SL DRX is applied to the network, for NR sidelink groupcast or broadcast reception. |

| *SL-TxResourceReqDisc* field descriptions |
| --- |
| ***sl-DestinationIdentityDisc***  This field is used to indicate the destination L2 ID for which the TX resource request and allocation from the network are concerned for relay discovery and non-relay discovery. |
| ***sl-SourceIdentityRelayUE***  This field is used to indicate the source L2 ID of relay-related discovery transmission by L2 U2N Relay UE. |
| ***sl-TxInterestedFreqListDisc***  Each entry of this field indicates the index of frequency on which the UE is interested to transmit NR sidelink discovery. The value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in *SIB12*, the value 2 corresponds to the frequency of second entry in *sl-FreqInfoList broadcast* in *SIB12* and so on. In this release, only value 1 can be included in the interested frequency list. In this release, only one entry can be included in the list. |

| *SL-TxResourceReqCommRelayInfo* field descriptions |
| --- |
| ***sl-RelayDRXConfig***  This field is used to indicate the applied sidelink DRX configuration for the relay related communication. |
| ***sl-DestinationIdentityL2U2N***  This field is used to indicate the destination L2 ID for which the TX resource request and allocation from the network are concerned for the established PC5 link for relay by L2 U2N Relay UE, or L3 U2N Relay UE, or L3 U2N Remote UE. |
| ***sl-LocalID-Request***  This field is used to request local UE ID for the corresponding destination by the L2 U2N Relay UE. |
| ***sl-TxInterestedFreqListL2U2N***  Each entry of this field indicates the index of frequency on which the UE is interested to transmit NR sidelink communication for established PC5 link for relay. The value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in SIB12, the value 2 corresponds to the frequency of second entry in *sl-FreqInfoList* broadcast in *SIB12* and so on. In this release, only value 1 can be included in the interested frequency list. In this release, only one entry can be included in the list. |
| ***sl-PagingIdentityRemoteUE***  This field is used to indicate the paging UE ID(s) for the corresponding destination(s) by the L2 U2N Relay UE. |

#### – *SystemInformation*

The *SystemInformation* message is used to convey one or more System Information Blocks or Positioning System Information Blocks. All the SIBs or posSIBs included are transmitted with the same periodicity.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH

Direction: Network to UE

*SystemInformation message*

-- ASN1START

-- TAG-SYSTEMINFORMATION-START

SystemInformation ::= SEQUENCE {

criticalExtensions CHOICE {

systemInformation SystemInformation-IEs,

criticalExtensionsFuture-r16 CHOICE {

posSystemInformation-r16 PosSystemInformation-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

}

SystemInformation-IEs ::= SEQUENCE {

sib-TypeAndInfo SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {

sib2 SIB2,

sib3 SIB3,

sib4 SIB4,

sib5 SIB5,

sib6 SIB6,

sib7 SIB7,

sib8 SIB8,

sib9 SIB9,

...,

sib10-v1610 SIB10-r16,

sib11-v1610 SIB11-r16,

sib12-v1610 SIB12-r16,

sib13-v1610 SIB13-r16,

sib14-v1610 SIB14-r16,

sib15-v1700 SIB15-r17,

sib16-v1700 SIB16-r17,

sib17-v1700 SIB17-r17,

sib18-v1700 SIB18-r17,

sib19-v1700 SIB19-r17,

sib20-v1700 SIB20-r17,

sib21-v1700 SIB21-r17

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-SYSTEMINFORMATION-STOP

-- ASN1STOP

#### – *UEAssistanceInformation*

The *UEAssistanceInformation* message is used for the indication of UE assistance information to the network.

Signalling radio bearer: SRB1, SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*UEAssistanceInformation message*

-- ASN1START

-- TAG-UEASSISTANCEINFORMATION-START

UEAssistanceInformation ::= SEQUENCE {

criticalExtensions CHOICE {

ueAssistanceInformation UEAssistanceInformation-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEAssistanceInformation-IEs ::= SEQUENCE {

delayBudgetReport DelayBudgetReport OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1540-IEs OPTIONAL

}

DelayBudgetReport::= CHOICE {

type1 ENUMERATED {

msMinus1280, msMinus640, msMinus320, msMinus160,msMinus80, msMinus60, msMinus40,

msMinus20, ms0, ms20,ms40, ms60, ms80, ms160, ms320, ms640, ms1280},

...

}

UEAssistanceInformation-v1540-IEs ::= SEQUENCE {

overheatingAssistance OverheatingAssistance OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1610-IEs OPTIONAL

}

OverheatingAssistance ::= SEQUENCE {

reducedMaxCCs ReducedMaxCCs-r16 OPTIONAL,

reducedMaxBW-FR1 ReducedMaxBW-FRx-r16 OPTIONAL,

reducedMaxBW-FR2 ReducedMaxBW-FRx-r16 OPTIONAL,

reducedMaxMIMO-LayersFR1 SEQUENCE {

reducedMIMO-LayersFR1-DL MIMO-LayersDL,

reducedMIMO-LayersFR1-UL MIMO-LayersUL

} OPTIONAL,

reducedMaxMIMO-LayersFR2 SEQUENCE {

reducedMIMO-LayersFR2-DL MIMO-LayersDL,

reducedMIMO-LayersFR2-UL MIMO-LayersUL

} OPTIONAL

}

OverheatingAssistance-r17 ::= SEQUENCE {

reducedMaxBW-FR2-2-r17 SEQUENCE {

reducedBW-FR2-2-DL-r17 ReducedAggregatedBandwidth-r17,

reducedBW-FR2-2-UL-r17 ReducedAggregatedBandwidth-r17

} OPTIONAL,

reducedMaxMIMO-LayersFR2-2 SEQUENCE {

reducedMIMO-LayersFR2-2-DL MIMO-LayersDL,

reducedMIMO-LayersFR2-2-UL MIMO-LayersUL

} OPTIONAL

}

ReducedAggregatedBandwidth ::= ENUMERATED {mhz0, mhz10, mhz20, mhz30, mhz40, mhz50, mhz60, mhz80, mhz100, mhz200, mhz300, mhz400}

ReducedAggregatedBandwidth-r17 ::= ENUMERATED {mhz0, mhz100, mhz200, mhz400, mhz800, mhz1200, mhz1600, mhz2000}

UEAssistanceInformation-v1610-IEs ::= SEQUENCE {

idc-Assistance-r16 IDC-Assistance-r16 OPTIONAL,

drx-Preference-r16 DRX-Preference-r16 OPTIONAL,

maxBW-Preference-r16 MaxBW-Preference-r16 OPTIONAL,

maxCC-Preference-r16 MaxCC-Preference-r16 OPTIONAL,

maxMIMO-LayerPreference-r16 MaxMIMO-LayerPreference-r16 OPTIONAL,

minSchedulingOffsetPreference-r16 MinSchedulingOffsetPreference-r16 OPTIONAL,

releasePreference-r16 ReleasePreference-r16 OPTIONAL,

sl-UE-AssistanceInformationNR-r16 SL-UE-AssistanceInformationNR-r16 OPTIONAL,

referenceTimeInfoPreference-r16 BOOLEAN OPTIONAL,

nonCriticalExtension UEAssistanceInformation-v1700-IEs OPTIONAL

}

UEAssistanceInformation-v1700-IEs ::= SEQUENCE {

ul-GapFR2-Preference-r17 UL-GapFR2-Preference-r17 OPTIONAL,

musim-Assistance-r17 MUSIM-Assistance-r17 OPTIONAL,

overheatingAssistance-r17 OverheatingAssistance-r17 OPTIONAL,

maxBW-PreferenceFR2-2-r17 MaxBW-PreferenceFR2-2-r17 OPTIONAL,

maxMIMO-LayerPreferenceFR2-2-r17 MaxMIMO-LayerPreferenceFR2-2-r17 OPTIONAL,

minSchedulingOffsetPreferenceExt-r17 MinSchedulingOffsetPreferenceExt-r17 OPTIONAL,

rlm-MeasRelaxationState-r17 BOOLEAN OPTIONAL,

bfd-MeasRelaxationState-r17 BIT STRING (SIZE (1..maxNrofServingCells)) OPTIONAL,

nonSDT-DataIndication-r17 SEQUENCE {

resumeCause-r17 ResumeCause OPTIONAL

} OPTIONAL,

scg-DeactivationPreference ENUMERATED { scgDeactivationPreferred, noPreference } OPTIONAL,

uplinkData-r17 ENUMERATED { true } OPTIONAL,

rrm-MeasRelaxationFulfilment-r17 BOOLEAN OPTIONAL,

propagationDelayDifference-r17 PropagationDelayDifference-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

IDC-Assistance-r16 ::= SEQUENCE {

affectedCarrierFreqList-r16 AffectedCarrierFreqList-r16 OPTIONAL,

affectedCarrierFreqCombList-r16 AffectedCarrierFreqCombList-r16 OPTIONAL,

...

}

AffectedCarrierFreqList-r16 ::= SEQUENCE (SIZE (1.. maxFreqIDC-r16)) OF AffectedCarrierFreq-r16

AffectedCarrierFreq-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueNR,

interferenceDirection-r16 ENUMERATED {nr, other, both, spare}

}

AffectedCarrierFreqCombList-r16 ::= SEQUENCE (SIZE (1..maxCombIDC-r16)) OF AffectedCarrierFreqComb-r16

AffectedCarrierFreqComb-r16 ::= SEQUENCE {

affectedCarrierFreqComb-r16 SEQUENCE (SIZE (2..maxNrofServingCells)) OF ARFCN-ValueNR OPTIONAL,

victimSystemType-r16 VictimSystemType-r16

}

VictimSystemType-r16 ::= SEQUENCE {

gps-r16 ENUMERATED {true} OPTIONAL,

glonass-r16 ENUMERATED {true} OPTIONAL,

bds-r16 ENUMERATED {true} OPTIONAL,

galileo-r16 ENUMERATED {true} OPTIONAL,

navIC-r16 ENUMERATED {true} OPTIONAL,

wlan-r16 ENUMERATED {true} OPTIONAL,

bluetooth-r16 ENUMERATED {true} OPTIONAL,

...

}

DRX-Preference-r16 ::= SEQUENCE {

preferredDRX-InactivityTimer-r16 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} OPTIONAL,

preferredDRX-LongCycle-r16 ENUMERATED {

ms10, ms20, ms32, ms40, ms60, ms64, ms70, ms80, ms128, ms160, ms256, ms320, ms512,

ms640, ms1024, ms1280, ms2048, ms2560, ms5120, ms10240, spare12, spare11, spare10,

spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1 } OPTIONAL,

preferredDRX-ShortCycle-r16 ENUMERATED {

ms2, ms3, ms4, ms5, ms6, ms7, ms8, ms10, ms14, ms16, ms20, ms30, ms32,

ms35, ms40, ms64, ms80, ms128, ms160, ms256, ms320, ms512, ms640, spare9,

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

preferredDRX-ShortCycleTimer-r16 INTEGER (1..16) OPTIONAL

}

MaxBW-Preference-r16 ::= SEQUENCE {

reducedMaxBW-FR1-r16 ReducedMaxBW-FRx-r16 OPTIONAL,

reducedMaxBW-FR2-r16 ReducedMaxBW-FRx-r16 OPTIONAL

}

MaxBW-PreferenceFR2-2-r17 ::= SEQUENCE {

reducedMaxBW-FR2-2-r17 SEQUENCE {

reducedBW-FR2-2-DL-r17 ReducedAggregatedBandwidth-r17 OPTIONAL,

reducedBW-FR2-2-UL-r17 ReducedAggregatedBandwidth-r17 OPTIONAL

} OPTIONAL

}

MaxCC-Preference-r16 ::= SEQUENCE {

reducedMaxCCs-r16 ReducedMaxCCs-r16 OPTIONAL

}

MaxMIMO-LayerPreference-r16 ::= SEQUENCE {

reducedMaxMIMO-LayersFR1-r16 SEQUENCE {

reducedMIMO-LayersFR1-DL-r16 INTEGER (1..8),

reducedMIMO-LayersFR1-UL-r16 INTEGER (1..4)

} OPTIONAL,

reducedMaxMIMO-LayersFR2-r16 SEQUENCE {

reducedMIMO-LayersFR2-DL-r16 INTEGER (1..8),

reducedMIMO-LayersFR2-UL-r16 INTEGER (1..4)

} OPTIONAL

}

MaxMIMO-LayerPreferenceFR2-2-r17 ::= SEQUENCE {

reducedMaxMIMO-LayersFR2-2-r17 SEQUENCE {

reducedMIMO-LayersFR2-2-DL-r17 INTEGER (1..8),

reducedMIMO-LayersFR2-2-UL-r17 INTEGER (1..4)

} OPTIONAL

}

MinSchedulingOffsetPreference-r16 ::= SEQUENCE {

preferredK0-r16 SEQUENCE {

preferredK0-SCS-15kHz-r16 ENUMERATED {sl1, sl2, sl4, sl6} OPTIONAL,

preferredK0-SCS-30kHz-r16 ENUMERATED {sl1, sl2, sl4, sl6} OPTIONAL,

preferredK0-SCS-60kHz-r16 ENUMERATED {sl2, sl4, sl8, sl12} OPTIONAL,

preferredK0-SCS-120kHz-r16 ENUMERATED {sl2, sl4, sl8, sl12} OPTIONAL

} OPTIONAL,

preferredK2-r16 SEQUENCE {

preferredK2-SCS-15kHz-r16 ENUMERATED {sl1, sl2, sl4, sl6} OPTIONAL,

preferredK2-SCS-30kHz-r16 ENUMERATED {sl1, sl2, sl4, sl6} OPTIONAL,

preferredK2-SCS-60kHz-r16 ENUMERATED {sl2, sl4, sl8, sl12} OPTIONAL,

preferredK2-SCS-120kHz-r16 ENUMERATED {sl2, sl4, sl8, sl12} OPTIONAL

} OPTIONAL

}

MinSchedulingOffsetPreferenceExt-r17 ::= SEQUENCE {

preferredK0-r17 SEQUENCE {

preferredK0-SCS-480kHz-r17 ENUMERATED {sl8, sl16, sl32, sl48} OPTIONAL,

preferredK0-SCS-960kHz-r17 ENUMERATED {sl8, sl16, sl32, sl48} OPTIONAL

} OPTIONAL,

preferredK2-r17 SEQUENCE {

preferredK2-SCS-480kHz-r17 ENUMERATED {sl8, sl16, sl32, sl48} OPTIONAL,

preferredK2-SCS-960kHz-r17 ENUMERATED {sl8, sl16, sl32, sl48} OPTIONAL

} OPTIONAL

}

MUSIM-Assistance-r17 ::= SEQUENCE {

musim-PreferredRRC-State-r17 ENUMERATED {idle, inactive, outOfConnected} OPTIONAL,

musim-GapPreferenceList-r17 MUSIM-GapPreferenceList-r17 OPTIONAL

}

MUSIM-GapPreferenceList-r17 ::= SEQUENCE (SIZE (1..4)) OF MUSIM-GapInfo-r17

ReleasePreference-r16 ::= SEQUENCE {

preferredRRC-State-r16 ENUMERATED {idle, inactive, connected, outOfConnected}

}

ReducedMaxBW-FRx-r16 ::= SEQUENCE {

reducedBW-DL-r16 ReducedAggregatedBandwidth,

reducedBW-UL-r16 ReducedAggregatedBandwidth

}

ReducedMaxCCs-r16 ::= SEQUENCE {

reducedCCsDL-r16 INTEGER (0..31),

reducedCCsUL-r16 INTEGER (0..31)

}

SL-UE-AssistanceInformationNR-r16 ::= SEQUENCE (SIZE (1..maxNrofTrafficPattern-r16)) OF SL-TrafficPatternInfo-r16

SL-TrafficPatternInfo-r16::= SEQUENCE {

trafficPeriodicity-r16 ENUMERATED {ms20, ms50, ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000},

timingOffset-r16 INTEGER (0..10239),

messageSize-r16 BIT STRING (SIZE (8)),

sl-QoS-FlowIdentity-r16 SL-QoS-FlowIdentity-r16

}

UL-GapFR2-Preference-r17::= SEQUENCE {

ul-GapFR2-PatternPreference-r17 INTEGER (0..3) OPTIONAL

}

PropagationDelayDifference-r17 ::= SEQUENCE (SIZE (1..4)) OF INTEGER (-270..270)

-- TAG-UEASSISTANCEINFORMATION-STOP

-- ASN1STOP

Editor's note: The value range for ReducedAggregatedBandwidth-r17 needs RAN4 confirmation

Editor's note: The value range for preferred K0/K2 for SCS 960 kHz needs RAN1 confirmation

| *UEAssistanceInformation* field descriptions |
| --- |
| ***affectedCarrierFreqList***  Indicates a list of NR carrier frequencies that are affected by IDC problem. |
| ***affectedCarrierFreqCombList***  Indicates a list of NR carrier frequencie combinations that are affected by IDC problems due to Inter-Modulation Distortion and harmonics from NR when configured with UL CA. |
| ***bfd-MeasRelaxationState***  Indicates the relaxation state of BFD measurements. Each bit corresponds to a serving cell of the cell group. A serving cell is mapped to the (*servCellIndex*+1)-th bit, starting from MSB. A bit that is set to 1 indicates that the UE is performing BFD measurements relaxation on the serving cell mapped on the bit. A bit that is set to 0 indicates that the UE is not performing BFD measurements relaxation on the serving cell mapped on the bit. If a serving cell is not configured to the UE, the corresponding bit is set to 0. |
| ***delayBudgetReport***  Indicates the UE-preferred adjustment to connected mode DRX. |
| ***interferenceDirection***  Indicates the direction of IDC interference. Value *nr* indicates that only NR is victim of IDC interference, value *other* indicates that only another radio is victim of IDC interference and value *both* indicates that both NR and another radio are victims of IDC interference. The other radio refers to either the ISM radio or GNSS (see TR 36.816 [44]). |
| ***minSchedulingOffsetPreference***  Indicates the UE's preferences on *minimumSchedulingOffset* of cross-slot scheduling for power saving. |
| ***minSchedulingOffsetPreferenceExt***  Indicates the UE's preferences on *minimumSchedulingOffset* of cross-slot scheduling for power saving for SCS 480 kHz and/or 960 kHz. |
| ***musim-GapPreferenceList***  Indicates whether the UE supports providing MUSIM assistance information with MUSIM gap preference and related MUSIM gap configuration, as defined in TS 38.133 [14] clause 9.1.2D. |
| ***musim-PreferredRRC-State***  Indicates the UE's preferred RRC state when leaving RRC\_CONNECTED. |
| ***nonSDT-DataIndication***  Informs the network about the arrival of data and/or signaling mapped to radio bearers not configured for SDT while *T319a* is running. |
| ***preferredDRX-InactivityTimer***  Indicates the UE's preferred DRX inactivity timer length for power saving. Value in ms (milliSecond). *ms0* corresponds to 0, *ms1* corresponds to 1 ms, *ms2* corresponds to 2 ms, and so on. If the field is absent from the *DRX-Preference* IE, it is interpreted as the UE having no preference for the DRX inactivity timer. If secondary DRX group is configured, the *preferredDRX-InactivityTimer* only applies to the default DRX group. |
| ***preferredDRX-LongCycle***  Indicates the UE's preferred long DRX cycle length for power saving. Value in ms. *ms10* corresponds to 10ms, *ms20* corresponds to 20 ms, *ms32* corresponds to 32 ms, and so on. If *preferredDRX-ShortCycle* is provided, the value of *preferredDRX-LongCycle* shall be a multiple of the *preferredDRX-ShortCycle* value. If the field is absent from the *DRX-Preference* IE, it is interpreted as the UE having no preference for the long DRX cycle. |
| ***preferredDRX-ShortCycle***  Indicates the UE's preferred short DRX cycle length for power saving. Value in ms. *ms2* corresponds to 2ms, *ms3* corresponds to 3 ms, *ms4* corresponds to 4 ms, and so on. If the field is absent from the *DRX-Preference* IE, it is interpreted as the UE having no preference for the short DRX cycle. |
| ***preferredDRX-ShortCycleTimer***  Indicates the UE's preferred short DRX cycle timer for power saving. Value in multiples of *preferredDRX-ShortCycle*. A value of 1 corresponds to *preferredDRX-ShortCycle*, a value of 2 corresponds to 2 \* *preferredDRX-ShortCycle* and so on. If the field is absent from the *DRX-Preference* IE, it is interpreted as the UE having no preference for the short DRX cycle timer. A preference for the short DRX cycle is indicated when a preference for the short DRX cycle timer is indicated. |
| ***preferredK0***  Indicates the UE's preferred value of *k0* (slot offset between DCI and its scheduled PDSCH - see TS 38.214 [19], clause 5.1.2.1) for cross-slot scheduling for power saving. Value is defined for each subcarrier spacing (numerology) in units of slots. *sl1* corresponds to 1 slot, *sl2* corresponds to 2 slots, *sl4* corresponds to 4 slots, and so on. If a value for a subcarrier spacing is absent, it is interpreted as the UE having no preference on *k0* for cross-slot scheduling for that subcarrier spacing. If the field is absent from the *MinSchedulingOffsetPreference* IE, it is interpreted as the UE having no preference on *k0* for cross-slot scheduling. |
| ***preferredK2***  Indicates the UE's preferred value of *k2* (slot offset between DCI and its scheduled PUSCH - see TS 38.214 [19], clause 6.1.2.1) for cross-slot scheduling for power saving. Value is defined for each subcarrier spacing (numerology) in units of slots. *sl1* corresponds to 1 slot, *sl2* corresponds to 2 slots, *sl4* corresponds to 4 slots, and so on. If a value for a subcarrier spacing is absent, it is interpreted as the UE having no preference on *k2* for cross-slot scheduling for that subcarrier spacing. If the field is absent from the *MinSchedulingOffsetPreference* IE, it is interpreted as the UE having no preference on *k2* for cross-slot scheduling. |
| ***preferredRRC-State***  Indicates the UE's preferred RRC state. The value *idle* is indicated if the UE prefers to be released from RRC\_CONNECTED and transition to RRC\_IDLE. The value *inactive* is indicated if the UE prefers to be released from RRC\_CONNECTED and transition to RRC\_INACTIVE. The value *connected* is indicated if the UE prefers to revert an earlier indication to leave RRC\_CONNECTED state. The value *outOfConnected* is indicated if the UE prefers to be released from RRC\_CONNECTED and has no preferred RRC state to transition to. The value *connected* can only be indicated if the UE is configured with *connectedReporting*. |
| ***propagationDelayDifference***  Indicates the service link propagation delay difference between serving cell and each neighbour cell included in *neighCellInfoList,* defined as neighbour cell's service link propagation delay minus serving cell's service link propagation delay, in number of ms. First entry in *propagationDelayDifference* corresponds to first entry in *neighCellInfoList*, second entry in *propagationDelayDifference* corresponds to second entry in *neighCellInfoList*, and so on. |
| ***reducedBW-FR1***  Indicates the UE's preference on reduced configuration corresponding to the maximum aggregated bandwidth across all downlink carrier(s) and across all uplink carrier(s) of FR1, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cell(s) operating on FR1. The aggregated bandwidth across all downlink carrier(s) of FR1 is the sum of bandwidth of active downlink BWP(s) across all activated downlink carrier(s) of FR1. The aggregated bandwidth across all uplink carrier(s) of FR1 is the sum of bandwidth of active uplink BWP(s) across all activated uplink carrier(s) of FR1. If the field is absent from the *MaxBW-Preference* IE or the *OverheatingAssistance* IE, it is interpreted as the UE having no preference on the maximum aggregated bandwidth of FR1.  When indicated to address overheating, this maximum aggregated bandwidth includes carrier(s) of FR1 of both the NR MCG and the SCG. This maximum aggregated bandwidth only includes carriers of FR1 of the SCG in (NG)EN-DC. Value *mhz0* is not used when indicated to address overheating.  When indicated to address power saving, this maximum aggregated bandwidth includes carrier(s) of FR1 of the cell group that this UE assistance information is associated with. The aggregated bandwidth can only range up to the current active configuration when indicated to address power savings. |
| ***reducedBW-FR2***  Indicates the UE's preference on reduced configuration corresponding to the maximum aggregated bandwidth across all downlink carrier(s) and across all uplink carrier(s) of FR2-1, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cell(s) operating on FR2-1. The aggregated bandwidth across all downlink carrier(s) of FR2-1 is the sum of bandwidth of active downlink BWP(s) across all activated downlink carrier(s) of FR2-1. The aggregated bandwidth across all uplink carrier(s) of FR2 is the sum of bandwidth of active uplink BWP(s) across all activated uplink carrier(s) of FR2-1. If the field is absent from the *MaxBW-Preference* IE or the *OverheatingAssistance* IE, it is interpreted as the UE having no preference on the maximum aggregated bandwidth of FR2-1.  When indicated to address overheating, this maximum aggregated bandwidth includes carrier(s) of FR2 of both the NR MCG and the NR SCG. This maximum aggregated bandwidth only includes carriers of FR2-1 of the SCG in (NG)EN-DC.  When indicated to address power saving, this maximum aggregated bandwidth includes carrier(s) of FR2-1 of the cell group that this UE assistance information is associated with. The aggregated bandwidth can only range up to the current active configuration when indicated to address power savings. |
| ***reducedMaxBW-FR2-2***  Indicates the UE's preference on reduced configuration corresponding to the maximum aggregated bandwidth across all downlink carrier(s) and across all uplink carrier(s) of FR2-2, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cell(s) operating on FR2-2. The aggregated bandwidth across all downlink carrier(s) of FR2-2 is the sum of bandwidth of active downlink BWP(s) across all activated downlink carrier(s) of FR2-2. The aggregated bandwidth across all uplink carrier(s) of FR2-2 is the sum of bandwidth of active uplink BWP(s) across all activated uplink carrier(s) of FR2-2. If the field is absent from the *MaxBW-PreferenceFR2-2* IE or the *OverheatingAssistance* IE, it is interpreted as the UE having no preference on the maximum aggregated bandwidth of FR2-2.  When indicated to address overheating, this maximum aggregated bandwidth includes carrier(s) of FR2-2 of both the NR MCG and the NR SCG. This maximum aggregated bandwidth only includes carriers of FR2-2 of the SCG in (NG)EN-DC.  When indicated to address power saving, this maximum aggregated bandwidth includes carrier(s) of FR2-2 of the cell group that this UE assistance information is associated with. The aggregated bandwidth can only range up to the current active configuration when indicated to address power savings. |
| ***reducedCCsDL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of downlink SCells indicated by the field, to address overheating or power saving.  When indicated to address overheating, this maximum number includes both SCells of the NR MCG and PSCell/SCells of the SCG. This maximum number only includes PSCell/SCells of the SCG in (NG)EN-DC.  When indicated to address power saving, this maximum number includes PSCell/SCells of the cell group that this UE assistance information is associated with. The maximum number of downlink SCells can only range up to the current active configuration when indicated to address power savings. |
| ***reducedCCsUL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of uplink SCells indicated by the field, to address overheating or power saving.  When indicated to address overheating, this maximum number includes both SCells of the NR MCG and PSCell/SCells of the SCG. This maximum number only includes PSCell/SCells of the SCG in (NG)EN-DC.  When indicated to address power saving, this maximum number includes PSCell/SCells of the cell group that this UE assistance information is associated with. The maximum number of uplink SCells can only range up to the current active configuration when indicated to address power savings. |
| ***reducedMIMO-LayersFR1-DL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of downlink MIMO layers of each serving cell operating on FR1 indicated by the field, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cells operating on FR1. The maximum number of downlink MIMO layers can only range up to the maximum number of MIMO layers configured across all activated downlink carrier(s) of FR1 in the cell group when indicated to address power savings. |
| ***reducedMIMO-LayersFR1-UL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of uplink MIMO layers of each serving cell operating on FR1 indicated by the field, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cells operating on FR1. The maximum number of uplink MIMO layers can only range up to the maximum number of MIMO layers configured across all activated uplink carrier(s) of FR1 in the cell group when indicated to address power savings. |
| ***reducedMIMO-LayersFR2-DL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of downlink MIMO layers of each serving cell operating on FR2-1 indicated by the field, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cells operating on FR2-1. The maximum number of downlink MIMO layers can only range up to the maximum number of MIMO layers configured across all activated downlink carrier(s) of FR2-1 in the cell group when indicated to address power savings. |
| ***reducedMIMO-LayersFR2-UL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of uplink MIMO layers of each serving cell operating on FR2-1 indicated by the field, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cells operating on FR2-1. The maximum number of uplink MIMO layers can only range up to the maximum number of MIMO layers configured across all activated uplink carrier(s) of FR2-1 in the cell group when indicated to address power savings. |
| ***reducedMIMO-LayersFR2-2-DL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of downlink MIMO layers of each serving cell operating on FR2-2 indicated by the field, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cells operating on FR2-2. The maximum number of downlink MIMO layers can only range up to the maximum number of MIMO layers configured across all activated downlink carrier(s) of FR2-2 in the cell group when indicated to address power savings. |
| ***reducedMIMO-LayersFR2-2-UL***  Indicates the UE's preference on reduced configuration corresponding to the maximum number of uplink MIMO layers of each serving cell operating on FR2-2 indicated by the field, to address overheating or power saving. This field is allowed to be reported only when UE is configured with serving cells operating on FR2-2. The maximum number of uplink MIMO layers can only range up to the maximum number of MIMO layers configured across all activated uplink carrier(s) of FR2-2 in the cell group when indicated to address power savings. |
| ***referenceTimeInfoPreference***  Indicates whether the UE prefers being provisioned with the timing information specified in the IE *ReferenceTimeInfo*. |
| ***resumeCause***  Provides the resume cause based on the information received from the upper layers. |
| ***rlm-MeasRelaxationState***  Indicates the relaxation state of RLM measurements. Value *true* indicates that the UE is performing relaxation of RLM measurements, and value *false* indicates that the UE is not performing relaxation of RLM measurements. |
| ***rrm-MeasRelaxationFulfilment***  Indicates whether the UE fulfils the relaxed measurement criterion for stationary UE in 5.7.4.4. Value true indicates that the UE fulfils the criterion, and value false indicates that the UE does not fulfil the criterion. |
| ***sl-QoS-FlowIdentity***  This identity uniquely identifies one sidelink QoS flow between the UE and the network in the scope of UE, which is unique for different destination and cast type. |
| ***sl-UE-AssistanceInformationNR***  Indicates the traffic characteristic of sidelink logical channel(s), specified in the IE *SL-TrafficPatternInfo,* that are setup for NR sidelink communication. |
| ***type1***  Indicates the preferred amount of increment/decrement to the long DRX cycle length with respect to the current configuration. Value in number of milliseconds. Value *ms40* corresponds to 40 milliseconds, *msMinus40* corresponds to -40 milliseconds and so on. |
| ***ul-GapFR2-PatternPreference***  Indicates the UE's preference on FR2 UL gap pattern as defined in TS 38.133 [14]. |
| ***victimSystemType***  Indicate the list of victim system types to which IDC interference is caused from NR when configured with UL CA. Value *gps*, *glonass*, *bds*, *galileo* and *navIC* indicates the type of GNSS. Value *wlan* indicates WLAN and value *bluetooth* indicates Bluetooth. |

|  |
| --- |
| *SL-TrafficPatternInfo field descriptions* |
| ***messageSize***  Indicates the maximum TB size based on the observed traffic pattern. The value refers to the index of TS 38.321 [3], table 6.1.3.1-2. |
| ***timingOffset***  This field indicates the estimated timing for a packet arrival in a sidelink logical channel. Specifically, the value indicates the timing offset with respect to subframe#0 of SFN#0 in milliseconds. |
| ***trafficPeriodicity***  This field indicates the estimated data arrival periodicity in a sidelink logical channel. Value ms20 corresponds to 20 ms, ms50 corresponds to 50 ms and so on. |

#### – *UECapabilityEnquiry*

The *UECapabilityEnquiry* message is used to request UE radio access capabilities for NR as well as for other RATs.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*UECapabilityEnquiry* message

-- ASN1START

-- TAG-UECAPABILITYENQUIRY-START

UECapabilityEnquiry ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueCapabilityEnquiry UECapabilityEnquiry-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityEnquiry-IEs ::= SEQUENCE {

ue-CapabilityRAT-RequestList UE-CapabilityRAT-RequestList,

lateNonCriticalExtension OCTET STRING OPTIONAL,

ue-CapabilityEnquiryExt OCTET STRING (CONTAINING UECapabilityEnquiry-v1560-IEs) OPTIONAL -- Need N

}

UECapabilityEnquiry-v1560-IEs ::= SEQUENCE {

capabilityRequestFilterCommon UE-CapabilityRequestFilterCommon OPTIONAL, -- Need N

nonCriticalExtension UECapabilityEnquiry-v1610-IEs OPTIONAL

}

UECapabilityEnquiry-v1610-IEs ::= SEQUENCE {

rrc-SegAllowed-r16 ENUMERATED {enabled} OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UECAPABILITYENQUIRY-STOP

-- ASN1STOP

#### – *UECapabilityInformation*

The IE *UECapabilityInformation* message is used to transfer UE radio access capabilities requested by the network.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*UECapabilityInformation* message

-- ASN1START

-- TAG-UECAPABILITYINFORMATION-START

UECapabilityInformation ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueCapabilityInformation UECapabilityInformation-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UECapabilityInformation-IEs ::= SEQUENCE {

ue-CapabilityRAT-ContainerList UE-CapabilityRAT-ContainerList OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

-- TAG-UECAPABILITYINFORMATION-STOP

-- ASN1STOP

#### – *UEInformationRequest*

The *UEInformationRequest* message is used by the network to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*UEInformationRequest message*

-- ASN1START

-- TAG-UEINFORMATIONREQUEST-START

UEInformationRequest-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueInformationRequest-r16 UEInformationRequest-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationRequest-r16-IEs ::= SEQUENCE {

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

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

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

ra-ReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

rlf-ReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

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

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEInformationRequest-v1700-IEs OPTIONAL

}

UEInformationRequest-v1700-IEs ::= SEQUENCE {

successHO-ReportReq-r17 ENUMERATED {true} OPTIONAL, -- Need N

coarseLocationRequest-r17 ENUMERATED {true} OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UEINFORMATIONREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationRequest-IEs* field descriptions |
| ***coarseLocationRequest***  This field is used to request UE to report coarse location information. |
| ***connEstFailReportReq***  This field is used to indicate whether the UE shall report information about the connection failure. |
| ***idleModeMeasurementReq***  This field indicates that the UE shall report the idle/inactive measurement information, if available, to the network in the *UEInformationResponse* message. |
| ***logMeasReportReq***  This field is used to indicate whether the UE shall report information about logged measurements. |
| ***mobilityHistoryReportReq***  This field is used to indicate whether the UE shall report information about mobility history information. |
| ***ra-ReportReq***  This field is used to indicate whether the UE shall report information about the random access procedure. |
| ***rlf-ReportReq***  This field is used to indicate whether the UE shall report information about the radio link failure. |
| ***successHO-ReportReq***  This field is used to indicate whether the UE shall report information about the successful handover report. |

#### – *UEInformationResponse*

The *UEInformationResponse* message is used by the UE to transfer information requested by the network.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*UEInformationResponse message*

-- ASN1START

-- TAG-UEINFORMATIONRESPONSE-START

UEInformationResponse-r16 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

ueInformationResponse-r16 UEInformationResponse-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEInformationResponse-r16-IEs ::= SEQUENCE {

measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

logMeasReport-r16 LogMeasReport-r16 OPTIONAL,

connEstFailReport-r16 ConnEstFailReport-r16 OPTIONAL,

ra-ReportList-r16 RA-ReportList-r16 OPTIONAL,

rlf-Report-r16 RLF-Report-r16 OPTIONAL,

mobilityHistoryReport-r16 MobilityHistoryReport-r16 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UEInformationResponse-v1700-IEs OPTIONAL

}

UEInformationResponse-v1700-IEs ::= SEQUENCE {

successHO-Report-r17 SuccessHO-Report-r17 OPTIONAL,

connEstFailReportList-r17 ConnEstFailReportList-r17 OPTIONAL,

coarseLocationInfo-r17 OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

LogMeasReport-r16 ::= SEQUENCE {

absoluteTimeStamp-r16 AbsoluteTimeInfo-r16,

traceReference-r16 TraceReference-r16,

traceRecordingSessionRef-r16 OCTET STRING (SIZE (2)),

tce-Id-r16 OCTET STRING (SIZE (1)),

logMeasInfoList-r16 LogMeasInfoList-r16,

logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

...

}

LogMeasInfoList-r16 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r16)) OF LogMeasInfo-r16

LogMeasInfo-r16 ::= SEQUENCE {

locationInfo-r16 LocationInfo-r16 OPTIONAL,

relativeTimeStamp-r16 INTEGER (0..7200),

servCellIdentity-r16 CGI-Info-Logging-r16 OPTIONAL,

measResultServingCell-r16 MeasResultServingCell-r16 OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR MeasResultListLogging2NR-r16 OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

anyCellSelectionDetected-r16 ENUMERATED {true} OPTIONAL,

...,

[[

inDeviceCoexDetected-r17 ENUMERATED {true} OPTIONAL

]]

}

ConnEstFailReport-r16 ::= SEQUENCE {

measResultFailedCell-r16 MeasResultFailedCell-r16,

locationInfo-r16 LocationInfo-r16 OPTIONAL,

measResultNeighCells-r16 SEQUENCE {

measResultNeighCellListNR MeasResultList2NR-r16 OPTIONAL,

measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

},

numberOfConnFail-r16 INTEGER (1..8),

perRAInfoList-r16 PerRAInfoList-r16,

timeSinceFailure-r16 TimeSinceFailure-r16,

...

}

ConnEstFailReportList-r17 ::= SEQUENCE (SIZE (1..maxCEFReport-r17)) OF ConnEstFailReport-r16

MeasResultServingCell-r16 ::= SEQUENCE {

resultsSSB-Cell MeasQuantityResults,

resultsSSB SEQUENCE{

best-ssb-Index SSB-Index,

best-ssb-Results MeasQuantityResults,

numberOfGoodSSB INTEGER (1..maxNrofSSBs-r16)

} OPTIONAL

}

MeasResultFailedCell-r16 ::= SEQUENCE {

cgi-Info CGI-Info-Logging-r16,

measResult-r16 SEQUENCE {

cellResults-r16 SEQUENCE{

resultsSSB-Cell-r16 MeasQuantityResults

},

rsIndexResults-r16 SEQUENCE{

resultsSSB-Indexes-r16 ResultsPerSSB-IndexList

}

}

}

RA-ReportList-r16 ::= SEQUENCE (SIZE (1..maxRAReport-r16)) OF RA-Report-r16

RA-Report-r16 ::= SEQUENCE {

cellId-r16 CHOICE {

cellGlobalId-r16 CGI-Info-Logging-r16,

pci-arfcn-r16 PCI-ARFCN-NR-r16

},

ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

raPurpose-r16 ENUMERATED {accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized,

schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI,

msg3RequestForOtherSI-r17, spare8, spare7, spare6, spare5, spare4, spare3,

spare2, spare1},

...,

[[

spCellID-r17 CGI-Info-Logging-r16 OPTIONAL

]]

}

RA-InformationCommon-r16 ::= SEQUENCE {

absoluteFrequencyPointA-r16 ARFCN-ValueNR,

locationAndBandwidth-r16 INTEGER (0..37949),

subcarrierSpacing-r16 SubcarrierSpacing,

msg1-FrequencyStart-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msg1-FrequencyStartCFRA-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msg1-SubcarrierSpacing-r16 SubcarrierSpacing OPTIONAL,

msg1-SubcarrierSpacingCFRA-r16 SubcarrierSpacing OPTIONAL,

msg1-FDM-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

msg1-FDMCFRA-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

perRAInfoList-r16 PerRAInfoList-r16,

...,

[[

perRAInfoList-v1660 PerRAInfoList-v1660 OPTIONAL

]],

[[

msg1-SCS-From-prach-ConfigurationIndex-r16 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL

]],

[[

msg1-SCS-From-prach-ConfigurationIndexCFRA-r16 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL

]],

[[

msgA-RO-FrequencyStart-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msgA-RO-FrequencyStartCFRA-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

msgA-SubcarrierSpacing-r17 SubcarrierSpacing OPTIONAL,

msgA-RO-FDM-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

msgA-RO-FDMCFRA-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

msgA-SCS-From-prach-ConfigurationIndex-r17 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL,

msgA-TransMax-r17 ENUMERATED {n1, n2, n4, n6, n8, n10, n20, n50, n100, n200} OPTIONAL,

msgA-MCS-r17 INTEGER (0..15) OPTIONAL,

nrofPRBs-PerMsgA-PO-r17 INTEGER (1..32) OPTIONAL,

msgA-PUSCH-TimeDomainAllocation-r17 INTEGER (1..maxNrofUL-Allocations) OPTIONAL,

frequencyStartMsgA-PUSCH-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

nrofMsgA-PO-FDM-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

dlPathlossRSRP-r17 RSRP-Range OPTIONAL,

intendedSIBs-r17 SEQUENCE (SIZE (1..maxSIB)) OF SIB-Type-r17 OPTIONAL,

ssbsForSI-Acquisition-r17 SEQUENCE (SIZE (1..maxNrofSSBs-r16)) OF SSB-Index OPTIONAL,

msgA-PUSCH-PayloadSize-r17 BIT STRING (SIZE (5)) OPTIONAL,

onDemandSISuccess-r17 ENUMERATED {true} OPTIONAL

]]

}

PerRAInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAInfo-r16

PerRAInfoList-v1660 ::= SEQUENCE (SIZE (1..200)) OF PerRACSI-RSInfo-v1660

PerRAInfo-r16 ::= CHOICE {

perRASSBInfoList-r16 PerRASSBInfo-r16,

perRACSI-RSInfoList-r16 PerRACSI-RSInfo-r16

}

PerRASSBInfo-r16 ::= SEQUENCE {

ssb-Index-r16 SSB-Index,

numberOfPreamblesSentOnSSB-r16 INTEGER (1..200),

perRAAttemptInfoList-r16 PerRAAttemptInfoList-r16

}

PerRACSI-RSInfo-r16 ::= SEQUENCE {

csi-RS-Index-r16 CSI-RS-Index,

numberOfPreamblesSentOnCSI-RS-r16 INTEGER (1..200)

}

PerRACSI-RSInfo-v1660 ::= SEQUENCE {

csi-RS-Index-v1660 INTEGER (1..96) OPTIONAL

}

PerRAAttemptInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAAttemptInfo-r16

PerRAAttemptInfo-r16 ::= SEQUENCE {

contentionDetected-r16 BOOLEAN OPTIONAL,

dlRSRPAboveThreshold-r16 BOOLEAN OPTIONAL,

...,

[[

fallbackToFourStepRA-r17 ENUMERATED {true} OPTIONAL

]]

}

SIB-Type-r17 ::= ENUMERATED {sibType2, sibType3, sibType4, sibType5, sibType9, sibType10-v1610, sibType11-v1610, sibType12-v1610,

sibType13-v1610, sibType14-v1610, spare6, spare5, spare4, spare3, spare2, spare1}

RLF-Report-r16 ::= CHOICE {

nr-RLF-Report-r16 SEQUENCE {

measResultLastServCell-r16 MeasResultRLFNR-r16,

measResultNeighCells-r16 SEQUENCE {

measResultListNR-r16 MeasResultList2NR-r16 OPTIONAL,

measResultListEUTRA-r16 MeasResultList2EUTRA-r16 OPTIONAL

} OPTIONAL,

c-RNTI-r16 RNTI-Value,

previousPCellId-r16 CHOICE {

nrPreviousCell-r16 CGI-Info-Logging-r16,

eutraPreviousCell-r16 CGI-InfoEUTRALogging

} OPTIONAL,

failedPCellId-r16 CHOICE {

nrFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-Info-Logging-r16,

pci-arfcn-r16 PCI-ARFCN-NR-r16

},

eutraFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-InfoEUTRALogging,

pci-arfcn-r16 PCI-ARFCN-EUTRA-r16

}

},

reconnectCellId-r16 CHOICE {

nrReconnectCellId-r16 CGI-Info-Logging-r16,

eutraReconnectCellId-r16 CGI-InfoEUTRALogging

} OPTIONAL,

timeUntilReconnection-r16 TimeUntilReconnection-r16 OPTIONAL,

reestablishmentCellId-r16 CGI-Info-Logging-r16 OPTIONAL,

timeConnFailure-r16 INTEGER (0..1023) OPTIONAL,

timeSinceFailure-r16 TimeSinceFailure-r16,

connectionFailureType-r16 ENUMERATED {rlf, hof},

rlf-Cause-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

beamFailureRecoveryFailure, lbtFailure-r16,

bh-rlfRecoveryFailure, t312-expiry-r17, spare1},

locationInfo-r16 LocationInfo-r16 OPTIONAL,

noSuitableCellFound-r16 ENUMERATED {true} OPTIONAL,

ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

...,

[[

csi-rsRLMConfigBitmap-v1650 BIT STRING (SIZE (96)) OPTIONAL

]],

[[

lastHO-Type-r17 ENUMERATED {cho, daps, spare2, spare1} OPTIONAL,

timeConnSourceDAPS-Failure-r17 TimeConnSourceDAPS-Failure-r17 OPTIONAL,

timeSinceCHO-Reconfig-r17 TimeSinceCHO-Reconfig-r17 OPTIONAL,

choCellId-r17 CHOICE {

cellGlobalId-r17 CGI-Info-Logging-r16,

pci-arfcn-r17 PCI-ARFCN-NR-r16

} OPTIONAL,

choCandidateCellList-r17 ChoCandidateCellList-r17 OPTIONAL

]]

},

eutra-RLF-Report-r16 SEQUENCE {

failedPCellId-EUTRA CGI-InfoEUTRALogging,

measResult-RLF-Report-EUTRA-r16 OCTET STRING,

...,

[[

measResult-RLF-Report-EUTRA-v1690 OCTET STRING OPTIONAL

]]

}

}

SuccessHO-Report-r17 ::= SEQUENCE {

sourceCellInfo-r17 SEQUENCE {

sourcePCellId-r17 CGI-Info-Logging-r16,

sourceCellMeas-r17 MeasResultSuccessHONR-r17 OPTIONAL,

rlf-InSourceDAPS-r17 ENUMERATED {true} OPTIONAL

},

targetCellInfo-r17 SEQUENCE {

targetPCellId-r17 CGI-Info-Logging-r16,

targetCellMeas-r17 MeasResultSuccessHONR-r17 OPTIONAL

},

measResultNeighCells-r17 SEQUENCE {

measResultListNR-r17 MeasResultList2NR-r16 OPTIONAL,

measResultListEUTRA-r17 MeasResultList2EUTRA-r16 OPTIONAL

} OPTIONAL,

locationInfo-r17 LocationInfo-r16 OPTIONAL,

timeSinceCHO-Reconfig-r17 TimeSinceCHO-Reconfig-r17 OPTIONAL,

shr-Cause-r17 SHR-Cause-r17 OPTIONAL,

ra-InformationCommon-r17 RA-InformationCommon-r16 OPTIONAL,

upInterruptionTimeAtHO-r17 UPInterruptionTimeAtHO-r17 OPTIONAL,

c-RNTI-r17 RNTI-Value OPTIONAL,

...

}

MeasResultList2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2NR-r16

MeasResultList2EUTRA-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2EUTRA-r16

MeasResult2NR-r16 ::= SEQUENCE {

ssbFrequency-r16 ARFCN-ValueNR OPTIONAL,

refFreqCSI-RS-r16 ARFCN-ValueNR OPTIONAL,

measResultList-r16 MeasResultListNR

}

MeasResultListLogging2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResultLogging2NR-r16

MeasResultLogging2NR-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueNR,

measResultListLoggingNR-r16 MeasResultListLoggingNR-r16

}

MeasResultListLoggingNR-r16 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultLoggingNR-r16

MeasResultLoggingNR-r16 ::= SEQUENCE {

physCellId-r16 PhysCellId,

resultsSSB-Cell-r16 MeasQuantityResults,

numberOfGoodSSB-r16 INTEGER (1..maxNrofSSBs-r16) OPTIONAL

}

MeasResult2EUTRA-r16 ::= SEQUENCE {

carrierFreq-r16 ARFCN-ValueEUTRA,

measResultList-r16 MeasResultListEUTRA

}

MeasResultRLFNR-r16 ::= SEQUENCE {

measResult-r16 SEQUENCE {

cellResults-r16 SEQUENCE{

resultsSSB-Cell-r16 MeasQuantityResults OPTIONAL,

resultsCSI-RS-Cell-r16 MeasQuantityResults OPTIONAL

},

rsIndexResults-r16 SEQUENCE{

resultsSSB-Indexes-r16 ResultsPerSSB-IndexList OPTIONAL,

ssbRLMConfigBitmap-r16 BIT STRING (SIZE (64)) OPTIONAL,

resultsCSI-RS-Indexes-r16 ResultsPerCSI-RS-IndexList OPTIONAL,

csi-rsRLMConfigBitmap-r16 BIT STRING (SIZE (96)) OPTIONAL

} OPTIONAL

}

}

MeasResultSuccessHONR-r17::= SEQUENCE {

measResult-r17 SEQUENCE {

cellResults-r17 SEQUENCE{

resultsSSB-Cell-r17 MeasQuantityResults OPTIONAL,

resultsCSI-RS-Cell-r17 MeasQuantityResults OPTIONAL

},

rsIndexResults-r17 SEQUENCE{

resultsSSB-Indexes-r17 ResultsPerSSB-IndexList OPTIONAL,

resultsCSI-RS-Indexes-r17 ResultsPerCSI-RS-IndexList OPTIONAL

}

}

}

ChoCandidateCellList-r17 ::= SEQUENCE(SIZE (1..maxNrofCondCells-r16)) OF ChoCandidateCell-r17

ChoCandidateCell-r17 ::= CHOICE {

cellGlobalId-r17 CGI-Info-Logging-r16,

pci-arfcn-r17 PCI-ARFCN-NR-r16

}

SHR-Cause-r17 ::= SEQUENCE {

t304-cause-r17 ENUMERATED {true} OPTIONAL,

t310-cause-r17 ENUMERATED {true} OPTIONAL,

t312-cause-r17 ENUMERATED {true} OPTIONAL,

sourceDAPS-Failure-r17 ENUMERATED {true} OPTIONAL,

...

}

TimeSinceFailure-r16 ::= INTEGER (0..172800)

MobilityHistoryReport-r16 ::= VisitedCellInfoList-r16

TimeUntilReconnection-r16 ::= INTEGER (0..172800)

TimeSinceCHO-Reconfig-r17 ::= INTEGER (0..1023)

TimeConnSourceDAPS-Failure-r17 ::= INTEGER (0..1023)

UPInterruptionTimeAtHO-r17 ::= INTEGER (0..1023)

-- TAG-UEINFORMATIONRESPONSE-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationResponse-IEs* field descriptions |
| ***coarseLocationInfo***  Parameter type Ellipsoid-Point defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. The least significant bits of *degreesLatitude* and *degreesLongitude* are set to 0 to meet the accuracy requirement corresponds to a granularity of approximately 2 km.  It is up to UE implementation how many LSBs are set to 0 to meet the accuracy requirement. |
| ***connEstFailReport***  This field is used to provide connection establishment failure or connection resume failure information*.* |
| ***connEstFailReportList***  This field is used to provide the list of *connEstFailReport* that are stored by the UE for the past up to *maxCEFReport-r17.* |
| ***logMeasReport***  This field is used to provide the measurement results stored by the UE associated to logged MDT. |
| ***measResultIdleEUTRA***  EUTRA measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***measResultIdleNR***  NR measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***ra-ReportList***  This field is used to provide the list of RA reports that is stored by the UE for the past upto *maxRAReport-r16* number of successful random access procedures, or failed or successful completion of on-demand system information request procedure. |
| ***rlf-Report***  This field is used to indicate the RLF report related contents. |
| ***successHO-Report***  This field is used to provide the successful handover report if triggered based on the successful handover configuration. |

|  |
| --- |
| *LogMeasReport* field descriptions |
| ***absoluteTimeStamp***  Indicates the absolute time when the logged measurement configuration logging is provided, as indicated by NR within *absoluteTimeInfo*. |
| ***anyCellSelectionDetected***  This field is used to indicate the detection of *any cell selection* state, as defined in TS 38.304 [20]. The UE sets this field when performing the logging of measurement results in RRC\_IDLE or RRC\_INACTIVE and there is no suitable cell or no acceptable cell. |
| ***inDeviceCoexDetected***  Indicates that measurement logging is suspended due to IDC problem detection. |
| ***measResultServingCell***  This field refers to the log measurement results taken in the Serving cell. |
| ***numberOfGoodSSB***  Indicates the number of good beams (beams that are above *absThreshSS-BlocksConsolidation,* if configured by the network) associated to the cells within the R value range (which is configured by network for cell reselection) of the highest ranked cell as part of the beam level measurements. If the UE has no SSB of a neighbour cell whose measurement quantity is above the *absThreshSS-BlocksConsolidation* or if the network has not configured the *absThreshSS-BlocksConsolidation*, then the UE does not include *numberOfGoodSSB* for the corresponding neighbour cell. If the UE has no SSB of the serving cell whose measurement quantity is above the *absThreshSS-BlocksConsolidation* or if the network has not configured the *absThreshSS-BlocksConsolidation*, then the UE shall set the *numberOfGoodSSB* for the serving cell to one. |
| ***relativeTimeStamp***  Indicates the time of logging measurement results, measured relative to the *absoluteTimeStamp*. Value in seconds. |
| ***tce-Id***  Parameter Trace Collection Entity Id: See TS 32.422 [52]. |
| ***traceRecordingSessionRef***  Parameter Trace Recording Session Reference: See TS 32.422 [52]. |

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| --- |
| *ConnEstFailReport* field descriptions |
| ***measResultFailedCell***  This field refers to the last measurement results taken in the cell, where connection establishment failure or connection resume failure happened. |
| ***measResultNeighCells***  This field refers to the neighbour cell measurements when connection establishment failure or connection resume failure happened. |
| ***numberOfConnFail***  This field is used to indicate the latest number of consecutive failed RRCSetup or RRCResume procedures in the same cell independent of RRC state transition. |
| ***timeSinceFailure***  This field is used to indicate the time that elapsed since the connection (establishment or resume) failure. Value in seconds. The maximum value 172800 means 172800s or longer. |

|  |
| --- |
| *RA-InformationCommon* field descriptions |
| ***absoluteFrequencyPointA***  This field indicates the absolute frequency position of the reference resource block (Common RB 0). |
| ***locationAndBandwidth***  Frequency domain location and bandwidth of the bandwidth part associated to the random-access resources used by the UE. |
| ***perRAInfoList, perRAInfoList-v1660***  This field provides detailed information about each of the random access attempts in the chronological order of the random access attempts. If perRAInfoList-v1660 is present, it shall contain the same number of entries, listed in the same order as in perRAInfoList-r16. |
| ***subcarrierSpacing***  Subcarrier spacing used in the BWP associated to the random-access resources used by the UE. |

|  |
| --- |
| *RA-Report* field descriptions |
| ***cellID***  This field indicates the CGI of the cell in which the associated random access procedure was performed. |
| ***contentionDetected***  This field is used to indicate that contention was detected for the transmitted preamble in the given random access attempt or not. This field is not included when the UE performs random access attempt is using contention free random-access resources or when the *raPurpose* is set to *requestForOtherSI* or when the RA attempt is a 2-step RA attempt and fallback to 4-step RA did not occur (i.e. *fallbackToFourStepRA* is not included). |
| ***csi-RS-Index, csi-RS-Index-v1660***  This field is used to indicate the CSI-RS index corresponding to the random access attempt.  If the random access procedure is for beam failure recovery, the field indicates the NZP-CSI-RS-ResourceId. For CSI-RS index larger than maxNrofCSI-RS-ResourcesRRM-1, the index value is the sum of csi-RS-Index (without suffix) and csi-RS-Index-v1660. |
| ***dlPathlossRSRP***  Measeured RSRP of the DL pathloss reference obtained at the time of *RA\_Type* selection stage of the RA procedure as captured in TS 38.321 [3]. |
| ***dlRSRPAboveThreshold***  In 4 step random access procedure, this field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold *rsrp-ThresholdSSB* in *beamFailureRecoveryConfig* in UL BWP configuration of UL BWP selected for random access procedure initiated for beam failure recovery; Otherwise, *rsrp-ThresholdSSB* in *rach-ConfigCommon* in UL BWP configuration of UL BWP selected for random access procedure.  In 2 step random access procedure, this field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold *msgA-RSRP-ThresholdSSB* in *rach-ConfigCommonTwoStepRA* in UL BWP configuration of UL BWP selected for random access procedure. |
| ***fallbackToFourStepRA***  This field indicates if a fallback indication in MsgB is received (according to TS 38.321 [3]) for the 2-step random access attempt. |
| ***intendedSIBs***  This field indicates the SIB(s) the UE wanted to receive as a result of the on demand SI request (when the RA procedure is a used as a SI request) initiated by the UE. That is, it indicates the one(s) of the SIB(s) in the SI message(s) requested to be broadcast that the UE was interested in. |
| ***msg1-SCS-From-prach-ConfigurationIndex***  This field is set by the UE with the corresponding SCS for CBRA as derived from the *prach-ConfigurationIndex* in *RACH-ConfigGeneric* when the *msg1-SubcarrierSpacing* is absent; otherwise, this field is absent. |
| ***msg1-SCS-From-prach-ConfigurationIndexCFRA***  This field is set by the UE with the corresponding SCS for CFRA as derived from the *prach-ConfigurationIndex* in *RACH-ConfigGeneric* when the *msg1-SubcarrierSpacing* is absent; otherwise, this field is absent. |
| ***msgA-PUSCH-PayloadSize***  This field indicates the size of the overall payload available in the UE buffer at the time of initiating the 2 step RA procedure. The value refers to the index of TS 38.321 [3], table 6.1.3.1-1, corresponding to the UE buffer size. |
| ***msgA-RO-FDM***  This field indicates the number of msgA PRACH transmission occasions Frequency-Division Multiplexed in one time instance for the PRACH resources configured for 2-step CBRA.. |
| ***msgA-RO-FDMCFRA***  This field indicates the number of msgA PRACH transmission occasions Frequency-Division Multiplexed in one time instance for the PRACH resources configured for 2-step CFRA. |
| ***msgA-RO-FrequencyStart***  This field indicates the lowest resource block of the contention based random-access resources for 2-step CBRA in the random-access procedure. The indication has the form of the offset of the lowest PRACH transmissions occasion with respect to PRB 0 in the frequency domain. |
| ***msgA-RO-FrequencyStartCFRA***  This field indicates the lowest resource block of the contention free random-access resources for the 2-step CFRA in the random-access procedure. The indication has the form of the offset of the lowest PRACH transmissions occasion with respect to PRB 0 in the frequency domain. |
| ***msgA-SCS-From-prach-ConfigurationIndex***  This field is set by the UE with the corresponding SCS as derived from the *msgA-PRACH-ConfigurationIndex* in *RACH-ConfigGenericTwoStepRA* (see tables Table 6.3.3.1-1, Table 6.3.3.1-2, Table 6.3.3.2-2 and Table 6.3.3.2-3, TS 38.211 [16]) when the *msgA-SubcarrierSpacing* is absent and when only 2-step random-access resources are available in the UL BWP used in the random-access procedure; otherwise, this field is absent. |
| ***numberOfPreamblesSentOnCSI-RS***  This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding CSI-RS. |
| ***numberOfPreamblesSentOnSSB***  This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding SS/PBCH block. |
| ***onDemandSISuccess***  This field is set to *true* when the RA report entry is included because of either msg1 based on demand SI request or msg3 based on demand SI request and if the on-demand SI request is successful. This field is set to *false* when the RA report entry is included because of either msg1 based on demand SI request or msg3 based on demand SI request and if the on-demand SI request is not successful. Otherwise, the field is absent. |
| ***perRAAttemptInfoList***  This field provides detailed information about a random access attempt. |
| ***perRACSI-RSInfoList***  This field provides detailed information about the successive random access attempts associated to the same CSI-RS. |
| ***perRASSBInfoList***  This field provides detailed information about the successive random access attempts associated to the same SS/PBCH block. |
| ***ra-InformationCommon***  This field is used to provide information on random access attempts. This field is mandatory present. |
| ***raPurpose***  This field is used to indicate the RA scenario for which the RA report entry is triggered. The RA accesses associated to Initial access from RRC\_IDLE, RRC re-establishment procedure, transition from RRC-INACTIVE. The indicator *beamFailureRecovery* is used in case of successful beam failure recovery related RA procedure in the SpCell [3]. The indicator *reconfigurationWithSync* is used if the UE executes a reconfiguration with sync. The indicator *ulUnSynchronized* is used if the random access procedure is initiated in a SpCell by DL or UL data arrival during RRC\_CONNECTED when the timeAlignmentTimer is not running in the PTAG or if the RA procedure is initiated in a serving cell by a PDCCH order [3]. The indicator *schedulingRequestFailure* is used in case of SR failures [3]. The indicator *noPUCCHResourceAvailable* is used when the UE has no valid SR PUCCH resources configured [3]. The indicator *requestForOtherSI* is used for MSG1 based on demand SI request. The indicator *msg3RequestForOtherSI* is used in case of MSG3 based SI request. The field can also be used for the SCG-related RA-Report when the *raPurpose* is set to *beamFailureRecovery*, *reconfigurationWithSync*, *ulUnSynchronized*, *schedulingRequestFailure* and *noPUCCHResourceAvailable*. |
| ***spCellID***  This field is used to indicate the CGI of the SpCell of the cell group associated to the SCell in which the associated random access procedure was performed. If the UE performs RA procedure on a SCell associated to the MCG, then this field is set to the CGI of the PCell and if the UE performs RA procedure on a SCell associated to the SCG, then this field is set to the CGI of the PSCell. Otherwise, the field is absent. |
| ***ssb-Index***  This field is used to indicate the SS/PBCH index of the SS/PBCH block corresponding to the random access attempt. |
| ***ssbsForSI-Acquisition***  This field indicates the SSB(s) (in the form of SSB index(es)) that the UE used to receive the requested SI message(s). The field is present if the purpose of the random access procedure was to request on-demand SI (i.e. if the *raPurpose* is set to *requestForOtherSI* or *msg3RequestForOtherSI*). Otherwise, the field is absent. |

|  |
| --- |
| *RLF-Report* field descriptions |
| ***choCandidateCellList***  This field is used to indicate the list of candidate target cells for conditional handover included in *condRRCReconfig* at the time of connection failure. The field does not include the candidate target cells included in *measResulNeighCells*. |
| ***choCellId***  This field is used to indicate the candidate target cell for conditional handover included in *condRRCReconfig* that the UE selected for CHO based recovery while T311 is running. |
| ***connectionFailureType***  This field is used to indicate whether the connection failure is due to radio link failure or handover failure. |
| ***csi-rsRLMConfigBitmap,csi-rsRLMConfigBitmap-v1650***  These fields are used to indicate the CSI-RS indexes configured in the RLM configurations for the active BWP when the UE declares RLF or HOF. The UE first fills in the *csi-rsRLMConfigBitmap-r16* to indicate the first 96 CSI-RS indexes and then *csi-rsRLMConfigBitmap-v1650* to indicate the latter 96 CSI-RS indexes. The first/leftmost bit in *csi-rsRLMConfigBitmap-r16* corresponds to CSI-RS index 0, the second bit corresponds to CSI-RS index 1. The first/leftmost bit in *csi-rsRLMConfigBitmap-v1650* corresponds to CSI-RS index 96, the second bit corresponds to CSI-RS index 97. These fields are included only if the *RadioLinkMonitoringConfig* for the respective BWP is configured. |
| ***c-RNTI***  This field indicates the C-RNTI used in the PCell upon detecting radio link failure or the C-RNTI used in the source PCell upon handover failure. |
| ***failedPCellId***  This field is used to indicate the PCell in which RLF is detected or the target PCell of the failed handover. For intra-NR handover *nrFailedPCellId* is included and for the handover from NR to EUTRA *eutraFailedPCellId* is included. The UE sets the ARFCN according to the frequency band used for transmission/ reception when the failure occurred. |
| ***failedPCellId-EUTRA***  This field is used to indicate the PCell in which RLF is detected or the source PCell of the failed handover in an E-UTRA RLF report. |
| ***lastHO-Type***  This field is used to indicate the type of the last executed handover before the last detected connection failure. The field is set to *cho* if the last executed handover was initiated by a conditional reconfiguration execution. The field is set to *daps* if the last executed handover was a DAPS handover. |
| ***measResultListEUTRA***  This field refers to the last measurement results taken in the neighboring EUTRA Cells, when the radio link failure or handover failure happened. |
| ***measResultListNR***  This field refers to the last measurement results taken in the neighboring NR Cells, when the radio link failure or handover failure happened or successful handover happened. If configuration of the conditional handover is available in *VarConditionalReconfig* when the radio link failure happened, or if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a conditional handover when the handover failure or the successful handover happened, the UE uses *measResultListNR-r17*, otherwise it uses *measResultListNR-r16*. |
| ***measResultLastServCell***  This field refers to the log measurement results taken in the PCell upon detecting radio link failure or the source PCell upon handover failure. |
| ***measResult-RLF-Report-EUTRA***  Includes the E-UTRA *RLF-Report-r9* IE as specified in TS 36.331 [10]. |
| ***measResult-RLF-Report-EUTRA-v1690***  Includes the E-UTRA *RLF-Report-v9e0* IE as specified in TS 36.331 [10]. |
| ***noSuitableCellFound***  This field is set by the UE when the T311 expires. |
| ***previousPCellId***  This field is used to indicate the source PCell of the last handover (source PCell when the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was received). For intra-NR handover *nrPreviousCell* is included and for the handover from EUTRA to NR *eutraPreviousCell* is included. |
| ***ra-InformationCommon***  This field is optionally included when c*onnectionFailureType* is set to 'hof' or when *connectionFailureType* is set to 'rlf' and the *rlf-Cause* equals to 'randomAccessProblem' or 'beamRecoveryFailure'; otherwise this field is absent. |
| ***reconnectCellId***  This field is used to indicate the cell in which the UE comes back to connected after connection failure and after failing to perform reestablishment. If the UE comes back to RRC CONNECTED in an NR cell then *nrReconnectCellID* is included and if the UE comes back to RRC CONNECTED in an LTE cell then *eutraReconnectCellID* is included |
| ***reestablishmentCellId***  If the UE was not configured with *conditionalReconfiguration* at the time of re-establishment attempt, or if the cell selected for the re-establishment attempt is not a candidate target cell for conditional reconfiguration, this field is used to indicate the cell in which the re-establishment attempt was made after connection failure. |
| ***rlf-Cause***  This field is used to indicate the cause of the last radio link failure that was detected. In case of handover failure information reporting (i.e., the *connectionFailureType* is set to '*hof*'), the UE is allowed to set this field to any value, except for the case in which a radio link failure was detected in the source PCell while performing a DAPS handover.. |
| ***ssbRLMConfigBitmap***  This field is used to indicate the SS/PBCH block indexes configured in the RLM configurations for the active BWP when the UE declares RLF or HOF.The first/leftmost bit corresponds to SSB index 0, the second bit corresponds to SSB index 1. This field is included only if the *RadioLinkMonitoringConfig* for the respective BWP is configured. |
| ***timeConnFailure***  This field is used to indicate the time elapsed since the last HO execution until connection failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeConnSourceDAPS-Failure***  This field is used to indicate the time that elapsed between the last DAPS handover execution and the radio link failure detected in the source cell while T304 is running. Value in milliseconds. The maximum value 1023 means 1023ms or longer. |
| ***timeSinceFailure***  This field is used to indicate the time that elapsed since the connection (radio link or handover) failure. Value in seconds. The maximum value 172800 means 172800s or longer. In the case of failure(s) (either at source or at target or at both) associated to DAPS handover, this field indicates the time elapsed since the latest connection (radio link or handover) failure. |
| *timeSinceCHO-Reconfig*  In case of handover failure, this field is used to indicate the time elapsed between the initiation of the last conditional reconfiguration execution towards the target cell and the reception of the latest conditional reconfiguration. In case of radio link failure, this field is used to indicate the time elapsed between the radio link failure and the reception of the latest conditional reconfiguration while connected to the source PCell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeUntilReconnection***  This field is used to indicate the time that elapsed between the connection (radio link or handover) failure and the next time the UE comes to RRC CONNECTED in an NR or EUTRA cell, after failing to perform reestablishment. Value in seconds. The maximum value 172800 means 172800s or longer. |

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| --- |
| *SuccessHO-Report* field descriptions |
| ***c-RNTI***  This field indicates the C-RNTI assigned by the target PCell of the handover for which the successful HO report was generated. |
| *rlf-InSourceDAPS*  This field indicates whether a radio link failure occurred at the source cell while T304 was running. |
| ***shr-Cause***  This field is used to indicate the cause of the successful HO report. |
| ***sourceCellMeas***  This field refers to the last measurement results taken in the source PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***sourcePCellId***  This field is used to indicate the source PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***targetCellId***  This field is used to indicate the target PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***targetCellMeas***  This field refers to the last measurement results taken in the target PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***timeSinceCHO-Reconfig***  This field is used to indicate the time elapsed between the initiation of the last conditional reconfiguration execution towards the target cell and the reception of the latest conditional reconfiguration for this target cell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***upInterruptionTimeAtHO***  This field is used to indicate the time elapsed between the time of arrival of the last PDCP PDU received from the source cell for any data radio bearer and the time of arrival of the first non-duplicate PDCP PDU received from the target cell for any data radio bearer, and it is measured at the time of arrival of the first non-duplicate PDCP PDU received from the target cell for any data radio bearer. The field is set only in case of DAPS handover. Value in milliseconds. The maximum value 1023 means 1023ms or longer. |

#### – *UEPositioningAssistanceInfo*

The *UEPositioningAssistanceInfo* message is used to provide positioning assistance information as requested by the Network.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*UEPositioningAssistanceInfo message*

-- ASN1START

-- TAG-UEPOSITIONINGASSISTANCEINFO-START

UEPositioningAssistanceInfo-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

uePositioningAssistanceInfo-r17 UEPositioningAssistanceInfo-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UEPositioningAssistanceInfo-r17-IEs ::= SEQUENCE {

ue-TxTEG-AssociationList-r17 UE-TxTEG-AssociationList-r17 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-TxTEG-AssociationList-r17 ::= SEQUENCE (SIZE (1..maxNrOfTxTEGReport-r17)) OF UE-TxTEG-Association-r17

UE-TxTEG-Association-r17 ::= SEQUENCE {

ue-TxTEG-ID-r17 INTEGER (0..maxNrOfTxTEG-ID-1-r17),

nr-TimeStamp-r17 NR-TimeStamp-r17,

associatedSRS-PosResourceIdList-r17 SEQUENCE (SIZE(1..maxNrofSRS-PosResources-r16)) OF SRS-PosResourceId-r16,

servCellId-r17 ServCellIndex OPTIONAL

}

NR-TimeStamp-r17 ::= SEQUENCE {

nr-SFN-r17 INTEGER (0..1023),

nr-Slot-r17 CHOICE {

scs15-r17 INTEGER (0..9),

scs30-r17 INTEGER (0..19),

scs60-r17 INTEGER (0..39),

scs120-r17 INTEGER (0..79)

},

...

}

-- TAG-UEPOSITIONINGASSISTANCEINFO-STOP

-- ASN1STOP

|  |
| --- |
| *UEPositioningAssistanceInfo* field descriptions |
| ***nr-TimeStamp***  This field specifies the latest time instance at which the association is valid prior to the reporting. |
| ***servCellID***  This field indicates the serving cell information of SRS for positioning resources associated to the UE Tx TEG report. |
| ***ue-TxTEG-ID***  Identifies the ID of UE Tx TEG. |

#### – *ULDedicatedMessageSegment*

The *ULDedicatedMessageSegment* message is used to transfer segments of the *UECapabilityInformation* or *MeasurementReportAppLayer* message. SRB1 is used at transfer of segments of *UECapabilityInformation* and SRB4 is used at transfer of segments of *MeasurementReportAppLayer*.

Signalling radio bearer: SRB1 or SRB4

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*ULDedicatedMessageSegment message*

-- ASN1START

-- TAG-ULDEDICATEDMESSAGESEGMENT-START

ULDedicatedMessageSegment-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

ulDedicatedMessageSegment-r16 ULDedicatedMessageSegment-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

ULDedicatedMessageSegment-r16-IEs ::= SEQUENCE {

segmentNumber-r16 INTEGER (0..15),

rrc-MessageSegmentContainer-r16 OCTET STRING,

rrc-MessageSegmentType-r16 ENUMERATED {notLastSegment, lastSegment},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-ULDEDICATEDMESSAGESEGMENT-STOP

-- ASN1STOP

|  |
| --- |
| *ULDedicatedMessageSegment* field descriptions |
| ***segmentNumber***  Identifies the sequence number of a segment within the encoded UL DCCH message. |
| ***rrc-MessageSegmentContainer***  Includes a segment of the encoded UL DCCH message. The size of the included segment in this container should be small enough that the resulting encoded RRC message PDU is less than or equal to the PDCP SDU size limit. |
| ***rrc-MessageSegmentType***  Indicates whether the included UL DCCH message segment is the last segment or not. |

#### – *ULInformationTransfer*

The *ULInformationTransfer* message is used for the uplink transfer of NAS or non-3GPP dedicated information, or IAB-DU specific F1-C related information.

Signalling radio bearer: SRB2 or SRB1 (only if SRB2 not established yet). If SRB2 is suspended, the UE does not send this message until SRB2 is resumed. If only *dedicatedInfoF1c* is included, SRB2 is used.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*ULInformationTransfer message*

-- ASN1START

-- TAG-ULINFORMATIONTRANSFER-START

ULInformationTransfer ::= SEQUENCE {

criticalExtensions CHOICE {

ulInformationTransfer ULInformationTransfer-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransfer-IEs ::= SEQUENCE {

dedicatedNAS-Message DedicatedNAS-Message OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension ULInformationTransfer-v1700-IEs OPTIONAL

}

ULInformationTransfer-v1700-IEs ::= SEQUENCE {

dedicatedInfoF1c-r17 DedicatedInfoF1c-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-ULINFORMATIONTRANSFER-STOP

-- ASN1STOP

#### – *ULInformationTransferIRAT*

The *ULInformationTransferIRAT* message is used for the uplink transfer of information terminated at NR MCG but specified by another RAT. In this version of the specification, the message is used for V2X sidelink communication messages specified in TS 36.331 [10].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*ULInformationTransferIRAT* message

-- ASN1START

-- TAG-ULINFORMATIONTRANSFERIRAT-START

ULInformationTransferIRAT-r16 ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ulInformationTransferIRAT-r16 ULInformationTransferIRAT-r16-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransferIRAT-r16-IEs ::= SEQUENCE {

ul-DCCH-MessageEUTRA-r16 OCTET STRING OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-ULINFORMATIONTRANSFERIRAT-STOP

-- ASN1STOP

| *ULInformationTransferIRAT* field descriptions |
| --- |
| ***ul-DCCH-MessageEUTRA***  Includes the *UL-DCCH-Message* as defined in TS 36.331 [10]. In this version of the specification, the field is only used to transfer the E-UTRA RRC *MeasurementReport*, E-UTRA RRC *SidelinkUEInformation* and the E-UTRA RRC *UEAssistanceInformation messages*. |

#### *– ULInformationTransferMRDC*

The *ULInformationTransferMRDC* message is used for the uplink transfer of MR-DC dedicated information (e.g. for transferring the NR or E-UTRA RRC *MeasurementReport* message, the *FailureInformation* message, the *UEAssistanceInformation* message, the *RRCReconfigurationComplete* message or the NR or E-UTRA RRC *MCGFailureInformation* message).

Signalling radio bearer: SRB1, SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*ULInformationTransferMRDC message*

-- ASN1START

-- TAG-ULINFORMATIONTRANSFERMRDC-START

ULInformationTransferMRDC ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE {

ulInformationTransferMRDC ULInformationTransferMRDC-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

ULInformationTransferMRDC-IEs::= SEQUENCE {

ul-DCCH-MessageNR OCTET STRING OPTIONAL,

ul-DCCH-MessageEUTRA OCTET STRING OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-ULINFORMATIONTRANSFERMRDC-STOP

-- ASN1STOP

| *ULInformationTransferMRDC* field descriptions |
| --- |
| ***ul-DCCH-MessageNR***  Includes the *UL-DCCH-Message*. In this version of the specification, the field is only used to transfer the NR RRC *MeasurementReport*, *RRCReconfigurationComplete, UEAssistanceInformation,* *FailureInformation*, and *IABOtherInformation* messages when sent via SRB1 and to transfer the NR *MCGFailureInformation* message when sent via SRB3. |
| ***ul-DCCH-MessageEUTRA***  Includes the *UL-DCCH-Message*. In this version of the specification, the field is only used to transfer the E-UTRA RRC *MeasurementReport* message when sent via SRB1 and to transfer the E-UTRA *MCGFailureInformation* message when sent via SRB3. |

## 6.3 RRC information elements

### 6.3.0 Parameterized types

#### – *SetupRelease*

*SetupRelease* allows the *ElementTypeParam* to be used as the referenced data type for the setup and release entries. See A.3.8 for guidelines.

-- ASN1START

-- TAG-SETUPRELEASE-START

SetupRelease { ElementTypeParam } ::= CHOICE {

release NULL,

setup ElementTypeParam

}

-- TAG-SETUPRELEASE-STOP

-- ASN1STOP

### 6.3.1 System information blocks

#### – *SIB2*

*SIB2* contains cell re-selection information common for intra-frequency, inter-frequency and/or inter-RAT cell re-selection (i.e. applicable for more than one type of cell re-selection but not necessarily all) as well as intra-frequency cell re-selection information other than neighbouring cell related.

*SIB2* information element

-- ASN1START

-- TAG-SIB2-START

SIB2 ::= SEQUENCE {

cellReselectionInfoCommon SEQUENCE {

nrofSS-BlocksToAverage INTEGER (2..maxNrofSS-BlocksToAverage) OPTIONAL, -- Need S

absThreshSS-BlocksConsolidation ThresholdNR OPTIONAL, -- Need S

rangeToBestCell RangeToBestCell OPTIONAL, -- Need R

q-Hyst ENUMERATED {

dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,

dB12, dB14, dB16, dB18, dB20, dB22, dB24},

speedStateReselectionPars SEQUENCE {

mobilityStateParameters MobilityStateParameters,

q-HystSF SEQUENCE {

sf-Medium ENUMERATED {dB-6, dB-4, dB-2, dB0},

sf-High ENUMERATED {dB-6, dB-4, dB-2, dB0}

}

} OPTIONAL, -- Need R

...

},

cellReselectionServingFreqInfo SEQUENCE {

s-NonIntraSearchP ReselectionThreshold OPTIONAL, -- Need S

s-NonIntraSearchQ ReselectionThresholdQ OPTIONAL, -- Need S

threshServingLowP ReselectionThreshold,

threshServingLowQ ReselectionThresholdQ OPTIONAL, -- Need R

cellReselectionPriority CellReselectionPriority,

cellReselectionSubPriority CellReselectionSubPriority OPTIONAL, -- Need R

...

},

intraFreqCellReselectionInfo SEQUENCE {

q-RxLevMin Q-RxLevMin,

q-RxLevMinSUL Q-RxLevMin OPTIONAL, -- Need R

q-QualMin Q-QualMin OPTIONAL, -- Need S

s-IntraSearchP ReselectionThreshold,

s-IntraSearchQ ReselectionThresholdQ OPTIONAL, -- Need S

t-ReselectionNR T-Reselection,

frequencyBandList MultiFrequencyBandListNR-SIB OPTIONAL, -- Need S

frequencyBandListSUL MultiFrequencyBandListNR-SIB OPTIONAL, -- Need R

p-Max P-Max OPTIONAL, -- Need S

smtc SSB-MTC OPTIONAL, -- Need S

ss-RSSI-Measurement SS-RSSI-Measurement OPTIONAL, -- Need R

ssb-ToMeasure SSB-ToMeasure OPTIONAL, -- Need S

deriveSSB-IndexFromCell BOOLEAN,

...,

[[

t-ReselectionNR-SF SpeedStateScaleFactors OPTIONAL -- Need N

]],

[[

smtc2-LP-r16 SSB-MTC2-LP-r16 OPTIONAL, -- Need R

ssb-PositionQCL-Common-r16 SSB-PositionQCL-Relation-r16 OPTIONAL -- Cond SharedSpectrum

]],

[[

ssb-PositionQCL-Common-r17 SSB-PositionQCL-Relation-r17 OPTIONAL -- Cond SharedSpectrum2

]]

},

...,

[[

relaxedMeasurement-r16 SEQUENCE {

lowMobilityEvaluation-r16 SEQUENCE {

s-SearchDeltaP-r16 ENUMERATED {

dB3, dB6, dB9, dB12, dB15,

spare3, spare2, spare1},

t-SearchDeltaP-r16 ENUMERATED {

s5, s10, s20, s30, s60, s120, s180,

s240, s300, spare7, spare6, spare5,

spare4, spare3, spare2, spare1}

} OPTIONAL, -- Need R

cellEdgeEvaluation-r16 SEQUENCE {

s-SearchThresholdP-r16 ReselectionThreshold,

s-SearchThresholdQ-r16 ReselectionThresholdQ OPTIONAL -- Need R

} OPTIONAL, -- Need R

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

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

} OPTIONAL -- Need R

]],

[[

cellEquivalentSize-r17 INTEGER(2..16) OPTIONAL, -- Cond HSDN

relaxedMeasurement-r17 SEQUENCE {

stationaryMobilityEvaluation-r17 SEQUENCE {

s-SearchDeltaP-Stationary-r17 ENUMERATED {dB2, dB3, dB6, dB9, dB12, dB15, spare2, spare1},

t-SearchDeltaP-Stationary-r17 ENUMERATED {s5, s10, s20, s30, s60, s120, s180, s240, s300, spare7, spare6, spare5,

spare4, spare3, spare2, spare1}

},

cellEdgeEvaluationWhileStationary-r17 SEQUENCE {

s-SearchThresholdP2-r17 ReselectionThreshold,

s-SearchThresholdQ2-r17 ReselectionThresholdQ OPTIONAL -- Need R

} OPTIONAL, -- Need R

combineRelaxedMeasCondition2-r17 ENUMERATED {true} OPTIONAL -- Need R

} OPTIONAL -- Need R

]]

}

RangeToBestCell ::= Q-OffsetRange

-- TAG-SIB2-STOP

-- ASN1STOP

| *SIB2* field descriptions |
| --- |
| ***absThreshSS-BlocksConsolidation***  Threshold for consolidation of L1 measurements per RS index. If the field is absent, the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***cellEdgeEvaluation***  Indicates the criteria for a UE to detect that it is not at cell edge, in order to relax measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.9.2). |
| ***cellEdgeEvaluationWhileStationary***  Indicates the criteria for a UE to detect that it is not at cell edge while stationary, in order to relax measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.9.4). |
| ***cellEquivalentSize***  The number of cell count used for mobility state estimation for this cell as specified in TS 38.304 [20]. |
| ***cellReselectionInfoCommon***  Cell re-selection information common for intra-frequency, inter-frequency and/ or inter-RAT cell re-selection. |
| ***cellReselectionServingFreqInfo***  Information common for non-intra-frequency cell re-selection i.e. cell re-selection to inter-frequency and inter-RAT cells. |
| ***combineRelaxedMeasCondition***  When both *lowMobilityEvalutation* and *cellEdgeEvalutation* criteria are present in SIB2, this parameter configures the UE to fulfil both criteria in order to relax measurement requirements for cell reselection. If the field is absent, the UE is allowed to relax measurement requirements for cell reselection when either or both of the criteria are met. (See TS 38.304 [20], clause 5.2.4.9.0) |
| ***combineRelaxedMeasCondition2***  When both *stationaryMobilityEvaluation* and *cellEdgeEvaluationWhileStationary* criteria are present in SIB2, this parameter configures the UE to fulfil both criteria in order to relax measurement requirements for cell reselection. If the field is absent, the UE is allowed to relax measurement requirements for cell reselection when only the stationary criteria is met. (See TS 38.304 [20], clause 5.2.4.9.0) |
| ***deriveSSB-IndexFromCell***  This field indicates whether the UE can utilize serving cell timing to derive the index of SS block transmitted by neighbour cell. If this field is set to *true*, the UE assumes SFN and frame boundary alignment across cells on the serving frequency as specified in TS 38.133 [14]. |
| ***frequencyBandList***  Indicates the list of frequency bands for which the NR cell reselection parameters apply. The UE behaviour in case the field is absent is described in clause 5.2.2.4.3. |
| ***highPriorityMeasRelax***  Indicates whether measurements can be relaxed on high priority frequencies. If the field is absent, the UE shall not relax measurements on high priority frequencies beyond "Thigher\_priority\_search" unless both low mobility and not at cell edge criteria are fulfilled (see TS 38.133 [14], clauses 4.2.2.7, 4.2.2.10 and 4.2.2.11). |
| ***intraFreqCellReselectionInfo***  Cell re-selection information common for intra-frequency cells. |
| ***lowMobilityEvaluation***  Indicates the criteria for a UE to detect low mobility, in order to relax measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.9.1). |
| ***nrofSS-BlocksToAverage***  Number of SS blocks to average for cell measurement derivation. If the field is absent the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***p-Max***  Value in dBm applicable for the intra-frequency neighbouring NR cells. If absent the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if *p-Max* is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39]. This field is ignored by IAB-MT. The IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [63]. |
| ***q-Hyst***  Parameter "*Qhyst*" in TS 38.304 [20], Value in dB. Value *dB1* corresponds to 1 dB, *dB2* corresponds to 2 dB and so on. |
| ***q-HystSF***  Parameter "Speed dependent ScalingFactor for Qhyst" in TS 38.304 [20]. The *sf-Medium* and *sf-High* concern the additional hysteresis to be applied, in Medium and High Mobility state respectively, to Qhyst as defined in TS 38.304 [20]. In dB. Value *dB-6* corresponds to -6dB, *dB-4* corresponds to -4dB and so on. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 38.304 [20], applicable for intra-frequency neighbour cells. If the field is absent, the UE applies the (default) value of negative infinity for Qqualmin. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 38.304 [20], applicable for intra-frequency neighbour cells. |
| ***q-RxLevMinSUL***  Parameter "Qrxlevmin" in TS 38.304 [20], applicable for intra-frequency neighbour cells. |
| ***rangeToBestCell***  Parameter "rangeToBestCell" in TS 38.304 [20]. The network configures only non-negative (in dB) values. |
| ***relaxedMeasurement***  Configuration to allow relaxation of RRM measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.9). |
| ***s-IntraSearchP***  Parameter "SIntraSearchP" in TS 38.304 [20]. |
| ***s-IntraSearchQ***  Parameter "SIntraSearchQ" in TS 38.304 [20]. If the field is absent, the UE applies the (default) value of 0 dB for SIntraSearchQ. |
| ***s-NonIntraSearchP***  Parameter "SnonIntraSearchP" in TS 38.304 [20]. If this field is absent, the UE applies the (default) value of infinity for SnonIntraSearchP. |
| ***s-NonIntraSearchQ***  Parameter "SnonIntraSearchQ" in TS 38.304 [20]. If the field is absent, the UE applies the (default) value of 0 dB for SnonIntraSearchQ. |
| ***s-SearchDeltaP***  Parameter "SSearchDeltaP" in TS 38.304 [20]. Value dB3 corresponds to 3 dB, dB6 corresponds to 6 dB and so on. |
| ***s-SearchDeltaP-Stationary***  Parameter "SSearchDeltaP-Stationary" in TS 38.304 [20]. Value *dB2* corresponds to 2 dB, *dB3* corresponds to 3 dB and so on. |
| ***s-SearchThresholdP, s-SearchThresholdP2***  Parameters "SSearchThresholdP" and "SSearchThresholdP2" in TS 38.304 [20]. The network configures *s-SearchThresholdP* and *s-SearchThresholdP2* to be less than or equal to *s-IntraSearchP* and *s-NonIntraSearchP*. |
| ***s-SearchThresholdQ, s-SearchThresholdQ2***  Parameters "SSearchThresholdQ" and "SSearchThresholdQ2" in TS 38.304 [20]. The network configures *s-SearchThresholdQ* and *s-SearchThresholdQ2* to be less than or equal to *s-IntraSearchQ* and *s-NonIntraSearchQ*. |
| ***smtc***  Measurement timing configuration for intra-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms for the intra-frequnecy cells. |
| ***smtc2-LP***  Measurement timing configuration for intra-frequency neighbour cells with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP*. The timing offset and duration are equal to the offset and duration indicated in *smtc* in *intraFreqCellReselectionInfo*. The periodicity in *smtc2-LP* can only be set to a value strictly larger than the periodicity in *smtc* in *intraFreqCellReselectionInfo* (e.g. if *smtc* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *smtc* indicates sf160, *smtc2-LP* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the intra-frequency neighbour cells with Long Periodicity. If *smtc2-LP* is absent, the UE assumes that there are no intra-frequency neighbour cells with a Long Periodicity. |
| ***ssb-PositionQCL-Common***  Indicates the QCL relation between SS/PBCH blocks for intra-frequency neighbor cells as specified in TS 38.213 [13], clause 4.1. |
| ***ssb-ToMeasure***  The set of SS blocks to be measured within the SMTC measurement duration (see TS 38.215 [9]). When the field is absent the UE measures on all SS-blocks. |
| ***stationaryMobilityEvaluation***  Indicates the criteria for a UE to detect stationary mobility, in order to relax measurement requirements for cell reselection (see TS 38.304 [20], clause 5.2.4.9.0). |
| ***t-ReselectionNR***  Parameter "TreselectionNR" in TS 38.304 [20]. |
| ***t-ReselectionNR-SF***  Parameter "Speed dependent ScalingFactor for TreselectionNR" in TS 38.304 [20]. If the field is absent, the UE behaviour is specified in TS 38.304 [20]. |
| ***threshServingLowP***  Parameter "ThreshServing, LowP" in TS 38.304 [20]. |
| ***threshServingLowQ***  Parameter "ThreshServing, LowQ" in TS 38.304 [20]. |
| ***t-SearchDeltaP***  Parameter "TSearchDeltaP" in TS 38.304 [20]. Value in seconds. Value *s5* means 5 seconds, value *s10* means 10 seconds and so on. |
| ***t-SearchDeltaP-Stationary***  Parameter "TSearchDeltaP-Stationary" in TS 38.304 [20]. Value in seconds. Value *s5* means 5 seconds, value *s10* means 10 seconds and so on. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *HSDN* | The field is optionally present, Need R, if *speedStateReselectionPars* is present; otherwise the field is not present. |
| *SharedSpectrum* | This field is mandatory present if this intra-frequency operates with shared spectrum channel access in FR1. Otherwise, it is absent, Need R. |
| *SharedSpectrum2* | This field is optionally present if this intra-frequency operates with shared spectrum channel access in FR2-2. Otherwise, it is absent, Need R. |

#### – *SIB3*

*SIB3* contains neighbouring cell related information relevant only for intra-frequency cell re-selection. The IE includes cells with specific re-selection parameters as well as exclude-listed cells.

*SIB3* information element

-- ASN1START

-- TAG-SIB3-START

SIB3 ::= SEQUENCE {

intraFreqNeighCellList IntraFreqNeighCellList OPTIONAL, -- Need R

intraFreqExcludedCellList IntraFreqExcludedCellList OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

intraFreqNeighCellList-v1610 IntraFreqNeighCellList-v1610 OPTIONAL, -- Need R

intraFreqAllowedCellList-r16 IntraFreqAllowedCellList-r16 OPTIONAL, -- Cond SharedSpectrum2

intraFreqCAG-CellList-r16 SEQUENCE (SIZE (1..maxPLMN)) OF IntraFreqCAG-CellListPerPLMN-r16 OPTIONAL -- Need R

]],

[[

intraFreqNeighHSDN-CellList-r17 IntraFreqNeighHSDN-CellList-r17 OPTIONAL, -- Need R

intraFreqNeighCellList-v1710 IntraFreqNeighCellList-v1710 OPTIONAL -- Need R

]]

}

IntraFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo

IntraFreqNeighCellList-v1610::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo-v1610

IntraFreqNeighCellList-v1710 ::= SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo-v1710

IntraFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange,

q-RxLevMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

q-RxLevMinOffsetCellSUL INTEGER (1..8) OPTIONAL, -- Need R

q-QualMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

...

}

IntraFreqNeighCellInfo-v1610 ::= SEQUENCE {

ssb-PositionQCL-r16 SSB-PositionQCL-Relation-r16 OPTIONAL -- Cond SharedSpectrum2

}

IntraFreqNeighCellInfo-v1710 ::= SEQUENCE {

ssb-PositionQCL-r17 SSB-PositionQCL-Relation-r17 OPTIONAL -- Cond SharedSpectrum2

}

IntraFreqExcludedCellList ::= SEQUENCE (SIZE (1..maxCellExcluded)) OF PCI-Range

IntraFreqAllowedCellList-r16 ::= SEQUENCE (SIZE (1..maxCellAllowed)) OF PCI-Range

IntraFreqCAG-CellListPerPLMN-r16 ::= SEQUENCE {

plmn-IdentityIndex-r16 INTEGER (1..maxPLMN),

cag-CellList-r16 SEQUENCE (SIZE (1..maxCAG-Cell-r16)) OF PCI-Range

}

IntraFreqNeighHSDN-CellList-r17 ::= SEQUENCE (SIZE (1..maxCellIntra)) OF PCI-Range

-- TAG-SIB3-STOP

-- ASN1STOP

| *SIB3* field descriptions |
| --- |
| ***intraFreqAllowedCellList***  List of allow-listed intra-frequency neighbouring cells, see TS 38.304 [20], clause 5.2.4. |
| ***intraFreqCAG-CellList***  List of intra-frequency neighbouring CAG cells (as defined in TS 38.304 [20]) per PLMN. |
| ***intraFreqExcludedCellList***  List of exclude-listed intra-frequency neighbouring cells. |
| ***intraFreqNeighCellList***  List of intra-frequency neighbouring cells with specific cell re-selection parameters. If *intraFreqNeighCellList-v1610* is present, it shall contain the same number of entries, listed in the same order as in *intraFreqNeighCellList* (without suffix). |
| ***intraFreqNeighHSDN-CellList***  List of intra-frequency neighbouring HSDN cells as specified in TS 38.304 [20]. |
| ***q-OffsetCell***  Parameter "Qoffsets,n" in TS 38.304 [20]. |
| ***q-QualMinOffsetCell***  Parameter "Qqualminoffsetcell" in TS 38.304 [20]. Actual value Qqualminoffsetcell = field value [dB]. |
| ***q-RxLevMinOffsetCell***  Parameter "Qrxlevminoffsetcell" in TS 38.304 [20]. Actual value Qrxlevminoffsetcell = field value \* 2 [dB]. |
| ***q-RxLevMinOffsetCellSUL***  Parameter "QrxlevminoffsetcellSUL" in TS 38.304 [20]. Actual value QrxlevminoffsetcellSUL = field value \* 2 [dB]. |
| ***ssb-PositionQCL***  Indicates the QCL relation between SS/PBCH blocks for a specific intra-frequency neighbor cell as specified in TS 38.213 [13], clause 4.1. If provided, the cell specific value overwrites the value signalled by *ssb-PositionQCL-Common* in *SIB2* for the indicated cell. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SharedSpectrum2* | The field is optional present, Need R, if this intra-frequency or neighbor cell operates with shared spectrum channel access. Otherwise, it is absent, Need R. |

#### – *SIB4*

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

*SIB4* information element

-- ASN1START

-- TAG-SIB4-START

SIB4 ::= SEQUENCE {

interFreqCarrierFreqList InterFreqCarrierFreqList,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

interFreqCarrierFreqList-v1610 InterFreqCarrierFreqList-v1610 OPTIONAL -- Need R

]],

[[

interFreqCarrierFreqList-v1700 InterFreqCarrierFreqList-v1700 OPTIONAL -- Need R

]]

}

InterFreqCarrierFreqList ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo

InterFreqCarrierFreqList-v1610 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1610

InterFreqCarrierFreqList-v1700 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1700

InterFreqCarrierFreqInfo ::= SEQUENCE {

dl-CarrierFreq ARFCN-ValueNR,

frequencyBandList MultiFrequencyBandListNR-SIB OPTIONAL, -- Cond Mandatory

frequencyBandListSUL MultiFrequencyBandListNR-SIB OPTIONAL, -- Need R

nrofSS-BlocksToAverage INTEGER (2..maxNrofSS-BlocksToAverage) OPTIONAL, -- Need S

absThreshSS-BlocksConsolidation ThresholdNR OPTIONAL, -- Need S

smtc SSB-MTC OPTIONAL, -- Need S

ssbSubcarrierSpacing SubcarrierSpacing,

ssb-ToMeasure SSB-ToMeasure OPTIONAL, -- Need S

deriveSSB-IndexFromCell BOOLEAN,

ss-RSSI-Measurement SS-RSSI-Measurement OPTIONAL, -- Need R

q-RxLevMin Q-RxLevMin,

q-RxLevMinSUL Q-RxLevMin OPTIONAL, -- Need R

q-QualMin Q-QualMin OPTIONAL, -- Need S

p-Max P-Max OPTIONAL, -- Need S

t-ReselectionNR T-Reselection,

t-ReselectionNR-SF SpeedStateScaleFactors OPTIONAL, -- Need S

threshX-HighP ReselectionThreshold,

threshX-LowP ReselectionThreshold,

threshX-Q SEQUENCE {

threshX-HighQ ReselectionThresholdQ,

threshX-LowQ ReselectionThresholdQ

} OPTIONAL, -- Cond RSRQ

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need R

cellReselectionSubPriority CellReselectionSubPriority OPTIONAL, -- Need R

q-OffsetFreq Q-OffsetRange DEFAULT dB0,

interFreqNeighCellList InterFreqNeighCellList OPTIONAL, -- Need R

interFreqExcludedCellList InterFreqExcludedCellList OPTIONAL, -- Need R

...

}

InterFreqCarrierFreqInfo-v1610 ::= SEQUENCE {

interFreqNeighCellList-v1610 InterFreqNeighCellList-v1610 OPTIONAL, -- Need R

smtc2-LP-r16 SSB-MTC2-LP-r16 OPTIONAL, -- Need R

interFreqAllowedCellList-r16 InterFreqAllowedCellList-r16 OPTIONAL, -- Cond SharedSpectrum2

ssb-PositionQCL-Common-r16 SSB-PositionQCL-Relation-r16 OPTIONAL, -- Cond SharedSpectrum

interFreqCAG-CellList-r16 SEQUENCE (SIZE (1..maxPLMN)) OF InterFreqCAG-CellListPerPLMN-r16 OPTIONAL -- Need R

}

InterFreqCarrierFreqInfo-v1700 ::= SEQUENCE {

interFreqNeighHSDN-CellList-r17 InterFreqNeighHSDN-CellList-r17 OPTIONAL, -- Need R

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

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

ssb-PositionQCL-Common-r17 SSB-PositionQCL-Relation-r17 OPTIONAL, -- Cond SharedSpectrum

interFreqNeighCellList-v1710 InterFreqNeighCellList-v1710 OPTIONAL -- Cond SharedSpectrum2

}

InterFreqNeighHSDN-CellList-r17 ::= SEQUENCE (SIZE (1..maxCellInter)) OF PCI-Range

InterFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo

InterFreqNeighCellList-v1610 ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo-v1610

InterFreqNeighCellList-v1710 ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo-v1710

InterFreqNeighCellInfo ::= SEQUENCE {

physCellId PhysCellId,

q-OffsetCell Q-OffsetRange,

q-RxLevMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

q-RxLevMinOffsetCellSUL INTEGER (1..8) OPTIONAL, -- Need R

q-QualMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

...

}

InterFreqNeighCellInfo-v1610 ::= SEQUENCE {

ssb-PositionQCL-r16 SSB-PositionQCL-Relation-r16 OPTIONAL -- Cond SharedSpectrum2

}

InterFreqNeighCellInfo-v1710 ::= SEQUENCE {

ssb-PositionQCL-r17 SSB-PositionQCL-Relation-r17 OPTIONAL -- Cond SharedSpectrum2

}

InterFreqExcludedCellList ::= SEQUENCE (SIZE (1..maxCellExcluded)) OF PCI-Range

InterFreqAllowedCellList-r16 ::= SEQUENCE (SIZE (1..maxCellAllowed)) OF PCI-Range

InterFreqCAG-CellListPerPLMN-r16 ::= SEQUENCE {

plmn-IdentityIndex-r16 INTEGER (1..maxPLMN),

cag-CellList-r16 SEQUENCE (SIZE (1..maxCAG-Cell-r16)) OF PCI-Range

}

-- TAG-SIB4-STOP

-- ASN1STOP

| *SIB4* field descriptions |
| --- |
| ***absThreshSS-BlocksConsolidation***  Threshold for consolidation of L1 measurements per RS index. If the field is absent, the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***deriveSSB-IndexFromCell***  This field indicates whether the UE may use the timing of any detected cell on that frequency to derive the SSB index of all neighbour cells on that frequency. If this field is set to *true*, the UE assumes SFN and frame boundary alignment across cells on the neighbor frequency as specified in TS 38.133 [14]. |
| ***dl-CarrierFreq***  This field indicates center frequency of the SS block of the neighbour cells, where the frequency corresponds to a GSCN value as specified in TS 38.101-1 [15]. |
| ***frequencyBandList***  Indicates the list of frequency bands for which the NR cell reselection parameters apply. |
| ***highSpeedMeasInterFreq***  If the field is set to *true* and UE supports high speed inter-frequency IDLE/INACTIVE measurements, the UE shall apply the enhanced inter-frequency RRM requirements on the inter-frequency carrier to support high speed up to 500 km/h in RRC\_IDLE/RRC\_INACTIVE as specified in TS 38.133 [14]. |
| ***interFreqAllowedCellList***  List of allow-listed inter-frequency neighbouring cells, see TS 38.304 [20], clause 5.2.4. |
| ***interFreqCAG-CellList***  List of inter-frequency neighbouring CAG cells (as defined in TS 38.304 [20] per PLMN. |
| ***interFreqCarrierFreqList***  List of neighbouring carrier frequencies and frequency specific cell re-selection information. If *interFreqCarrierFreqList-v1610* or */interFreqCarrierFreqList-v1700* are present, they shall contain the same number of entries, listed in the same order as in *interFreqCarrierFreqList* (without suffix). |
| ***interFreqExcludedCellList***  List of exclude-listed inter-frequency neighbouring cells. |
| ***interFreqNeighCellList***  List of inter-frequency neighbouring cells with specific cell re-selection parameters. If *interFreqNeighCellList-v1610* is present, it shall contain the same number of entries, listed in the same order as in *interFreqNeighCellList* (without suffix). |
| ***interFreqNeighHSDN-CellList***  List of inter-frequency neighbouring HSDN cells as specified in TS 38.304 [20]. |
| ***nrofSS-BlocksToAverage***  Number of SS blocks to average for cell measurement derivation. If the field is absent, the UE uses the measurement quantity as specified in TS 38.304 [20]. |
| ***p-Max***  Value in dBm applicable for the neighbouring NR cells on this carrier frequency. If absent the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if *p-Max* is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39]. This field is ignored by IAB-MT. The IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [63]. |
| ***q-OffsetCell***  Parameter "Qoffsets,n" in TS 38.304 [20]. |
| ***q-OffsetFreq***  Parameter "Qoffsetfrequency" in TS 38.304 [20]. |
| ***q-QualMin***  Parameter "Qqualmin" in TS 38.304 [20]. If the field is absent, the UE applies the (default) value of negative infinity for Qqualmin. |
| ***q-QualMinOffsetCell***  Parameter "Qqualminoffsetcell" in TS 38.304 [20]. Actual value Qqualminoffsetcell = field value [dB]. |
| ***q-RxLevMin***  Parameter "Qrxlevmin" in TS 38.304 [20]. |
| ***q-RxLevMinOffsetCell***  Parameter "Qrxlevminoffsetcell" in TS 38.304 [20]. Actual value Qrxlevminoffsetcell = field value \* 2 [dB]. |
| ***q-RxLevMinOffsetCellSUL***  Parameter "QrxlevminoffsetcellSUL" in TS 38.304 [20]. Actual value QrxlevminoffsetcellSUL = field value \* 2 [dB]. |
| ***q-RxLevMinSUL***  Parameter "Qrxlevmin" in TS 38.304 [20]. |
| ***redCapAccessAllowed***  Indicates whether RedCap UEs are allowed to access the frequency. |
| ***smtc***  Measurement timing configuration for inter-frequency measurement. If this field is absent, the UE assumes that SSB periodicity is 5 ms in this frequency. |
| ***smtc2-LP***  Measurement timing configuration for inter-frequency neighbour cells with a Long Periodicity (LP) indicated by periodicity in *smtc2-LP*. The timing offset and duration are equal to the offset and duration indicated in *smtc* in *InterFreqCarrierFreqInfo*. The periodicity in *smtc2-LP* can only be set to a value strictly larger than the periodicity in *smtc* in *InterFreqCarrierFreqInfo* (e.g. if *smtc* indicates sf20 the Long Periodicity can only be set to sf40, sf80 or sf160, if *smtc* indicates sf160, *smtc2-LP* cannot be configured). The *pci-List*, if present, includes the physical cell identities of the inter-frequency neighbour cells with Long Periodicity. If *smtc2-LP* is absent, the UE assumes that there are no inter-frequency neighbour cells with a Long Periodicity. |
| ***ssb-PositionQCL***  Indicates the QCL relation between SS/PBCH blocks for a specific neighbor cell as specified in TS 38.213 [13], clause 4.1. If provided, the cell specific value overwrites the common value signalled by *ssb-PositionQCL-Common* in *SIB4* for the indicated cell. |
| ***ssb-PositionQCL-Common***  Indicates the QCL relation between SS/PBCH blocks for inter-frequency neighbor cells as specified in TS 38.213 [13], clause 4.1. |
| ***ssb-ToMeasure***  The set of SS blocks to be measured within the SMTC measurement duration (see TS 38.215 [9]). When the field is absent the UE measures on all SS-blocks. |
| ***ssbSubcarrierSpacing***  Subcarrier spacing of SSB.  Only the following values are applicable depending on the used frequency:  FR1: 15 or 30 kHz  FR2-1: 120 or 240 kHz  FR2-2: 120, 480, or 960 kHz |
| ***threshX-HighP***  Parameter "ThreshX, HighP" in TS 38.304 [20]. |
| ***threshX-HighQ***  Parameter "ThreshX, HighQ" in TS 38.304 [20]. |
| ***threshX-LowP***  Parameter "ThreshX, LowP" in TS 38.304 [20]. |
| ***threshX-LowQ***  Parameter "ThreshX, LowQ" in TS 38.304 [20]. |
| ***t-ReselectionNR***  Parameter "TreselectionNR" in TS 38.304 [20]. |
| ***t-ReselectionNR-SF***  Parameter "Speed dependent ScalingFactor for TreselectionNR" in TS 38.304 [20]. If the field is absent, the UE behaviour is specified in TS 38.304 [20]. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Mandatory* | The field is mandatory present in SIB4. |
| *RSRQ* | The field is mandatory present if *threshServingLowQ* is present in *SIB2*; otherwise it is absent. |
| *SharedSpectrum* | This field is mandatory present if this inter-frequency operates with shared spectrum channel access. Otherwise, it is absent, Need R. |
| *SharedSpectrum2* | The field is optional present, Need R, if this inter-frequency or neighbor cell operates with shared spectrum channel access. Otherwise, it is absent, Need R. |

#### – *SIB5*

*SIB5* contains information relevant only for inter-RAT cell re-selection i.e. information about E-UTRA frequencies and E-UTRAs neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency.

*SIB5* information element

-- ASN1START

-- TAG-SIB5-START

SIB5 ::= SEQUENCE {

carrierFreqListEUTRA CarrierFreqListEUTRA OPTIONAL, -- Need R

t-ReselectionEUTRA T-Reselection,

t-ReselectionEUTRA-SF SpeedStateScaleFactors OPTIONAL, -- Need S

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

carrierFreqListEUTRA-v1610 CarrierFreqListEUTRA-v1610 OPTIONAL -- Need R

]],

[[

carrierFreqListEUTRA-v1700 CarrierFreqListEUTRA-v1700 OPTIONAL, -- Need R

idleModeMeasVoiceFallback-r17 ENUMERATED{true} OPTIONAL -- Need R

]]

}

CarrierFreqListEUTRA ::= SEQUENCE (SIZE (1..maxEUTRA-Carrier)) OF CarrierFreqEUTRA

CarrierFreqListEUTRA-v1610 ::= SEQUENCE (SIZE (1..maxEUTRA-Carrier)) OF CarrierFreqEUTRA-v1610

CarrierFreqListEUTRA-v1700 ::= SEQUENCE (SIZE (1..maxEUTRA-Carrier)) OF CarrierFreqEUTRA-v1700

CarrierFreqEUTRA ::= SEQUENCE {

carrierFreq ARFCN-ValueEUTRA,

eutra-multiBandInfoList EUTRA-MultiBandInfoList OPTIONAL, -- Need R

eutra-FreqNeighCellList EUTRA-FreqNeighCellList OPTIONAL, -- Need R

eutra-ExcludedCellList EUTRA-FreqExcludedCellList OPTIONAL, -- Need R

allowedMeasBandwidth EUTRA-AllowedMeasBandwidth,

presenceAntennaPort1 EUTRA-PresenceAntennaPort1,

cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need R

cellReselectionSubPriority CellReselectionSubPriority OPTIONAL, -- Need R

threshX-High ReselectionThreshold,

threshX-Low ReselectionThreshold,

q-RxLevMin INTEGER (-70..-22),

q-QualMin INTEGER (-34..-3),

p-MaxEUTRA INTEGER (-30..33),

threshX-Q SEQUENCE {

threshX-HighQ ReselectionThresholdQ,

threshX-LowQ ReselectionThresholdQ

} OPTIONAL -- Cond RSRQ

}

CarrierFreqEUTRA-v1610 ::= SEQUENCE {

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

}

CarrierFreqEUTRA-v1700 ::= SEQUENCE {

eutra-FreqNeighHSDN-CellList-r17 EUTRA-FreqNeighHSDN-CellList-r17 OPTIONAL -- Need R

}

EUTRA-FreqNeighHSDN-CellList-r17 ::= SEQUENCE (SIZE (1..maxCellEUTRA)) OF EUTRA-PhysCellIdRange

EUTRA-FreqExcludedCellList ::= SEQUENCE (SIZE (1..maxEUTRA-CellExcluded)) OF EUTRA-PhysCellIdRange

EUTRA-FreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellEUTRA)) OF EUTRA-FreqNeighCellInfo

EUTRA-FreqNeighCellInfo ::= SEQUENCE {

physCellId EUTRA-PhysCellId,

dummy EUTRA-Q-OffsetRange,

q-RxLevMinOffsetCell INTEGER (1..8) OPTIONAL, -- Need R

q-QualMinOffsetCell INTEGER (1..8) OPTIONAL -- Need R

}

-- TAG-SIB5-STOP

-- ASN1STOP

| *SIB5* field descriptions |
| --- |
| ***carrierFreqListEUTRA***  List of carrier frequencies of E-UTRA. If the *carrierFreqListEUTRA-v1610/ carrierFreqListEUTRA-v1700* is present, it shall contain the same number of entries, listed in the same order as in the *carrierFreqListEUTRA* (without suffix). |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***eutra-ExcludedCellList***  List of exclude-listed E-UTRA neighbouring cells. |
| ***eutra-FreqNeighHSDN-CellList***  List of neighbouring EUTRA HSDN cells as specified in TS 36.304 [27]. |
| ***eutra-multiBandInfoList***  Indicates the list of frequency bands in addition to the band represented by *carrierFreq* for which cell reselection parameters are common, and a list of *additionalPmax* and *additionalSpectrumEmission* values, as defined in TS 36.101 [22], table 6.2.4-1, for the frequency bands in *eutra-multiBandInfoList* |
| ***highSpeedEUTRACarrier***  If the field is present, the UE shall apply the enhanced NR-EUTRA inter-RAT measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [14] to the E-UTRA carrier. |
| ***idleModeMeasVoiceFallback***  Indicates whether E-UTRA idle/inactive measurements and reporting for EPS fallback can be used. |
| ***p-MaxEUTRA***  The maximum allowed transmission power in dBm on the (uplink) carrier frequency, see TS 36.304 [27]. |
| ***q-QualMin***  Parameter "Q*qualmin*" in TS 36.304 [27]. Actual value Qqualmin = field value [dB]. |
| ***q-QualMinOffsetCell***  Parameter "*Qqualminoffsetcell*" in TS 36.304 [27]. Actual value Qqualminoffsetcell = field value [dB]. |
| ***q-RxLevMin***  Parameter "Q*rxlevmin*" in TS 36.304 [27]. Actual value Qrxlevmin = field value \* 2 [dBm]. |
| ***q-RxLevMinOffsetCell***  Parameter "*Qrxlevminoffsetcell*" in TS 36.304 [27]. Actual value Qrxlevminoffsetcell = field value \* 2 [dB]. |
| ***t-ReselectionEUTRA***  Parameter "TreselectionEUTRA" in TS 38.304 [20]. |
| ***threshX-High***  Parameter "ThreshX, HighP" in TS 38.304 [20]. |
| ***threshX-HighQ***  Parameter "ThreshX, HighQ" in TS 38.304 [20]. |
| ***threshX-Low***  Parameter "ThreshX, LowP" in TS 38.304 [20]. |
| ***threshX-LowQ***  Parameter "ThreshX, LowQ" in TS 38.304 [20]. |
| ***t-ReselectionEUTRA-SF***  Parameter "Speed dependent ScalingFactor for TreselectionEUTRA" in TS 38.304 [20]. If the field is absent, the UE behaviour is specified in TS 38.304 [20]. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *RSRQ* | The field is mandatory present if the *threshServingLowQ* is present in *SIB2*; otherwise it is absent. |

#### *– SIB6*

*SIB6* contains an ETWS primary notification.

*SIB6* information element

-- ASN1START

-- TAG-SIB6-START

SIB6 ::= SEQUENCE {

messageIdentifier BIT STRING (SIZE (16)),

serialNumber BIT STRING (SIZE (16)),

warningType OCTET STRING (SIZE (2)),

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB6-STOP

-- ASN1STOP

|  |
| --- |
| *SIB6* field descriptions |
| ***messageIdentifier***  Identifies the source and type of ETWS notification. |
| ***serialNumber***  Identifies variations of an ETWS notification. |
| ***warningType***  Identifies the warning type of the ETWS primary notification and provides information on emergency user alert and UE popup. |

#### *– SIB7*

*SIB7* contains an ETWS secondary notification.

*SIB7* information element

-- ASN1START

-- TAG-SIB7-START

SIB7 ::= SEQUENCE {

messageIdentifier BIT STRING (SIZE (16)),

serialNumber BIT STRING (SIZE (16)),

warningMessageSegmentType ENUMERATED {notLastSegment, lastSegment},

warningMessageSegmentNumber INTEGER (0..63),

warningMessageSegment OCTET STRING,

dataCodingScheme OCTET STRING (SIZE (1)) OPTIONAL, -- Cond Segment1

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB7-STOP

-- ASN1STOP

|  |
| --- |
| *SIB7* field descriptions |
| ***dataCodingScheme***  Identifies the alphabet/coding and the language applied variations of an ETWS notification. |
| ***messageIdentifier***  Identifies the source and type of ETWS notification. |
| ***serialNumber***  Identifies variations of an ETWS notification. |
| ***warningMessageSegment***  Carries a segment of the Warning Message Contents IE. |
| ***warningMessageSegmentNumber***  Segment number of the ETWS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, A segment number of one corresponds to the second segment, and so on. |
| ***warningMessageSegmentType***  Indicates whether the included ETWS warning message segment is the last segment or not. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Segment1* | The field is mandatory present in the first segment of *SIB7*, otherwise it is absent. |

#### *– SIB8*

*SIB8* contains a CMAS notification.

*SIB8* information element

-- ASN1START

-- TAG-SIB8-START

SIB8 ::= SEQUENCE {

messageIdentifier BIT STRING (SIZE (16)),

serialNumber BIT STRING (SIZE (16)),

warningMessageSegmentType ENUMERATED {notLastSegment, lastSegment},

warningMessageSegmentNumber INTEGER (0..63),

warningMessageSegment OCTET STRING,

dataCodingScheme OCTET STRING (SIZE (1)) OPTIONAL, -- Cond Segment1

warningAreaCoordinatesSegment OCTET STRING OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB8-STOP

-- ASN1STOP

|  |
| --- |
| *SIB8* field descriptions |
| ***dataCodingScheme***  Identifies the alphabet/coding and the language applied variations of a CMAS notification. |
| ***messageIdentifier***  Identifies the source and type of CMAS notification. |
| ***serialNumber***  Identifies variations of a CMAS notification. |
| ***warningAreaCoordinatesSegment***  If present, carries a segment, with one or more octets, of the geographical area where the CMAS warning message is valid as defined in [28]. The first octet of the first *warningAreaCoordinatesSegment* is equivalent to the first octet of Warning Area Coordinates IE defined in and encoded according to TS 23.041 [29] and so on. |
| ***warningMessageSegment***  Carries a segment, with one or more octets, of the *Warning Message Contents* IE defined in TS 38.413 [42]. The first octet of the *Warning Message Contents* IE is equivalent to the first octet of the *CB data* IE defined in and encoded according to TS 23.041 [29], clause 9.4.2.2.5, and so on. |
| ***warningMessageSegmentNumber***  Segment number of the CMAS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on. If warning area coordinates are provided for the warning message, then this field applies to both warning message segment and warning area coordinates segment. |
| ***warningMessageSegmentType***  Indicates whether the included CMAS warning message segment is the last segment or not. If warning area coordinates are provided for the warning message, then this field applies to both warning message segment and warning area coordinates segment. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Segment1* | The field is mandatory present in the first segment of *SIB8*, otherwise it is absent. |

#### – *SIB9*

*SIB9* contains information related to GPS time and Coordinated Universal Time (UTC). The UE may use the parameters provided in this system information block to obtain the UTC, the GPS and the local time.

NOTE: The UE may use the time information for numerous purposes, possibly involving upper layers e.g. to assist GPS initialisation, to synchronise the UE clock.

*SIB9* information element

-- ASN1START

-- TAG-SIB9-START

SIB9 ::= SEQUENCE {

timeInfo SEQUENCE {

timeInfoUTC INTEGER (0..549755813887),

dayLightSavingTime BIT STRING (SIZE (2)) OPTIONAL, -- Need R

leapSeconds INTEGER (-127..128) OPTIONAL, -- Need R

localTimeOffset INTEGER (-63..64) OPTIONAL -- Need R

} OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

referenceTimeInfo-r16 ReferenceTimeInfo-r16 OPTIONAL -- Need R

]]

}

-- TAG-SIB9-STOP

-- ASN1STOP

|  |
| --- |
| *SIB9* field descriptions |
| ***dayLightSavingTime***  Indicates if and how daylight-saving time (DST) is applied to obtain the local time. The semantics are the same as the semantics of the *Daylight Saving Time* IE in TS 24.501 [23] and TS 24.008 [38]. The first/leftmost bit of the bit string contains the b2 of octet 3 and the second bit of the bit string contains b1 of octet 3 in the value part of the *Daylight Saving Time* IE in TS 24.008 [38]. |
| ***leapSeconds***  Number of leap seconds offset between GPS Time and UTC. UTC and GPS time are related i.e. GPS time -leapSeconds = UTC time. |
| ***localTimeOffset***  Offset between UTC and local time in units of 15 minutes. Actual value = field value \* 15 minutes. Local time of the day is calculated as UTC time + localTimeOffset. |
| ***timeInfoUTC***  Coordinated Universal Time corresponding to the SFN boundary at or immediately after the ending boundary of the SI-window in which SIB9 is transmitted. The field counts the number of UTC seconds in 10 ms units since 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Sunday, December 31, 1899 and Monday, January 1, 1900). See NOTE 1. This field is excluded when determining changes in system information, i.e. changes of *timeInfoUTC* should neither result in system information change notifications nor in a modification of *valueTag* in *SIB1*. |

NOTE 1: The UE may use this field together with the *leapSeconds* field to obtain GPS time as follows: GPS Time (in seconds) = timeInfoUTC (in seconds) - 2,524,953,600 (seconds) + leapSeconds, where 2,524,953,600 is the number of seconds between 00:00:00 on Gregorian calendar date 1 January, 1900 and 00:00:00 on Gregorian calendar date 6 January, 1980 (start of GPS time).

#### – *SIB10*

*SIB10* contains the HRNNs of the NPNs listed in SIB1.

***SIB10* information element**

-- ASN1START

-- TAG-SIB10-START

SIB10-r16 ::= SEQUENCE {

hrnn-List-r16 HRNN-List-r16 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

HRNN-List-r16 ::= SEQUENCE (SIZE (1..maxNPN-r16)) OF HRNN-r16

HRNN-r16 ::= SEQUENCE {

hrnn-r16 OCTET STRING (SIZE(1.. maxHRNN-Len-r16)) OPTIONAL -- Need R

}

-- TAG-SIB10-STOP

-- ASN1STOP

|  |
| --- |
| *SIB10* field descriptions |
| ***HRNN-List***  The same amount of HRNN (see TS 23.003 [21]) elements as the number of NPNs in SIB 1 are included. The n-th entry of *HRNN-List* contains the human readable network name of the n-th NPN of SIB1. The *hrnn* in the corresponding entry in *HRNN-List* is absent if there is no HRNN associated with the given NPN. |

#### – *SIB11*

*SIB11* contains information related to idle/inactive measurements.

*SIB11* information element

-- ASN1START

-- TAG-SIB11-START

SIB11-r16 ::= SEQUENCE {

measIdleConfigSIB-r16 MeasIdleConfigSIB-r16 OPTIONAL, -- Need S

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB11-STOP

-- ASN1STOP

| *SIB11* field descriptions |
| --- |
| ***measIdleConfigSIB***  Indicates measurement configuration to be stored and used by the UE while in RRC\_IDLE or RRC\_INACTIVE. |

#### – *SIB12*

SIB12 contains NR sidelink communication/discovery configuration.

*SIB12* information element

-- ASN1START

-- TAG-SIB12-START

SIB12-r16 ::= SEQUENCE {

segmentNumber-r16 INTEGER (0..63),

segmentType-r16 ENUMERATED {notLastSegment, lastSegment},

segmentContainer-r16 OCTET STRING

}

SIB12-IEs-r16 ::= SEQUENCE {

sl-ConfigCommonNR-r16 SL-ConfigCommonNR-r16,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...,

[[

sl-DRX-ConfigCommonGC-BC-r17 SL-DRX-ConfigGC-BC-r17 OPTIONAL, -- Need R

sl-DiscConfigCommon-r17 SL-DiscConfigCommon-r17 OPTIONAL, -- Need R

sl-L2U2N-Relay-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-NonRelayDiscovery-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-L3U2N-RelayDiscovery-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-TimersAndConstantsRemoteUE-r17 UE-TimersAndConstantsRemoteUE-r17 OPTIONAL -- Need R

]]

}

SL-ConfigCommonNR-r16 ::= SEQUENCE {

sl-FreqInfoList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommon-r16 OPTIONAL, -- Need R

sl-UE-SelectedConfig-r16 SL-UE-SelectedConfig-r16 OPTIONAL, -- Need R

sl-NR-AnchorCarrierFreqList-r16 SL-NR-AnchorCarrierFreqList-r16 OPTIONAL, -- Need R

sl-EUTRA-AnchorCarrierFreqList-r16 SL-EUTRA-AnchorCarrierFreqList-r16 OPTIONAL, -- Need R

sl-RadioBearerConfigList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL, -- Need R

sl-RLC-BearerConfigList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need R

sl-MeasConfigCommon-r16 SL-MeasConfigCommon-r16 OPTIONAL, -- Need R

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-OffsetDFN-r16 INTEGER (1..1000) OPTIONAL, -- Need R

t400-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need R

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL, -- Need R

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL -- Need R

}

SL-NR-AnchorCarrierFreqList-r16 ::= SEQUENCE (SIZE (1..maxFreqSL-NR-r16)) OF ARFCN-ValueNR

SL-EUTRA-AnchorCarrierFreqList-r16 ::= SEQUENCE (SIZE (1..maxFreqSL-EUTRA-r16)) OF ARFCN-ValueEUTRA

SL-DiscConfigCommon-r17 ::= SEQUENCE {

sl-RelayUE-ConfigCommon-r17 SL-RelayUE-Config-r17,

sl-RemoteUE-ConfigCommon-r17 SL-RemoteUE-Config-r17

}

-- TAG-SIB12-STOP

-- ASN1STOP

| *SIB12* field descriptions |
| --- |
| ***segmentContainer***  This field includes a segment of the encoded *SIB12-IEs*. The size of the included segment in this container should be small enough that the SIB message size is less than or equal to the maximum size of a NR SI, i.e. 2976 bits when SIB12 is broadcast. |
| ***segmentNumber***  This field identifies the sequence number of a segment of *SIB12-IEs*. A segment number of zero corresponds to the first segment, A segment number of one corresponds to the second segment, and so on. |
| ***segmentType***  This field indicates whether the included segment is the last segment or not. |
| ***sl-CSI-Acquisition***  This field indicates whether CSI reporting is enabled in sidelink unicast. If not set, SL CSI reporting is disabled. |
| ***sl-DRX-ConfigCommonGC-BC***  This field indicates the sidelink DRX configuration for groupcast and broadcast communication, as specified in TS 38.321 [3]. This field, if present, also indicates the gNB is capable of sidelink DRX. |
| ***sl-EUTRA-AnchorCarrierFreqList***  This field indicates the EUTRA anchor carrier frequency list, which can provide the NR sidelink communication configurations. |
| ***sl-FreqInfoList***  This field indicates the NR sidelink communication configuration on some carrier frequency (ies). In this release, only one entry can be configured in the list. |
| ***sl-L2U2N-Relay***  This field indicates the support of NR sidelink Layer-2 relay. |
| ***sl-L3U2N-RelayDiscovery***  This field indicates the support of L3 U2N relay AS-layer capability, i.e. NR sidelink relay discovery. |
| ***sl-MaxNumConsecutiveDTX***  This field indicates the maximum number of consecutive HARQ DTX before triggering sidelink RLF. Value n1 corresponds to 1, value n2 corresponds to 2, and so on. |
| ***sl-MeasConfigCommon***  This field indicates the measurement configurations (e.g. RSRP) for NR sidelink communication. |
| ***sl-NonRelayDiscovery***  This field indicates the support of NR sidelink non-relay discovery. |
| ***sl-NR-AnchorCarrierFreqList***  This field indicates the NR anchor carrier frequency list, which can provide the NR sidelink communication configurations. |
| ***sl-OffsetDFN***  Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference. Value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds, and so on. |
| ***sl-RadioBearerConfigList***  This field indicates one or multiple sidelink radio bearer configurations. |
| ***sl-RLC-BearerConfigList***  This field indicates one or multiple sidelink RLC bearer configurations. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |
| ***t400***  Indicates the value for timer T400 as described in clause 7.1. Value ms100 corresponds to 100 ms, value ms200 corresponds to 200 ms and so on. |

#### – *SIB13*

SIB13 contains configurations of V2X sidelink communication defined in TS 36.331 [10].

*SIB13* information element

-- ASN1START

-- TAG-SIB13-START

SIB13-r16 ::= SEQUENCE {

sl-V2X-ConfigCommon-r16 OCTET STRING,

dummy OCTET STRING,

tdd-Config-r16 OCTET STRING,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB13-STOP

-- ASN1STOP

| *SIB13* field descriptions |
| --- |
| ***dummy***  This field is not used in the specification and the UE ignores the received value. |
| ***sl-V2X-ConfigCommon***  This field includes the E-UTRA *SystemInformationBlockType21* message as specified in TS 36.331 [10]. |
| ***tdd-Config***  This field includes the *tdd-Config* in E-UTRA *SystemInformationBlockType1* message as specified in TS 36.331 [10]. |

#### – *SIB14*

SIB14 contains configurations of V2X sidelink communication defined in TS 36.331 [10], which can be used jointly with that included in *SIB13*.

*SIB14* information element

-- ASN1START

-- TAG-SIB14-START

SIB14-r16 ::= SEQUENCE {

sl-V2X-ConfigCommonExt-r16 OCTET STRING,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB14-STOP

-- ASN1STOP

| *SIB14* field descriptions |
| --- |
| ***sl-V2X-ConfigCommonExt***  This field includes the E-UTRA *SystemInformationBlockType26* message as specified in TS 36.331 [10]. |

#### – *SIB15*

*SIB15* contains configurations of disaster roaming information.

*SIB15* information element

-- ASN1START

-- TAG-SIB15-START

SIB15-r17 ::= SEQUENCE {

commonPLMNsWithDisasterCondition-r17 SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity OPTIONAL, -- Need R

applicableDisasterInfoList-r17 SEQUENCE (SIZE (1..maxPLMN)) OF ApplicableDisasterInfo-r17 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

ApplicableDisasterInfo-r17 ::= CHOICE {

noDisasterRoaming-r17 NULL,

disasterRoamingFromAnyPLMN-r17 NULL,

commonPLMNs-r17 NULL,

dedicatedPLMNs-r17 SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity

}

-- TAG-SIB15-STOP

-- ASN1STOP

| *SIB15* field descriptions |
| --- |
| ***commonPLMNsWithDisasterCondition***  A list of PLMN(s) for which disaster condition applies and that disaster inbound roaming is accepted, which can be commonly applicable to the PLMNs sharing the cell. |
| ***applicableDisasterInfoList***  A list indicating the applicable disaster roaming information for the networks indicated in *plmn-IdentityList* and *npn-IdentityList-r16*. The network indicates in this list one entry for each entry of *plmn-IdentityList*, followed by one entry for each entry of *npn-IdentifyList-r16*, meaning that this list will have as many entries as the number of entries of the combination of *plmn-IdentityList* and *npn-IdentifyList-r16*. The first entry in this list indicates the disaster roaming information applicable for the network(s) in the first entry of *plmn-IdentityList*/*npn-IdentityList-r16*, the second entry in this list indicates the disaster roaming information applicable for the network(s) in the second entry of *plmn-IdentityList*/*npn-IdentityList-r16*, and so on. Each entry in this list can either be having the value *noDisasterRoaming*, *disasterRoamingFromAnyPLMN*, *commonPLMNs*, or *dedicatedPLMNs*. If an entry in this list takes the value *noDisasterRoaming*, disaster inbound roaming is not allowed in this network(s). If an entry in this list takes the value *disasterRoamingFromAnyPLMN*, this network(s) accepts disaster inbound roamers from any other PLMN (except those indicated in SIB1). If an entry in this list takes the value *commonPLMNs*, the PLMN(s) with disaster conditions indicated in the field *commonPLMNsWithDisasterCondition* apply for this network(s). If an entry in this list contains the value *dedicatedPLMNs*, the listed PLMN(s) are the PLMN(s) with disaster conditions that the network(s) corresponding to this entry accepts disaster inbound roamers from. For SNPNs, the network indicates the value *noDisasterRoaming*. |

#### – *SIB16*

SIB16 contains configurations of slice specific cell reselection information.

*SIB16* information element

-- ASN1START

-- TAG-SIB16-START

SIB16-r17 ::= SEQUENCE {

freqPriorityListSlicing-r17 FreqPriorityListSlicing-r17 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIB16-STOP

-- ASN1STOP

| *SIB16* field descriptions |
| --- |
| ***freqPriorityListSlicing***  This field indicates cell reselection priorities for slicing. |

#### – *SIB17*

SIB17 contains configurations of TRS resources for idle/inactive UEs.

*SIB17* information element

-- ASN1START

-- TAG-SIB17-START

SIB17-r17 ::= SEQUENCE {

segmentNumber-r17 INTEGER (0..63),

segmentType-r17 ENUMERATED {notLastSegment, lastSegment},

segmentContainer-r17 OCTET STRING

}

SIB17-IEs-r17 ::= SEQUENCE {

trs-ResourceSetConfig-r17 SEQUENCE (SIZE (1..maxNrofTRS-ResourceSets-r17)) OF TRS-ResourceSet-r17,

validityDuration-r17 ENUMERATED {t1, t2, t4, t8, t16, t32, t64, t128, t256, t512, infinity, spare5, spare4, spare3, spare2,

spare1} OPTIONAL, -- Need S

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

TRS-ResourceSet-r17 ::= SEQUENCE {

powerControlOffsetSS-r17 ENUMERATED {db-3, db0, db3, db6},

scramblingID-Info-r17 CHOICE {

scramblingIDforCommon-r17 ScramblingId,

scramblingIDperResourceListWith2-r17 SEQUENCE (SIZE (2)) OF ScramblingId,

scramblingIDperResourceListWith4-r17 SEQUENCE (SIZE (4)) OF ScramblingId,

...

},

firstOFDMSymbolInTimeDomain-r17 INTEGER (0..9),

startingRB-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1),

nrofRBs-r17 INTEGER (24..maxNrofPhysicalResourceBlocksPlus1),

ssb-Index-r17 SSB-Index,

periodicityAndOffset-r17 CHOICE {

slots10 INTEGER (0..9),

slots20 INTEGER (0..19),

slots40 INTEGER (0..39),

slots80 INTEGER (0..79)

},

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

indBitID-r17 INTEGER (0..5),

nrofResources-r17 ENUMERATED {n2, n4}

}

-- TAG-SIB17-STOP

-- ASN1STOP

| *SIB17* field descriptions |
| --- |
| ***segmentContainer***  This field includes a segment of the encoded *SIB17-IEs*. The size of the included segment in this container should be small enough that the SIB message size is less than or equal to the maximum size of a NR SI, i.e. 2976 bits when *SIB17* is broadcast. |
| ***segmentNumber***  This field identifies the sequence number of a segment of *SIB17-IEs*. A segment number of zero corresponds to the first segment, a segment number of one corresponds to the second segment, and so on. |
| ***segmentType***  This field indicates whether the included segment is the last segment or not. |
| ***trs-ResourceSetConfig***  RS configuration of TRS occasion(s) for idle/inactive UE(s), in terms of a list of N>=1 NZP TRS resource set(s). The maximum number of TRS resource sets configured by higher layer is 64. If a TRS resource is configured, the L1 based availability indication is always enabled based on that configuration. A UE which acquired *SIB17* with a TRS configuration but did not yet receive an associated L1-based availability indication considers the configured TRS as unavailable. If SIB scheduling indicates that *SIB17* has changed, the UE considers its configured TRS(s) as unavailable until it receives the associated L1-based availability indication(s). |
| ***validityDuration***  The valid time duration for L1 availability indication, time unit is one default paging cycle. When the field is absent, UE assumes a default time duration to be 2 default paging cycles. The field is only valid while the UE has a valid *SIB17*. |

| *TRS-ResourceSet* field descriptions |
| --- |
| ***firstOFDMSymbolInTimeDomain***  The index of the first OFDM symbol in the PRB used for TRS in a slot. The field indicates the first symbol in a slot for the first TRS resource within the slot, and the symbol for the second TRS resource in the same slot can be derived implicitly with symbol index as *firstOFDMSymbolInTimeDomain*+4. |
| ***frequencyDomainAllocation***  Indicates the offset of the first RE to RE#0 in a RB in row1. |
| ***indBitID***  The index of the associated bit in TRS availability indication field in DCI. Each TRS resource set is configured with an ID i for the association with (i+1)-th indication bit in TRS availability indication field in DCI. |
| ***nrofRBs***  Number of PRBs across which corresponding TRS resource spans. |
| ***nrofResources***  The number of TRS resources for a TRS resource set. |
| ***periodicityAndOffset***  The periodicity and slot offset (slot) for periodic TRS. It is used to determine the location of the first slot of TRS resource set. The periodicity value *slots10* corresponds to 10 slots, value *slots20* corresponds to 20 slots, and so on. |
| ***powerControlOffsetSS***  Power offset (dB) of NZP CSI-RS RE to SSS RE. |
| ***scramblingID-Info***  One or more scrambling IDs are configured for a TRS resource set. If a common scrambling ID is configured, it applies to all the TRS resources within the TRS resource set. Otherwise, each TRS resource within the TRS resource set is provided with a scrambling ID. If the number of TRS resources for the TRS resource set is 2, *scramblingIDperResourceListWith2-r17* is configured, while *scramblingIDperResourceListWith4-r17* is configured for the case that the number of TRS resources for the TRS resource set is 4. |
| ***ssb-Index***  The index of reference SSB with which quasi-collocation information is provided as specified in TS 38.214 [19] clause 5.1.5. |
| ***startingRB***  The PRB index where corresponding TRS resource starts in relation to common resource block #0 (CRB#0) on the common resource block grid. |

#### – *SIB18*

*SIB18* contains Group IDs for Network selection (GINs) to support access using credentials from a Credentials Holder or to support UE onboarding.

***SIB18* information element**

-- ASN1START

-- TAG-SIB18-START

SIB18-r17 ::= SEQUENCE {

gin-ElementList-r17 SEQUENCE (SIZE (1..maxGIN-r17)) OF GIN-Element-r17 OPTIONAL, -- Need R

gins-PerSNPN-List-r17 SEQUENCE (SIZE (1..maxNPN-r16)) OF GINs-PerSNPN-r17 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

GIN-Element-r17 ::= SEQUENCE {

plmn-Identity-r17 PLMN-Identity,

nid-List-r17 SEQUENCE (SIZE (1..maxGIN-r17)) OF NID-r16

}

GINs-PerSNPN-r17 ::= SEQUENCE {

supportedGINs-r17 BIT STRING (SIZE (1..maxGIN-r17)) OPTIONAL -- Need R

}

-- TAG-SIB18-STOP

-- ASN1STOP

|  |
| --- |
| *SIB18* field descriptions |
| ***gin-ElementList***  The *gin-ElementList* contains one or more GIN elements. Each GIN element contains either one GIN, which is identified by a PLMN ID and a NID, or multiple GINs that share the same PLMN ID. The total number of GINs indicated does not exceed maxGIN-r17. The GIN index *m* is defined as d1+d2+…+d(n-1)+i for the GIN included in the *n*-th entry of the *gin-ElementList* and the *i*-th entry of its corresponding *GIN-Element*, where *d(k)* is the number of GIN index values used in the *k*-th *gin-ElementList* entry. |
| ***gins-PerSNPN-List***  Indicates the supported GINs for each SNPN. The network includes the same number of entries as the number of SNPNs in *snpn-AccessInfoList* in provided in SIB1, and the n-th entry in this list corresponds to the n-th SNPN listed in *snpn-AccessInfoList* provided in SIB1. This field is not present if there is only a single SNPN in *snpn-AccessInfoList* in SIB1, as in that case all GINs in this SIB is associated with that SNPN. |

|  |
| --- |
| *GINs-PerSNPN* field descriptions |
| ***supportedGINs***  Indicates the GINs which are supported by the given SNPN. The first/leftmost bit corresponds to the GIN with GIN index 1, the second bit corresponds to the GIN with GIN index 2 and so on. A bit set to 1 indicates that the GIN is supported by the SNPN. If the field is not present, then the corresponding SNPN does not support any GINs. |

– *SIB19*

*SIB19* contains satellite assistance information.

***SIB19* information element**

-- ASN1START

-- TAG-SIB19-START

SIB19-r17 ::= SEQUENCE {

ntn-Config-r17 NTN-Config-r17 OPTIONAL, -- Need R

t-Service-r17 INTEGER (0..549755813887) OPTIONAL, -- Need R

referenceLocation-r17 ReferenceLocation-r17 OPTIONAL, -- Need R

distanceThresh-r17 INTEGER(0..65525) OPTIONAL, -- Need R

ntn-NeighCellConfigList-r17 NTN-NeighCellConfigList-r17 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

NTN-NeighCellConfigList-r17 ::= SEQUENCE (SIZE(1..maxCellNTN-r17)) OF NTN-NeighCellConfig-r17

NTN-NeighCellConfig-r17 ::= SEQUENCE {

ntn-Config-r17 NTN-Config-r17 OPTIONAL, -- Need R

carrierFreq-r17 ARFCN-ValueNR OPTIONAL, -- Need R

physCellId-r17 PhysCellId OPTIONAL -- Need R

}

-- TAG-SIB19-STOP

-- ASN1STOP

| ***SIB19* field descriptions** |
| --- |
| ***distanceThresh***  Distance from the serving cell reference location and is used in location-based measurement initiation in RRC\_IDLE and RRC\_INACTIVE, as defined in TS 38.304 [20]. Each step represents 50m. |
| ***ntn-Config***  Provides parameters needed for the UE to access NR via NTN access such as Ephemeris data, common TA parameters, k\_offset, validity duration for UL sync information and epoch. The validity duration, *ntn-UlSyncValidityDuration*, is mandatory present. |
| ***ntn-NeighCellConfigList***  Provides a list of NTN neighbour cells including their *ntn-Config*, carrier frequency and *PhysCellId*. |
| ***referenceLocation***  Reference location of the serving cell provided via NTN quasi-Earth fixed system and is used in location-based measurement initiation in RRC\_IDLE and RRC\_INACTIVE, as defined in TS 38.304 [20].. |
| ***t-Service***  Indicates the time information on when a cell provided via NTN quasi-Earth fixed system is going to stop serving the area it is currently covering. The field indicates a time in multiples of 10 ms after 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Sunday, December 31, 1899 and Monday, January 1, 1900). This field is excluded when determining changes in system information, i.e. changes of *t-Service* should neither result in system information change notifications nor in a modification of *valueTag* in *SIB1*. The exact stop time is between the time indicated by the value of this field minus 1 and the time indicated by the value of this field. |

#### – *SIB20*

*SIB20* contains the information required to acquire the MCCH configuration for MBS broadcast.

*SIB20* information element

-- ASN1START

-- TAG-SIB20-START

SIB20-r17 ::= SEQUENCE {

mcch-Config-r17 MCCH-Config-r17,

cfr-ConfigMCCH-MTCH-r17 CFR-ConfigMCCH-MTCH-r17 OPTIONAL, -- Need S

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

MCCH-Config-r17 ::= SEQUENCE {

mcch-RepetitionPeriodAndOffset-r17 MCCH-RepetitionPeriodAndOffset-r17,

mcch-WindowStartSlot-r17 INTEGER (0..79),

mcch-WindowDuration-r17 ENUMERATED {sl2, sl4, sl8, sl10, sl20, sl40,sl80, sl160} OPTIONAL, -- Need S

mcch-ModificationPeriod-r17 ENUMERATED {rf2, rf4, rf8, rf16, rf32, rf64, rf128, rf256,

rf512, rf1024, r2048, rf4096, rf8192, rf16384, rf32768, rf65536}

}

MCCH-RepetitionPeriodAndOffset-r17 ::= CHOICE {

rf1-r17 INTEGER(0),

rf2-r17 INTEGER(0..1),

rf4-r17 INTEGER(0..3),

rf8-r17 INTEGER(0..7),

rf16-r17 INTEGER(0..15),

rf32-r17 INTEGER(0..31),

rf64-r17 INTEGER(0..63),

rf128-r17 INTEGER(0..127),

rf256-r17 INTEGER(0..255)

}

-- TAG-SIB20-STOP

-- ASN1STOP

| *SIB20* field descriptions |
| --- |
| ***cfr-ConfigMCCH-MTCH***  Common frequency resource used for MCCH and MTCH reception. If the field is absent, the CFR for broadcast has the same location and size as CORESET0 and PDSCH configuration of MCCH is the same as PDSCH configuration provided in *initialDownlinkBWP* in *SIB1*. |
| ***mcch-WindowDuration***  Indicates, starting from the slot indicated by *mcch-WindowStartSlot*, the duration in slot during which MCCH may be scheduled. Absence of this field means that MCCH is only scheduled in the slot indicated by *mcch-WindowStartSlot*. |
| ***mcch-ModificationPeriod***  Defines periodically appearing boundaries, i.e. radio frames for which SFN mod *mcch-ModificationPeriod* = 0. The contents of different transmissions of MCCH information can only be different if there is at least one such boundary in-between them. Value rf2 corresponds to two radio frames, value rf4 corresponds to four radio frames and so on. |
| ***mcch-RepetitionPeriodAndOffset***  Defines the length and the offset of the MCCH repetition period. rf1 corresponds to a repetition period length of one radio frame, rf2 corresponds to a repetition period length of two radio frames and so on. The corresponding integer value indicates the offset of the repetition period in the number of radio frames. MCCH is scheduled in radio frames for which: SFN mod repetition period length = offset of the repetition period. |
| ***mcch-WindowStartSlot***  Indicates the slot in which MCCH transmission window starts. |

#### – *SIB21*

*SIB21* contains the mapping between frequency and MBS services.

*SIB21* information element

-- ASN1START

-- TAG-SIB21-START

SIB21-r17 ::= SEQUENCE {

mbs-FSAI-IntraFreq-r17 MBS-FSAI-List-r17 OPTIONAL, -- Need R

mbs-FSAI-InterFreqList-r17 MBS-FSAI-InterFreqList-r17 OPTIONAL, -- Need R

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

MBS-FSAI-List-r17 ::= SEQUENCE (SIZE (1..maxFSAI-MBS-r17)) OF MBS-FSAI-r17

MBS-FSAI-InterFreqList-r17 ::= SEQUENCE (SIZE (1..maxFreq)) OF MBS-FSAI-InterFreq-r17

MBS-FSAI-InterFreq-r17 ::= SEQUENCE {

dl-CarrierFreq-r17 ARFCN-ValueNR,

mbs-FSAI-List-r17 MBS-FSAI-List-r17

}

MBS-FSAI-r17 ::= OCTET STRING (SIZE (3))

-- TAG-SIB21-STOP

-- ASN1STOP

| *SIB21* field descriptions |
| --- |
| ***mbs-FSAI-InterFreqList***  Contains a list of neighboring frequencies including additional bands, if any, that provide MBS services and the corresponding MBS FSAIs. |
| ***mbs-FSAI-IntraFreq***  Contains the list of MBS FSAIs for the current frequency. For MBS service continuity, the UE shall use all MBS FSAIs listed in *mbs-FSAI-IntraFreq* to derive the MBS frequencies of interest. |

### 6.3.1a Positioning System information blocks

#### – *PosSystemInformation-r16-IEs*

-- ASN1START

-- TAG-POSSYSTEMINFORMATION-R16-IES-START

PosSystemInformation-r16-IEs ::= SEQUENCE {

posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {

posSib1-1-r16 SIBpos-r16,

posSib1-2-r16 SIBpos-r16,

posSib1-3-r16 SIBpos-r16,

posSib1-4-r16 SIBpos-r16,

posSib1-5-r16 SIBpos-r16,

posSib1-6-r16 SIBpos-r16,

posSib1-7-r16 SIBpos-r16,

posSib1-8-r16 SIBpos-r16,

posSib2-1-r16 SIBpos-r16,

posSib2-2-r16 SIBpos-r16,

posSib2-3-r16 SIBpos-r16,

posSib2-4-r16 SIBpos-r16,

posSib2-5-r16 SIBpos-r16,

posSib2-6-r16 SIBpos-r16,

posSib2-7-r16 SIBpos-r16,

posSib2-8-r16 SIBpos-r16,

posSib2-9-r16 SIBpos-r16,

posSib2-10-r16 SIBpos-r16,

posSib2-11-r16 SIBpos-r16,

posSib2-12-r16 SIBpos-r16,

posSib2-13-r16 SIBpos-r16,

posSib2-14-r16 SIBpos-r16,

posSib2-15-r16 SIBpos-r16,

posSib2-16-r16 SIBpos-r16,

posSib2-17-r16 SIBpos-r16,

posSib2-18-r16 SIBpos-r16,

posSib2-19-r16 SIBpos-r16,

posSib2-20-r16 SIBpos-r16,

posSib2-21-r16 SIBpos-r16,

posSib2-22-r16 SIBpos-r16,

posSib2-23-r16 SIBpos-r16,

posSib3-1-r16 SIBpos-r16,

posSib4-1-r16 SIBpos-r16,

posSib5-1-r16 SIBpos-r16,

posSib6-1-r16 SIBpos-r16,

posSib6-2-r16 SIBpos-r16,

posSib6-3-r16 SIBpos-r16,

... ,

posSib1-9-v1700 SIBpos-r16,

posSib1-10-v1700 SIBpos-r16,

posSib2-24-v1700 SIBpos-r16,

posSib2-25-v1700 SIBpos-r16,

posSib6-4-v1700 SIBpos-r16,

posSib6-5-v1700 SIBpos-r16,

posSib6-6-v1700 SIBpos-r16

},

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-POSSYSTEMINFORMATION-R16-IES-STOP

-- ASN1STOP

#### – *PosSI-SchedulingInfo*

-- ASN1START

-- TAG-POSSI-SCHEDULINGINFO-START

PosSI-SchedulingInfo-r16 ::= SEQUENCE {

posSchedulingInfoList-r16 SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r16,

posSI-RequestConfig-r16 SI-RequestConfig OPTIONAL, -- Cond MSG-1

posSI-RequestConfigSUL-r16 SI-RequestConfig OPTIONAL, -- Cond SUL-MSG-1

...,

[[

posSI-RequestConfig-RedCap-r17 SI-RequestConfig OPTIONAL -- Cond REDCAP-MSG-1

]]

}

PosSchedulingInfo-r16 ::= SEQUENCE {

offsetToSI-Used-r16 ENUMERATED {true} OPTIONAL, -- Need R

posSI-Periodicity-r16 ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},

posSI-BroadcastStatus-r16 ENUMERATED {broadcasting, notBroadcasting},

posSIB-MappingInfo-r16 PosSIB-MappingInfo-r16,

...

}

PosSIB-MappingInfo-r16 ::= SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16

PosSIB-Type-r16 ::= SEQUENCE {

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

gnss-id-r16 GNSS-ID-r16 OPTIONAL, -- Need R

sbas-id-r16 SBAS-ID-r16 OPTIONAL, -- Need R

posSibType-r16 ENUMERATED { posSibType1-1, posSibType1-2, posSibType1-3, posSibType1-4, posSibType1-5, posSibType1-6,

posSibType1-7, posSibType1-8, posSibType2-1, posSibType2-2, posSibType2-3, posSibType2-4,

posSibType2-5, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9, posSibType2-10,

posSibType2-11, posSibType2-12, posSibType2-13, posSibType2-14, posSibType2-15,

posSibType2-16, posSibType2-17, posSibType2-18, posSibType2-19, posSibType2-20,

posSibType2-21, posSibType2-22, posSibType2-23, posSibType3-1, posSibType4-1,

posSibType5-1,posSibType6-1, posSibType6-2, posSibType6-3,... },

areaScope-r16 ENUMERATED {true} OPTIONAL -- Need S

}

GNSS-ID-r16 ::= SEQUENCE {

gnss-id-r16 ENUMERATED{gps, sbas, qzss, galileo, glonass, bds, ...},

...

}

SBAS-ID-r16 ::= SEQUENCE {

sbas-id-r16 ENUMERATED { waas, egnos, msas, gagan, ...},

...

}

-- TAG-POSSI-SCHEDULINGINFO-STOP

-- ASN1STOP

|  |
| --- |
| *PosSI-SchedulingInfo* field descriptions |
| ***areaScope***  Indicates that a posSIB is area specific. If the field is absent, the posSIB is cell specific. |
| ***encrypted***  The presence of this field indicates that the *pos-sib-type* is encrypted as specified in TS 37.355 [49]. |
| ***gnss-id***  The presence of this field indicates that the positioning SIB type is for a specific GNSS. Indicates a specific GNSS (see also TS 37.355 [49]) |
| ***posSI-BroadcastStatus***  Indicates if the SI message is being broadcasted or not. Change of *posSI-BroadcastStat*us should not result in system information change notifications in Short Message transmitted with P-RNTI over DCI (see clause 6.5). The value of the indication is valid until the end of the BCCH modification period when set to *broadcasting*. |
| ***posSI-RequestConfig***  Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *posSI-BroadcastStatus* is set to notBroadcasting. |
| ***posSI-RequestConfig-RedCap***  Configuration of Msg1 resources for *initialUplinkBWP-RedCap*that the RedCap UE uses for requesting SI-messages for which *posSI-BroadcastStatus* is set to *notBroadcasting*. |
| ***posSI-RequestConfigSUL***  Configuration of Msg1 resources that the UE uses for requesting SI-messages for which *posSI-BroadcastStatus* is set to notBroadcasting. |
| ***posSIB-MappingInfo***  List of the posSIBs mapped to this *SystemInformation* message. |
| ***posSibType***  The positioning SIB type is defined in TS 37.355 [49]. |
| ***posSI-Periodicity***  Periodicity of the SI-message in radio frames, such that rf8 denotes 8 radio frames, rf16 denotes 16 radio frames, and so on. If the *offsetToSI-Used* is configured, the *posSI-Periodicity* of rf8 cannot be used. |
| ***offsetToSI-Used***  This field, if present indicates that all the SI messages in *posSchedulingInfoList* are scheduled with an offset of 8 radio frames compared to SI messages in *schedulingInfoList*. *offsetToSI-Used* may be present only if the shortest configured SI message periodicity for SI messages in *schedulingInfoList* is 80ms. If SI offset is used, this field is present in each of the SI messages in the *posSchedulingInfoList*. |
| ***sbas-id***  The presence of this field indicates that the positioning SIB type is for a specific SBAS. Indicates a specific SBAS (see also TS 37.355 [49]). |

| Conditional presence | Explanation |
| --- | --- |
| *MSG-1* | The field is optionally present, Need R, if *posSI-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *PosSchedulingInfo*. It is absent otherwise. |
| *SUL-MSG-1* | The field is optionally present, Need R, if *supplementaryUplink* is configured in *ServingCellConfigCommonSIB* and if *posSI-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *PosSchedulingInfo*. It is absent otherwise. |
| *REDCAP-MSG-1* | The field is optionally present, Need R, if *initialUplinkBWP-RedCap* is configured in *UplinkConfigCommonSIB* and if *posSI-BroadcastStatus* is set to *notBroadcasting* for any SI-message included in *PosSchedulingInfo*. It is absent otherwise. |

#### – *SIBpos*

The IE *SIBpos* contains positioning assistance data as defined in TS 37.355 [49].

*SIBpos* information element

-- ASN1START

-- TAG-SIPOS-START

SIBpos-r16 ::= SEQUENCE {

assistanceDataSIB-Element-r16 OCTET STRING,

lateNonCriticalExtension OCTET STRING OPTIONAL,

...

}

-- TAG-SIPOS-STOP

-- ASN1STOP

| *SIBpos* field descriptions |
| --- |
| ***assistanceDataSIB-Element***  Parameter *AssistanceDataSIBelement* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |

### 6.3.2 Radio resource control information elements

#### – *AdditionalSpectrumEmission*

The IE *AdditionalSpectrumEmission* is used to indicate emission requirements to be fulfilled by the UE (see TS 38.101-1 [15], clause 6.2.3, and TS 38.101-2 [39], clause 6.2.3).

*AdditionalSpectrumEmission* information element

-- ASN1START

-- TAG-ADDITIONALSPECTRUMEMISSION-START

AdditionalSpectrumEmission ::= INTEGER (0..7)

-- TAG-ADDITIONALSPECTRUMEMISSION-STOP

-- ASN1STOP

#### – *Alpha*

The IE *Alpha* defines possible values of a the pathloss compensation coefficient for uplink power control. Value *alpha0* corresponds to the value 0, Value *alpha04* corresponds to the value 0.4, Value *alpha05* corresponds to the value 0.5 and so on. Value *alpha1* corresponds to value 1. See also clause 7.1 of TS 38.213 [13].

-- ASN1START

-- TAG-ALPHA-START

Alpha ::= ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1}

-- TAG-ALPHA-STOP

-- ASN1STOP

#### – *AMF-Identifier*

The IE *AMF-Identifier* (AMFI) comprises of an AMF Region ID, an AMF Set ID and an AMF Pointer as specified in TS 23.003 [21], clause 2.10.1.

*AMF-Identifier* information element

-- ASN1START

-- TAG-AMF-IDENTIFIER-START

AMF-Identifier ::= BIT STRING (SIZE (24))

-- TAG-AMF-IDENTIFIER-STOP

-- ASN1STOP

#### – *ARFCN-ValueEUTRA*

The IE *ARFCN-ValueEUTRA* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) E-UTRA carrier frequency, as defined in TS 36.101 [22].

*ARFCN-ValueEUTRA* information element

-- ASN1START

-- TAG-ARFCN-VALUEEUTRA-START

ARFCN-ValueEUTRA ::= INTEGER (0..maxEARFCN)

-- TAG-ARFCN-VALUEEUTRA-STOP

-- ASN1STOP

#### – *ARFCN-ValueNR*

The IE *ARFCN-ValueNR* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) NR global frequency raster, as defined in TS 38.101-1 [15] and TS 38.101-2 [39], clause 5.4.2.

-- ASN1START

-- TAG-ARFCN-VALUENR-START

ARFCN-ValueNR ::= INTEGER (0..maxNARFCN)

-- TAG-ARFCN-VALUENR-STOP

-- ASN1STOP

#### – *ARFCN-ValueUTRA-FDD*

The IE *ARFCN-ValueUTRA-FDD* is used to indicate the ARFCN applicable for a downlink (Nd, FDD) UTRA-FDD carrier frequency, as defined in TS 25.331 [45].

*ARFCN-ValueUTRA-FDD* information element

-- ASN1START

-- TAG-ARFCN-ValueUTRA-FDD-START

ARFCN-ValueUTRA-FDD-r16 ::= INTEGER (0..16383)

-- TAG-ARFCN-ValueUTRA-FDD-STOP

-- ASN1STOP

#### – *AvailabilityCombinationsPerCell*

The IE *AvailabilityCombinationsPerCell* is used to configure the *AvailabilityCombinations* applicable for a cell of the IAB DU (see TS 38.213 [13], clause 14). Note that the IE *AvailabilityCombinationsPerCellIndex* can only be configured up to 511.

*AvailabilityCombinationsPerCell* information element

-- ASN1START

-- TAG-AVAILABILITYCOMBINATIONSPERCELL-START

AvailabilityCombinationsPerCell-r16 ::= SEQUENCE {

availabilityCombinationsPerCellIndex-r16 AvailabilityCombinationsPerCellIndex-r16,

iab-DU-CellIdentity-r16 CellIdentity,

positionInDCI-AI-r16 INTEGER(0..maxAI-DCI-PayloadSize-1-r16) OPTIONAL, -- Need M

availabilityCombinations-r16 SEQUENCE (SIZE (1..maxNrofAvailabilityCombinationsPerSet-r16)) OF AvailabilityCombination-r16,

...,

[[

availabilityCombinationsRBGroups-r17 SEQUENCE (SIZE (1..maxNrofAvailabilityCombinationsPerSet-r16)) OF AvailabilityCombinationRB-Groups-r17 OPTIONAL -- Need M

]]

}

AvailabilityCombinationsPerCellIndex-r16 ::= INTEGER(0..maxNrofDUCells-r16)

AvailabilityCombination-r16 ::= SEQUENCE {

availabilityCombinationId-r16 AvailabilityCombinationId-r16,

resourceAvailability-r16 SEQUENCE (SIZE (1..maxNrofResourceAvailabilityPerCombination-r16)) OF INTEGER (0..7)

}

AvailabilityCombinationId-r16 ::= INTEGER (0..maxNrofAvailabilityCombinationsPerSet-1-r16)

AvailabilityCombinationRB-Groups-r17 ::= SEQUENCE {

availabilityCombinationId-r17 AvailabilityCombinationId-r16,

rb-SetGroups-r17 SEQUENCE (SIZE (1..maxNrofRB-SetGroups-r17)) OF RB-SetGroup-r17 OPTIONAL, -- Need R

resourceAvailability-r17 SEQUENCE (SIZE (1..maxNrofResourceAvailabilityPerCombination-r16)) OF INTEGER (0..7) OPTIONAL -- Need R

}

RB-SetGroup-r17 ::= SEQUENCE {

resourceAvailability-r17 SEQUENCE (SIZE (1..maxNrofResourceAvailabilityPerCombination-r16)) OF INTEGER (0..7) OPTIONAL, -- Need R

rb-Sets-r17 SEQUENCE (SIZE (1..maxNrofRB-Sets-r17)) OF INTEGER (0..7) OPTIONAL -- Need R

}

-- TAG-AVAILABILITYCOMBINATIONSPERCELL-STOP

-- ASN1STOP

|  |
| --- |
| *AvailabilityCombination field descriptions* |
| ***availabilityCombinationId***  This ID is used in the DCI Format 2\_5 payload to dynamically select this *AvailabilityCombination*, see TS 38.213 [13], clause 14. |
| ***resourceAvailability***  Indicates the resource availability of soft symbols for a set of consecutive slots in the time domain. The meaning of this field is described in TS 38.213 [13], Table 14.3. If included in *RB-SetGroup* within *AvailabilityCombinationRB-Groups-r17*, it indicates the availability of soft resources for an RB set group. If included in *AvailabilityCombinationRB-Groups-r17* when the *rb-SetGroups* is not configured, it indicates the availability of soft resources in one or multiple slots for all RB sets of a DU cell. |

|  |
| --- |
| *AvailabilityCombinationsPerCell* field descriptions |
| ***iab-DU-CellIdentity***  The ID of the IAB-DU cell for which the *availabilityCombinations* are applicable. |
| ***positionInDCI-AI***  The (starting) position (bit) of the *AvailabilityCombinationId* for the indicated IAB-DU cell (*iab-DU-CellIdentity*) within the DCI payload. |

|  |
| --- |
| *AvailabilityCombinationRBGroups* field descriptions |
| ***rb-SetGroups***  Indicates the RB set groups configured for the availability combination. Each group includes consecutive RB sets. |
| ***rb-Sets***  Indicates the one or more RB set indexes associated to one or more RB sets configured for one RB set group. |

#### – *AvailabilityIndicator*

The IE *AvailabilityIndicator* is used to configure monitoring a PDCCH for Availability Indicators (AI).

*AvailabilityIndicator* information element

-- ASN1START

-- TAG-AVAILABILITYINDICATOR-START

AvailabilityIndicator-r16 ::= SEQUENCE {

ai-RNTI-r16 AI-RNTI-r16,

dci-PayloadSizeAI-r16 INTEGER (1..maxAI-DCI-PayloadSize-r16),

availableCombToAddModList-r16 SEQUENCE (SIZE(1..maxNrofDUCells-r16)) OF AvailabilityCombinationsPerCell-r16 OPTIONAL, -- Need N

availableCombToReleaseList-r16 SEQUENCE (SIZE(1..maxNrofDUCells-r16)) OF AvailabilityCombinationsPerCellIndex-r16 OPTIONAL, -- Need N

...

}

AI-RNTI-r16 ::= RNTI-Value

-- TAG-AVAILABILITYINDICATOR-STOP

-- ASN1STOP

|  |
| --- |
| *AvailabilityIndicator* field descriptions |
| ***ai-RNTI***  Used by an IAB-MT for detection of DCI format 2\_5 indicating *AvailabilityCombinationId* for an IAB-DU's cells. |
| ***availableCombToAddModList***  A list of *availabilityCombinations* to add for the IAB-DU's cells. (see TS 38.213 [13], clause 14). |
| ***availableCombToReleaseList***  A list of *availabilityCombinations* to release for the IAB-DU's cells. (see TS 38.213 [13], clause 14). |
| ***dci-PayloadSizeAI***  Total length of the DCI payload scrambled with ai-RNTI (see TS 38.213 [13]). |

#### – *BAP-RoutingID*

The IE *BAP-RoutingID* is used for IAB-node to configure the BAP Routing ID.

*BAP-RoutingID* information element

-- ASN1START

-- TAG-BAPROUTINGID-START

BAP-RoutingID-r16::= SEQUENCE{

bap-Address-r16 BIT STRING (SIZE (10)),

bap-PathId-r16 BIT STRING (SIZE (10))

}

-- TAG-BAPROUTINGID-STOP

-- ASN1STOP

|  |
| --- |
| *BAP-RoutingID* field descriptions |
| ***bap-Address***  The ID of a destination IAB-node or IAB-donor-DU used in the BAP header. |
| ***bap-PathId***  The ID of a path used in the BAP header. |

#### *– BeamFailureRecoveryConfig*

The IE *BeamFailureRecoveryConfig* is used to configure the UE with RACH resources and candidate beams for beam failure recovery in case of beam failure detection. See also TS 38.321 [3], clause 5.1.1.

*BeamFailureRecoveryConfig* information element

-- ASN1START

-- TAG-BEAMFAILURERECOVERYCONFIG-START

BeamFailureRecoveryConfig ::= SEQUENCE {

rootSequenceIndex-BFR INTEGER (0..137) OPTIONAL, -- Need M

rach-ConfigBFR RACH-ConfigGeneric OPTIONAL, -- Need M

rsrp-ThresholdSSB RSRP-Range OPTIONAL, -- Need M

candidateBeamRSList SEQUENCE (SIZE(1..maxNrofCandidateBeams)) OF PRACH-ResourceDedicatedBFR OPTIONAL, -- Need M

ssb-perRACH-Occasion ENUMERATED {oneEighth, oneFourth, oneHalf, one, two,

four, eight, sixteen} OPTIONAL, -- Need M

ra-ssb-OccasionMaskIndex INTEGER (0..15) OPTIONAL, -- Need M

recoverySearchSpaceId SearchSpaceId OPTIONAL, -- Need R

ra-Prioritization RA-Prioritization OPTIONAL, -- Need R

beamFailureRecoveryTimer ENUMERATED {ms10, ms20, ms40, ms60, ms80, ms100, ms150, ms200} OPTIONAL, -- Need M

...,

[[

msg1-SubcarrierSpacing SubcarrierSpacing OPTIONAL -- Need M

]],

[[

ra-PrioritizationTwoStep-r16 RA-Prioritization OPTIONAL, -- Need R

candidateBeamRSListExt-v1610 SetupRelease{ CandidateBeamRSListExt-r16 } OPTIONAL -- Need M

]],

[[

spCell-BFR-CBRA-r16 ENUMERATED {true} OPTIONAL -- Need R

]]

}

PRACH-ResourceDedicatedBFR ::= CHOICE {

ssb BFR-SSB-Resource,

csi-RS BFR-CSIRS-Resource

}

BFR-SSB-Resource ::= SEQUENCE {

ssb SSB-Index,

ra-PreambleIndex INTEGER (0..63),

...

}

BFR-CSIRS-Resource ::= SEQUENCE {

csi-RS NZP-CSI-RS-ResourceId,

ra-OccasionList SEQUENCE (SIZE(1..maxRA-OccasionsPerCSIRS)) OF INTEGER (0..maxRA-Occasions-1) OPTIONAL, -- Need R

ra-PreambleIndex INTEGER (0..63) OPTIONAL, -- Need R

...

}

CandidateBeamRSListExt-r16::= SEQUENCE (SIZE(1.. maxNrofCandidateBeamsExt-r16)) OF PRACH-ResourceDedicatedBFR

-- TAG-BEAMFAILURERECOVERYCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *BeamFailureRecoveryConfig* field descriptions |
| ***beamFailureRecoveryTimer***  Timer for beam failure recovery timer. Upon expiration of the timer the UE does not use CFRA for BFR. Value in ms. Value *ms10* corresponds to 10 ms, value *ms20* corresponds to 20 ms, and so on. |
| ***candidateBeamRSList, candidateBeamRSListExt-v1610***  Set of reference signals (CSI-RS and/or SSB) identifying the candidate beams for recovery and the associated RA parameters. This set includes all elements of *candidateBeamRSList* (without suffix) and all elements of *candidateBeamRSListExt-v1610*. The UE maintains *candidateBeamRSList* and *candidateBeamRSListExt-v1610* separately: Receiving *candidateBeamRSListExt-v1610* set to *release* releases only the entries that were configured by *candidateBeamRSListExt-v1610*, and receiving *candidateBeamRSListExt-v1610* set to *setup* replaces only the entries that were configured by *candidateBeamRSListExt-v1610* with the newly signalled entries. The network configures these reference signals to be within the linked DL BWP (i.e., within the DL BWP with the same *bwp-Id*) of the UL BWP in which the *BeamFailureRecoveryConfig* is provided. |
| ***msg1-SubcarrierSpacing***  Subcarrier spacing for contention free beam failure recovery (see TS 38.211 [16], clause 5.3.2).  Only the following values are applicable depending on the used frequency:  FR1: 15 or 30 kHz  FR2-1: 60 or 120 kHz  FR2-2: 120, 480, or 960 kHz |
| ***rsrp-ThresholdSSB***  L1-RSRP threshold used for determining whether a candidate beam may be used by the UE to attempt contention free random access to recover from beam failure (see TS 38.213 [13], clause 6). |
| ***ra-prioritization***  Parameters which apply for prioritized random access procedure for BFR (see TS 38.321 [3], clause 5.1.1). |
| ***ra-PrioritizationTwoStep***  Parameters which apply for prioritized 2-step random access procedure for BFR (see TS 38.321 [3], clause 5.1.1). |
| ***ra-ssb-OccasionMaskIndex***  Explicitly signalled PRACH Mask Index for RA Resource selection in TS 38.321 [3]. The mask is valid for all SSB resources. |
| ***rach-ConfigBFR***  Configuration of random access parameters for BFR. |
| ***recoverySearchSpaceId***  Search space to use for BFR RAR. The network configures this search space to be within the linked DL BWP (i.e., within the DL BWP with the same *bwp-Id*) of the UL BWP in which the *BeamFailureRecoveryConfig* is provided. The CORESET associated with the recovery search space cannot be associated with another search space. Network always configures the UE with a value for this field when contention free random access resources for BFR are configured. |
| ***rootSequenceIndex-BFR***  PRACH root sequence index (see TS 38.211 [16], clause 6.3.3.1) for beam failure recovery. |
| ***spCell-BFR-CBRA***  Indicates that UE is configured to send BFR MAC CE for SpCell BFR as specified in TS38.321 [3]. |
| ***ssb-perRACH-Occasion***  Number of SSBs per RACH occasion for CF-BFR, see TS 38.213 [13], clause 8.1. |

|  |
| --- |
| *BFR-CSIRS-Resource* field descriptions |
| ***csi-RS***  The ID of a *NZP-CSI-RS-Resource* configured in the *CSI-MeasConfig* of this serving cell. This reference signal determines a candidate beam for beam failure recovery (BFR). |
| ***ra-OccasionList***  RA occasions that the UE shall use when performing BFR upon selecting the candidate beam identified by this CSI-RS. The network ensures that the RA occasion indexes provided herein are also configured by *prach-ConfigurationIndex* and *msg1-FDM*. Each RACH occasion is sequentially numbered, first, in increasing order of frequency resource indexes for frequency multiplexed PRACH occasions; second, in increasing order of time resource indexes for time multiplexed PRACH occasions within a PRACH slot and Third, in increasing order of indexes for PRACH slots.  If the field is absent the UE uses the RA occasion associated with the SSB that is QCLed with this CSI-RS. |
| ***ra-PreambleIndex***  The RA preamble index to use in the RA occasions associated with this CSI-RS. If the field is absent, the UE uses the preamble index associated with the SSB that is QCLed with this CSI-RS. |

|  |
| --- |
| *BFR-SSB-Resource* field descriptions |
| ***ra-PreambleIndex***  The preamble index that the UE shall use when performing BFR upon selecting the candidate beams identified by this SSB. |
| ***ssb***  The ID of an SSB transmitted by this serving cell. It determines a candidate beam for beam failure recovery (BFR). |

#### *– BeamFailureRecoveryRSConfig*

The IE *BeamFailureRecoveryRSConfig* is used to configure the UE with candidate beams for beam failure recovery in case of beam failure detection. See also TS 38.321 [3], clause 5.17.

*BeamFailureRecoveryRSConfig* information element

-- ASN1START

-- TAG-BEAMFAILURERECOVERYRSCONFIG-START

BeamFailureRecoveryRSConfig-r16 ::= SEQUENCE {

rsrp-ThresholdBFR-r16 RSRP-Range OPTIONAL, -- Need M

candidateBeamRS-List-r16 SEQUENCE (SIZE(1..maxNrofCandidateBeams-r16)) OF CandidateBeamRS-r16 OPTIONAL, -- Need M

...,

[[

candidateBeamRS-List2-r17 SEQUENCE (SIZE(1..maxNrofCandidateBeams-r16)) OF CandidateBeamRS-r16 OPTIONAL -- Need R

]]

}

-- TAG-BEAMFAILURERECOVERYRSCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *BeamFailureRecoveryRSConfig* field descriptions |
| ***candidateBeamRS-List***  A list of reference signals (CSI-RS and/or SSB) identifying the candidate beams for recovery. The network always configures this parameter in every instance of this IE. |
| ***candidateBeamRS-List2***  A list of reference signals (CSI-RS and/or SSB) identifying the candidate beams for recovery. |
| ***rsrp-ThresholdBFR***  L1-RSRP threshold used for determining whether a candidate beam may be included by the UE in BFR MAC CE (see TS 38.213 [13], clause 6). The network always configures this parameter in every instance of this IE. |

#### – *BetaOffsets*

The IE *BetaOffsets* is used to configure beta-offset values, see TS 38.213 [13], clause 9.3.

*BetaOffsets* information element

-- ASN1START

-- TAG-BETAOFFSETS-START

BetaOffsets ::= SEQUENCE {

betaOffsetACK-Index1 INTEGER(0..31) OPTIONAL, -- Need S

betaOffsetACK-Index2 INTEGER(0..31) OPTIONAL, -- Need S

betaOffsetACK-Index3 INTEGER(0..31) OPTIONAL, -- Need S

betaOffsetCSI-Part1-Index1 INTEGER(0..31) OPTIONAL, -- Need S

betaOffsetCSI-Part1-Index2 INTEGER(0..31) OPTIONAL, -- Need S

betaOffsetCSI-Part2-Index1 INTEGER(0..31) OPTIONAL, -- Need S

betaOffsetCSI-Part2-Index2 INTEGER(0..31) OPTIONAL -- Need S

}

-- TAG-BETAOFFSETS-STOP

-- ASN1STOP

|  |
| --- |
| *BetaOffsets* field descriptions |
| ***betaOffsetACK-Index1***  Up to 2 bits HARQ-ACK (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 11. |
| ***betaOffsetACK-Index2***  Up to 11 bits HARQ-ACK (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 11. |
| ***betaOffsetACK-Index3***  Above 11 bits HARQ-ACK (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 11. |
| ***betaOffsetCSI-Part1-Index1***  Up to 11 bits of CSI part 1 bits (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 13. |
| ***betaOffsetCSI-Part1-Index2***  Above 11 bits of CSI part 1 bits (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 13. |
| ***betaOffsetCSI-Part2-Index1***  Up to 11 bits of CSI part 2 bits (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 13. |
| ***betaOffsetCSI-Part2-Index2***  Above 11 bits of CSI part 2 bits (see TS 38.213 [13], clause 9.3). When the field is absent the UE applies the value 13. |

#### – *BetaOffsetsCrossPri*

The IE *BetaOffsetsCrossPri* is used to configure beta-offset values for cross-priority HARQ-ACK multiplexing on PUSCH.

*BetaOffsetsCrossPri* information element

-- ASN1START

-- TAG-BETAOFFSETSCROSSPRI-START

BetaOffsetsCrossPri-r17 ::= SEQUENCE (SIZE(3)) OF INTEGER(0..31)

-- TAG-BETAOFFSETSCROSSPRI-STOP

-- ASN1STOP

#### – *BH-LogicalChannelIdentity*

The IE *BH-LogicalChannelIdentity* is used to identify a logical channel between an IAB-node and its parent IAB-node or IAB-donor-DU.

*BH-LogicalChannelIdentity* information element

-- ASN1START

-- TAG-BHLOGICALCHANNELIDENTITY-START

BH-LogicalChannelIdentity-r16 ::= CHOICE {

bh-LogicalChannelIdentity-r16 LogicalChannelIdentity,

bh-LogicalChannelIdentityExt-r16 BH-LogicalChannelIdentity-Ext-r16

}

-- TAG-BHLOGICALCHANNELIDENTITY-STOP

-- ASN1STOP

|  |
| --- |
| *BH-LogicalChannelIdentity* field descriptions |
| ***bh-LogicalChannelIdentity***  ID used for the MAC logical channel. |
| ***bh-LogicalChannelIdentityExt***  ID used for the MAC logical channel. |

#### – *BH-LogicalChannelIdentity-Ext*

The IE *BH-LogicalChannelIdentity-Ext* is used to identify a logical channel between an IAB-node and its parent node.

*BH-LogicalChannelIdentity-Ext* information element

-- ASN1START

-- TAG-BHLOGICALCHANNELIDENTITYEXT-START

BH-LogicalChannelIdentity-Ext-r16 ::= INTEGER (320.. maxLC-ID-Iab-r16)

-- TAG-BHLOGICALCHANNELIDENTITYEXT-STOP

-- ASN1STOP

#### – *BH-RLC-ChannelConfig*

The IE *BH-RLC-ChannelConfig* is used to configure an RLC entity, a corresponding logical channel in MAC for BH RLC channel between IAB-node and its parent node.

*BH-RLC-ChannelConfig* information element

-- ASN1START

-- TAG-BHRLCCHANNELCONFIG-START

BH-RLC-ChannelConfig-r16::= SEQUENCE {

bh-LogicalChannelIdentity-r16 BH-LogicalChannelIdentity-r16 OPTIONAL, -- Cond LCH-SetupOnly

bh-RLC-ChannelID-r16 BH-RLC-ChannelID-r16,

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

rlc-Config-r16 RLC-Config OPTIONAL, -- Cond LCH-Setup

mac-LogicalChannelConfig-r16 LogicalChannelConfig OPTIONAL, -- Cond LCH-Setup

...

}

-- TAG-BHRLCCHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *BH-RLC-ChannelConfig* field descriptions |
| ***bh-LogicalChannelIdentity***  Indicates the logical channel id for BH RLC channel of the IAB-node. |
| ***bh-RLC-ChannelID***  Indicates the BH RLC channel in the link between IAB-MT of the IAB-node and IAB-DU of the parent IAB-node or IAB-donor-DU. |
| ***reestablishRLC***  Indicates that RLC should be re-established. |
| ***rlc-Config***  Determines the RLC mode (UM, AM) and provides corresponding parameters. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *LCH-Setup* | This field is mandatory present upon creation of a new logical channel for a BH RLC channel. It is optionally present, Need M, otherwise. |
| *LCH-SetupOnly* | This field is mandatory present upon creation of a new logical channel for a BH RLC channel. It is absent, Need M otherwise. |

#### – *BH-RLC-ChannelID*

The IE *BH-RLC-ChannelID* is used to identify a BH RLC channel in the link between IAB-MT of the IAB-node and IAB-DU of the parent IAB-node or IAB-donor-DU.

*BH-RLC-ChannelID* information element

-- ASN1START

-- TAG-BHRLCCHANNELID-START

BH-RLC-ChannelID-r16 ::= BIT STRING (SIZE (16))

-- TAG-BHRLCCHANNELID-STOP

-- ASN1STOP

#### – *BSR-Config*

The IE *BSR-Config* is used to configure buffer status reporting.

*BSR-Config* information element

-- ASN1START

-- TAG-BSR-CONFIG-START

BSR-Config ::= SEQUENCE {

periodicBSR-Timer ENUMERATED { sf1, sf5, sf10, sf16, sf20, sf32, sf40, sf64,

sf80, sf128, sf160, sf320, sf640, sf1280, sf2560, infinity },

retxBSR-Timer ENUMERATED { sf10, sf20, sf40, sf80, sf160, sf320, sf640, sf1280, sf2560,

sf5120, sf10240, spare5, spare4, spare3, spare2, spare1},

logicalChannelSR-DelayTimer ENUMERATED { sf20, sf40, sf64, sf128, sf512, sf1024, sf2560, spare1} OPTIONAL, -- Need R

...

}

-- TAG-BSR-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *BSR-Config* field descriptions |
| ***logicalChannelSR-DelayTimer***  Value in number of subframes. Value *sf20* corresponds to 20 subframes, *sf40* corresponds to 40 subframes, and so on. |
| ***periodicBSR-Timer***  Value in number of subframes. Value *sf1* corresponds to 1 subframe, value *sf5* corresponds to 5 subframes and so on. |
| ***retxBSR-Timer***  Value in number of subframes. Value *sf10* corresponds to 10 subframes, value *sf20* corresponds to 20 subframes and so on. |

#### – *BWP*

The IE *BWP* is used to configure generic parameters of a bandwidth part as defined in TS 38.211 [16], clause 4.5, and TS 38.213 [13], clause 12.

For each serving cell the network configures at least an initial downlink bandwidth part and one (if the serving cell is configured with an uplink) or two (if using supplementary uplink (SUL)) initial uplink bandwidth parts. Furthermore, the network may configure additional uplink and downlink bandwidth parts for a serving cell.

The uplink and downlink bandwidth part configurations are divided into common and dedicated parameters.

*BWP* information element

-- ASN1START

-- TAG-BWP-START

BWP ::= SEQUENCE {

locationAndBandwidth INTEGER (0..37949),

subcarrierSpacing SubcarrierSpacing,

cyclicPrefix ENUMERATED { extended } OPTIONAL -- Need R

}

-- TAG-BWP-STOP

-- ASN1STOP

|  |
| --- |
| *BWP* field descriptions |
| ***cyclicPrefix***  Indicates whether to use the extended cyclic prefix for this bandwidth part. If not set, the UE uses the normal cyclic prefix. Normal CP is supported for all subcarrier spacings and slot formats. Extended CP is supported only for 60 kHz subcarrier spacing. (see TS 38.211 [16], clause 4.2). Except for SUL, the network ensures the same cyclic prefix length is used in active DL BWP and active UL BWP within a serving cell. |
| ***locationAndBandwidth***  Frequency domain location and bandwidth of this bandwidth part. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 [19] with assumptions as described in TS 38.213 [13], clause 12, i.e. setting =275. The first PRB is a PRB determined by *subcarrierSpacing* of this BWP and *offsetToCarrier* (configured in *SCS-SpecificCarrier* contained within *FrequencyInfoDL* / *FrequencyInfoUL* / *FrequencyInfoUL-SIB* / *FrequencyInfoDL-SIB* within *ServingCellConfigCommon* / *ServingCellConfigCommonSIB*) corresponding to this subcarrier spacing. In case of TDD, a BWP-pair (UL BWP and DL BWP with the same *bwp-Id*) must have the same center frequency (see TS 38.213 [13], clause 12) |
| ***subcarrierSpacing***  Subcarrier spacing to be used in this BWP for all channels and reference signals unless explicitly configured elsewhere. Corresponds to subcarrier spacing according to TS 38.211 [16], table 4.2-1. The value *kHz15* corresponds to µ=0, value *kHz30* corresponds to µ=1, and so on.  Only the following values are applicable depending on the used frequency:  FR1: 15, 30, or 60 kHz  FR2-1: 60 or 120 kHz  FR2-2: 120, 480, or 960 kHz  For the initial DL BWP and operation in licensed spectrum this field has the same value as the field *subCarrierSpacingCommon* in *MIB* of the same serving cell. Except for SUL, the network ensures the same subcarrier spacing is used in active DL BWP and active UL BWP within a serving cell. For the initial DL BWP and operation with shared spectrum channel access, the value of this field corresponds to the subcarrier spacing of the SSB associated to the initial DL BWP. |

#### – *BWP-Downlink*

The IE *BWP-Downlink* is used to configure an additional downlink bandwidth part (not for the initial BWP).

*BWP-Downlink* information element

-- ASN1START

-- TAG-BWP-DOWNLINK-START

BWP-Downlink ::= SEQUENCE {

bwp-Id BWP-Id,

bwp-Common BWP-DownlinkCommon OPTIONAL, -- Cond SetupOtherBWP

bwp-Dedicated BWP-DownlinkDedicated OPTIONAL, -- Cond SetupOtherBWP

...

}

-- TAG-BWP-DOWNLINK-STOP

-- ASN1STOP

|  |
| --- |
| *BWP-Downlink* field descriptions |
| ***bwp-Id***  An identifier for this bandwidth part. Other parts of the RRC configuration use the *BWP-Id* to associate themselves with a particular bandwidth part.  The network configures the BWPs with consecutive IDs from 1. The Network does not include the value 0, since value 0 is reserved for the initial BWP. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SetupOtherBWP* | The field is mandatory present upon configuration of a new DL BWP. The field is optionally present, Need M, otherwise. |

#### – *BWP-DownlinkCommon*

The IE *BWP-DownlinkCommon* is used to configure the common parameters of a downlink BWP. They are "cell specific" and the network ensures the necessary alignment with corresponding parameters of other UEs. The common parameters of the initial bandwidth part of the PCell are also provided via system information. For all other serving cells, the network provides the common parameters via dedicated signalling.

*BWP-DownlinkCommon* information element

-- ASN1START

-- TAG-BWP-DOWNLINKCOMMON-START

BWP-DownlinkCommon ::= SEQUENCE {

genericParameters BWP,

pdcch-ConfigCommon SetupRelease { PDCCH-ConfigCommon } OPTIONAL, -- Need M

pdsch-ConfigCommon SetupRelease { PDSCH-ConfigCommon } OPTIONAL, -- Need M

...

}

-- TAG-BWP-DOWNLINKCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| *BWP-DownlinkCommon* field descriptions |
| ***pdcch-ConfigCommon***  Cell specific parameters for the PDCCH of this BWP. This field is absent for a dormant BWP. |
| ***pdsch-ConfigCommon***  Cell specific parameters for the PDSCH of this BWP. |

#### – *BWP-DownlinkDedicated*

The IE *BWP-DownlinkDedicated* is used to configure the dedicated (UE specific) parameters of a downlink BWP.

*BWP-DownlinkDedicated* information element

-- ASN1START

-- TAG-BWP-DOWNLINKDEDICATED-START

BWP-DownlinkDedicated ::= SEQUENCE {

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

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

sps-Config SetupRelease { SPS-Config } OPTIONAL, -- Need M

radioLinkMonitoringConfig SetupRelease { RadioLinkMonitoringConfig } OPTIONAL, -- Need M

...,

[[

sps-ConfigToAddModList-r16 SPS-ConfigToAddModList-r16 OPTIONAL, -- Need N

sps-ConfigToReleaseList-r16 SPS-ConfigToReleaseList-r16 OPTIONAL, -- Need N

sps-ConfigDeactivationStateList-r16 SPS-ConfigDeactivationStateList-r16 OPTIONAL, -- Need R

beamFailureRecoverySCellConfig-r16 SetupRelease {BeamFailureRecoveryRSConfig-r16} OPTIONAL, -- Cond SCellOnly

sl-PDCCH-Config-r16 SetupRelease { PDCCH-Config } OPTIONAL, -- Need M

sl-V2X-PDCCH-Config-r16 SetupRelease { PDCCH-Config } OPTIONAL -- Need M

]],

[[

preConfGapStatus-r17 BIT STRING (SIZE (maxNrofGapId-r17)) OPTIONAL, -- Cond PreConfigMG

beamFailureRecoverySpCellConfig-r17 SetupRelease { BeamFailureRecoveryRSConfig-r16} OPTIONAL, -- Cond SpCellOnly

harq-FeedbackEnablingforSPSactive-r17 BOOLEAN OPTIONAL, -- Need R

cfr-ConfigMulticast-r17 SetupRelease { CFR-ConfigMulticast-r17 } OPTIONAL, -- Need M

dl-PPW-PreConfigToAddModList-r17 DL-PPW-PreConfigToAddModList-r17 OPTIONAL, -- Need N

dl-PPW-PreConfigToReleaseList-r17 DL-PPW-PreConfigToReleaseList-r17 OPTIONAL, -- Need N

nonCellDefiningSSB-r17 NonCellDefiningSSB-r17 OPTIONAL, -- Need R

servingCellMO-r17 MeasObjectId OPTIONAL -- Cond MeasObject-NCDSSB

]]

}

SPS-ConfigToAddModList-r16 ::= SEQUENCE (SIZE (1..maxNrofSPS-Config-r16)) OF SPS-Config

SPS-ConfigToReleaseList-r16 ::= SEQUENCE (SIZE (1..maxNrofSPS-Config-r16)) OF SPS-ConfigIndex-r16

SPS-ConfigDeactivationState-r16 ::= SEQUENCE (SIZE (1..maxNrofSPS-Config-r16)) OF SPS-ConfigIndex-r16

SPS-ConfigDeactivationStateList-r16 ::= SEQUENCE (SIZE (1..maxNrofSPS-DeactivationState)) OF SPS-ConfigDeactivationState-r16

DL-PPW-PreConfigToAddModList-r17 ::= SEQUENCE (SIZE (1..maxNrofPPW-Config-r17)) OF DL-PPW-PreConfig-r17

DL-PPW-PreConfigToReleaseList-r17 ::= SEQUENCE (SIZE (1..maxNrofPPW-Config-r17)) OF DL-PPW-ID-r17

-- TAG-BWP-DOWNLINKDEDICATED-STOP

-- ASN1STOP

|  |
| --- |
| *BWP-DownlinkDedicated* field descriptions |
| ***beamFailureRecoverySCellConfig***  Configuration of candidate RS for beam failure recovery in SCells. |
| ***beamFailureRecoverySpCellConfig***  Configuration of candidate RS for beam failure recovery in SpCells. |
| ***cfr-ConfigMulticast***  UE specific common frequency resource configuration for MBS multicast for one dedicated BWP. This field can be configured within at most one serving cell. |
| ***dl-PPW-PreConfigToAddModList***  Indicates a list of DL-PRS processing window configurations to be added or modified for the dedicated DL BWP. |
| ***dl-PPW-PreConfigToReleaseList***  Indicates a list of DL-PRS processing window configurations to be released for the dedicated DL BWP. |
| ***harq-FeedbackEnablingforSPSactive***  If enabled, UE reports ACK/NACK for the first SPS PDSCH after activation, regardless of if HARQ feedback is enabled or disabled corresponding to the first SPS PDSCH after activation. Otherwise, UE follows configuration of HARQ feedback enabled/disabled corresponding to the first SPS PDSCH after activation. |
| ***nonCellDefiningSSB-r17***  If configured, the RedCap UE operating in this BWP uses this SSB for the purposes for which it would otherwise have used the cell-defining SSB of the serving cell (e.g. obtaining sync, measurements, RLM). Furthermore, other parts of the BWP configuration that refer to an SSB (e.g. the "SSB" configured in the *QCL-Info* IE; the "ssb-Index" configured in the *RadioLinkMonitoringRS*; *CFRA-SSB-Resource*; *PRACH-ResourceDedicatedBFR*) refer implicitily to this NCD-SSB.  The NCD-SSB has the same values for the properties (e.g., *ssb-PositionsInBurst*, *PCI*, *ssb-periodicity*, *ssb-PBCH-BlockPower*) of the corresponding CD-SSB apart from the values of the properties configured in the *NonCellDefiningSSB-r17* IE. |
| ***pdcch-Config***  UE specific PDCCH configuration for one BWP. |
| ***pdsch-Config***  UE specific PDSCH configuration for one BWP. |
| ***preConfGapStatus***  Indicates whether the pre-configured measurement gaps (i.e. the gaps configured with *preConfigInd*) are activated or deactivated upon the switch to this BWP. If this field is configured, the UE shall apply network-controlled mechanism for activation and deactivation of the pre-configured measurement gaps, otherwise the UE shall apply the autonomous activation/deactivation mechanism, as specified in TS 38.133 [14]. The first/leftmost bit corresponds to the measurement gap with gap ID 1, the second bit corresponds to measurement gap with gap ID 2, and so on. Value 0 indicates that the corresponding pre-configured measurement gap is deactivated while value 1 indicates that the corresponding pre-configured measurement gap is activated. The UE shall ignore the bit if the corresponding measurement gap is not a pre-configured measurement gap. |
| ***servingCellMO***  *measObjectId* of the *MeasObjectNR* in *MeasConfig* which is associated to the serving cell. For this *MeasObjectNR*, the following relationship applies between this *MeasObjectNR* and *nonCellDefiningSSB* in *BWP-DownlinkDedicated* of the associated downlink BWP: if *ssbFrequency* is configured, its value is the same as the *absoluteFrequencySSB* in the *nonCellDefiningSSB*. If the field is present in a downlink BWP and the BWP is activated, the RedCap UE uses this measurement object for serving cell measurements, otherwise, the RedCap UE uses the *servingCellMO* in *ServingCellConfig* IE. |
| ***sps-Config***  UE specific SPS (Semi-Persistent Scheduling) configuration for one BWP. Except for reconfiguration with sync, the NW does not reconfigure *sps-Config* when there is an active configured downlink assignment (see TS 38.321 [3]). However, the NW may release the *sps-Config* at any time. Network can only configure SPS in one BWP using either this field or *sps-ConfigToAddModList.* |
| ***sps-ConfigDeactivationStateList***  Indicates a list of the deactivation states in which each state can be mapped to a single or multiple SPS configurations to be deactivated, see clause 10.2 in TS 38.213 [13]. If a state is mapped to multiple SPS configurations, each of these SPS configurations is configured with the same *harq-CodebookID*. |
| ***sps-ConfigToAddModList***  Indicates a list of one or more DL SPS configurations to be added or modified in one BWP. Except for reconfiguration with sync, the NW does not reconfigure a SPS configuration when it is active (see TS 38.321 [3]). |
| ***sps-ConfigToReleaseList***  Indicates a list of one or more DL SPS configurations to be released. The NW may release a SPS configuration at any time. |
| ***radioLinkMonitoringConfig***  UE specific configuration of radio link monitoring for detecting cell- and beam radio link failure occasions. The maximum number of failure detection resources should be limited up to 8 for both cell and beam radio link failure detection. For SCells, only periodic 1-port CSI-RS can be configured in IE *RadioLinkMonitoringConfig*. |
| ***sl-PDCCH-Config***  Indicates the UE specific PDCCH configurations for receiving the SL grants (via SL-RNTI or SL-CS-RNTI) for NR sidelink communication***.*** |
| ***sl-V2X-PDCCH-Config***  Indicates the UE specific PDCCH configurations for receiving SL grants (i.e. sidelink SPS) for V2X sidelink communication***.*** |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *MeasObject-NCD-SSB* | This field is optionally present Need S if the UE is a RedCap UE and *nonCellDefiningSSB* is configured in this DL BWP. It is absent otherwise. |
| *PreConfigMG* | The field is optionally present, Need R, if there is at least one per UE gap configured with *preConfigInd* or there is at least one per FR gap of the same FR which the BWP belongs to and configured with *preConfigInd*. It is absent, Need R, otherwise. |
| *ScellOnly* | The field is optionally present, Need M, in the *BWP-DownlinkDedicated* of an Scell. It is absent otherwise. |
| *SpCellOnly* | The field is optionally present, Need M, in the *BWP-DownlinkDedicated* of an Spcell. It is absent otherwise. |

#### – *BWP-Id*

The IE *BWP-Id* is used to refer to Bandwidth Parts (BWP). The initial BWP is referred to by *BWP-Id* 0. The other BWPs are referred to by *BWP-Id* 1 to *maxNrofBWPs*.

*BWP-Id* information element

-- ASN1START

-- TAG-BWP-ID-START

BWP-Id ::= INTEGER (0..maxNrofBWPs)

-- TAG-BWP-ID-STOP

-- ASN1STOP

#### – *BWP-Uplink*

The IE *BWP-Uplink* is used to configure an additional uplink bandwidth part (not for the initial BWP).

*BWP-Uplink* information element

-- ASN1START

-- TAG-BWP-UPLINK-START

BWP-Uplink ::= SEQUENCE {

bwp-Id BWP-Id,

bwp-Common BWP-UplinkCommon OPTIONAL, -- Cond SetupOtherBWP

bwp-Dedicated BWP-UplinkDedicated OPTIONAL, -- Cond SetupOtherBWP

...

}

-- TAG-BWP-UPLINK-STOP

-- ASN1STOP

|  |
| --- |
| *BWP-Uplink* field descriptions |
| ***bwp-Id***  An identifier for this bandwidth part. Other parts of the RRC configuration use the *BWP-Id* to associate themselves with a particular bandwidth part.  The network configures the BWPs with consecutive IDs from 1. The Network does not include the value 0, since value 0 is reserved for the initial BWP. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SetupOtherBWP* | The field is mandatory present upon configuration of a new UL BWP. The field is optionally present, Need M, otherwise. |

#### – *BWP-UplinkCommon*

The IE *BWP-UplinkCommon* is used to configure the common parameters of an uplink BWP. They are "cell specific" and the network ensures the necessary alignment with corresponding parameters of other UEs. The common parameters of the initial bandwidth part of the PCell are also provided via system information. For all other serving cells, the network provides the common parameters via dedicated signalling.

*BWP-UplinkCommon* information element

-- ASN1START

-- TAG-BWP-UPLINKCOMMON-START

BWP-UplinkCommon ::= SEQUENCE {

genericParameters BWP,

rach-ConfigCommon SetupRelease { RACH-ConfigCommon } OPTIONAL, -- Need M

pusch-ConfigCommon SetupRelease { PUSCH-ConfigCommon } OPTIONAL, -- Need M

pucch-ConfigCommon SetupRelease { PUCCH-ConfigCommon } OPTIONAL, -- Need M

...,

[[

rach-ConfigCommonIAB-r16 SetupRelease { RACH-ConfigCommon } OPTIONAL, -- Need M

useInterlacePUCCH-PUSCH-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

msgA-ConfigCommon-r16 SetupRelease { MsgA-ConfigCommon-r16 } OPTIONAL -- Cond SpCellOnly2

]],

[[

enableRA-PrioritizationForSlicing-r17 BOOLEAN OPTIONAL, -- Cond RAPrioSliceAI

additionalRACH-ConfigList-r17 SetupRelease { AdditionalRACH-ConfigList-r17 } OPTIONAL, -- Cond SpCellOnly2

rsrp-ThresholdMsg3-r17 RSRP-Range OPTIONAL, -- Need R

numberOfMsg3-RepetitionsList-r17 SEQUENCE (SIZE (4)) OF NumberOfMsg3-Repetitions-r17 OPTIONAL, -- Cond Msg3Rep

mcs-Msg3-Repetitions-r17 SEQUENCE (SIZE (8)) OF INTEGER (0..31) OPTIONAL -- Cond Msg3Rep

]]

}

AdditionalRACH-ConfigList-r17 ::= SEQUENCE (SIZE(1..maxAdditionalRACH-r17)) OF AdditionalRACH-Config-r17

AdditionalRACH-Config-r17 ::= SEQUENCE {

rach-ConfigCommon-r17 RACH-ConfigCommon OPTIONAL, -- Need R

msgA-ConfigCommon-r17 MsgA-ConfigCommon-r16 OPTIONAL, -- Need R

...

}

NumberOfMsg3-Repetitions-r17::= ENUMERATED {n1, n2, n3, n4, n7, n8, n12, n16}

-- TAG-BWP-UPLINKCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| *BWP-UplinkCommon* field descriptions |
| ***additionalRACH-ConfigList***  List of feature or feature combination-specific RACH configurations, i.e. the RACH configurations configured in addition to the one configured by *rach-ConfigCommon* and by *msgA-ConfigCommon*. The network associates all possible preambles of an additional RACH configuration to a feature or feature combination. |
| ***enableRA-PrioritizationForSlicing***  Indicates whether or not the *ra-PrioritizationForSlicing/ra-PrioritizationForSlicingTwoStep* should override the *ra-PrioritizationForAccessIdentity*. The field is applicable only when the UE is configured by upper layers with both NSAG and Access Identiy 1 or 2. If value *TRUE* is configured, the UE should only apply the *ra-PrioritizationForSlicing/ra-PrioritizationForSlicingTwoStep*. If value *FALSE* is configured, the UE should only apply ra-PrioritizationForAccessIdentity. If the field is absent, the set of applied parameters is up to UE implementation. |
| ***mcs-Msg3-Repetitions***  Configuration of eight candidate MCS indexes for PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI. Only the first 4 configured or default MCS indexes are used for PUSCH transmission scheduled by RAR UL grant. If this field is absent when the set(s) of Random Access resources with MSG3 repetition indication are configured in the *BWP-UplinkCommon*, the UE shall apply the values {0, 1, 2, 3, 4, 5, 6, 7} (see see TS 38.214 [19], clause 6.1.4). |
| ***msgA-ConfigCommon***  Configuration of the cell specific PRACH and PUSCH resource parameters for transmission of MsgA in 2-step random access type procedure. The NW can configure *msgA-ConfigCommon* only for UL BWPs if the linked DL BWPs (same bwp-Id as UL-BWP) are the initial DL BWPs or DL BWPs containing the SSB associated to the initial BL BWP |
| ***numberOfMsg3-RepetitionsList***  The number of repetitions for PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI. If this field is absent when the set(s) of Random Access resources with MSG3 repetition indication are configured in the *BWP-UplinkCommon*, the UE shall apply the values {n1, n2, n3, n4} (see see TS 38.214 [19], clause 6.1.2.1). |
| ***pucch-ConfigCommon***  Cell specific parameters for the PUCCH of this BWP. |
| ***pusch-ConfigCommon***  Cell specific parameters for the PUSCH of this BWP. |
| ***rach-ConfigCommon***  Configuration of cell specific random access parameters which the UE uses for contention based and contention free random access as well as for contention based beam failure recovery in this BWP. The NW configures SSB-based RA (and hence *RACH-ConfigCommon*) only for UL BWPs if the linked DL BWPs (same *bwp-Id* as UL-BWP) are the initial DL BWPs or DL BWPs containing the SSB associated to the initial DL BWP or for RedCap UEs DL BWPs associated with *nonCellDefiningSSB*. The network configures *rach-ConfigCommon*, whenever it configures contention free random access (for reconfiguration with sync or for beam failure recovery). |
| ***rach-ConfigCommonIAB***  Configuration of cell specific random access parameters for the IAB-MT. The IAB specific IAB RACH configuration is used by IAB-MT, if configured. |
| ***rsrp-ThresholdMsg3***  Threshold used by the UE for determining whether to select resources indicating Msg3 repetition in this BWP, as specified in TS 38.321 [3]. The field is mandatory if both set(s) of Random Access resources with MSG3 repetition indication and set(s) of Random Access resources without MSG3 repetition indication are configured in the BWP. It is absent otherwise. |
| ***useInterlacePUCCH-PUSCH***  If the field is present, the UE uses uplink frequency domain resource allocation Type 2 for cell-specific PUSCH, e.g., PUSCH scheduled by RAR UL grant (see 38.213 clause 8.3 and 38.214 clause 6.1.2.2) and uses interlaced PUCCH Format 0 and 1 for cell-specific PUCCH (see TS 38.213 [13], clause 9.2.1). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Msg3Rep* | This field is optional present, Need S, if the set(s) of Random Access resources with MSG3 repetition indication are configured in the *BWP-UplinkCommon*. It is absent otherwise. |
| *RAPrioSliceAI* | The field is optionally present, Need R, if both parameters *ra-PrioritizationForAccessIdentity* and the *ra-PrioritizationForSlicing/ra-PrioritizationForSlicingTwoStep* are included, and the field is sent in system information. It is absent otherwise. |
| *SpCellOnly2* | The field is optionally present, Need M, in the *BWP-UplinkCommon* of an SpCell. It is absent otherwise. |

#### – *BWP-UplinkDedicated*

The IE *BWP-UplinkDedicated* is used to configure the dedicated (UE specific) parameters of an uplink BWP.

*BWP-UplinkDedicated* information element

-- ASN1START

-- TAG-BWP-UPLINKDEDICATED-START

BWP-UplinkDedicated ::= SEQUENCE {

pucch-Config SetupRelease { PUCCH-Config } OPTIONAL, -- Need M

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

configuredGrantConfig SetupRelease { ConfiguredGrantConfig } OPTIONAL, -- Need M

srs-Config SetupRelease { SRS-Config } OPTIONAL, -- Need M

beamFailureRecoveryConfig SetupRelease { BeamFailureRecoveryConfig } OPTIONAL, -- Cond SpCellOnly

...,

[[

sl-PUCCH-Config-r16 SetupRelease { PUCCH-Config } OPTIONAL, -- Need M

cp-ExtensionC2-r16 INTEGER (1..28) OPTIONAL, -- Need R

cp-ExtensionC3-r16 INTEGER (1..28) OPTIONAL, -- Need R

useInterlacePUCCH-PUSCH-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

pucch-ConfigurationList-r16 SetupRelease { PUCCH-ConfigurationList-r16 } OPTIONAL, -- Need M

lbt-FailureRecoveryConfig-r16 SetupRelease { LBT-FailureRecoveryConfig-r16 } OPTIONAL, -- Need M

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

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

configuredGrantConfigType2DeactivationStateList-r16 ConfiguredGrantConfigType2DeactivationStateList-r16 OPTIONAL -- Need R

]],

[[

ul-TCI-StateList-r17 CHOICE {

explicitlist SEQUENCE {

ul-TCI-ToAddModList-r17 SEQUENCE (SIZE (1..maxUL-TCI-r17)) OF TCI-UL-State-r17 OPTIONAL, -- Need N

ul-TCI-ToReleaseList-r17 SEQUENCE (SIZE (1..maxUL-TCI-r17)) OF TCI-UL-State-Id-r17 OPTIONAL -- Need N

},

unifiedTCI-StateRef-r17 ServingCellAndBWP-Id-r17

} OPTIONAL, -- Need R

ul-powerControl-r17 Uplink-powerControlId-r17 OPTIONAL, -- Cond NoTCI-PC

pucch-ConfigurationListMulticast1-r17 SetupRelease { PUCCH-ConfigurationList-r16 } OPTIONAL, -- Need M

pucch-ConfigurationListMulticast2-r17 SetupRelease { PUCCH-ConfigurationList-r16 } OPTIONAL -- Need M

]]

}

ConfiguredGrantConfigToAddModList-r16 ::= SEQUENCE (SIZE (1..maxNrofConfiguredGrantConfig-r16)) OF ConfiguredGrantConfig

ConfiguredGrantConfigToReleaseList-r16 ::= SEQUENCE (SIZE (1..maxNrofConfiguredGrantConfig-r16)) OF ConfiguredGrantConfigIndex-r16

ConfiguredGrantConfigType2DeactivationState-r16 ::= SEQUENCE (SIZE (1..maxNrofConfiguredGrantConfig-r16)) OF ConfiguredGrantConfigIndex-r16

ConfiguredGrantConfigType2DeactivationStateList-r16 ::=

SEQUENCE (SIZE (1..maxNrofCG-Type2DeactivationState)) OF ConfiguredGrantConfigType2DeactivationState-r16

-- TAG-BWP-UPLINKDEDICATED-STOP

-- ASN1STOP

|  |
| --- |
| *BWP-UplinkDedicated* field descriptions |
| ***beamFailureRecoveryConfig***  Configuration of beam failure recovery. If *supplementaryUplink* is present, the field is present only in one of the uplink carriers, either UL or SUL. |
| ***configuredGrantConfig***  A *Configured-Grant* of *type1* or *type2*. It may be configured for UL or SUL but in case of *type1* not for both at a time. Except for reconfiguration with sync, the NW does not reconfigure *configuredGrantConfig* when there is an active configured uplink grant Type 2 (see TS 38.321 [3]). However, the NW may release the *configuredGrantConfig* at any time. Network can only configure configured grant in one BWP using either this field or *configuredGrantConfigToAddModList.* |
| ***configuredGrantConfigToAddModList***  Indicates a list of one or more configured grant configurations to be added or modified for one BWP. Except for reconfiguration with sync, the NW does not reconfigure a Type 2 configured grant configuration when it is active (see TS 38.321 [3]). The network configures multiple CG configurations for one BWP with either all configurations or no configuration configured with *cg-RetransmissionTimer-r16*. |
| ***configuredGrantConfigToReleaseList***  Indicates a list of one or more UL Configured Grant configurations to be released. The NW may release a configured grant configuration at any time. |
| ***configuredGrantConfigType2DeactivationStateList***  Indicates a list of the deactivation states in which each state can be mapped to a single or multiple Configured Grant type 2 configurations to be deactivated when the corresponding deactivation DCI is received, see clause 7.3.1 in TS 38.212 [17] and clause 10.2 in TS 38.213 [13]. |
| ***cp-ExtensionC2, cp-ExtensionC3***  Configures the cyclic prefix (CP) extension (see TS 38.211 [16], clause 5.3.1). For 15 kHz SCS, {1..28} are valid for both *cp-ExtensionC2* and *cp-ExtensionC3*. For 30 kHz SCS, {1..28} are valid for *cp-ExtensionC2* and {2..28} are valid for *cp-ExtensionC3.* For 60 kHz SCS, {2..28} are valid for *cp-ExtensionC2* and {3..28} are valid for *cp-ExtensionC3*. |
| ***lbt-FailureRecoveryConfig***  Configures parameters used for detection of consistent uplink LBT failures for operationwith shared spectrum channel access, as specified in TS 38.321 [3]. |
| ***pucch-Config***  PUCCH configuration for one BWP of the normal UL or SUL of a serving cell. If the UE is configured with SUL, the network configures PUCCH only on the BWPs of one of the uplinks (normal UL or SUL). The network configures *PUCCH-Config* at least on non-initial BWP(s) for SpCell and PUCCH SCell. If supported by the UE, the network may configure at most one additional SCell of a cell group with *PUCCH-Config* (i.e. PUCCH SCell) ; if PUCCH cell switching is supported by the UE, the network may configure at most one additional SCell with *PUCCH-Config* within each PUCCH group.  In (NG)EN-DC and NE-DC, the NW configures at most one serving cell per frequency range with PUCCH. In (NG)EN-DC and NE-DC, if two PUCCH groups are configured, the serving cells of the NR PUCCH group in FR2 use the same numerology. For NR-DC, the maximum number of PUCCH groups in each cell group is one, and only the same numerology is supported for the cell group with carriers only in FR2.  The NW may configure PUCCH for a BWP when setting up the BWP. The network may also add/remove the *pucch-Config* in an *RRCReconfiguration* with *reconfigurationWithSync* (for SpCell or PUCCH SCell) or with SCell release and add (for PUCCH SCell) to move the PUCCH between the UL and SUL carrier of one serving cell. In other cases, only modifications of a previously configured *pucch-Config* are allowed.  If one (S)UL BWP of a serving cell is configured with PUCCH, all other (S)UL BWPs must be configured with PUCCH, too. |
| ***pucch-ConfigurationList***  PUCCH configurations for two simultaneously constructed HARQ-ACK codebooks (see TS 38.213 [13], clause 9.1). Different PUCCH Resource IDs are configured in different *PUCCH-Config* within the *pucch-ConfigurationList* if configured. |
| ***pucch-ConfigurationListMulticast1***  PUCCH configurations for two simultaneously constructed HARQ-ACK codebooks for MBS multicast (see TS 38.213, clause 9). |
| ***pucch-ConfigurationListMulticast2***  PUCCH configurations for two simultaneously constructed NACK-only feedback for MBS multicast (see TS 38.213, clause 9). |
| ***pusch-Config***  PUSCH configuration for one BWP of the normal UL or SUL of a serving cell. If the UE is configured with SUL and if it has a *PUSCH-Config* for both UL and SUL, an UL/SUL indicator field in DCI indicates which of the two to use. See TS 38.212 [17], clause 7.3.1. |
| ***sl-PUCCH-Config***  Indicates the UE specific PUCCH configurations used for the HARQ-ACK feedback reporting for NR sidelink communication. |
| ***srs-Config***  Uplink sounding reference signal configuration. |
| ***ul-powerControl***  Configures power control parameters for PUCCH, PUSCH and SRS when UE is configured with *unifiedTCI-StateType* for this serving cell. |
| ***ul-TCI-StateList***  Indicate the applicable UL TCI states for PUCCH, PUSCH and SRS. |
| ***ul-TCI-ToAddModList***  Indicates a list of UL TCI states. |
| ***unifiedTCI-StateRef***  Provides the serving cell and UL BWP where applicable UL TCI states applicable to this UL BWP are defined. |
| ***useInterlacePUCCH-PUSCH***  If the field is present, the UE uses uplink frequency domain resource allocation Type 2 for PUSCH (see 38.213 clause 8.3 and 38.214 clause 6.1.2.2) and uses interlaced PUCCH Format 0, 1, 2, and 3 for PUCCH (see TS 38.213 [13], clause 9.2.1). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *NoTCI-PC* | The field is optionally present, Need R, if *unifiedTCI-StateType* is configured for this serving cell and *ul-powerControl* is not configured for any UL TCI state or joint TCI state of this serving cell. Otherwise it is absent, Need R |
| *SpCellOnly* | The field is optionally present, Need M, in the *BWP-UplinkDedicated* of an SpCell. It is absent otherwise. |

NOTE 1: In case of *RRCReconfiguration* with *reconfigurationWithSync*, the UE performs a MAC reset, which involves releasing the PUCCH-CSI/SRS/SR configuration in accordance with clause 5.3.12 and TS 38.321 [6], clauses 5.12 and 5.2. Hence, for these parts of the dedicated radio resource configuration, delta signalling is not supported in the message when *reconfigurationWithSync* is included.

#### *– CandidateBeamRS*

The IE *CandidateBeamRS* inlcudes candidate beams for beam failure recovery in case of beam failure detection. See also TS 38.321 [3], clause 5.17.

*CandidateBeamRS* information element

-- ASN1START

-- TAG-CANDIDATEBEAMRS-START

CandidateBeamRS-r16 ::= SEQUENCE {

candidateBeamConfig-r16 CHOICE {

ssb-r16 SSB-Index,

csi-RS-r16 NZP-CSI-RS-ResourceId

},

servingCellId ServCellIndex OPTIONAL -- Need R

}

-- TAG-CANDIDATEBEAMRS-STOP

-- ASN1STOP

|  |
| --- |
| *CandidateBeamRS* field descriptions |
| ***candidateBeamConfig***  Indicates the resource (i.e. SSB or CSI-RS) defining this beam resource. |
| ***servingCellId***  If the field is absent, the RS belongs to the serving cell in which *BeamFailureRSRecoveryConfig* is configured. |

#### – *CellAccessRelatedInfo*

The IE *CellAccessRelatedInfo* indicates cell access related information for this cell.

*CellAccessRelatedInfo* information element

-- ASN1START

-- TAG-CELLACCESSRELATEDINFO-START

CellAccessRelatedInfo ::= SEQUENCE {

plmn-IdentityInfoList PLMN-IdentityInfoList,

cellReservedForOtherUse ENUMERATED {true} OPTIONAL, -- Need R

...,

[[

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

npn-IdentityInfoList-r16 NPN-IdentityInfoList-r16 OPTIONAL -- Need R

]],

[[

snpn-AccessInfoList-r17 SEQUENCE (SIZE (1..maxNPN-r16)) OF SNPN-AccessInfo-r17 OPTIONAL -- Need R

]]

}

SNPN-AccessInfo-r17 ::= SEQUENCE {

extCH-Supported-r17 ENUMERATED {true} OPTIONAL, -- Need R

extCH-WithoutConfigAllowed-r17 ENUMERATED {true} OPTIONAL, -- Need R

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

imsEmergencySupportForSNPN-r17 ENUMERATED {true} OPTIONAL -- Need R

}

-- TAG-CELLACCESSRELATEDINFO-STOP

-- ASN1STOP

|  |
| --- |
| *CellAccessRelatedInfo* field descriptions |
| ***cellReservedForFutureUse***  Indicates whether the cell is reserved, as defined in 38.304 [20] for future use. The field is applicable to all PLMNs and NPNs. This field is ignored by IAB-MT. |
| ***cellReservedForOtherUse***  Indicates whether the cell is reserved, as defined in 38.304 [20]. The field is applicable to all PLMNs. This field is ignored by IAB-MT for cell barring determination, but still considered by NPN capable IAB-MT for determination of an NPN-only cell. |
| ***npn-IdentityInfoList***  The *npn-IdentityInfoList* is used to configure a set of *NPN-IdentityInfo* elements. Each of those elements contains a list of one or more NPN Identities and additional information associated with those NPNs. The total number of PLMNs (identified by a PLMN identity in *plmn -IdentityList*), PNI-NPNs (identified by a PLMN identity and a CAG-ID), and SNPNs (identified by a PLMN identity and a NID) together in the *PLMN-IdentityInfoList* and *NPN-IdentityInfoList* does not exceed 12, except for the NPN-only cells. A PNI-NPN and SNPN can be included only once, and in only one entry of the *NPN-IdentityInfoList*. In case of NPN-only cells the *PLMN-IdentityList* contains a single element that does not count to the limit of 12. The NPN index is defined as *B+c1+c2+…+c(n-1)+d1+d2+…+d(m-1)+e(i)* for the NPN identity included in the *n*-th entry of *NPN-IdentityInfoList* and in the *m*-th entry of *npn-Identitylist* within that *NPN-IdentityInfoList* entry, and the *i*-th entry of its corresponding *NPN-Identity*, where  - *B* is the index used for the last PLMN in the *PLMN-IdentittyInfoList*; in NPN-only cells *B* is considered 0;  - *c(j)* is the number of NPN index values used in the *j*-th *NPN-IdentityInfoList* entry;  - *d(k)* is the number of NPN index values used in the *k*-th *npn-IdentityList* entry within the *n*-th *NPN-IdentityInfoList* entry;  - e(i) is  - *i* if the *n*-th entry of *NPN-IdentityInfoList* entry is for SNPN(s);  - 1 if the *n*-th entry of *NPN-IdentityInfoList* entry is for PNI-NPN(s). |
| ***plmn-IdentityInfoList***  The *plmn-IdentityInfoList* is used to configure a set of *PLMN-IdentityInfo* elements. Each of those elements contains a list of one or more PLMN Identities and additional information associated with those PLMNs. A PLMN-identity can be included only once, and in only one entry of the *PLMN-IdentityInfoList*. The PLMN index is defined as *b1+b2+…+b(n-1)+i* for the PLMN included at the *n*-th entry of *PLMN-IdentityInfoList* and the *i*-th entry of its corresponding *PLMN-IdentityInfo*, where *b(j)* is the number of *PLMN-Identity* entries in each *PLMN-IdentityInfo*, respectively. |
| ***snpn-AccessInfoList***  This list provides access related information for each SNPN in *npn-IdentityInfoList*, see TS 23.501 [32]. The n-th entry of the list contains the access related information of the n-th SNPN in *npn-IdentityInfoList*. |

|  |
| --- |
| *SNPN-AccessInfo* field descriptions |
| ***extCH-Supported***  Indicates whether the SNPN supports access using credentials from a Credentials Holder as specified in TS 23.501 [32]. |
| ***extCH-WithoutConfigAllowed***  Indicates whether the SNPN allows registration attempts with credentials from a Credentials Holder from UEs that are not explicitly configured to select the SNPN as specified in TS 23.501 [32]. |
| ***imsEmergencySupportForSNPN***  Indicates whether the SNPN supports IMS emergency bearer services for UEs in limited service mode in the cell. If absent, IMS emergency call is not supported by the SNPN in the cell for UEs in limited service mode. |
| ***onboardingEnabled***  Indicates whether the onboarding SNPN allows registration for onboarding in the cell as specified in TS 23.501 [32]. |

#### *– CellAccessRelatedInfo-EUTRA-5GC*

The IE *CellAccessRelatedInfo-EUTRA-5GC* indicates cell access related information for an LTE cell connected to 5GC.

*CellAccessRelatedInfo-EUTRA-5GC* information element

-- ASN1START

-- TAG-CELLACCESSRELATEDINFOEUTRA-5GC-START

CellAccessRelatedInfo-EUTRA-5GC ::= SEQUENCE {

plmn-IdentityList-eutra-5gc PLMN-IdentityList-EUTRA-5GC,

trackingAreaCode-eutra-5gc TrackingAreaCode,

ranac-5gc RAN-AreaCode OPTIONAL,

cellIdentity-eutra-5gc CellIdentity-EUTRA-5GC

}

PLMN-IdentityList-EUTRA-5GC::= SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity-EUTRA-5GC

PLMN-Identity-EUTRA-5GC ::= CHOICE {

plmn-Identity-EUTRA-5GC PLMN-Identity,

plmn-index INTEGER (1..maxPLMN)

}

CellIdentity-EUTRA-5GC ::= CHOICE {

cellIdentity-EUTRA BIT STRING (SIZE (28)),

cellId-index INTEGER (1..maxPLMN)

}

-- TAG-CELLACCESSRELATEDINFOEUTRA-5GC-STOP

-- ASN1STOP

#### *– CellAccessRelatedInfo-EUTRA-EPC*

The IE *CellAccessRelatedInfo-EUTRA-EPC* indicates cell access related information for an LTE cell connected to EPC.

*CellAccessRelatedInfo-EUTRA-EPC* information element

-- ASN1START

-- TAG-CELLACCESSRELATEDINFOEUTRA-EPC-START

CellAccessRelatedInfo-EUTRA-EPC ::= SEQUENCE {

plmn-IdentityList-eutra-epc PLMN-IdentityList-EUTRA-EPC,

trackingAreaCode-eutra-epc BIT STRING (SIZE (16)),

cellIdentity-eutra-epc BIT STRING (SIZE (28))

}

PLMN-IdentityList-EUTRA-EPC::= SEQUENCE (SIZE (1..maxPLMN)) OF PLMN-Identity

-- TAG-CELLACCESSRELATEDINFOEUTRA-EPC-STOP

-- ASN1STOP

#### – *CellGroupConfig*

The *CellGroupConfig* IE is used to configure a master cell group (MCG) or secondary cell group (SCG). A cell group comprises of one MAC entity, a set of logical channels with associated RLC entities and of a primary cell (SpCell) and one or more secondary cells (SCells).

*CellGroupConfig* information element

-- ASN1START

-- TAG-CELLGROUPCONFIG-START

-- Configuration of one Cell-Group:

CellGroupConfig ::= SEQUENCE {

cellGroupId CellGroupId,

rlc-BearerToAddModList SEQUENCE (SIZE(1..maxLC-ID)) OF RLC-BearerConfig OPTIONAL, -- Need N

rlc-BearerToReleaseList SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity OPTIONAL, -- Need N

mac-CellGroupConfig MAC-CellGroupConfig OPTIONAL, -- Need M

physicalCellGroupConfig PhysicalCellGroupConfig OPTIONAL, -- Need M

spCellConfig SpCellConfig OPTIONAL, -- Need M

sCellToAddModList SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellConfig OPTIONAL, -- Need N

sCellToReleaseList SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellIndex OPTIONAL, -- Need N

...,

[[

reportUplinkTxDirectCurrent ENUMERATED {true} OPTIONAL -- Cond BWP-Reconfig

]],

[[

bap-Address-r16 BIT STRING (SIZE (10)) OPTIONAL, -- Need M

bh-RLC-ChannelToAddModList-r16 SEQUENCE (SIZE(1..maxBH-RLC-ChannelID-r16)) OF BH-RLC-ChannelConfig-r16 OPTIONAL, -- Need N

bh-RLC-ChannelToReleaseList-r16 SEQUENCE (SIZE(1..maxBH-RLC-ChannelID-r16)) OF BH-RLC-ChannelID-r16 OPTIONAL, -- Need N

f1c-TransferPath-r16 ENUMERATED {lte, nr, both} OPTIONAL, -- Need M

simultaneousTCI-UpdateList1-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousTCI-UpdateList2-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousSpatial-UpdatedList1-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousSpatial-UpdatedList2-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

uplinkTxSwitchingOption-r16 ENUMERATED {switchedUL, dualUL} OPTIONAL, -- Need R

uplinkTxSwitchingPowerBoosting-r16 ENUMERATED {enabled} OPTIONAL -- Need R

]],

[[

reportUplinkTxDirectCurrentTwoCarrier-r16 ENUMERATED {true} OPTIONAL -- Need N

]],

[[

f1c-TransferPathNRDC-r17 ENUMERATED {mcg, scg, both} OPTIONAL, -- Need M

uplinkTxSwitching-2T-Mode-r17 ENUMERATED {enabled} OPTIONAL, -- Cond 2Tx

uplinkTxSwitching-DualUL-TxState-r17 ENUMERATED {oneT, twoT} OPTIONAL, -- Cond 2Tx

uu-RelayRLC-ChannelToAddModList-r17 SEQUENCE (SIZE(1..maxUu-RelayRLC-ChannelID-r17)) OF Uu-RelayRLC-ChannelConfig-r17

OPTIONAL, -- Need N

uu-RelayRLC-ChannelToReleaseList-r17 SEQUENCE (SIZE(1..maxUu-RelayRLC-ChannelID-r17)) OF Uu-RelayRLC-ChannelID-r17

OPTIONAL, -- Need N

simultaneousU-TCI-UpdateList1-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousU-TCI-UpdateList2-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousU-TCI-UpdateList3-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousU-TCI-UpdateList4-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

rlc-BearerToReleaseListExt-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentityExt-r17 OPTIONAL, -- Need N

iab-ResourceConfigToAddModList-r17 SEQUENCE (SIZE(1..maxNrofIABResourceConfig-r17)) OF IAB-ResourceConfig-r17 OPTIONAL, -- Need N

iab-ResourceConfigToReleaseList-r17 SEQUENCE (SIZE(1..maxNrofIABResourceConfig-r17)) OF IAB-ResourceConfigID-r17 OPTIONAL -- Need N

]]

}

-- Serving cell specific MAC and PHY parameters for a SpCell:

SpCellConfig ::= SEQUENCE {

servCellIndex ServCellIndex OPTIONAL, -- Cond SCG

reconfigurationWithSync ReconfigurationWithSync OPTIONAL, -- Cond ReconfWithSync

rlf-TimersAndConstants SetupRelease { RLF-TimersAndConstants } OPTIONAL, -- Need M

rlmInSyncOutOfSyncThreshold ENUMERATED {n1} OPTIONAL, -- Need S

spCellConfigDedicated ServingCellConfig OPTIONAL, -- Need M

...,

[[

lowMobilityEvaluationConnected-r17 SEQUENCE {

s-SearchDeltaP-Connected-r17 ENUMERATED {dB3, dB6, dB9, dB12, dB15, spare3, spare2, spare1},

t-SearchDeltaP-Connected-r17 ENUMERATED {s5, s10, s20, s30, s60, s120, s180, s240, s300, spare7, spare6, spare5,

spare4, spare3, spare2, spare1}

} OPTIONAL, -- Need R

goodServingCellEvaluationRLM-r17 GoodServingCellEvaluation-r17 OPTIONAL, -- Need R

goodServingCellEvaluationBFD-r17 GoodServingCellEvaluation-r17 OPTIONAL, -- Need R

deactivatedSCG-Config-r17 SetupRelease { DeactivatedSCG-Config-r17 } OPTIONAL -- Cond SCG-Opt

]]

}

ReconfigurationWithSync ::= SEQUENCE {

spCellConfigCommon ServingCellConfigCommon OPTIONAL, -- Need M

newUE-Identity RNTI-Value,

t304 ENUMERATED {ms50, ms100, ms150, ms200, ms500, ms1000, ms2000, ms10000},

rach-ConfigDedicated CHOICE {

uplink RACH-ConfigDedicated,

supplementaryUplink RACH-ConfigDedicated

} OPTIONAL, -- Need N

...,

[[

smtc SSB-MTC OPTIONAL -- Need S

]],

[[

daps-UplinkPowerConfig-r16 DAPS-UplinkPowerConfig-r16 OPTIONAL -- Need N

]],

[[

sl-PathSwitchConfig-r17 SL-PathSwitchConfig-r17 OPTIONAL -- Cond DirectToIndirect-PathSwitch

]]

}

DAPS-UplinkPowerConfig-r16 ::= SEQUENCE {

p-DAPS-Source-r16 P-Max,

p-DAPS-Target-r16 P-Max,

uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

}

SCellConfig ::= SEQUENCE {

sCellIndex SCellIndex,

sCellConfigCommon ServingCellConfigCommon OPTIONAL, -- Cond SCellAdd

sCellConfigDedicated ServingCellConfig OPTIONAL, -- Cond SCellAddMod

...,

[[

smtc SSB-MTC OPTIONAL -- Need S

]],

[[

sCellState-r16 ENUMERATED {activated} OPTIONAL, -- Cond SCellAddSync

secondaryDRX-GroupConfig-r16 ENUMERATED {true} OPTIONAL -- Cond DRX-Config2

]],

[[

preConfGapStatus-r17 BIT STRING (SIZE (maxNrofGapId-r17)) OPTIONAL, -- Cond PreConfigMG

goodServingCellEvaluationBFD-r17 GoodServingCellEvaluation-r17 OPTIONAL, -- Need R

sCellSIB20-r17 SetupRelease { SCellSIB20-r17 } OPTIONAL -- Need M

]]

}

SCellSIB20-r17 ::= OCTET STRING (CONTAINING SystemInformation)

DeactivatedSCG-Config-r17 ::= SEQUENCE {

bfd-and-RLM BOOLEAN,

...

}

GoodServingCellEvaluation-r17 ::= SEQUENCE {

offset-r17 ENUMERATED {db2, db4, db6, db8} OPTIONAL -- Need S

}

SL-PathSwitchConfig-r17 ::= SEQUENCE {

targetRelayUE-Identity-r17 SL-SourceIdentity-r17,

t420-r17 ENUMERATED {ms50, ms100, ms150, ms200, ms500, ms1000, ms2000, ms10000},

...

}

IAB-ResourceConfig-r17 ::= SEQUENCE {

iab-ResourceConfigID-r17 IAB-ResourceConfigID-r17,

slotList-r17 SEQUENCE (SIZE (1..5120)) OF INTEGER (0..5119) OPTIONAL, -- Need M

periodicitySlotList-r17 ENUMERATED {ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, ms20, ms40, ms80, ms160} OPTIONAL, -- Need M

slotListSubcarrierSpacing-r17 SubcarrierSpacing OPTIONAL, -- Need M

...

}

IAB-ResourceConfigID-r17 ::= INTEGER(0..maxNrofIABResourceConfig-1-r17)

-- TAG-CELLGROUPCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CellGroupConfig* field descriptions |
| ***bap-Address***  BAP address of the parent node in cell group. |
| ***bh-RLC-ChannelToAddModList***  Configuration of the backhaul RLC entities and the corresponding MAC Logical Channels to be added and modified. |
| ***bh-RLC-ChannelToReleaseList***  List of the backhaul RLC entities and the corresponding MAC Logical Channels to be released. |
| ***f1c-TransferPath***  The F1-C transfer path that an EN-DC IAB-MT should use for transferring F1-C packets to the IAB-donor-CU. If IAB-MT is configured with *lte*, IAB-MT can only use LTE leg for F1-C transfer. If IAB-MT is configured with *nr*, IAB-MT can only use NR leg for F1-C transfer. If IAB-MT is configured with *both*, it is up to IAB-MT to select an LTE leg or a NR leg for F1-C transfer. If the field is not configured, the IAB node uses the NR leg as the default one. |
| ***f1c-TransferPathNRDC***  The F1-C transfer path that an NR-DC IAB-MT should use for transferring F1-C packets to the IAB-donor-CU. If IAB-MT is configured with *mcg*, IAB-MT can only use the MCG for F1-C transfer. If IAB-MT is configured with *scg*, IAB-MT can only use the SCG for F1-C transfer. If IAB-MT is configured with *both*, it is up to IAB-MT to select the MCG or the SCG for F1-C transfer. |
| ***mac-CellGroupConfig***  MAC parameters applicable for the entire cell group. |
| ***rlc-BearerToAddModList***  Configuration of the MAC Logical Channel, the corresponding RLC entities and association with radio bearers. |
| ***reportUplinkTxDirectCurrent***  Enables reporting of uplink and supplementary uplink Direct Current location information upon BWP configuration and reconfiguration. This field is only present when the BWP configuration is modified or any serving cell is added or removed. This field is absent in the IE *CellGroupConfig* when provided as part of *RRCSetup* message. If UE is configured with SUL carrier, UE reports both UL and SUL Direct Current locations. |
| ***reportUplinkTxDirectCurrentTwoCarrier***  Enables reporting of uplink Direct Current location information when the UE is configured with uplink intra-band CA with two carriers. This field is absent in the IE *CellGroupConfig* when provided as part of *RRCSetup* message. |
| ***rlc-BearerToReleaseListExt***  List of the RLC entities and the corresponding MAC Logical Channels to be released for multicast MRBs. |
| ***rlmInSyncOutOfSyncThreshold***  BLER threshold pair index for IS/OOS indication generation, see TS 38.133 [14], table 8.1.1-1. *n1* corresponds to the value 1. When the field is absent, the UE applies the value 0. Whenever this is reconfigured, UE resets N310 and N311, and stops T310, if running. Network does not include this field. |
| ***sCellSIB20***  This field is used to transfer *SIB20* of the SCell in order to allow the UE for MBS broadcast reception on SCell. The network configures this field only for a single SCell at a time. |
| ***sCellState***  Indicates whether the SCell shall be considered to be in activated state upon SCell configuration. If the field is included for an SCell configured with TRS for fast activation of the SCell, such TRS is not used for the corresponding SCell. |
| ***sCellToAddModList***  List of secondary serving cells (SCells) to be added or modified. |
| ***sCellToReleaseList***  List of secondary serving cells (SCells) to be released. |
| ***secondaryDRX-GroupConfig***  The field is used to indicate whether the SCell belongs to the secondary DRX group. All serving cells in the secondary DRX group shall belong to one Frequency Range and all serving cells in the legacy DRX group shall belong to another Frequency Range. |
| ***simultaneousSpatial-UpdatedList1, simultaneousSpatial-UpdatedList2***  List of serving cells which can be updated simultaneously for spatial relation with a MAC CE. The *simultaneousSpatial-UpdatedList1* and *simultaneousSpatial-UpdatedList2* shall not contain same serving cells. Network should not configure serving cells that are configured with a BWP with two different values for the *coresetPoolIndex* in these lists. |
| ***simultaneousTCI-UpdateList1, simultaneousTCI-UpdateList2***  List of serving cells which can be updated simultaneously for TCI relation with a MAC CE. The *simultaneousTCI-UpdateList1* and *simultaneousTCI-UpdateList2* shall not contain same serving cells. Network should not configure serving cells that are configured with a BWP with two different values for the *coresetPoolIndex* in these lists. |
| ***simultaneousU-TCI-UpdateList1, simultaneousU-TCI-UpdateList2, simultaneousU-TCI-UpdateList3, simultaneousU-TCI-UpdateList4***  List of serving cells for which the Unified TCI States Activation/Deactivation MAC CE applies simultaneously, as specified in TS 38.321 [3] clause 6.1.3.47. The different lists shall not contain same serving cells. Network only configures in these lists serving cells that are configured with *unifiedtci-StateType*. |
| ***spCellConfig***  Parameters for the SpCell of this cell group (PCell of MCG or PSCell of SCG). |
| ***uplinkTxSwitchingOption***  Indicates which option is configured for dynamic UL Tx switching for inter-band UL CA or (NG)EN-DC. The field is set to *switchedUL* if network configures option 1 as specified in TS 38.214 [19], or *dualUL* if network configures option 2 as specified in TS 38.214 [19]. Network always configures UE with a value for this field in inter-band UL CA case and (NG)EN-DC case where UE supports dynamic UL Tx switching. |
| ***uplinkTxSwitchingPowerBoosting***  Indicates whether the UE is allowed to enable 3dB boosting on the maximum output power for transmission on carrier2 under the operation state in which 2-port transmission can be supported on carrier2 for inter-band UL CA case with dynamic UL Tx switching as defined in TS 38.101-1 [15]. Network can only configure this field for dynamic UL Tx switching in inter-band UL CA case with power Class 3 as defined in TS 38.101-1 [15]. |
| ***uplinkTxSwitching-2T-Mode***  Indicates 2Tx-2Tx switching mode is configured for inter-band UL CA or SUL, in which the switching gap duration for a triggered uplink switching (as specified in TS 38.214 [19]) is equal to the switching time capability value reported for the switching mode.  If this field is absent and *uplinkTxSwitching* is configured, it is interpreted that 1Tx-2Tx UL Tx switching is configured as specified in TS 38.214 [19]. In this case, there is one uplink (or one uplink band in case of intra-band) configured with *uplinkTxSwitching*, on which the maximum number of antenna ports among all configured P-SRS/A-SRS and activated SP-SRS resources should be 1 and non-codebook based UL MIMO is not configured. |
| ***uplinkTxSwitching-DualUL-TxState***  Indicates the state of Tx chains if the state of Tx chains after the UL Tx switching is not unique (as specified in TS 38.214 [19]) in case of 2Tx-2Tx switching is configured and *uplinkTxSwitchingOption* is set to *dualUL*. Value *oneT* indicates 1Tx is assumed to be supported on the carriers on each band, value *twoT* indicates 2Tx is assumed to be supported on that carrier. |
| ***uu-RelayRLC-ChannelToAddModList***  List of the Uu RLC entities and the corresponding MAC Logical Channels to be added or modified. |
| ***uu-RelayRLC-ChannelToReleaseList***  List of the Uu RLC entities and the corresponding MAC Logical Channels to be released. |

|  |
| --- |
| *DeactivatedSCG-Config* field descriptions |
| ***bfd-and-RLM***  If the field is set to *true*, the UE shall perform RLM and BFD on the PSCell when the SCG is deactivated. If set to *false*, the UE is not required to perform RLM and BFD on the PSCell when the SCG is deactivated. |

|  |
| --- |
| *DAPS-UplinkPowerConfig* field descriptions |
| ***p-DAPS-Source***  The maximum total transmit power to be used by the UE in the source cell group during DAPS handover. |
| ***p-DAPS-Target***  The maximum total transmit power to be used by the UE in the target cell group during DAPS handover. |
| ***uplinkPowerSharingDAPS-Mode***  Indicates the uplink power sharing mode that the UE uses in DAPS handover (see TS 38.213 [13]). |

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| --- |
| *GoodServingCellEvaluation* field descriptions |
| ***offset***  The parameter "X" (dB) for the good serving cell quality criterion in RRC\_CONNECTED, for a cell operating in FR1 and FR2, respectively. If this field is absent, the UE applies the (default) value of 0 dB for "X". |

|  |
| --- |
| *IAB-ResourceConfig* field descriptions |
| ***IAB-ResourceConfigID***  This ID is used to indicate the specific resource configuration addressed by the MAC CEs specified in TS 38.321 [3]. |
| ***periodicitySlotList***  Indicates the periodicity in ms of the list of slot indexes indicated in *slotList*. |
| ***slotList***  Indicates the list of slot indexes to which the information indicated in the specific MAC CE applies to, as specified in TS 38.321 [3]. The values of the entries in the *slotList* are strictly less than the value of the *periodicitySlotList*. |
| ***slotListSubcarrierSpacing***  Subcarrier spacing used as reference for the *slotList* configuration.  Only the following values are applicable depending on the used frequency:  FR1: 15 or 30 kHz  FR2-1: 60 or 120 kHz  FR2-2: 120 or 480 kHz |

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| --- |
| *ReconfigurationWithSync* field descriptions |
| ***rach-ConfigDedicated***  Random access configuration to be used for the reconfiguration with sync (e.g. handover). The UE performs the RA according to these parameters in the *firstActiveUplinkBWP* (see *UplinkConfig*). |
| ***smtc***  The SSB periodicity/offset/duration configuration of target cell for NR PSCell change and NR PCell change. The network sets the *periodicityAndOffset* to indicate the same periodicity as *ssb-periodicityServingCell* in *spCellConfigCommon*.  For case of NR PCell change, the *smtc* is based on the timing reference of (source) PCell. For case of NR PSCell change, it is based on the timing reference of source PSCell.  If both this field and *targetCellSMTC-SCG* are absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. For a RedCap UE, if the first active DL BWP included in this RRC message is configured with *nonCellDefiningSSB-r17*, this field corresponds to the NCD-SSB indicated by *nonCellDefiningSSB-r17*, otherwise, this field corresponds to the CD-SSB indicated by *absoluteFrequencySSB* in *frequencyInfoDL*. |

|  |
| --- |
| *SCellConfig* field descriptions |
| ***goodServingCellEvaluationBFD***  Indicates the criterion for a UE to detect the good serving cell quality for BFD relaxation in an SCell in RRC\_CONNECTED. This field is always configured when the network enables BFD relaxation for the UE in this SCell. |
| ***preConfGapStatus***  Indicates whether the pre-configured measurement gaps (i.e. the gaps configured with *preConfigInd*) are activated or deactivated while this SCell is deactivated. If this field is configured, the UE shall apply network-controlled mechanism for activation and deactivation of the pre-configured measurement gaps, otherwise the UE shall apply the autonomous activation/deactivation mechanism, as specified in TS 38.133 [14]. The first/leftmost bit corresponds to the measurement gap with gap ID 1, the second bit corresponds to measurement gap with gap ID 2, and so on. Value 0 indicates that the corresponding pre-configured measurement gap is deactivated while value 1 indicates that the corresponding pre-configured measurement gap is activated. The UE shall ignore the bit if the corresponding measurement gap is not a pre-configured measurement gap. |
| ***smtc***  The SSB periodicity/offset/duration configuration of target cell for NR SCell addition. The network sets the *periodicityAndOffset* to indicate the same periodicity as *ssb-periodicityServingCell* in *sCellConfigCommon*. The *smtc* is based on the timing of the SpCell of associated cell group. In case of inter-RAT handover to NR, the timing reference is the NR PCell. In case of intra-NR PCell change (standalone NR) or NR PSCell change (EN-DC), the timing reference is the target SpCell. If the field is absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |

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| --- |
| *SpCellConfig* field descriptions |
| ***deactivated-SCG-Config***  Configuration applicable when the SCG is deactivated. The network always configures this field before or when indicating that the SCG is deactivated in an *RRCReconfiguration*, *RRCResume*, E-UTRA *RRCConnectionReconfiguration* or E-UTRA *RRCConnectionResume* message. |
| ***goodServingCellEvaluationBFD***  Indicates the criterion for a UE to detect the good serving cell quality for BFD relaxation in the SpCell in RRC\_CONNECTED. The field is always configured when the network enables BFD relaxation for the UE in this SpCell. |
| ***goodServingCellEvaluationRLM***  Indicates the criterion for a UE to detect the good serving cell quality for RLM relaxation in the SpCell in RRC\_CONNECTED. The field is always configured when the network enables RLM relaxation for the UE in this SpCell. |
| ***lowMobilityEvaluationConnected***  Indicates the criterion for a UE to detect low mobility in RRC\_CONNECTED in an SpCell. The *s-SearchDeltaP-Connected* is the parameter "SSearchDeltaP-connected". Value *dB*3 corresponds to 3 dB, *dB*6 corresponds to 6 dB and so on. The *t-SearchDeltaP-Connected* is the parameter "TSearchDeltaP-Connected". Value *s5* means 5 seconds, value *s10* means 10 seconds and so on. Low mobility criterion is configured in NR PCell for the case of NR SA/ NR CA/ NE-DC/NR-DC, and in the NR PSCell for the case of EN-DC. |
| ***reconfigurationWithSync***  Parameters for the synchronous reconfiguration to the target SpCell. |
| ***rlf-TimersAndConstants***  Timers and constants for detecting and triggering cell-level radio link failure. For the SCG, *rlf-TimersAndConstants* can only be set to *setup* and is always included at SCG addition. |
| ***servCellIndex***  Serving cell ID of a PSCell. The PCell of the Master Cell Group uses ID = 0. |

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| --- |
| *SL-PathSwitchConfig* field descriptions |
| ***targetRelayUE-Identity***  Indicates the L2 source ID of the target L2 U2N Relay UE during path switch. |
| ***T420***  Indicates the timer value of T420 to be used during path switch. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *2Tx* | The field is optionally present, Need R, if *uplinkTxSwitching* is configured; otherwise it is absent, Need R. |
| *BWP-Reconfig* | The field is optionally present, Need N, if the BWPs are reconfigured or if serving cells are added or removed. Otherwise it is absent. |
| *DirectToIndirect-PathSwitch* | The field is mandatory present for the L2 U2N remote UE at path switch to the target L2 U2N Relay UE. It is absent otherwise. |
| *DRX-Config2* | The field is optionally present, Need N, if *drx-ConfigSecondaryGroup* is configured. It is absent otherwise. |
| *PreConfigMG* | The field is optionally present, Need R, if there is at least one per UE gap configured with *preConfigInd* or there is at least one per FR gap of the same FR which the SCell belongs to and configured with *preConfigInd*. It is absent, Need R, otherwise. |
| *ReconfWithSync* | The field is mandatory present in the *RRCReconfiguration* message:  - in each configured *CellGroupConfig* for which the SpCell changes,  - in the *masterCellGroup:*  - at change of AS security key derived from KgNB,  - in an *RRCReconfiguration* message contained in a *DLInformationTransferMRDC* message,  - path switch of L2 U2N remote UE to the target PCell,  - path switch of L2 U2N remote UE to the target L2 U2N Relay UE,  - in the *secondaryCellGroup* at:  - PSCell addition,  - SCG resume with NR-DC or (NG)EN-DC,  - update of required SI for PSCell,  - change of AS security key derived from S-KgNB in NR-DC while the UE is configured with at least one radio bearer with *keyToUse* set to *secondary* and that is not released by this *RRCReconfiguration* message,  - MN handover in (NG)EN-DC.  Otherwise, it is optionally present, need M. The field is absent in the *masterCellGroup* in *RRCResume* and *RRCSetup* messages and is absent in the *masterCellGroup* in *RRCReconfiguration* messages if source configuration is not released during DAPS handover. |
| *SCellAdd* | The field is mandatory present upon SCell addition; otherwise it is absent, Need M. |
| *SCellAddMod* | The field is mandatory present upon SCell addition; otherwise it is optionally present, need M. |
| *SCellAddSync* | The field is optionally present, Need N, in the *masterCellGroup* and, if the SCG is not indicated as deactivated, in the *secondaryCellGroup* in case of SCell addition, reconfiguration with sync, and resuming an RRC connection. It is absent otherwise. |
| *SCG* | The field is mandatory present in an *SpCellConfig* for the PSCell. It is absent otherwise. |
| *SCG-Opt* | The field is optionally present, Need M, in an SpCellConfig for the PSCell. It is absent otherwise. |

NOTE: In case of change of AS security key derived from S-KgNB/S-KeNB, if *reconfigurationWithSync* is not included in the *masterCellGroup*, the network releases all existing MCG RLC bearers associated with a radio bearer with *keyToUse* set to *secondary*. In case of change of AS security key derived from KgNB/KeNB, if *reconfigurationWithSync* is not included in the *secondaryCellGroup*, the network releases all existing SCG RLC bearers associated with a radio bearer with *keyToUse* set to *primary*.

#### – *CellGroupId*

The IE *CellGroupId* is used to identify a cell group. Value 0 identifies the master cell group. Other values identify secondary cell groups. In this version of the specification only values 0 and 1 are supported.

*CellGroupId* information element

-- ASN1START

-- TAG-CELLGROUPID-START

CellGroupId ::= INTEGER (0.. maxSecondaryCellGroups)

-- TAG-CELLGROUPID-STOP

-- ASN1STOP

#### – *CellIdentity*

The IE *CellIdentity* is used to unambiguously identify a cell within a PLMN/SNPN.

*CellIdentity* information element

-- ASN1START

-- TAG-CELLIDENTITY-START

CellIdentity ::= BIT STRING (SIZE (36))

-- TAG-CELLIDENTITY-STOP

-- ASN1STOP

#### – *CellReselectionPriority*

The IE *CellReselectionPriority* concerns the absolute priority of the concerned carrier frequency, as used by the cell reselection procedure. Corresponds to parameter "priority" in TS 38.304 [20]. Value 0 means lowest priority. The UE behaviour for the case the field is absent, if applicable, is specified in TS 38.304 [20].

*CellReselectionPriority* information element

-- ASN1START

-- TAG-CELLRESELECTIONPRIORITY-START

CellReselectionPriority ::= INTEGER (0..7)

-- TAG-CELLRESELECTIONPRIORITY-STOP

-- ASN1STOP

#### – *CellReselectionSubPriority*

The IE *CellReselectionSubPriority* indicates a fractional value to be added to the value of *cellReselectionPriority* to obtain the absolute priority of the concerned carrier frequency for E-UTRA and NR. Value *oDot2* corresponds to 0.2, value *oDot4* corresponds to 0.4 and so on.

*CellReselectionSubPriority* information element

-- ASN1START

-- TAG-CELLRESELECTIONSUBPRIORITY-START

CellReselectionSubPriority ::= ENUMERATED {oDot2, oDot4, oDot6, oDot8}

-- TAG-CELLRESELECTIONSUBPRIORITY-STOP

-- ASN1STOP

#### – *CFR-ConfigMulticast*

The IE *CFR-ConfigMulticast* indicates UE specific common frequency resource configuration for multicast for one dedicated BWP.

*CFR-ConfigMulticast* information element

-- ASN1START

-- TAG-CFR-CONFIGMULTICAST-START

CFR-ConfigMulticast-r17::= SEQUENCE {

locationAndBandwidthMulticast-r17 INTEGER (0..37949) OPTIONAL, -- Need S

pdcch-ConfigMulticast-r17 PDCCH-Config OPTIONAL, -- Need M

pdsch-ConfigMulticast-r17 PDSCH-Config OPTIONAL, -- Need M

sps-ConfigMulticastToAddModList-r17 SPS-ConfigMulticastToAddModList-r17 OPTIONAL, -- Need N

sps-ConfigMulticastToReleaseList-r17 SPS-ConfigMulticastToReleaseList-r17 OPTIONAL -- Need N

}

SPS-ConfigMulticastToAddModList-r17 ::= SEQUENCE (SIZE (1..8)) OF SPS-Config

SPS-ConfigMulticastToReleaseList-r17 ::= SEQUENCE (SIZE (1..8)) OF SPS-ConfigIndex-r16

-- TAG-CFR-CONFIGMULTICAST-STOP

-- ASN1STOP

| *CFR-ConfigMulticast* field descriptions |
| --- |
| ***locationAndBandwidthMulticast***  Frequency domain location and bandwidth for MBS multicast. The value of the field shall be interpreted as resource indicator value (RIV) as defined TS 38.214 [19] with assumptions as described in TS 38.213 [13], clause 12, i.e. setting N^size\_BWP=275. The first PRB is a PRB determined by subcarrierSpacing of the associated BWP and offsetToCarrier corresponding to this subcarrier spacing. If not configured, the UE applies the value of locationAndBandwidth of the DL BWP in which the cfr-ConfigMulticast is configured. |
| ***pdcch-ConfigMulticast***  UE specific group-common PDCCH configuration for MBS multicast for one CFR. |
| ***pdsch-ConfigMulticast***  UE specific group-common PDSCH configuration for MBS multicast for one CFR. |
| ***sps-ConfigMulticastToAddModList***  Indicates a list of one or more DL SPS configurations for MBS multicast. |
| ***sps-ConfigMulticastToReleaseList***  Indicates a list of one or more DL SPS configurations to be released. The NW may release a SPS configuration at any time. |

#### *– CGI-InfoEUTRA*

The IE CGI-InfoEUTRA indicates EUTRA cell access related information, which is reported by the UE as part of E-UTRA report CGI procedure.

*CGI-InfoEUTRA* information element

-- ASN1START

-- TAG-CGI-INFOEUTRA-START

CGI-InfoEUTRA ::= SEQUENCE {

cgi-info-EPC SEQUENCE {

cgi-info-EPC-legacy CellAccessRelatedInfo-EUTRA-EPC,

cgi-info-EPC-list SEQUENCE (SIZE (1..maxPLMN)) OF CellAccessRelatedInfo-EUTRA-EPC OPTIONAL

} OPTIONAL,

cgi-info-5GC SEQUENCE (SIZE (1..maxPLMN)) OF CellAccessRelatedInfo-EUTRA-5GC OPTIONAL,

freqBandIndicator FreqBandIndicatorEUTRA,

multiBandInfoList MultiBandInfoListEUTRA OPTIONAL,

freqBandIndicatorPriority ENUMERATED {true} OPTIONAL

}

-- TAG-CGI-INFOEUTRA-STOP

-- ASN1STOP

#### *– CGI-InfoEUTRALogging*

The IE CGI-InfoEUTRALogging indicates EUTRA cell related information, which is reported by the UE as part of RLF reporting procedure.

*CGI-InfoEUTRALogging* information element

-- ASN1START

-- TAG-CGI-INFOEUTRALOGGING-START

CGI-InfoEUTRALogging ::= SEQUENCE {

plmn-Identity-eutra-5gc PLMN-Identity OPTIONAL,

trackingAreaCode-eutra-5gc TrackingAreaCode OPTIONAL,

cellIdentity-eutra-5gc BIT STRING (SIZE (28)) OPTIONAL,

plmn-Identity-eutra-epc PLMN-Identity OPTIONAL,

trackingAreaCode-eutra-epc BIT STRING (SIZE (16)) OPTIONAL,

cellIdentity-eutra-epc BIT STRING (SIZE (28)) OPTIONAL

}

-- TAG-CGI-INFOEUTRALOGGING-STOP

-- ASN1STOP

|  |
| --- |
| *CGI-InfoEUTRALogging* field descriptions |
| ***cellIdentity-eutra-epc, cellIdentity-eutra-5GC***  Unambiguously identify a cell within the context of the PLMN. It belongs the first PLMN entry of *plmn-IdentityList* (when connected to EPC) or of *plmn-IdentityList-r15* (when connected to 5GC) in *SystemInformationBlockType1*. |
| ***plmn-Identity-eutra-epc, plmn-Identity-eutra-5GC***  Identifies the PLMN of the cell for the reported *cellIdentity*: the first PLMN entry of *plmn-IdentityList* (when connected to EPC) or of *plmn-IdentityList-r15* (when connected to 5GC) in *SystemInformationBlockType1* that contained the reported *cellIdentity*. |
| ***trackingAreaCode-eutra-epc, trackingAreaCode-eutra-5gc***  Indicates Tracking Area Code to which the cell indicated by *cellIdentity-eutra-epc, cellIdentity-eutra-5GC* belongs. |

#### *– CGI-InfoNR*

The IE *CGI-InfoNR* indicates cell access related information, which is reported by the UE as part of report CGI procedure.

*CGI-InfoNR* information element

-- ASN1START

-- TAG-CGI-INFO-NR-START

CGI-InfoNR ::= SEQUENCE {

plmn-IdentityInfoList PLMN-IdentityInfoList OPTIONAL,

frequencyBandList MultiFrequencyBandListNR OPTIONAL,

noSIB1 SEQUENCE {

ssb-SubcarrierOffset INTEGER (0..15),

pdcch-ConfigSIB1 PDCCH-ConfigSIB1

} OPTIONAL,

...,

[[

npn-IdentityInfoList-r16 NPN-IdentityInfoList-r16 OPTIONAL

]],

[[

cellReservedForOtherUse-r16 ENUMERATED {true} OPTIONAL

]]

}

-- TAG-CGI-INFO-NR-STOP

-- ASN1STOP

| *CGI-InfoNR* field descriptions |
| --- |
| ***noSIB1***  Contains *ssb-SubcarrierOffset* and *pdcch-ConfigSIB1* fields acquired by the UE from *MIB* of the cell for which report CGI procedure was requested by the network in case *SIB1* was not broadcast by the cell. |
| ***cellReservedForOtherUse***  Contains *cellReservedForOtherUse* field acquired by the UE that supports *nr-CGI-Reporting-NPN* from *SIB1* of the cell for which report CGI procedure was requested by the network. |

#### – *CGI-Info-Logging*

The IE *CGI-Info-Logging* indicates the NR Cell Global Identifier (NCGI) for logging purposes (e.g. RLF report), the globally unique identity, and the TAC information of a cell in NR.

*CGI-Info-Logging* information element

-- ASN1START

-- TAG-CGI-INFO-LOGGING-START

CGI-Info-Logging-r16 ::= SEQUENCE {

plmn-Identity-r16 PLMN-Identity,

cellIdentity-r16 CellIdentity,

trackingAreaCode-r16 TrackingAreaCode OPTIONAL

}

-- TAG-CGI-INFO-LOGGING-STOP

-- ASN1STOP

|  |
| --- |
| *CGI-Info-Logging* field descriptions |
| ***cellIdentity***  Unambiguously identify a cell within the context of the PLMN. It belongs the first *PLMN-IdentityInfo* IE of *PLMN-IdentityInfoList* in *SIB1*. |
| ***plmn-Identity***  Identifies the PLMN of the cell for the reported *cellIdentity*: the first PLMN entry of *plmn-IdentityList* (in SIB1) in the instance of *PLMN-IdentityInfoList* that contained the reported *cellIdentity*. |
| ***trackingAreaCode***  Indicates Tracking Area Code to which the cell indicated by cellIdentity field belongs. |

#### – *CLI-RSSI-Range*

The IE *CLI-RSSI-Range* specifies the value range used in CLI-RSSI measurements and thresholds. The integer value for CLI-RSSI measurements is according to Table 10.1.22.2.2-1 in TS 38.133 [14].

*CLI-RSSI-Range* information element

-- ASN1START

-- TAG-CLI-RSSI-RANGE-START

CLI-RSSI-Range-r16 ::= INTEGER(0..76)

-- TAG-CLI-RSSI-RANGE-STOP

-- ASN1STOP

#### – *CodebookConfig*

The IE *CodebookConfig* is used to configure codebooks of Type-I and Type-II (see TS 38.214 [19], clause 5.2.2.2)

*CodebookConfig* information element

-- ASN1START

-- TAG-CODEBOOKCONFIG-START

CodebookConfig ::= SEQUENCE {

codebookType CHOICE {

type1 SEQUENCE {

subType CHOICE {

typeI-SinglePanel SEQUENCE {

nrOfAntennaPorts CHOICE {

two SEQUENCE {

twoTX-CodebookSubsetRestriction BIT STRING (SIZE (6))

},

moreThanTwo SEQUENCE {

n1-n2 CHOICE {

two-one-TypeI-SinglePanel-Restriction BIT STRING (SIZE (8)),

two-two-TypeI-SinglePanel-Restriction BIT STRING (SIZE (64)),

four-one-TypeI-SinglePanel-Restriction BIT STRING (SIZE (16)),

three-two-TypeI-SinglePanel-Restriction BIT STRING (SIZE (96)),

six-one-TypeI-SinglePanel-Restriction BIT STRING (SIZE (24)),

four-two-TypeI-SinglePanel-Restriction BIT STRING (SIZE (128)),

eight-one-TypeI-SinglePanel-Restriction BIT STRING (SIZE (32)),

four-three-TypeI-SinglePanel-Restriction BIT STRING (SIZE (192)),

six-two-TypeI-SinglePanel-Restriction BIT STRING (SIZE (192)),

twelve-one-TypeI-SinglePanel-Restriction BIT STRING (SIZE (48)),

four-four-TypeI-SinglePanel-Restriction BIT STRING (SIZE (256)),

eight-two-TypeI-SinglePanel-Restriction BIT STRING (SIZE (256)),

sixteen-one-TypeI-SinglePanel-Restriction BIT STRING (SIZE (64))

},

typeI-SinglePanel-codebookSubsetRestriction-i2 BIT STRING (SIZE (16)) OPTIONAL -- Need R

}

},

typeI-SinglePanel-ri-Restriction BIT STRING (SIZE (8))

},

typeI-MultiPanel SEQUENCE {

ng-n1-n2 CHOICE {

two-two-one-TypeI-MultiPanel-Restriction BIT STRING (SIZE (8)),

two-four-one-TypeI-MultiPanel-Restriction BIT STRING (SIZE (16)),

four-two-one-TypeI-MultiPanel-Restriction BIT STRING (SIZE (8)),

two-two-two-TypeI-MultiPanel-Restriction BIT STRING (SIZE (64)),

two-eight-one-TypeI-MultiPanel-Restriction BIT STRING (SIZE (32)),

four-four-one-TypeI-MultiPanel-Restriction BIT STRING (SIZE (16)),

two-four-two-TypeI-MultiPanel-Restriction BIT STRING (SIZE (128)),

four-two-two-TypeI-MultiPanel-Restriction BIT STRING (SIZE (64))

},

ri-Restriction BIT STRING (SIZE (4))

}

},

codebookMode INTEGER (1..2)

},

type2 SEQUENCE {

subType CHOICE {

typeII SEQUENCE {

n1-n2-codebookSubsetRestriction CHOICE {

two-one BIT STRING (SIZE (16)),

two-two BIT STRING (SIZE (43)),

four-one BIT STRING (SIZE (32)),

three-two BIT STRING (SIZE (59)),

six-one BIT STRING (SIZE (48)),

four-two BIT STRING (SIZE (75)),

eight-one BIT STRING (SIZE (64)),

four-three BIT STRING (SIZE (107)),

six-two BIT STRING (SIZE (107)),

twelve-one BIT STRING (SIZE (96)),

four-four BIT STRING (SIZE (139)),

eight-two BIT STRING (SIZE (139)),

sixteen-one BIT STRING (SIZE (128))

},

typeII-RI-Restriction BIT STRING (SIZE (2))

},

typeII-PortSelection SEQUENCE {

portSelectionSamplingSize ENUMERATED {n1, n2, n3, n4} OPTIONAL, -- Need R

typeII-PortSelectionRI-Restriction BIT STRING (SIZE (2))

}

},

phaseAlphabetSize ENUMERATED {n4, n8},

subbandAmplitude BOOLEAN,

numberOfBeams ENUMERATED {two, three, four}

}

}

}

CodebookConfig-r16 ::= SEQUENCE {

codebookType CHOICE {

type2 SEQUENCE {

subType CHOICE {

typeII-r16 SEQUENCE {

n1-n2-codebookSubsetRestriction-r16 CHOICE {

two-one BIT STRING (SIZE (16)),

two-two BIT STRING (SIZE (43)),

four-one BIT STRING (SIZE (32)),

three-two BIT STRING (SIZE (59)),

six-one BIT STRING (SIZE (48)),

four-two BIT STRING (SIZE (75)),

eight-one BIT STRING (SIZE (64)),

four-three BIT STRING (SIZE (107)),

six-two BIT STRING (SIZE (107)),

twelve-one BIT STRING (SIZE (96)),

four-four BIT STRING (SIZE (139)),

eight-two BIT STRING (SIZE (139)),

sixteen-one BIT STRING (SIZE (128))

},

typeII-RI-Restriction-r16 BIT STRING (SIZE(4))

},

typeII-PortSelection-r16 SEQUENCE {

portSelectionSamplingSize-r16 ENUMERATED {n1, n2, n3, n4},

typeII-PortSelectionRI-Restriction-r16 BIT STRING (SIZE (4))

}

},

numberOfPMI-SubbandsPerCQI-Subband-r16 INTEGER (1..2),

paramCombination-r16 INTEGER (1..8)

}

}

}

CodebookConfig-r17 ::= SEQUENCE {

codebookType CHOICE {

type1 SEQUENCE {

typeI-SinglePanel-Group1-r17 SEQUENCE {

nrOfAntennaPorts CHOICE {

two SEQUENCE {

twoTX-CodebookSubsetRestriction1-r17 BIT STRING (SIZE (6))

},

moreThanTwo SEQUENCE {

n1-n2 CHOICE {

two-one-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (8)),

two-two-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (64)),

four-one-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (16)),

three-two-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (96)),

six-one-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (24)),

four-two-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (128)),

eight-one-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (32)),

four-three-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (192)),

six-two-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (192)),

twelve-one-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (48)),

four-four-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (256)),

eight-two-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (256)),

sixteen-one-TypeI-SinglePanel-Restriction1-r17 BIT STRING (SIZE (64))

}

}

}

} OPTIONAL, -- Need R

typeI-SinglePanel-Group2-r17 SEQUENCE {

nrOfAntennaPorts CHOICE {

two SEQUENCE {

twoTX-CodebookSubsetRestriction2-r17 BIT STRING (SIZE (6))

},

moreThanTwo SEQUENCE {

n1-n2 CHOICE {

two-one-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (8)),

two-two-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (64)),

four-one-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (16)),

three-two-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (96)),

six-one-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (24)),

four-two-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (128)),

eight-one-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (32)),

four-three-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (192)),

six-two-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (192)),

twelve-one-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (48)),

four-four-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (256)),

eight-two-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (256)),

sixteen-one-TypeI-SinglePanel-Restriction2-r17 BIT STRING (SIZE (64))

}

}

}

} OPTIONAL, -- Need R

typeI-SinglePanel-ri-RestrictionSTRP-r17 BIT STRING (SIZE (8)) OPTIONAL, -- Need R

typeI-SinglePanel-ri-RestrictionSDM-r17 BIT STRING (SIZE (4)) OPTIONAL -- Need R

},

type2 SEQUENCE {

typeII-PortSelection-r17 SEQUENCE {

paramCombination-r17 INTEGER (1..8),

valueOfN-r17 ENUMERATED {n2, n4} OPTIONAL, -- Need R

numberOfPMI-SubbandsPerCQI-Subband-r17 INTEGER(1..2) OPTIONAL, -- Need R

typeII-PortSelectionRI-Restriction-r17 BIT STRING (SIZE (4))

}

}

}

}

-- TAG-CODEBOOKCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CodebookConfig* field descriptions |
| ***codebookMode***  CodebookMode as specified in TS 38.214 [19], clause 5.2.2.2.2. |
| ***codebookType***  CodebookType including possibly sub-types and the corresponding parameters for each (see TS 38.214 [19], clause 5.2.2.2). |
| ***n1-n2-codebookSubsetRestriction***  Number of antenna ports in first (*n1*) and second (*n2*) dimension and codebook subset restriction (see TS 38.214 [19] clause 5.2.2.2.3).  Number of bits for codebook subset restriction is CEIL(log2(nchoosek(O1\*O2,4)))+8\*n1\*n2 where nchoosek(a,b) = a!/(b!(a-b)!). |
| ***n1-n2***  Number of antenna ports in first (n1) and second (n2) dimension and codebook subset restriction (see TS 38.214 [19] clause 5.2.2.2.1). |
| ***ng-n1-n2***  Codebook subset restriction for Type I Multi-panel codebook (see TS 38.214 [19], clause 5.2.2.2.2). |
| ***numberOfBeams***  Number of beams, L, used for linear combination. |
| ***numberOfPMI-SubbandsPerCQI-Subband***  Field indicates how PMI subbands are defined per CQI subband according to TS 38.214 [19], clause 5.2.2.2.5, and 5.2.2.2.7. |
| ***paramCombination***  Field describes supported parameter combination (*M, ,* ) as specified in TS 38.214. |
| ***phaseAlphabetSize***  The size of the PSK alphabet, QPSK or 8-PSK. |
| ***portSelectionSamplingSize***  The size of the port selection codebook (parameter d), see TS 38.214 [19] clause 5.2.2.2.6. |
| ***ri-Restriction***  Restriction for RI for *TypeI-MultiPanel-RI-Restriction* (see TS 38.214 [19], clause 5.2.2.2.2). |
| ***subbandAmplitude***  If subband amplitude reporting is activated (*true*). |
| ***twoTX-CodebookSubsetRestriction***  Codebook subset restriction for 2TX codebook (see TS 38.214 [19] clause 5.2.2.2.1). |
| ***typeI-SinglePanel-codebookSubsetRestriction-i2***  i2 codebook subset restriction for Type I Single-panel codebook used when *reportQuantity* is CRI/Ri/i1/CQI (see TS 38.214 [19] clause 5.2.2.2.1). |
| ***typeI-SinglePanel-ri-Restriction***  Restriction for RI for *TypeI-SinglePanel-RI-Restriction* (see TS 38.214 [19], clause 5.2.2.2.1). |
| ***typeI-SinglePanel-Group1, typeI-SinglePanel-Group2***  Configures codebooks for CSI calculation when UE is configured with two CMR Groups with *CMRGroupingAndPairing* in the *NZP-CSI-RS-ResourceSet* associated with the *CSI-ReportConfig*. Network configures the same number of ports for both codebooks. |
| ***typeI-SinglePanel-ri-RestrictionSDM, typeI-SinglePanel-ri-RestrictionSTRP***  Restriction for RI for *N* Resource Pairs when two CMR Groups are configured with *CMRGroupingAndPairing* in the *NZP-CSI-RS-ResourceSet* associated with the *CSI-ReportConfig* (see TS 38.214 [19], clause 5.2.1.4.2). |
| ***typeII-PortSelectionRI-Restriction***  Restriction for RI for *TypeII-PortSelection-RI-Restriction* (see TS 38.214 [19], clauses 5.2.2.2.4 and 5.2.2.2.6). |
| ***typeII-RI-Restriction***  Restriction for RI for *TypeII-RI-Restriction* (see TS 38.214 [19], clauses 5.2.2.2.3 and 5.2.2.2.5). |
| ***valueOfN-r17***  Field provides the value of parameter N as specified in TS 38.214 [19], clause 5.2.2.2.7. The field is present only when M=2 set by *paramCombination*, see TS 38.314. |

#### – *CommonLocationInfo*

The IE *CommonLocationInfo* is used to transfer detailed location information available at the UE to correlate measurements and UE position information.

*CommonLocationInfo* information element

-- ASN1START

-- TAG-COMMONLOCATIONINFO-START

CommonLocationInfo-r16 ::= SEQUENCE {

gnss-TOD-msec-r16 OCTET STRING OPTIONAL,

locationTimestamp-r16 OCTET STRING OPTIONAL,

locationCoordinate-r16 OCTET STRING OPTIONAL,

locationError-r16 OCTET STRING OPTIONAL,

locationSource-r16 OCTET STRING OPTIONAL,

velocityEstimate-r16 OCTET STRING OPTIONAL

}

-- TAG-COMMONLOCATIONINFO-STOP

-- ASN1STOP

|  |
| --- |
| *CommonLocationInfo* field descriptions |
| ***gnss-TOD-msec***  Parameter type *gnss-TOD-msec* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***locationTimeStamp***  Parameter type *DisplacementTimeStamp* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***locationCoordinate***  Parameter type *LocationCoordinates* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***locationError***  Parameter *LocationError* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***locationSource***  Parameter *LocationSource* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |
| ***velocityEstimate***  Parameter type *Velocity* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |

#### *– CondReconfigId*

The IE *CondReconfigId* is used to identify a CHO, CPA or CPC configuration.

*CondReconfigId* information element

-- ASN1START

-- TAG-CONDRECONFIGID-START

CondReconfigId-r16 ::= INTEGER (1.. maxNrofCondCells-r16)

-- TAG-CONDRECONFIGID-STOP

-- ASN1STOP

#### *– CondReconfigToAddModList*

The IE *CondReconfigToAddModList* concerns a list of conditional reconfigurations to add or modify, with for each entry the *condReconfigId* and the associated *condExecutionCond/condExecutionCondSCG* and *condRRCReconfig*.

*CondReconfigToAddModList* information element

-- ASN1START

-- TAG-CONDRECONFIGTOADDMODLIST-START

CondReconfigToAddModList-r16 ::= SEQUENCE (SIZE (1.. maxNrofCondCells-r16)) OF CondReconfigToAddMod-r16

CondReconfigToAddMod-r16 ::= SEQUENCE {

condReconfigId-r16 CondReconfigId-r16,

condExecutionCond-r16 SEQUENCE (SIZE (1..2)) OF MeasId OPTIONAL, -- Need M

condRRCReconfig-r16 OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL, -- Cond condReconfigAdd

...,

[[

condExecutionCondSCG-r17 OCTET STRING (CONTAINING CondReconfigExecCondSCG-r17) OPTIONAL -- Need M

]]

}

CondReconfigExecCondSCG-r17 ::= SEQUENCE (SIZE (1..2)) OF MeasId

-- TAG-CONDRECONFIGTOADDMODLIST-STOP

-- ASN1STOP

| *CondReconfigToAddMod* field descriptions |
| --- |
| ***condExecutionCond***  The execution condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for CHO, CPA, intra-SN CPC without MN involvement or MN initiated inter-SN CPC. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject.* For CHO, if network configures *condEventD1* or *condEventT1* for a candidate cell network configures a second triggering event *condEventA3, condEventA4* or *condEventA5* for the same candidate cell. Network does not configure both *condEventD1* and *condEventT1* for the same candidate cell. |
| ***condExecutionCondSCG***  Contains execution condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for SN initiated inter-SN CPC. The Meas Ids refer to the *measConfig* associated with the SCG. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject*. For each *condReconfigurationId*, the network always configures either *condExecutionCond* or *condExecutionCondSCG* (not both). |
| ***condRRCReconfig***  The *RRCReconfiguration* message to be applied when the condition(s) are fulfilled. The *RRCReconfiguration* message contained in *condRRCReconfig* cannot contain the field *conditionalReconfiguration* or the field *daps-Config*. For CPA and for CPC, the *RRCReconfiguration* message contained in *condRRCReconfig* cannot contain the field *scg-State*. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *condReconfigAdd* | The field is mandatory present when a *condReconfigId* is being added. Otherwise the field is optional, need M. |

#### *– ConditionalReconfiguration*

The IE *ConditionalReconfiguration* is used to add, modify and release the configuration of conditional reconfiguration.

*ConditionalReconfiguration* information element

-- ASN1START

-- TAG-CONDITIONALRECONFIGURATION-START

ConditionalReconfiguration-r16 ::= SEQUENCE {

attemptCondReconfig-r16 ENUMERATED {true} OPTIONAL, -- Cond CHO

condReconfigToRemoveList-r16 CondReconfigToRemoveList-r16 OPTIONAL, -- Need N

condReconfigToAddModList-r16 CondReconfigToAddModList-r16 OPTIONAL, -- Need N

...

}

CondReconfigToRemoveList-r16 ::= SEQUENCE (SIZE (1.. maxNrofCondCells-r16)) OF CondReconfigId-r16

-- TAG-CONDITIONALRECONFIGURATION-STOP

-- ASN1STOP

| *ConditionalReconfiguration* field descriptions |
| --- |
| ***attemptCondReconfig***  If present, the UE shall perform conditional reconfiguration if selected cell is a target candidate cell and it is the first cell selection after failure as described in clause 5.3.7.3. |
| ***condReconfigToAddModList***  List of the configuration of candidate SpCells to be added or modified for CHO, CPA or CPC. |
| ***condReconfigToRemoveList***  List of the configuration of candidate SpCells to be removed. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *CHO* | The field is optional present, Need R, if the UE is configured with at least a candidate SpCell for CHO. Otherwise the field is not present. |

#### – *ConfiguredGrantConfig*

The IE *ConfiguredGrantConfig* is used to configure uplink transmission without dynamic grant according to two possible schemes. The actual uplink grant may either be configured via RRC (*type1*) or provided via the PDCCH (addressed to CS-RNTI) (*type2*). Multiple Configured Grant configurations may be configured in one BWP of a serving cell.

*ConfiguredGrantConfig* information element

-- ASN1START

-- TAG-CONFIGUREDGRANTCONFIG-START

ConfiguredGrantConfig ::= SEQUENCE {

frequencyHopping ENUMERATED {intraSlot, interSlot} OPTIONAL, -- Need S

cg-DMRS-Configuration DMRS-UplinkConfig,

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

mcs-TableTransformPrecoder ENUMERATED {qam256, qam64LowSE} OPTIONAL, -- Need S

uci-OnPUSCH SetupRelease { CG-UCI-OnPUSCH } OPTIONAL, -- Need M

resourceAllocation ENUMERATED { resourceAllocationType0, resourceAllocationType1, dynamicSwitch },

rbg-Size ENUMERATED {config2} OPTIONAL, -- Need S

powerControlLoopToUse ENUMERATED {n0, n1},

p0-PUSCH-Alpha P0-PUSCH-AlphaSetId,

transformPrecoder ENUMERATED {enabled, disabled} OPTIONAL, -- Need S

nrofHARQ-Processes INTEGER(1..16),

repK ENUMERATED {n1, n2, n4, n8},

repK-RV ENUMERATED {s1-0231, s2-0303, s3-0000} OPTIONAL, -- Need R

periodicity ENUMERATED {

sym2, sym7, sym1x14, sym2x14, sym4x14, sym5x14, sym8x14, sym10x14, sym16x14, sym20x14,

sym32x14, sym40x14, sym64x14, sym80x14, sym128x14, sym160x14, sym256x14, sym320x14, sym512x14,

sym640x14, sym1024x14, sym1280x14, sym2560x14, sym5120x14,

sym6, sym1x12, sym2x12, sym4x12, sym5x12, sym8x12, sym10x12, sym16x12, sym20x12, sym32x12,

sym40x12, sym64x12, sym80x12, sym128x12, sym160x12, sym256x12, sym320x12, sym512x12, sym640x12,

sym1280x12, sym2560x12

},

configuredGrantTimer INTEGER (1..64) OPTIONAL, -- Need R

rrc-ConfiguredUplinkGrant SEQUENCE {

timeDomainOffset INTEGER (0..5119),

timeDomainAllocation INTEGER (0..15),

frequencyDomainAllocation BIT STRING (SIZE(18)),

antennaPort INTEGER (0..31),

dmrs-SeqInitialization INTEGER (0..1) OPTIONAL, -- Need R

precodingAndNumberOfLayers INTEGER (0..63),

srs-ResourceIndicator INTEGER (0..15) OPTIONAL, -- Need R

mcsAndTBS INTEGER (0..31),

frequencyHoppingOffset INTEGER (1.. maxNrofPhysicalResourceBlocks-1) OPTIONAL, -- Need R

pathlossReferenceIndex INTEGER (0..maxNrofPUSCH-PathlossReferenceRSs-1),

...,

[[

pusch-RepTypeIndicator-r16 ENUMERATED {pusch-RepTypeA,pusch-RepTypeB} OPTIONAL, -- Need M

frequencyHoppingPUSCH-RepTypeB-r16 ENUMERATED {interRepetition, interSlot} OPTIONAL, -- Cond RepTypeB

timeReferenceSFN-r16 ENUMERATED {sfn512} OPTIONAL -- Need S

]],

[[

pathlossReferenceIndex2-r17 INTEGER (0..maxNrofPUSCH-PathlossReferenceRSs-1) OPTIONAL, -- Need R

srs-ResourceIndicator2-r17 INTEGER (0..15) OPTIONAL, -- Need R

precodingAndNumberOfLayers2-r17 INTEGER (0..63) OPTIONAL, -- Need R

timeDomainAllocation-v1710 INTEGER (16..63) OPTIONAL, -- Need M

timeDomainOffset-r17 INTEGER (0..40959) OPTIONAL, -- Need R

cg-SDT-Configuration-r17 CG-SDT-Configuration-r17 OPTIONAL -- Need M

]]

} OPTIONAL, -- Need R

...,

[[

cg-RetransmissionTimer-r16 INTEGER (1..64) OPTIONAL, -- Need R

cg-minDFI-Delay-r16 ENUMERATED

{sym7, sym1x14, sym2x14, sym3x14, sym4x14, sym5x14, sym6x14, sym7x14, sym8x14,

sym9x14, sym10x14, sym11x14, sym12x14, sym13x14, sym14x14,sym15x14, sym16x14

} OPTIONAL, -- Need R

cg-nrofPUSCH-InSlot-r16 INTEGER (1..7) OPTIONAL, -- Need R

cg-nrofSlots-r16 INTEGER (1..40) OPTIONAL, -- Need R

cg-StartingOffsets-r16 CG-StartingOffsets-r16 OPTIONAL, -- Need R

cg-UCI-Multiplexing-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

cg-COT-SharingOffset-r16 INTEGER (1..39) OPTIONAL, -- Need R

betaOffsetCG-UCI-r16 INTEGER (0..31) OPTIONAL, -- Need R

cg-COT-SharingList-r16 SEQUENCE (SIZE (1..1709)) OF CG-COT-Sharing-r16 OPTIONAL, -- Need R

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

harq-ProcID-Offset2-r16 INTEGER (0..15) OPTIONAL, -- Need M

configuredGrantConfigIndex-r16 ConfiguredGrantConfigIndex-r16 OPTIONAL, -- Cond CG-List

configuredGrantConfigIndexMAC-r16 ConfiguredGrantConfigIndexMAC-r16 OPTIONAL, -- Cond CG-IndexMAC

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

startingFromRV0-r16 ENUMERATED {on, off} OPTIONAL, -- Need R

phy-PriorityIndex-r16 ENUMERATED {p0, p1} OPTIONAL, -- Need R

autonomousTx-r16 ENUMERATED {enabled} OPTIONAL -- Cond LCH-BasedPrioritization

]],

[[

cg-betaOffsetsCrossPri0-r17 SetupRelease { BetaOffsetsCrossPriSelCG-r17 } OPTIONAL, -- Need M

cg-betaOffsetsCrossPri1-r17 SetupRelease { BetaOffsetsCrossPriSelCG-r17 } OPTIONAL, -- Need M

mappingPattern-r17 ENUMERATED {cyclicMapping, sequentialMapping} OPTIONAL, -- Cond SRSsets

sequenceOffsetForRV-r17 INTEGER (0..3) OPTIONAL, -- Need R

p0-PUSCH-Alpha2-r17 P0-PUSCH-AlphaSetId OPTIONAL, -- Need R

powerControlLoopToUse2-r17 ENUMERATED {n0, n1} OPTIONAL, -- Need R

cg-COT-SharingList-r17 SEQUENCE (SIZE (1..50722)) OF CG-COT-Sharing-r17 OPTIONAL, -- Need R

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

repK-v1710 ENUMERATED {n12, n16, n24, n32} OPTIONAL, -- Need R

nrofHARQ-Processes-v1700 INTEGER(17..32) OPTIONAL, -- Need M

harq-ProcID-Offset2-v1700 INTEGER (16..31) OPTIONAL, -- Need R

configuredGrantTimer-v1700 INTEGER(33..288) OPTIONAL, -- Need R

cg-minDFI-Delay-v1710 INTEGER (238..3584) OPTIONAL -- Need R

]]

}

CG-UCI-OnPUSCH ::= CHOICE {

dynamic SEQUENCE (SIZE (1..4)) OF BetaOffsets,

semiStatic BetaOffsets

}

CG-COT-Sharing-r16 ::= CHOICE {

noCOT-Sharing-r16 NULL,

cot-Sharing-r16 SEQUENCE {

duration-r16 INTEGER (1..39),

offset-r16 INTEGER (1..39),

channelAccessPriority-r16 INTEGER (1..4)

}

}

CG-COT-Sharing-r17 ::= CHOICE {

noCOT-Sharing-r17 NULL,

cot-Sharing-r17 SEQUENCE {

duration-r17 INTEGER (1..319),

offset-r17 INTEGER (1..319)

}

}

CG-StartingOffsets-r16 ::= SEQUENCE {

cg-StartingFullBW-InsideCOT-r16 SEQUENCE (SIZE (1..7)) OF INTEGER (0..6) OPTIONAL, -- Need R

cg-StartingFullBW-OutsideCOT-r16 SEQUENCE (SIZE (1..7)) OF INTEGER (0..6) OPTIONAL, -- Need R

cg-StartingPartialBW-InsideCOT-r16 INTEGER (0..6) OPTIONAL, -- Need R

cg-StartingPartialBW-OutsideCOT-r16 INTEGER (0..6) OPTIONAL -- Need R

}

BetaOffsetsCrossPriSelCG-r17 ::= CHOICE {

dynamic-r17 SEQUENCE (SIZE (1..4)) OF BetaOffsetsCrossPri-r17,

semiStatic-r17 BetaOffsetsCrossPri-r17

}

CG-SDT-Configuration-r17 ::= SEQUENCE {

cg-SDT-RetransmissionTimer INTEGER (1..64) OPTIONAL, -- Need R

sdt-SSB-Subset-r17 CHOICE {

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

mediumBitmap-r17 BIT STRING (SIZE (8)),

longBitmap-r17 BIT STRING (SIZE (64))

} OPTIONAL, -- Need S

sdt-SSB-PerCG-PUSCH-r17 ENUMERATED {oneEighth, oneFourth, half, one, two, four, eight, sixteen} OPTIONAL, -- Need M

sdt-P0-PUSCH-r17 INTEGER (-16..15) OPTIONAL, -- Need M

sdt-Alpha-r17 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need M

sdt-DMRS-Ports-r17 CHOICE {

dmrsType1-r17 BIT STRING (SIZE (8)),

dmrsType2-r17 BIT STRING (SIZE (12))

} OPTIONAL, -- Need M

sdt-NrofDMRS-Sequences-r17 INTEGER (1..2) OPTIONAL -- Need M

}

-- TAG-CONFIGUREDGRANTCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *ConfiguredGrantConfig* field descriptions |
| ***antennaPort***  Indicates the antenna port(s) to be used for this configuration, and the maximum bitwidth is 5. See TS 38.214 [19], clause 6.1.2, and TS 38.212 [17], clause 7.3.1. The UE ignores this field in case of CG-SDT. |
| ***autonomousTx***  If this field is present, the Configured Grant configuration is configured with autonomous transmission, see TS 38.321 [3]. |
| ***betaOffsetCG-UCI***  Beta offset for CG-UCI in CG-PUSCH, see TS 38.213 [13], clause 9.3 |
| ***cg-betaOffsetsCrossPri0, cg-betaOffsetsCrossPri1***  Selection between and configuration of dynamic and semi-static beta-offset for multiplexing HARQ-ACK in CG-PUSCH with different priorities.  The field *cg-betaOffsetsCrossPri0* indicates multiplexing LP HARQ-ACK in HP CG-PUSCH. This field is configured only if *phy-PriorityIndex-r16* is configured with value *p1*.  The field *cg-betaOffsetsCrossPri1* indicates multiplexing HP HARQ-ACK in LP CG-PUSCH. This field is configured only if *phy-PriorityIndex-r16* is configured with value *p0*. |
| ***cg-COT-SharingList***  Indicates a table for COT sharing combinations (see 37.213 [48], clause 4.1.3). One row of the table can be set to noCOT-Sharing to indicate that there is no channel occupancy sharing. If the *cg-RetransmissionTimer-r16* is configured and the UE operates as an initiating device in semi-static channel access mode (see TS 37.213 [48], clause 4.3), then c*g-COT-SharingList-r16* is configured*.* |
| ***cg-COT-SharingOffset***  Indicates the offset from the end of the slot where the COT sharing indication in UCI is enabled where the offset in symbols is equal to 14\*n, where n is the signaled value for *cg-COT-SharingOffset*. Applicable when *ul-toDL-COT-SharingED-Threshold-r16* is not configured (see 37.213 [48], clause 4.1.3). |
| ***cg-DMRS-Configuration***  DMRS configuration (see TS 38.214 [19], clause 6.1.2.3). |
| ***cg-minDFI-Delay***  Indicates the minimum duration (in unit of symbols) from the ending symbol of the PUSCH to the starting symbol of the PDCCH containing the downlink feedback indication (DFI) carrying HARQ-ACK for this PUSCH. The HARQ-ACK received before this minimum duration is not considered as valid for this PUSCH (see TS 38.213 [13], clause 10.5). The following minimum duration values are supported, depending on the configured subcarrier spacing [symbols]:  15 kHz: 7, m\*14, where m = {1, 2, 3, 4}  30 kHz: 7, m\*14, where m = {1, 2, 3, 4, 5, 6, 7, 8}  60 kHz: 7, m\*14, where m = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16}  120 kHz: 7, m\*14, where m = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32}  480 kHz: m\*14, where m = {2, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 104, 108, 112, 116, 120, 124, 128}  960 kHz: m\*14, where m = {4, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232, 240, 248, 256} |
| ***cg-nrofPUSCH-InSlot***  Indicates the number of consecutive PUSCH configured to CG within a slot where the SLIV indicating the first PUSCH and additional PUSCH appended with the same length (see TS 38.214 [19], clause 6.1.2.3). The network can only configure this field if *cg-RetransmissionTimer* is configured. |
| ***cg-nrofSlots***  Indicates the number of allocated slots in a configured grant periodicity following the time instance of configured grant offset (see TS 38.214 [19], clause 6.1.2.3). The network can only configure this field if *cg-RetransmissionTimer* is configured. |
| ***cg-RetransmissionTimer***  Indicates the initial value of the configured retransmission timer (see TS 38.321 [3]) in multiples of *periodicity*. The value of *cg-RetransmissionTimer* is always less than or equal to the value of *configuredGrantTimer.* This field is always configured together with *harq-ProcID-Offset*. This field is not configured for operation in licensed spectrum or simultaneously with *harq-ProcID-Offset2.* |
| ***cg-StartingOffsets***  This field is not applicable for a UE which is allowed to operate as an initiating device in semi-static channel access mode, i.e., not applicable for a UE configured with UE FFP parameters (e.g. period, offset) regardless whether the UE would initiate its own COT or would share gNB's COT. |
| ***cg-UCI-Multiplexing***  If present, this field indicates that in the case of PUCCH overlapping with CG-PUSCH(s) within a PUCCH group, the CG-UCI and HARQ-ACK are jointly encoded (see TS 38.213 [13], clause 9). |
| ***configuredGrantConfigIndex***  Indicates the index of the Configured Grant configurations within the BWP. |
| ***configuredGrantConfigIndexMAC***  Indicates the index of the Configured Grant configurations within the MAC entity. |
| ***configuredGrantTimer***  Indicates the initial value of the configured grant timer (see TS 38.321 [3]) in multiples of periodicity. When *cg-RetransmissonTimer* is configured, if HARQ processes are shared among different configured grants on the same BWP, *configuredGrantTimer \* periodicity* is set to the same value for the configurations that share HARQ processes on this BWP. The value of the extension *configuredGrantTimer* is 2 times the configured value. |
| ***dmrs-SeqInitialization***  The network configures this field if *transformPrecoder* is disabled or when the value of *sdt-NrofDMRS-Sequences* is set to 1. Otherwise, the field is absent. |
| ***frequencyDomainAllocation***  Indicates the frequency domain resource allocation, see TS 38.214 [19], clause 6.1.2, and TS 38.212 [17], clause 7.3.1). |
| ***frequencyHopping***  The value *intraSlot* enables 'Intra-slot frequency hopping' and the value *interSlot* enables 'Inter-slot frequency hopping'. If the field is absent, frequency hopping is not configured. The field *frequencyHopping* applies to configured grant for 'pusch-RepTypeA' (see TS 38.214 [19], clause 6.3.1). |
| ***frequencyHoppingOffset***  Frequency hopping offset used when frequency hopping is enabled (see TS 38.214 [19], clause 6.1.2 and clause 6.3). |
| ***frequencyHoppingPUSCH-RepTypeB***  Indicates the frequency hopping scheme for Type 1 CG when *pusch-RepTypeIndicator* is set to 'pusch-RepTypeB' (see TS 38.214 [19], clause 6.1). The value *interRepetition* enables 'Inter-repetition frequency hopping', and the value *interSlot* enables 'Inter-slot frequency hopping'. If the field is absent, the frequency hopping is not enabled for Type 1 CG. |
| ***harq-ProcID-Offset***  For operation with shared spectrum channel access configured with *cg-RetransmissionTimer-r16*, this configures the range of HARQ process IDs which can be used for this configured grant where the UE can select a HARQ process ID within [*harq-procID-offset, ..,* (*harq-procID-offset + nrofHARQ-Processes* – 1)]. |
| ***harq-ProcID-Offset2***  Indicates the offset used in deriving the HARQ process IDs, see TS 38.321 [3], clause 5.4.1. This field is not configured together with *cg-RetransmissionTimer-r16*. If the field *harq-ProcID-Offset2-v1700* is present, the UE shall ignore the *harq-ProcID-Offset2-r16*. |
| ***mappingPattern***  Indicates whether the UE should follow Cyclical mapping pattern or Sequential mapping pattern when two SRS resource sets are configured in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage 'codebook' or 'noncodebook' for PUSCH transmission with a Type 1 configured grant and/or a Type 2 configured grant as described in clause 6.1.2.3 of TS 38.214 [19] |
| ***mcs-Table***  Indicates the MCS table the UE shall use for PUSCH without transform precoding. If the field is absent the UE applies the value *qam64*. |
| ***mcs-TableTransformPrecoder***  Indicates the MCS table the UE shall use for PUSCH with transform precoding. If the field is absent the UE applies the value *qam64*. |
| ***mcsAndTBS***  The modulation order, target code rate and TB size (see TS 38.214 [19], clause 6.1.2). The NW does not configure the values 28~31 in this version of the specification. |
| ***nrofHARQ-Processes***  The number of HARQ processes configured. It applies for both Type 1 and Type 2. See TS 38.321 [3], clause 5.4.1. If the UE is configured with *nrofHARQ-Processes-v1700, the* UE shall ignore *nrofHARQ-Processes (without suffix)*. |
| ***pathlossReferenceIndex***  Indicates the reference signal index used as PUSCH pathloss reference (see TS 38.213 [13], clause 7.1.1). In case of CG-SDT, the UE does not use this field. |
| ***pathlossReferenceIndex2***  Indicates the reference signal used as PUSCH pathloss reference for the second SRS resource set. When this field is present, pathlossReferenceIndex indicates the reference signal used as PUSCH pathloss reference for the first SRS resource set |
| ***p0-PUSCH-Alpha***  Index of the *P0-PUSCH-AlphaSet* to be used for this configuration. |
| ***p0-PUSCH-Alpha2***  Index of the *P0-PUSCH-AlphaSet* to be used for second SRS resource set. If this field is present, the *p0-PUSCH-Alpha* provides index for the P0-PUSCH-AlphaSet to be used for first SRS resource set. |
| ***periodicity***  Periodicity for UL transmission without UL grant for type 1 and type 2 (see TS 38.321 [3], clause 5.8.2).  The following periodicities are supported depending on the configured subcarrier spacing [symbols]:  15 kHz: 2, 7, n\*14, where n={1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 128, 160, 320, 640}  30 kHz: 2, 7, n\*14, where n={1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 128, 160, 256, 320, 640, 1280}  60 kHz with normal CP 2, 7, n\*14, where n={1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 128, 160, 256, 320, 512, 640, 1280, 2560}  60 kHz with ECP: 2, 6, n\*12, where n={1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 128, 160, 256, 320, 512, 640, 1280, 2560}  120 kHz: 2, 7, n\*14, where n={1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 128, 160, 256, 320, 512, 640, 1024, 1280, 2560, 5120}  480 and 960 kHz: n\*14, where n={1, 2, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 128, 160, 256, 320, 512, 640, 1024, 1280, 2560, 5120} |
| ***periodicityExt***  This field is used to calculate the periodicity for UL transmission without UL grant for type 1 and type 2 (see TS 38.321 [3], clause 5,8.2). If this field is present, the field *periodicity* is ignored.  The following periodicites are supported depending on the configured subcarrier spacing [symbols]:  15 kHz: *periodicityExt*\*14, where *periodicityExt* has a value between 1 and 640.  30 kHz: *periodicityExt*\*14, where *periodicityExt* has a value between 1 and 1280.  60 kHz with normal CP: *periodicityExt*\*14, where *periodicityExt* has a value between 1 and 2560.  60 kHz with ECP: *periodicityExt*\*12, where *periodicityExt* has a value between 1 and 2560.  120 kHz: *periodicityExt*\*14, where *periodicityExt* has a value between 1 and 5120.  480 kHz: *periodicityExt*\*14, where *periodicityExt* has a value between 1 and 20480.  960 kHz: *periodicityExt*\*14, where *periodicityExt* has a value between 1 and 40960. |
| ***phy-PriorityIndex***  Indicates the PHY priority of CG PUSCH at least for PHY-layer collision handling. Value *p0* indicates low priority and value *p1* indicates high priority. The network does not configure this for CG-SDT. |
| ***powerControlLoopToUse***  Closed control loop to apply (see TS 38.213 [13], clause 7.1.1). |
| ***powerControlLoopToUse2***  Closed control loop to apply to second SRS resource set (see TS 38.213 [13], clause 7.1.1). If this field is present, the *powerControlLoopToUse* applies to the first SRS resource set. |
| ***precodingAndNumberOfLayers***  Indicates the precoding and number of layers (see TS 38.212 [17], clause 7.3.1.1.2, and TS 38.214 [19], clause 6.1.2.3). In case of CG-SDT, network sets this field to 1. |
| ***precodingAndNumberOfLayers2***  Indicates the precoding and number of layers for the second SRS resource set. When this field is present, *precodingAndNumberOfLayers* indicated the precoding and number of layers for the first SRS resource set. |
| ***pusch-RepTypeIndicator***  Indicates whether UE follows the behavior for PUSCH repetition type A or the behavior for PUSCH repetition type B for each Type 1 configured grant configuration. The value *pusch-RepTypeA* enables the 'PUSCH repetition type A' and the value *pusch-RepTypeB* enables the 'PUSCH repetition type B' (see TS 38.214 [19], clause 6.1.2.3). The value *pusch-RepTypeB* is not configured simultaneously with *cg-nrofPUSCH-InSlot-r16* and *cg-nrofSlots-r16*. The network does not configure this field if *cg-RetransmissionTimer-r16* is configured for CG operation with shared spectrum channel access. |
| ***rbg-Size***  Selection between configuration 1 and configuration 2 for RBG size for PUSCH. The UE does not apply this field if *resourceAllocation* is set to *resourceAllocationType1*. Otherwise, the UE applies the value *config1* when the field is absent. Note: *rbg-Size* is used when the *transformPrecoder* parameter is disabled. |
| ***repK-RV***  The redundancy version (RV) sequence to use. See TS 38.214 [19], clause 6.1.2. The network configures this field if repetitions are used, i.e., if *repK* is set to *n2*, *n4* or *n8*. This field is not configured when *cg-RetransmissionTimer* is configured. Otherwise, the field is absent. |
| ***repK***  Number of repetitions K, see TS 38.214 [19]. If the field *repK-v1710* is present, the UE shall ignore the *repK* (without suffix). |
| ***resourceAllocation***  Configuration of resource allocation type 0 and resource allocation type 1. For Type 1 UL data transmission without grant, *resourceAllocation* should be *resourceAllocationType0* or *resourceAllocationType1*. |
| ***rrc-ConfiguredUplinkGrant***  Configuration for "configured grant" transmission with fully RRC-configured UL grant (Type1). If this field is absent the UE uses UL grant configured by DCI addressed to CS-RNTI (Type2). |
| ***sequenceOffsetForRV***  Configures the RV offset for the starting RV for the first repetition (first actual repetition in PUSCH repetition Type B) towards the second 'SRS resource set' for PUSCH configured in either *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage 'codebook' or 'noncodebook'. |
| ***srs-ResourceIndicator***  Indicates the SRS resource to be used. The network does not configure this for CG-SDT. |
| ***srs-ResourceIndicator2***  Indicates the SRS resource to be used for the second SRS resource set. When this field is present, the srs-ResourceIndicator is used for the first SRS resource set. |
| ***startingFromRV0***  This field is used to determine the initial transmission occasion of a transport block for a given RV sequence, see TS 38.214 [19], clause 6.1.2.3.1. The network does not configure this field if *cg-RetransmissionTimer-r16* is configured for CG operation. |
| ***timeDomainAllocation, timeDomainAllocation-v1710***  Indicates a combination of start symbol and length and PUSCH mapping type, see TS 38.214 [19], clause 6.1.2 and TS 38.212 [17], clause 7.3.1.  If the field *timeDomainAllocation-v1710* is present, the UE shall ignore *timeDomainAllocation* field (without suffix). |
| ***timeDomainOffset***  Offset related to the reference SFN indicated by *timeReferenceSFN*, see TS 38.321 [3], clause 5.8.2. *timeDomainOffset-r17* is only applicable to 480 kHz and 960 kHz. If *timeDomainOffset-r17* is present, the UE shall ignore *timeDomainOffset* (without suffix). |
| ***timeReferenceSFN***  Indicates SFN used for determination of the offset of a resource in time domain. The UE uses the closest SFN with the indicated number preceding the reception of the configured grant configuration, see TS 38.321 [3], clause 5.8.2. If the field *timeReferenceSFN* is not present, the reference SFN is 0. |
| ***transformPrecoder***  Enables or disables transform precoding for *type1* and *type2*. If the field is absent, the UE enables or disables transform precoding in accordance with the field *msg3-transformPrecoder* in *RACH-ConfigCommon*, see TS 38.214 [19], clause 6.1.3. |
| ***uci-OnPUSCH***  Selection between and configuration of dynamic and semi-static beta-offset. For Type 1 UL data transmission without grant, *uci-OnPUSCH* should be set to *semiStatic.* |

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| *CG-COT-Sharing* field descriptions |
| ***channelAccessPriority***  Indicates the Channel Access Priority Class that the gNB can assume when sharing the UE initiated COT (see 37.213 [48], clause 4.1.3). |
| ***duration***  Indicates the number of DL transmission slots within UE initiated COT (see 37.213 [48], clause 4.1.3). |
| ***offset***  Indicates the number of DL transmission slots from the end of the slot where CG-UCI is detected after which COT sharing can be used (see 37.213 [48], clause 4.1.3). |

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| *CG-StartingOffsets* field descriptions |
| ***cg-StartingFullBW-InsideCOT***  A set of configured grant PUSCH transmission starting offsets which indicates the length of a CP extension of the first symbol that is located before the configured resource when frequency domain resource allocation includes all interlaces in the allocated RB set(s) and the CG PUSCH resource is inside gNB COT (see TS 38.214 [19], clause 6.1.2.3). |
| ***cg-StartingFullBW-OutsideCOT***  A set of configured grant PUSCH transmission starting offset indices (see TS 38.211[16], Table 5.3.1-2) which indicates the length of a CP extension of the first symbol that is located before the configured resource when frequency domain resource allocation includes all interlaces in the allocated RB set(s) and the CG PUSCH resource is outside gNB COT (see TS 38.214 [19], clause 6.1.2.3). |
| ***cg-StartingPartialBW-InsideCOT***  A set of configured grant PUSCH transmission starting offset index (see TS 38.211[16], Table 5.3.1-2) which indicates the length of a CP extension of the first symbol that is located before the configured resource when frequency domain resource allocation does not include all interlaces in the allocated RB set(s) and the CG PUSCH resource is inside gNB COT (see TS 38.214 [19], clause 6.1.2.3). |
| ***cg-StartingPartialBW-OutsideCOT***  A set of configured grant PUSCH transmission starting offset index (see TS 38.211[16], Table 5.3.1-2) which indicates the length of a CP extension of the first symbol that is located before the configured resource when frequency domain resource allocation does not include all interlaces in the allocated RB set(s) and the CG PUSCH resource is outside gNB COT (see TS 38.214 [19], clause 6.1.2.3). |

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| *CG-SDT-Configuration* field descriptions |
| ***cg-SDT-RetransmissionTimer***  Indicates the initial value of the configured grant retransmission timer used for the initial transmission of CG-SDT with CCCH message (see TS 38.321 [3]) in multiples of *periodicity*. |
| ***sdt-DMRS-Ports***  Indicates the set of DMRS ports for SSB to PUSCH mapping (see TS 38.213 [13]). |
| ***sdt-NrofDMRS-Sequences***  Indicates the number of DMRS sequences for SSB to PUSCH mapping (see TS 38.213 [13]). |
| ***sdt-SSB-Subset***  Indicates SSB subset for SSB to CG PUSCH mapping within one CG configuration. If this field is absent, UE assumes the SSB set includes all actually transmitted SSBs configured by SIB1. |
| ***sdt-SSB-PerCG-PUSCH***  The number of SSBs per CG PUSCH (see TS 38.213 [13]). Value *one* corresponds to 1 SSBs per CG PUSCH, value *two* corresponds to 2 SSBs per CG PUSCH and so on. |
| ***sdt-P0-PUSCH***  Indicates P0 value for PUSCH for CG SDT in steps of 1dB (see TS 38.213 [13]). When this field is configured, the UE ignores the *p0-PUSCH-Alpha*. |
| ***sdt-Alpha***  Indicates alpha value for PUSCH for CG SDT. *alpha0* indicates value 0 is used *alpha04* indicates value 4 is used and so on (see TS 38.213 [13]). When this field is configured, the UE ignores the *p0-PUSCH-Alpha*. |

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| Conditional Presence | Explanation |
| *LCH-BasedPrioritization* | This field is optionally present, Need R, if *lch-BasedPrioritization* is configured in the MAC entity. It is absent otherwise. |
| *RepTypeB* | The field is optionally present if pusch-RepTypeIndicator is set to pusch-RepTypeB, Need S, and absent otherwise. |
| *CG-List* | The field is mandatory present when included in *configuredGrantConfigToAddModList-r16*, otherwise the field is absent. |
| *CG-IndexMAC* | The field is mandatory present if at least one configured grant is configured by *configuredGrantConfigToAddModList-r16* in any BWP of this MAC entity, otherwise it is optionally present, need R. |
| *SRSsets* | This field is mandatory present when UE is configured with two SRS sets configured in either *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage codebook or non-codebook. Otherwise it is absent, Need R |

#### – *ConfiguredGrantConfigIndex*

The IE *ConfiguredGrantConfigIndex* is used to indicate the index of one of multiple UL Configured Grant configurations in one BWP.

*ConfiguredGrantConfigIndex* information element

-- ASN1START

-- TAG-CONFIGUREDGRANTCONFIGINDEX-START

ConfiguredGrantConfigIndex-r16 ::= INTEGER (0.. maxNrofConfiguredGrantConfig-1-r16)

-- TAG-CONFIGUREDGRANTCONFIGINDEX-STOP

-- ASN1STOP

#### – *ConfiguredGrantConfigIndexMAC*

The IE *ConfiguredGrantConfigIndexMAC* is used to indicate the unique Configured Grant configurations index per MAC entity.

*ConfiguredGrantConfigIndexMAC* information element

-- ASN1START

-- TAG-CONFIGUREDGRANTCONFIGINDEXMAC-START

ConfiguredGrantConfigIndexMAC-r16 ::= INTEGER (0.. maxNrofConfiguredGrantConfigMAC-1-r16)

-- TAG-CONFIGUREDGRANTCONFIGINDEXMAC-STOP

-- ASN1STOP

#### – *ConnEstFailureControl*

The IE *ConnEstFailureControl* is used to configure parameters for connection establishment failure control.

*ConnEstFailureControl* information element

-- ASN1START

-- TAG-CONNESTFAILURECONTROL-START

ConnEstFailureControl ::= SEQUENCE {

connEstFailCount ENUMERATED {n1, n2, n3, n4},

connEstFailOffsetValidity ENUMERATED {s30, s60, s120, s240, s300, s420, s600, s900},

connEstFailOffset INTEGER (0..15) OPTIONAL -- Need S

}

-- TAG-CONNESTFAILURECONTROL-STOP

-- ASN1STOP

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| *ConnEstFailureControl* field descriptions |
| ***connEstFailCount***  Number of times that the UE detects T300 expiry on the same cell before applying *connEstFailOffset*. |
| ***connEstFailOffset***  Parameter "Qoffsettemp" in TS 38.304 [20]. If the field is absent, the value of infinity shall be used for "Qoffsettemp". |
| ***connEstFailOffsetValidity***  Amount of time that the UE applies *connEstFailOffset* before removing the offset from evaluation of the cell. Value *s30* corresponds to 30 seconds, value *s60* corresponds to 60 seconds, and so on. |

#### – *ControlResourceSet*

The IE *ControlResourceSet* is used to configure a time/frequency control resource set (CORESET) in which to search for downlink control information (see TS 38.213 [13], clause 10.1).

*ControlResourceSet* information element

-- ASN1START

-- TAG-CONTROLRESOURCESET-START

ControlResourceSet ::= SEQUENCE {

controlResourceSetId ControlResourceSetId,

frequencyDomainResources BIT STRING (SIZE (45)),

duration INTEGER (1..maxCoReSetDuration),

cce-REG-MappingType CHOICE {

interleaved SEQUENCE {

reg-BundleSize ENUMERATED {n2, n3, n6},

interleaverSize ENUMERATED {n2, n3, n6},

shiftIndex INTEGER(0..maxNrofPhysicalResourceBlocks-1) OPTIONAL -- Need S

},

nonInterleaved NULL

},

precoderGranularity ENUMERATED {sameAsREG-bundle, allContiguousRBs},

tci-StatesPDCCH-ToAddList SEQUENCE(SIZE (1..maxNrofTCI-StatesPDCCH)) OF TCI-StateId OPTIONAL, -- Cond NotSIB-initialBWP

tci-StatesPDCCH-ToReleaseList SEQUENCE(SIZE (1..maxNrofTCI-StatesPDCCH)) OF TCI-StateId OPTIONAL, -- Cond NotSIB-initialBWP

tci-PresentInDCI ENUMERATED {enabled} OPTIONAL, -- Need S

pdcch-DMRS-ScramblingID INTEGER (0..65535) OPTIONAL, -- Need S

...,

[[

rb-Offset-r16 INTEGER (0..5) OPTIONAL, -- Need S

tci-PresentDCI-1-2-r16 INTEGER (1..3) OPTIONAL, -- Need S

coresetPoolIndex-r16 INTEGER (0..1) OPTIONAL, -- Need S

controlResourceSetId-v1610 ControlResourceSetId-v1610 OPTIONAL -- Need S

]],

[[

followUnifiedTCIstate-r17 ENUMERATED {enabled} OPTIONAL -- Need R

]]

}

-- TAG-CONTROLRESOURCESET-STOP

-- ASN1STOP

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| *ControlResourceSet* field descriptions |
| ***cce-REG-MappingType***  Mapping of Control Channel Elements (CCE) to Resource Element Groups (REG) (see TS 38.211 [16], clauses 7.3.2.2 and 7.4.1.3.2). |
| ***controlResourceSetId***  Identifies the instance of the *ControlResourceSet* IE. Value 0 identifies the common CORESET configured in *MIB* and in *ServingCellConfigCommon* (*controlResourceSetZero*) and is hence not used here in the *ControlResourceSet* IE. Other values identify CORESETs configured by dedicated signalling or in *SIB1* or *SIB20*. The *controlResourceSetId* is unique among the BWPs of a serving cell.  If the field *controlResourceSetId-v1610* is present, the UE shall ignore the *controlResourceSetId* field (without suffix). |
| ***coresetPoolIndex***  The index of the CORESET pool for this CORESET as specified in TS 38.213 [13] (clauses 9 and 10) and TS 38.214 [19] (clauses 5.1 and 6.1). If the field is absent, the UE applies the value 0. |
| ***duration***  Contiguous time duration of the CORESET in number of symbols (see TS 38.211 [16], clause 7.3.2.2). |
| ***followUnifiedTCIstate***  When set to enabled, for PDCCH reception on this CORESET, the UE applies the "indicated" DL only TCI or joint TCI as specified in TS 38.214 clause 5.1.5. |
| ***frequencyDomainResources***  Frequency domain resources for the CORESET. Each bit corresponds a group of 6 RBs, with grouping starting from the first RB group in the BWP or MBS CFR where the CORESET is configured. When at least one search space is configured with *freqMonitorLocation-r16*, only the first bits are valid (see TS 38.213 [13], clause 10.1). The first (left-most / most significant) bit corresponds to the first RB group in the BWP or MBS CFR where the CORESET is configured, and so on. A bit that is set to 1 indicates that this RB group belongs to the frequency domain resource of this CORESET. Bits corresponding to a group of RBs not fully contained in the bandwidth part within which the CORESET is configured are set to zero (see TS 38.211 [16], clause 7.3.2.2). |
| ***interleaverSize***  Interleaver-size (see TS 38.211 [16], clause 7.3.2.2). |
| ***pdcch-DMRS-ScramblingID***  PDCCH DMRS scrambling initialization (see TS 38.211 [16], clause 7.4.1.3.1). When the field is absent the UE applies the value of the *physCellId* configured for this serving cell. |
| ***precoderGranularity***  Precoder granularity in frequency domain (see TS 38.211 [16], clauses 7.3.2.2 and 7.4.1.3.2). |
| ***rb-Offset***  Indicates the RB level offset in units of RB from the first RB of the first 6RB group to the first RB of BWP (see 38.213 [13], clause 10.1). |
| ***reg-BundleSize***  Resource Element Groups (REGs) can be bundled to create REG bundles. This parameter defines the size of such bundles (see TS 38.211 [16], clause 7.3.2.2). |
| ***shiftIndex***  When the field is absent the UE applies the value of the *physCellId*configured for this serving cell (see TS 38.211 [16], clause 7.3.2.2). |
| ***tci-PresentInDCI***  This field indicates if TCI field is present or absent in DCI format 1\_1 and DCI format 4\_2. When the field is absent the UE considers the TCI to be absent/disabled. In case of cross carrier scheduling, the network sets this field to enabled for the *ControlResourceSet* used for cross carrier scheduling in DCI format 1\_1 in the scheduling cell if *enableDefaultBeamForCCS* is not configured (see TS 38.214 [19], clause 5.1.5). |
| ***tci-PresentDCI-1-2***  Configures the number of bits for "Transmission configuration indicator" in DCI format 1\_2. When the field is absent the UE applies the value of 0 bit for the "Transmission configuration indicator" in DCI format 1\_2 (see TS 38.212, clause 7.3.1 and TS 38.214, clause 5.1.5). In case of cross carrier scheduling, the network configures this field for the *ControlResourceSet* used for cross carrier scheduling in DCI format 1\_2 in the scheduling cell if *enableDefaultBeamForCCS* is not configured (see TS 38.214 [19], clause 5.1.5). |
| ***tci-StatesPDCCH-ToAddList***  A subset of the TCI states defined in pdsch-Config included in the *BWP-DownlinkDedicated* corresponding to the serving cell and to the DL BWP to which the *ControlResourceSet* belong to. They are used for providing QCL relationships between the DL RS(s) in one RS Set (TCI-State) and the PDCCH DMRS ports (see TS 38.213 [13], clause 6.). The network configures at most *maxNrofTCI-StatesPDCCH* entries. The QCL relationships defined herein do not apply to MBS broadcast. |

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| --- | --- |
| Conditional Presence | Explanation |
| *NotSIB-initialBWP* | The field is absent in *SIB1/SIB20* and in the *PDCCH-ConfigCommon* of the initial BWP in *ServingCellConfigCommon*, if *SIB1/SIB20* is broadcasted. Otherwise, it is optionally present, Need N. |

#### – *ControlResourceSetId*

The *ControlResourceSetId* IE concerns a short identity, used to identify a control resource set within a serving cell. The *ControlResourceSetId* = 0 identifies the ControlResourceSet#0 configured via PBCH (*MIB*) and in *controlResourceSetZero* (*ServingCellConfigCommon*). The ID space is used across the BWPs and MBS CFRs of a Serving Cell.

*ControlResourceSetId* information element

-- ASN1START

-- TAG-CONTROLRESOURCESETID-START

ControlResourceSetId ::= INTEGER (0..maxNrofControlResourceSets-1)

ControlResourceSetId-r16 ::= INTEGER (0..maxNrofControlResourceSets-1-r16)

ControlResourceSetId-v1610 ::= INTEGER (maxNrofControlResourceSets..maxNrofControlResourceSets-1-r16)

-- TAG-CONTROLRESOURCESETID-STOP

-- ASN1STOP

#### – *ControlResourceSetZero*

The IE *ControlResourceSetZero* is used to configure CORESET#0 of the initial BWP (see TS 38.213 [13], clause 13).

*ControlResourceSetZero* information element

-- ASN1START

-- TAG-CONTROLRESOURCESETZERO-START

ControlResourceSetZero ::= INTEGER (0..15)

-- TAG-CONTROLRESOURCESETZERO-STOP

-- ASN1STOP

#### – *CrossCarrierSchedulingConfig*

The IE *CrossCarrierSchedulingConfig* is used to specify the configuration when the cross-carrier scheduling is used in a cell.

*CrossCarrierSchedulingConfig* information element

-- ASN1START

-- TAG-CROSSCARRIERSCHEDULINGCONFIG-START

CrossCarrierSchedulingConfig ::= SEQUENCE {

schedulingCellInfo CHOICE {

own SEQUENCE { -- Cross carrier scheduling: scheduling cell

cif-Presence BOOLEAN

},

other SEQUENCE { -- Cross carrier scheduling: scheduled cell

schedulingCellId ServCellIndex,

cif-InSchedulingCell INTEGER (1..7)

}

},

...,

[[

carrierIndicatorSize-r16 SEQUENCE {

carrierIndicatorSizeDCI-1-2-r16 INTEGER (0..3),

carrierIndicatorSizeDCI-0-2-r16 INTEGER (0..3)

} OPTIONAL, -- Cond CIF-PRESENCE

enableDefaultBeamForCCS-r16 ENUMERATED {enabled} OPTIONAL -- Need S

]],

[[

ccs-BlindDetectionSplit-r17 ENUMERATED {oneSeventh, threeFourteenth, twoSeventh, threeSeventh,

oneHalf, fourSeventh, fiveSeventh, spare1} OPTIONAL -- Need R

]]

}

-- TAG-CROSSCARRIERSCHEDULINGCONFIG-STOP

-- ASN1STOP

| *CrossCarrierSchedulingConfig* field descriptions |
| --- |
| ***carrierIndicatorSizeDCI-0-2, carrierIndicatorSizeDCI-1-2***  Configures the number of bits for the field of carrier indicator in PDCCH DCI format 0\_2/1\_2. The field *carrierIndicatorSizeDCI-0-2* refers to DCI format 0\_2 and the field *carrierIndicatorSizeDCI-1-2* refers to DCI format 1\_2, respectively (see TS 38.212 [17], clause 7.3.1 and TS 38.213 [13], clause 10.1). |
| ***ccs-BlindDetectionSplit***  Indicates the share of blind detection candidates and non-overlapping CCEs for PDCCH monitoring on an SpCell and an SCell when cross-carrier scheduling is configured from the SCell for the SpCell (see TS 38.213 [13], clause 10.1.1). The network only configures this field when it sets the field *other* for an SpCell, i.e., when it configures cross-carrier scheduling of the SpCell by a PDCCH on an Scell. |
| ***cif-Presence***  The field is used to indicate whether carrier indicator field is present (value *true*) or not (value *false*) in PDCCH DCI formats, see TS 38.213 [13]. If *cif-Presence* is set to *true*, the CIF value indicating a grant or assignment for this cell is 0. |
| ***cif-InSchedulingCell***  The field indicates the CIF value used in the scheduling cell to indicate a grant or assignment applicable for this cell, see TS 38.213 [13]. If configured for an SpCell, the non-fallback DCI formats on the SpCell include same number of CIF bits as the corresponding non-fallback DCI formats on the scheduling cell, and the CIF bits are considered reserved. |
| ***enableDefaultBeamForCCS***  This field indicates whether default beam selection for cross-carrier scheduled PDSCH is enabled, see TS 38.214 [19]. If not present, the default beam selection behaviour is not applied, i.e. Rel-15 behaviour is applied. This field can only be configured in the cross-scheduled SCell or SpCell. |
| ***other***  Parameters for cross-carrier scheduling. If configured for an SpCell, the SpCell can be scheduled by the PDCCH on another SCell as well as by the PDCCH on the SpCell. If configured for an SCell, the SCell is scheduled by a PDDCH on another cell. |
| ***own***  Parameters for self-scheduling, i.e., a serving cell is scheduled by its own PDCCH. |
| ***schedulingCellId***  If configured for an SpCell, this field indicates which SCell, in addition to the SpCell, signals the downlink allocations and uplink grants, if applicable, for the concerned SpCell. If configured for an Scell, this field indicates which cell signals the downlink allocations and uplink grants, if applicable, for the concerned SCell. In case the UE is configured with DC, the scheduling cell is part of the same cell group (i.e. MCG or SCG) as the scheduled cell. In case the UE is configured with two PUCCH groups, the scheduling cell and the scheduled cell are within the same PUCCH group. If *drx-ConfigSecondaryGroup* is configured in the *MAC-CellGroupConfig* associated with this serving cell, the scheduling cell and the scheduled cell belong to the same Frequency Range. In addition, the serving cell with an aperiodic CSI trigger and the PUSCH resource scheduled for the report are on the same carrier and serving cell, but the cell for which CSI is reported may belong to the same or a different Frequency Range. The network should not trigger a CSI request for a serving cell in the other Frequency Range when that serving cell is outside Active Time. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *CIF-PRESENCE* | The field is mandatory present if the *cif-Presence* is set to *true*. The field is absent otherwise. |

#### – *CSI-AperiodicTriggerStateList*

The *CSI-AperiodicTriggerStateList* IE is used to configure the UE with a list of aperiodic trigger states. Each codepoint of the DCI field "CSI request" is associated with one trigger state (see TS 38.321 [3], clause 6.1.3.13). Upon reception of the value associated with a trigger state, the UE will perform measurement of CSI-RS, CSI-IM and/or SSB (reference signals) and aperiodic reporting on L1 according to all entries in the *associatedReportConfigInfoList* for that trigger state.

*CSI-AperiodicTriggerStateList* information element

-- ASN1START

-- TAG-CSI-APERIODICTRIGGERSTATELIST-START

CSI-AperiodicTriggerStateList ::= SEQUENCE (SIZE (1..maxNrOfCSI-AperiodicTriggers)) OF CSI-AperiodicTriggerState

CSI-AperiodicTriggerState ::= SEQUENCE {

associatedReportConfigInfoList SEQUENCE (SIZE(1..maxNrofReportConfigPerAperiodicTrigger)) OF CSI-AssociatedReportConfigInfo,

...

}

CSI-AssociatedReportConfigInfo ::= SEQUENCE {

reportConfigId CSI-ReportConfigId,

resourcesForChannel CHOICE {

nzp-CSI-RS SEQUENCE {

resourceSet INTEGER (1..maxNrofNZP-CSI-RS-ResourceSetsPerConfig),

qcl-info SEQUENCE (SIZE(1..maxNrofAP-CSI-RS-ResourcesPerSet)) OF TCI-StateId

OPTIONAL -- Cond Aperiodic

},

csi-SSB-ResourceSet INTEGER (1..maxNrofCSI-SSB-ResourceSetsPerConfig)

},

csi-IM-ResourcesForInterference INTEGER(1..maxNrofCSI-IM-ResourceSetsPerConfig) OPTIONAL, -- Cond CSI-IM-ForInterference

nzp-CSI-RS-ResourcesForInterference INTEGER (1..maxNrofNZP-CSI-RS-ResourceSetsPerConfig) OPTIONAL, -- Cond NZP-CSI-RS-ForInterference

...,

[[

ap-CSI-MultiplexingMode-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

resourcesForChannel2-r17 CHOICE {

nzp-CSI-RS2-r17 SEQUENCE {

resourceSet2-r17 INTEGER (1..maxNrofNZP-CSI-RS-ResourceSetsPerConfig),

qcl-info2-r17 SEQUENCE (SIZE(1..maxNrofAP-CSI-RS-ResourcesPerSet)) OF TCI-StateId

OPTIONAL -- Cond Aperiodic

},

csi-SSB-ResourceSet2-r17 INTEGER (1..maxNrofCSI-SSB-ResourceSetsPerConfigExt)

} OPTIONAL, -- Cond NoUnifiedTCI

csi-SSB-ResourceSetExt INTEGER (1..maxNrofCSI-SSB-ResourceSetsPerConfigExt) OPTIONAL -- Need R

]]

}

-- TAG-CSI-APERIODICTRIGGERSTATELIST-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-AssociatedReportConfigInfo* field descriptions |
| ***ap-CSI-MultiplexingMode***  Indicates if the behavior of transmitting aperiodic CSI on the first PUSCH repetitions corresponding to two SRS resource sets configured in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage '*codebook*' or '*noncodebook*' is enabled or not. |
| ***csi-IM-ResourcesForInterference***  *CSI-IM-ResourceSet* for interference measurement. Entry number in csi-IM-ResourceSetList in the CSI-ResourceConfig indicated by *csi-IM-ResourcesForInterference* in the *CSI-ReportConfig* indicated by *reportConfigId* above (value 1 corresponds to the first entry, value 2 to the second entry, and so on). The indicated *CSI-IM-ResourceSet* should have exactly the same number of resources like the *NZP-CSI-RS-ResourceSet* indicated in *resourceSet* within *nzp-CSI-RS*. |
| ***csi-SSB-ResourceSet,*** ***csi-SSB-ResourceSet2***  CSI-SSB-ResourceSet for channel measurements. Entry number in *csi-SSB-ResourceSetList* in the *CSI-ResourceConfig* indicated by *resourcesForChannelMeasurement* in the *CSI-ReportConfig* indicated by *reportConfigId* above (value 1 corresponds to the first entry, value 2 to the second entry, and so on). |
| ***nzp-CSI-RS-ResourcesForInterference***  *NZP-CSI-RS-ResourceSet* for interference measurement. Entry number in *nzp-CSI-RS-ResourceSetList* in the *CSI-ResourceConfig* indicated by *nzp-CSI-RS-ResourcesForInterference* in the *CSI-ReportConfig* indicated by *reportConfigId* above (value 1 corresponds to the first entry, value 2 to the second entry, and so on). |
| ***qcl-info, qcl-info2***  List of references to TCI-States for providing the QCL source and QCL type for each *NZP-CSI-RS-Resource* listed in *nzp-CSI-RS-Resources* of the *NZP-CSI-RS-ResourceSet* indicated by *resourceSet* within *nzp-CSI-RS*. Each *TCI-StateId* refers to the *TCI-State* which has this value for *tci-StateId* and is defined in *tci-StatesToAddModList* in the *PDSCH-Config* included in the *BWP-Downlink* corresponding to the serving cell and to the DL BWP to which the *resourcesForChannelMeasuremen*t (in the *CSI-ReportConfig* indicated by *reportConfigId* above) belong to. First entry in *qcl-info* corresponds to first entry in *nzp-CSI-RS-Resources* of that *NZP-CSI-RS-ResourceSet*, second entry in *qcl-info* corresponds to second entry in *nzp-CSI-RS-Resources*, and so on (see TS 38.214 [19], clause 5.2.1.5.1). When this field is absent for aperiodic CSI RS, the UE shall use QCL information included in the "indicated" DL only/Joint TCI state as specified in TS 38.214 |
| ***reportConfigId***  The *reportConfigId* of one of the *CSI-ReportConfigToAddMod* configured in *CSI-MeasConfig* |
| ***resourcesForChannel2***  Configures reference signals for channel measurement corresponding to the second resource set for L1-RSRP measurement as configured in IE *CSI-ResourceConfig* when *nrofReportedGroups-r17* is configured in IE *CSI-ReportConfig*. If this is present, network configures csi-SSB-ResourceSetExt instead of csi-SSB-ResourceSet and the UE ignores csi-SSB-ResourceSet in resourcesForChannel, and the *resourcesForChannel* configures the reference signals for channel measurement corresponding to the first resource set for L1-RSRP measurement (see TS 38.214 [19], clause 5.2.1.4). |
| ***resourceSet***  *NZP-CSI-RS-ResourceSet* for channel measurements. Entry number in *nzp-CSI-RS-ResourceSetList* in the *CSI-ResourceConfig* indicated by *resourcesForChannelMeasurement* in the *CSI-ReportConfig* indicated by r*eportConfigId* above (value 1 corresponds to the first entry, value 2 to the second entry, and so on). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Aperiodic* | The field is mandatory present if the *NZP-CSI-RS-Resources* in the associated *resourceSet* have the resourceType aperiodic. The field is absent otherwise. |
| *CSI-IM-ForInterference* | This field is mandatory present if the *CSI-ReportConfig* identified by *reportConfigId* is configured with *csi-IM-ResourcesForInterference*; otherwise it is absent. |
| *NZP-CSI-RS-ForInterference* | This field is mandatory present if the *CSI-ReportConfig* identified by *reportConfigId* is configured with *nzp-CSI-RS-ResourcesForInterference*; otherwise it is absent. |
| *NoUnifiedTCI* | This field is absent, Need R, if *unifiedTCI-StateType* is configured for the serving cell in which the *CSI-AperiodicTriggerStateList* is included. It is optionally present, Need R, otherwise. |

#### – *CSI-FrequencyOccupation*

The IE *CSI-FrequencyOccupation* is used to configure the frequency domain occupation of a channel state information measurement resource (e.g. *NZP-CSI-RS-Resource*, *CSI-IM-Resource*).

*CSI-FrequencyOccupation* information element

-- ASN1START

-- TAG-CSI-FREQUENCYOCCUPATION-START

CSI-FrequencyOccupation ::= SEQUENCE {

startingRB INTEGER (0..maxNrofPhysicalResourceBlocks-1),

nrofRBs INTEGER (24..maxNrofPhysicalResourceBlocksPlus1),

...

}

-- TAG-CSI-FREQUENCYOCCUPATION-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-FrequencyOccupation* field descriptions |
| ***nrofRBs***  Number of PRBs across which this CSI resource spans. Only multiples of 4 are allowed. The smallest configurable number is the minimum of 24 and the width of the associated BWP. If the configured value is larger than the width of the corresponding BWP, the UE shall assume that the actual CSI-RS bandwidth is equal to the width of the BWP. |
| ***startingRB***  PRB where this CSI resource starts in relation to common resource block #0 (CRB#0) on the common resource block grid. Only multiples of 4 are allowed (0, 4, ...) |

#### – *CSI-IM-Resource*

The IE *CSI-IM-Resource* is used to configure one CSI Interference Management (IM) resource.

*CSI-IM-Resource* information element

-- ASN1START

-- TAG-CSI-IM-RESOURCE-START

CSI-IM-Resource ::= SEQUENCE {

csi-IM-ResourceId CSI-IM-ResourceId,

csi-IM-ResourceElementPattern CHOICE {

pattern0 SEQUENCE {

subcarrierLocation-p0 ENUMERATED { s0, s2, s4, s6, s8, s10 },

symbolLocation-p0 INTEGER (0..12)

},

pattern1 SEQUENCE {

subcarrierLocation-p1 ENUMERATED { s0, s4, s8 },

symbolLocation-p1 INTEGER (0..13)

}

} OPTIONAL, -- Need M

freqBand CSI-FrequencyOccupation OPTIONAL, -- Need M

periodicityAndOffset CSI-ResourcePeriodicityAndOffset OPTIONAL, -- Cond PeriodicOrSemiPersistent

...

}

-- TAG-CSI-IM-RESOURCE-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-IM-Resource* field descriptions |
| ***csi-IM-ResourceElementPattern***  The resource element pattern (Pattern0 (2,2) or Pattern1 (4,1)) with corresponding parameters (see TS 38.214 [19], clause 5.2.2.4) |
| ***freqBand***  Frequency-occupancy of CSI-IM (see TS 38.214 [19], clause 5.2.2.4) |
| ***periodicityAndOffset***  Periodicity and slot offset for periodic/semi-persistent CSI-IM. Network always configures the UE with a value for this field for periodic and semi-persistent CSI-IM-Resources (as indicated in CSI-ResourceConfig). A change of configuration between periodic or semi-persistent and aperiodic for a CSI-IM-Resource is not supported without a release and add. |
| ***subcarrierLocation-p0***  OFDM subcarrier occupancy of the CSI-IM resource for Pattern0 (see TS 38.214 [19], clause 5.2.2.4) |
| ***subcarrierLocation-p1***  OFDM subcarrier occupancy of the CSI-IM resource for Pattern1 (see TS 38.214 [19], clause 5.2.2.4) |
| ***symbolLocation-p0***  OFDM symbol location of the CSI-IM resource for Pattern0 (see TS 38.214 [19], clause 5.2.2.4) |
| ***symbolLocation-p1***  OFDM symbol location of the CSI-IM resource for Pattern1 (see TS 38.214 [19], clause 5.2.2.4) |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *PeriodicOrSemiPersistent* | The field is optionally present, Need M, for periodic and semi-persistent CSI-IM-Resources (as indicated in CSI-ResourceConfig). The field is absent otherwise. |

#### – *CSI-IM-ResourceId*

The IE *CSI-IM-ResourceId* is used to identify one *CSI-IM-Resource*.

*CSI-IM-ResourceId* information element

-- ASN1START

-- TAG-CSI-IM-RESOURCEID-START

CSI-IM-ResourceId ::= INTEGER (0..maxNrofCSI-IM-Resources-1)

-- TAG-CSI-IM-RESOURCEID-STOP

-- ASN1STOP

#### – *CSI-IM-ResourceSet*

The IE *CSI-IM-ResourceSet* is used to configure a set of one or more CSI Interference Management (IM) resources (their IDs) and set-specific parameters.

*CSI-IM-ResourceSet* information element

-- ASN1START

-- TAG-CSI-IM-RESOURCESET-START

CSI-IM-ResourceSet ::= SEQUENCE {

csi-IM-ResourceSetId CSI-IM-ResourceSetId,

csi-IM-Resources SEQUENCE (SIZE(1..maxNrofCSI-IM-ResourcesPerSet)) OF CSI-IM-ResourceId,

...

}

-- TAG-CSI-IM-RESOURCESET-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-IM-ResourceSet* field descriptions |
| ***csi-IM-Resources***  *CSI-IM-Resources* associated with this *CSI-IM-ResourceSet* (see TS 38.214 [19], clause 5.2). |

#### – *CSI-IM-ResourceSetId*

The IE *CSI-IM-ResourceSetId* is used to identify *CSI-IM-ResourceSet*s.

*CSI-IM-ResourceSetId* information element

-- ASN1START

-- TAG-CSI-IM-RESOURCESETID-START

CSI-IM-ResourceSetId ::= INTEGER (0..maxNrofCSI-IM-ResourceSets-1)

-- TAG-CSI-IM-RESOURCESETID-STOP

-- ASN1STOP

#### – *CSI-MeasConfig*

The IE *CSI-MeasConfig* is used to configure CSI-RS (reference signals) belonging to the serving cell in which *CSI-MeasConfig* is included, channel state information reports to be transmitted on PUCCH on the serving cell in which *CSI-MeasConfig* is included and channel state information reports on PUSCH triggered by DCI received on the serving cell in which *CSI-MeasConfig* is included. See also TS 38.214 [19], clause 5.2.

*CSI-MeasConfig* information element

-- ASN1START

-- TAG-CSI-MEASCONFIG-START

CSI-MeasConfig ::= SEQUENCE {

nzp-CSI-RS-ResourceToAddModList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-Resource OPTIONAL, -- Need N

nzp-CSI-RS-ResourceToReleaseList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-Resources)) OF NZP-CSI-RS-ResourceId OPTIONAL, -- Need N

nzp-CSI-RS-ResourceSetToAddModList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSet

OPTIONAL, -- Need N

nzp-CSI-RS-ResourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSets)) OF NZP-CSI-RS-ResourceSetId

OPTIONAL, -- Need N

csi-IM-ResourceToAddModList SEQUENCE (SIZE (1..maxNrofCSI-IM-Resources)) OF CSI-IM-Resource OPTIONAL, -- Need N

csi-IM-ResourceToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-IM-Resources)) OF CSI-IM-ResourceId OPTIONAL, -- Need N

csi-IM-ResourceSetToAddModList SEQUENCE (SIZE (1..maxNrofCSI-IM-ResourceSets)) OF CSI-IM-ResourceSet OPTIONAL, -- Need N

csi-IM-ResourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-IM-ResourceSets)) OF CSI-IM-ResourceSetId OPTIONAL, -- Need N

csi-SSB-ResourceSetToAddModList SEQUENCE (SIZE (1..maxNrofCSI-SSB-ResourceSets)) OF CSI-SSB-ResourceSet OPTIONAL, -- Need N

csi-SSB-ResourceSetToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-SSB-ResourceSets)) OF CSI-SSB-ResourceSetId OPTIONAL, -- Need N

csi-ResourceConfigToAddModList SEQUENCE (SIZE (1..maxNrofCSI-ResourceConfigurations)) OF CSI-ResourceConfig

OPTIONAL, -- Need N

csi-ResourceConfigToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-ResourceConfigurations)) OF CSI-ResourceConfigId

OPTIONAL, -- Need N

csi-ReportConfigToAddModList SEQUENCE (SIZE (1..maxNrofCSI-ReportConfigurations)) OF CSI-ReportConfig OPTIONAL, -- Need N

csi-ReportConfigToReleaseList SEQUENCE (SIZE (1..maxNrofCSI-ReportConfigurations)) OF CSI-ReportConfigId

OPTIONAL, -- Need N

reportTriggerSize INTEGER (0..6) OPTIONAL, -- Need M

aperiodicTriggerStateList SetupRelease { CSI-AperiodicTriggerStateList } OPTIONAL, -- Need M

semiPersistentOnPUSCH-TriggerStateList SetupRelease { CSI-SemiPersistentOnPUSCH-TriggerStateList } OPTIONAL, -- Need M

...,

[[

reportTriggerSizeDCI-0-2-r16 INTEGER (0..6) OPTIONAL -- Need R

]],

[[

sCellActivationRS-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxNrofSCellActRS-r17)) OF SCellActivationRS-Config-r17 OPTIONAL, -- Need N

sCellActivationRS-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofSCellActRS-r17)) OF SCellActivationRS-ConfigId-r17 OPTIONAL -- Need N

]]

}

-- TAG-CSI-MEASCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-MeasConfig* field descriptions |
| ***aperiodicTriggerStateList***  Contains trigger states for dynamically selecting one or more aperiodic and semi-persistent reporting configurations and/or triggering one or more aperiodic CSI-RS resource sets for channel and/or interference measurement (see TS 38.214 [19], clause 5.2.1). |
| ***csi-IM-ResourceSetToAddModList***  Pool of *CSI-IM-ResourceSet* which can be referred to from *CSI-ResourceConfig* or from MAC CEs. |
| ***csi-IM-ResourceToAddModList***  Pool of *CSI-IM-Resource* which can be referred to from *CSI-IM-ResourceSet*. |
| ***csi-ReportConfigToAddModList***  Configured CSI report settings as specified in TS 38.214 [19] clause 5.2.1.1. |
| ***csi-ResourceConfigToAddModList***  Configured CSI resource settings as specified in TS 38.214 [19] clause 5.2.1.2. |
| ***csi-SSB-ResourceSetToAddModList***  Pool of CSI-SSB-ResourceSet which can be referred to from *CSI-ResourceConfig*. |
| ***nzp-CSI-RS-ResourceSetToAddModList***  Pool of *NZP-CSI-RS-ResourceSet* which can be referred to from *CSI-ResourceConfig* or from MAC CEs. |
| ***nzp-CSI-RS-ResourceToAddModList***  Pool of *NZP-CSI-RS-Resource* which can be referred to from *NZP-CSI-RS-ResourceSet*. |
| ***reportTriggerSize, reportTriggerSizeDCI-0-2***  Size of CSI request field in DCI (bits) (see TS 38.214 [19], clause 5.2.1.5.1). The field *reportTriggerSize* applies to DCI format 0\_1 and the field *reportTriggerSizeDCI-0-2* applies to DCI format 0\_2 (see TS 38.214 [19], clause 5.2.1.5.1). |
| ***scellActivationRS-ConfigToAddModList***  Configured RS for fast SCell activation as specified in TS 38.214 [19] clause x.y.z. |

#### – *CSI-ReportConfig*

The IE *CSI-ReportConfig* is used to configure a periodic or semi-persistent report sent on PUCCH on the cell in which the *CSI-ReportConfig* is included, or to configure a semi-persistent or aperiodic report sent on PUSCH triggered by DCI received on the cell in which the *CSI-ReportConfig* is included (in this case, the cell on which the report is sent is determined by the received DCI). See TS 38.214 [19], clause 5.2.1.

*CSI-ReportConfig* information element

-- ASN1START

-- TAG-CSI-REPORTCONFIG-START

CSI-ReportConfig ::= SEQUENCE {

reportConfigId CSI-ReportConfigId,

carrier ServCellIndex OPTIONAL, -- Need S

resourcesForChannelMeasurement CSI-ResourceConfigId,

csi-IM-ResourcesForInterference CSI-ResourceConfigId OPTIONAL, -- Need R

nzp-CSI-RS-ResourcesForInterference CSI-ResourceConfigId OPTIONAL, -- Need R

reportConfigType CHOICE {

periodic SEQUENCE {

reportSlotConfig CSI-ReportPeriodicityAndOffset,

pucch-CSI-ResourceList SEQUENCE (SIZE (1..maxNrofBWPs)) OF PUCCH-CSI-Resource

},

semiPersistentOnPUCCH SEQUENCE {

reportSlotConfig CSI-ReportPeriodicityAndOffset,

pucch-CSI-ResourceList SEQUENCE (SIZE (1..maxNrofBWPs)) OF PUCCH-CSI-Resource

},

semiPersistentOnPUSCH SEQUENCE {

reportSlotConfig ENUMERATED {sl5, sl10, sl20, sl40, sl80, sl160, sl320},

reportSlotOffsetList SEQUENCE (SIZE (1.. maxNrofUL-Allocations)) OF INTEGER(0..32),

p0alpha P0-PUSCH-AlphaSetId

},

aperiodic SEQUENCE {

reportSlotOffsetList SEQUENCE (SIZE (1..maxNrofUL-Allocations)) OF INTEGER(0..32)

}

},

reportQuantity CHOICE {

none NULL,

cri-RI-PMI-CQI NULL,

cri-RI-i1 NULL,

cri-RI-i1-CQI SEQUENCE {

pdsch-BundleSizeForCSI ENUMERATED {n2, n4} OPTIONAL -- Need S

},

cri-RI-CQI NULL,

cri-RSRP NULL,

ssb-Index-RSRP NULL,

cri-RI-LI-PMI-CQI NULL

},

reportFreqConfiguration SEQUENCE {

cqi-FormatIndicator ENUMERATED { widebandCQI, subbandCQI } OPTIONAL, -- Need R

pmi-FormatIndicator ENUMERATED { widebandPMI, subbandPMI } OPTIONAL, -- Need R

csi-ReportingBand CHOICE {

subbands3 BIT STRING(SIZE(3)),

subbands4 BIT STRING(SIZE(4)),

subbands5 BIT STRING(SIZE(5)),

subbands6 BIT STRING(SIZE(6)),

subbands7 BIT STRING(SIZE(7)),

subbands8 BIT STRING(SIZE(8)),

subbands9 BIT STRING(SIZE(9)),

subbands10 BIT STRING(SIZE(10)),

subbands11 BIT STRING(SIZE(11)),

subbands12 BIT STRING(SIZE(12)),

subbands13 BIT STRING(SIZE(13)),

subbands14 BIT STRING(SIZE(14)),

subbands15 BIT STRING(SIZE(15)),

subbands16 BIT STRING(SIZE(16)),

subbands17 BIT STRING(SIZE(17)),

subbands18 BIT STRING(SIZE(18)),

...,

subbands19-v1530 BIT STRING(SIZE(19))

} OPTIONAL -- Need S

} OPTIONAL, -- Need R

timeRestrictionForChannelMeasurements ENUMERATED {configured, notConfigured},

timeRestrictionForInterferenceMeasurements ENUMERATED {configured, notConfigured},

codebookConfig CodebookConfig OPTIONAL, -- Need R

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

groupBasedBeamReporting CHOICE {

enabled NULL,

disabled SEQUENCE {

nrofReportedRS ENUMERATED {n1, n2, n3, n4} OPTIONAL -- Need S

}

},

cqi-Table ENUMERATED {table1, table2, table3, table4-r17} OPTIONAL, -- Need R

subbandSize ENUMERATED {value1, value2},

non-PMI-PortIndication SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourcesPerConfig)) OF PortIndexFor8Ranks OPTIONAL, -- Need R

...,

[[

semiPersistentOnPUSCH-v1530 SEQUENCE {

reportSlotConfig-v1530 ENUMERATED {sl4, sl8, sl16}

} OPTIONAL -- Need R

]],

[[

semiPersistentOnPUSCH-v1610 SEQUENCE {

reportSlotOffsetListDCI-0-2-r16 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER(0..32) OPTIONAL, -- Need R

reportSlotOffsetListDCI-0-1-r16 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER(0..32) OPTIONAL -- Need R

} OPTIONAL, -- Need R

aperiodic-v1610 SEQUENCE {

reportSlotOffsetListDCI-0-2-r16 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER(0..32) OPTIONAL, -- Need R

reportSlotOffsetListDCI-0-1-r16 SEQUENCE (SIZE (1.. maxNrofUL-Allocations-r16)) OF INTEGER(0..32) OPTIONAL -- Need R

} OPTIONAL, -- Need R

reportQuantity-r16 CHOICE {

cri-SINR-r16 NULL,

ssb-Index-SINR-r16 NULL

} OPTIONAL, -- Need R

codebookConfig-r16 CodebookConfig-r16 OPTIONAL -- Need R

]],

[[

cqi-BitsPerSubband-r17 ENUMERATED {bits4} OPTIONAL, -- Need R

groupBasedBeamReporting-v1710 SEQUENCE {

nrofReportedGroups-r17 ENUMERATED {n1, n2, n3, n4}

} OPTIONAL, -- Need R

codebookConfig-r17 CodebookConfig-r17 OPTIONAL, -- Need R

sharedCMR-r17 ENUMERATED {enable} OPTIONAL, -- Need R

csi-ReportMode-r17 ENUMERATED {mode1, mode2} OPTIONAL, -- Need R

numberOfSingleTRP-CSI-Mode1-r17 ENUMERATED {n0, n1, n2} OPTIONAL, -- Need R

reportQuantity-r17 CHOICE {

cri-RSRP-Index-r17 NULL,

ssb-Index-RSRP-Index-r17 NULL,

cri-SINR-Index-r17 NULL,

ssb-Index-SINR-Index-r17 NULL

} OPTIONAL -- Need R

]]

}

CSI-ReportPeriodicityAndOffset ::= CHOICE {

slots4 INTEGER(0..3),

slots5 INTEGER(0..4),

slots8 INTEGER(0..7),

slots10 INTEGER(0..9),

slots16 INTEGER(0..15),

slots20 INTEGER(0..19),

slots40 INTEGER(0..39),

slots80 INTEGER(0..79),

slots160 INTEGER(0..159),

slots320 INTEGER(0..319)

}

PUCCH-CSI-Resource ::= SEQUENCE {

uplinkBandwidthPartId BWP-Id,

pucch-Resource PUCCH-ResourceId

}

PortIndexFor8Ranks ::= CHOICE {

portIndex8 SEQUENCE{

rank1-8 PortIndex8 OPTIONAL, -- Need R

rank2-8 SEQUENCE(SIZE(2)) OF PortIndex8 OPTIONAL, -- Need R

rank3-8 SEQUENCE(SIZE(3)) OF PortIndex8 OPTIONAL, -- Need R

rank4-8 SEQUENCE(SIZE(4)) OF PortIndex8 OPTIONAL, -- Need R

rank5-8 SEQUENCE(SIZE(5)) OF PortIndex8 OPTIONAL, -- Need R

rank6-8 SEQUENCE(SIZE(6)) OF PortIndex8 OPTIONAL, -- Need R

rank7-8 SEQUENCE(SIZE(7)) OF PortIndex8 OPTIONAL, -- Need R

rank8-8 SEQUENCE(SIZE(8)) OF PortIndex8 OPTIONAL -- Need R

},

portIndex4 SEQUENCE{

rank1-4 PortIndex4 OPTIONAL, -- Need R

rank2-4 SEQUENCE(SIZE(2)) OF PortIndex4 OPTIONAL, -- Need R

rank3-4 SEQUENCE(SIZE(3)) OF PortIndex4 OPTIONAL, -- Need R

rank4-4 SEQUENCE(SIZE(4)) OF PortIndex4 OPTIONAL -- Need R

},

portIndex2 SEQUENCE{

rank1-2 PortIndex2 OPTIONAL, -- Need R

rank2-2 SEQUENCE(SIZE(2)) OF PortIndex2 OPTIONAL -- Need R

},

portIndex1 NULL

}

PortIndex8::= INTEGER (0..7)

PortIndex4::= INTEGER (0..3)

PortIndex2::= INTEGER (0..1)

-- TAG-CSI-REPORTCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-ReportConfig* field descriptions |
| ***carrier***  Indicates in which serving cell the *CSI-ResourceConfig* indicated below are to be found. If the field is absent, the resources are on the same serving cell as this report configuration. |
| ***codebookConfig***  Codebook configuration for Type-1 or Type-2 including codebook subset restriction. Network can only configure one of *codebookConfig*, *codebookConfig-r16* or *codebookConfig-r17* to a UE. |
| ***cqi-BitsPerSubband***  This field can only be present if *cqi-FormatIndicator* is set to *subbandCQI*. If the field is configured with *bits4*, the UE uses 4-bit sub-band CQI. If the field is not present and *cqi-FormatIndicator* is set to *subbandCQI*, the UE uses 2-bit sub-band differential CQI. |
| ***cqi-FormatIndicator***  Indicates whether the UE shall report a single (wideband) or multiple (subband) CQI (see TS 38.214 [19], clause 5.2.1.4). |
| ***cqi-Table***  Which CQI table to use for CQI calculation (see TS 38.214 [19], clause 5.2.2.1). For a RedCap UE, CQI table 2 is only supported if the UE indicates support of 256QAM for PUSCH. |
| ***csi-IM-ResourcesForInterference***  CSI IM resources for interference measurement. *csi-ResourceConfigId* of a *CSI-ResourceConfig* included in the configuration of the serving cell indicated with the field "carrier" above. The *CSI-ResourceConfig* indicated here contains only CSI-IM resources. The *bwp-Id* in that *CSI-ResourceConfig* is the same value as the *bwp-Id* in the *CSI-ResourceConfig* indicated by *resourcesForChannelMeasurement*. |
| ***csi-ReportingBand***  Indicates a contiguous or non-contiguous subset of subbands in the bandwidth part which CSI shall be reported for. Each bit in the bit-string represents one subband. The right-most bit in the bit string represents the lowest subband in the BWP. The choice determines the number of subbands (subbands3 for 3 subbands, subbands4 for 4 subbands, and so on) (see TS 38.214 [19], clause 5.2.1.4). This field is absent if there are less than 24 PRBs (no sub band) and present otherwise (see TS 38.214 [19], clause 5.2.1.4). |
| ***csi-ReportMode***  Configures the CSI report modes Mode1 or Mode 2 (see TS 38.214 [19], clause 5.2.1.4.2) |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***groupBasedBeamReporting***  Turning on/off group beam based reporting (see TS 38.214 [19], clause 5.2.1.4). If *groupBasedBeamReporting* (without suffix) is set to disabled, *groupBasedBeamReporting-v1710* is absent. |
| ***non-PMI-PortIndication***  Port indication for RI/CQI calculation. For each CSI-RS resource in the linked ResourceConfig for channel measurement, a port indication for each rank R, indicating which R ports to use. Applicable only for non-PMI feedback (see TS 38.214 [19], clause 5.2.1.4.2).  The first entry in *non-PMI-PortIndication* corresponds to the NZP-CSI-RS-Resource indicated by the first entry in *nzp-CSI-RS-Resources* in the *NZP-CSI-RS-ResourceSet* indicated in the first entry of *nzp-CSI-RS-ResourceSetList* of the *CSI-ResourceConfig* whose *CSI-ResourceConfigId* is indicated in a CSI-MeasId together with the above *CSI-ReportConfigId*; the second entry in *non-PMI-PortIndication* corresponds to the NZP-CSI-RS-Resource indicated by the second entry in *nzp-CSI-RS-Resources* in the *NZP-CSI-RS-ResourceSet* indicated in the first entry of *nzp-CSI-RS-ResourceSetList* of the same *CSI-ResourceConfig*, and so on until the NZP-CSI-RS-Resource indicated by the last entry in *nzp-CSI-RS-Resources* in the in the *NZP-CSI-RS-ResourceSet* indicated in the first entry of *nzp-CSI-RS-ResourceSetList* of the same *CSI-ResourceConfig*. Then the next entry corresponds to the NZP-CSI-RS-Resource indicated by the first entry in *nzp-CSI-RS-Resources* in the *NZP-CSI-RS-ResourceSet* indicated in the second entry of *nzp-CSI-RS-ResourceSetList* of the same *CSI-ResourceConfig* and so on. |
| ***nrofReportedGroups***  Number of reported resource groups per CSI-report *n1* means one resource group, *n2* means 2 resource groups, and so on. If *nrofReportedGroups* is configured, the UE ignores groupBasedBeamReporting (without suffix). |
| ***nrofReportedRS***  The number (N) of measured RS resources to be reported per report setting in a non-group-based report. N <= N\_max, where N\_max is either 2 or 4 depending on UE capability.  (see TS 38.214 [19], clause 5.2.1.4) When the field is absent the UE applies the value 1. |
| ***numberOfSingleTRP-CSI-Mode1***  Configures the number of reported X CSIs when *csi-ReportMode* is set to 'Mode 1' as described in TS 38.214 [19], clause 5.2.1.4.2. The field is present only if csi-ReportMode configures Mode 1. |
| ***nzp-CSI-RS-ResourcesForInterference***  NZP CSI RS resources for interference measurement. *csi-ResourceConfigId* of a *CSI-ResourceConfig* included in the configuration of the serving cell indicated with the field "carrier" above. The *CSI-ResourceConfig* indicated here contains only NZP-CSI-RS resources. The *bwp-Id* in that *CSI-ResourceConfig* is the same value as the *bwp-Id* in the *CSI-ResourceConfig* indicated by *resourcesForChannelMeasurement*. |
| ***p0alpha***  Index of the p0-alpha set determining the power control for this CSI report transmission (see TS 38.214 [19], clause 6.2.1.2). |
| ***pdsch-BundleSizeForCSI***  PRB bundling size to assume for CQI calculation when *reportQuantity* is CRI/RI/i1/CQI. If the field is absent, the UE assumes that no PRB bundling is applied (see TS 38.214 [19], clause 5.2.1.4.2). |
| ***pmi-FormatIndicator***  Indicates whether the UE shall report a single (wideband) or multiple (subband) PMI. (see TS 38.214 [19], clause 5.2.1.4). |
| ***pucch-CSI-ResourceList***  Indicates which PUCCH resource to use for reporting on PUCCH. |
| ***reportConfigType***  Time domain behavior of reporting configuration. |
| ***reportFreqConfiguration***  Reporting configuration in the frequency domain. (see TS 38.214 [19], clause 5.2.1.4). |
| ***reportQuantity***  The CSI related quantities to report. see TS 38.214 [19], clause 5.2.1. If the field *reportQuantity-r16* is present, UE shall ignore *reportQuantity* (without suffix). |
| ***reportSlotConfig***  Periodicity and slot offset (see TS 38.214 [19], clause 5.2.1.4). If the field *reportSlotConfig-v1530* is present, the UE shall ignore the value provided in *reportSlotConfig* (without suffix). |
| ***reportSlotOffsetList, reportSlotOffsetListDCI-0-1***, ***reportSlotOffsetListDCI-0-2***  Timing offset Y for semi persistent reporting using PUSCH. This field lists the allowed offset values. This list must have the same number of entries as the *pusch-TimeDomainAllocationList* in *PUSCH-Config*. A particular value is indicated in DCI. The network indicates in the DCI field of the UL grant, which of the configured report slot offsets the UE shall apply. The DCI value 0 corresponds to the first report slot offset in this list, the DCI value 1 corresponds to the second report slot offset in this list, and so on. The first report is transmitted in slot n+Y, second report in n+Y+P, where P is the configured periodicity.  Timing offset Y for aperiodic reporting using PUSCH. This field lists the allowed offset values. This list must have the same number of entries as the *pusch-TimeDomainAllocationList* in *PUSCH-Config*. A particular value is indicated in DCI. The network indicates in the DCI field of the UL grant, which of the configured report slot offsets the UE shall apply. The DCI value 0 corresponds to the first report slot offset in this list, the DCI value 1 corresponds to the second report slot offset in this list, and so on (see TS 38.214 [19], clause 6.1.2.1).  The field *reportSlotOffsetListDCI-0-1* applies to DCI format 0\_1 and the field *reportSlotOffsetListDCI-0-2* applies to DCI format 0\_2 (see TS 38.214 [19], clause 6.1.2.1). |
| ***resourcesForChannelMeasurement***  Resources for channel measurement. *csi-ResourceConfigId* of a *CSI-ResourceConfig* included in the configuration of the serving cell indicated with the field "carrier" above. The *CSI-ResourceConfig* indicated here contains only NZP-CSI-RS resources and/or SSB resources. This *CSI-ReportConfig* is associated with the DL BWP indicated by *bwp-Id* in that *CSI-ResourceConfig*. |
| ***sharedCMR***  Enables sharing of channel measurement resources between different CSI measurement hypotheses when (1) *csi-ReportMode* is set to 'Mode1' and *numberOfSingleTRP-CSI-Mode1* is set to 1 or 2; or (2) *csi-ReportMode* is set to 'Mode2' (see TS 38.214 [19], clause 5.2.1.4.2). |
| ***subbandSize***  Indicates one out of two possible BWP-dependent values for the subband size as indicated in TS 38.214 [19], table 5.2.1.4-2 . If *csi-ReportingBand* is absent, the UE shall ignore this field. |
| ***timeRestrictionForChannelMeasurements***  Time domain measurement restriction for the channel (signal) measurements (see TS 38.214 [19], clause 5.2.1.1). |
| ***timeRestrictionForInterferenceMeasurements***  Time domain measurement restriction for interference measurements (see TS 38.214 [19], clause 5.2.1.1). |

|  |
| --- |
| *PortIndexFor8Ranks* field descriptions |
| ***portIndex8***  Port-Index configuration for up to rank 8. If present, the network configures port indexes for at least one of the ranks. |
| ***portIndex4***  Port-Index configuration for up to rank 4. If present, the network configures port indexes for at least one of the ranks. |
| ***portIndex2***  Port-Index configuration for up to rank 2. If present, the network configures port indexes for at least one of the ranks. |
| ***portIndex1***  Port-Index configuration for rank 1. |

|  |
| --- |
| *PUCCH-CSI-Resource* field descriptions |
| ***pucch-Resource***  PUCCH resource for the associated uplink BWP. Only PUCCH-Resource of format 2, 3 and 4 is supported. The actual PUCCH-Resource is configured in *PUCCH-Config* and referred to by its ID. When two *PUCCH-Config* are configured within *PUCCH-ConfigurationList*, *PUCCH-ResourceId* in a *PUCCH-CSI-Resource* refers to a PUCCH-Resource in the *PUCCH-Config* used for HARQ-ACK with low priority. |

#### – *CSI-ReportConfigId*

The IE *CSI-ReportConfigId* is used to identify one *CSI-ReportConfig*.

*CSI-ReportConfigId* information element

-- ASN1START

-- TAG-CSI-REPORTCONFIGID-START

CSI-ReportConfigId ::= INTEGER (0..maxNrofCSI-ReportConfigurations-1)

-- TAG-CSI-REPORTCONFIGID-STOP

-- ASN1STOP

#### – *CSI-ResourceConfig*

The IE *CSI-ResourceConfig* defines a group of one or more *NZP-CSI-RS-ResourceSet*, *CSI-IM-ResourceSet* and/or *CSI-SSB-ResourceSet*.

*CSI-ResourceConfig* information element

-- ASN1START

-- TAG-CSI-RESOURCECONFIG-START

CSI-ResourceConfig ::= SEQUENCE {

csi-ResourceConfigId CSI-ResourceConfigId,

csi-RS-ResourceSetList CHOICE {

nzp-CSI-RS-SSB SEQUENCE {

nzp-CSI-RS-ResourceSetList SEQUENCE (SIZE (1..maxNrofNZP-CSI-RS-ResourceSetsPerConfig)) OF NZP-CSI-RS-ResourceSetId

OPTIONAL, -- Need R

csi-SSB-ResourceSetList SEQUENCE (SIZE (1..maxNrofCSI-SSB-ResourceSetsPerConfig)) OF CSI-SSB-ResourceSetId OPTIONAL -- Need R

},

csi-IM-ResourceSetList SEQUENCE (SIZE (1..maxNrofCSI-IM-ResourceSetsPerConfig)) OF CSI-IM-ResourceSetId

},

bwp-Id BWP-Id,

resourceType ENUMERATED { aperiodic, semiPersistent, periodic },

...,

[[

csi-SSB-ResourceSetListExt-r17 CSI-SSB-ResourceSetId OPTIONAL -- Need R

]]

}

-- TAG-CSI-RESOURCECONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-ResourceConfig* field descriptions |
| ***bwp-Id***  The DL BWP which the CSI-RS associated with this *CSI-ResourceConfig* are located in (see TS 38.214 [19], clause 5.2.1.2. |
| ***csi-IM-ResourceSetList***  List of references to CSI-IM resources used for CSI measurement and reporting in a CSI-RS resource set. Contains up to *maxNrofCSI-IM-ResourceSetsPerConfig* resource sets if *resourceType* is 'aperiodic' and 1 otherwise (see TS 38.214 [19], clause 5.2.1.2). |
| ***csi-ResourceConfigId***  Used in *CSI-ReportConfig* to refer to an instance of *CSI-ResourceConfig.* |
| ***csi-SSB-ResourceSetList, csi-SSB-ResourceSetListExt***  List of references to SSB resources used for CSI measurement and reporting in a CSI-RS resource set (see TS 38.214 [19], clause 5.2.1.2). If *groupBasedBeamReporting-v1710* is configured in the IE *CSI-ReportConfig* that indicates this *CSI-ResourceConfig* as *resourceForChannelMeasurement*, the network configures 2 resource sets, which may be two NZP CSI-RS resource sets, two CSI SSB resource sets or one NZP CSI-RS resource set and one CSI-SSB resource set (see TS 38.214 [19], clause 5.2.1.2 and 5.2.1.4.2). In this case, in TS 38.212 [17] Table 6.3.1.1.2-8B:  - if the list has one CSI-SSB resource set, this resource set is indicated by a resource set indicator set to 1, while the resource set indicator of the *NZP CSI-RS resource* set is 0;  - if the list has two CSI-SSB resource sets, the first resource set is indicated by a resource set indicator set to 0 and the second resource set by a resource set indicator set to 1. |
| ***nzp-CSI-RS-ResourceSetList***  List of references to NZP CSI-RS resources used for beam measurement and reporting in a CSI-RS resource set. Contains up to *maxNrofNZP-CSI-RS-ResourceSetsPerConfig* resource sets if *resourceType* is 'aperiodic'. Otherwise, contains 1 resource set when *groupBasedBeamReporting-v1710* is not configured in IE *CSI-ReportConfig*. If *groupBasedBeamReporting-v1710* is configured and *resourceType* is set to 'periodic' or 'semipersistent', then the network configures 2 resource sets, which may be two NZP CSI-RS resource sets, two CSI SSB resource sets or one NZP CSI-RS resource set and one CSI-SSB resource set (see TS 38.214 [19], clause 5.2.1.2 and 5.2.1.4.2). In this case, in :TS 38.212 [17] Table 6.3.1.1.2-8B:  - if the list has one NZP CSI-RS resource set, this resource set is indicated by a resource set indicator set to 0;  - if the list has two NZP CSI-RS resource sets, the first resource set is indicated by a resource set indicator set to 0 and the second resource set by a resource set indicator set to 1. |
| ***resourceType***  Time domain behavior of resource configuration (see TS 38.214 [19], clause 5.2.1.2). It does not apply to resources provided in the *csi-SSB-ResourceSetList*. |

#### – *CSI-ResourceConfigId*

The IE *CSI-ResourceConfigId* is used to identify a *CSI-ResourceConfig*.

*CSI-ResourceConfigId* information element

-- ASN1START

-- TAG-CSI-RESOURCECONFIGID-START

CSI-ResourceConfigId ::= INTEGER (0..maxNrofCSI-ResourceConfigurations-1)

-- TAG-CSI-RESOURCECONFIGID-STOP

-- ASN1STOP

#### – *CSI-ResourcePeriodicityAndOffset*

The IE *CSI-ResourcePeriodicityAndOffset* is used to configure a periodicity and a corresponding offset for periodic and semi-persistent CSI resources, and for periodic and semi-persistent reporting on PUCCH. both, the periodicity and the offset are given in number of slots. The periodicity value *slots4* corresponds to 4 slots, value *slots5* corresponds to 5 slots, and so on.

*CSI-ResourcePeriodicityAndOffset* information element

-- ASN1START

-- TAG-CSI-RESOURCEPERIODICITYANDOFFSET-START

CSI-ResourcePeriodicityAndOffset ::= CHOICE {

slots4 INTEGER (0..3),

slots5 INTEGER (0..4),

slots8 INTEGER (0..7),

slots10 INTEGER (0..9),

slots16 INTEGER (0..15),

slots20 INTEGER (0..19),

slots32 INTEGER (0..31),

slots40 INTEGER (0..39),

slots64 INTEGER (0..63),

slots80 INTEGER (0..79),

slots160 INTEGER (0..159),

slots320 INTEGER (0..319),

slots640 INTEGER (0..639)

}

-- TAG-CSI-RESOURCEPERIODICITYANDOFFSET-STOP

-- ASN1STOP

#### – *CSI-RS-ResourceConfigMobility*

The IE *CSI-RS-ResourceConfigMobility* is used to configure CSI-RS based RRM measurements.

*CSI-RS-ResourceConfigMobility* information element

-- ASN1START

-- TAG-CSI-RS-RESOURCECONFIGMOBILITY-START

CSI-RS-ResourceConfigMobility ::= SEQUENCE {

subcarrierSpacing SubcarrierSpacing,

csi-RS-CellList-Mobility SEQUENCE (SIZE (1..maxNrofCSI-RS-CellsRRM)) OF CSI-RS-CellMobility,

...,

[[

refServCellIndex ServCellIndex OPTIONAL -- Need S

]]

}

CSI-RS-CellMobility ::= SEQUENCE {

cellId PhysCellId,

csi-rs-MeasurementBW SEQUENCE {

nrofPRBs ENUMERATED { size24, size48, size96, size192, size264},

startPRB INTEGER(0..2169)

},

density ENUMERATED {d1,d3} OPTIONAL, -- Need R

csi-rs-ResourceList-Mobility SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesRRM)) OF CSI-RS-Resource-Mobility

}

CSI-RS-Resource-Mobility ::= SEQUENCE {

csi-RS-Index CSI-RS-Index,

slotConfig CHOICE {

ms4 INTEGER (0..31),

ms5 INTEGER (0..39),

ms10 INTEGER (0..79),

ms20 INTEGER (0..159),

ms40 INTEGER (0..319)

},

associatedSSB SEQUENCE {

ssb-Index SSB-Index,

isQuasiColocated BOOLEAN

} OPTIONAL, -- Need R

frequencyDomainAllocation CHOICE {

row1 BIT STRING (SIZE (4)),

row2 BIT STRING (SIZE (12))

},

firstOFDMSymbolInTimeDomain INTEGER (0..13),

sequenceGenerationConfig INTEGER (0..1023),

...

}

CSI-RS-Index ::= INTEGER (0..maxNrofCSI-RS-ResourcesRRM-1)

-- TAG-CSI-RS-RESOURCECONFIGMOBILITY-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-RS-CellMobility* field descriptions |
| ***csi-rs-ResourceList-Mobility***  List of CSI-RS resources for mobility. The maximum number of CSI-RS resources that can be configured per *measObjectNR* depends on the configuration of *associatedSSB* and the support of *increasedNumberofCSIRSPerMO* capability (see TS 38.214 [19], clause 5.1.6.1.3). |
| ***density***  Frequency domain density for the 1-port CSI-RS for L3 mobility. See TS 38.211 [16], clause 7.4.1. |
| ***nrofPRBs***  Allowed size of the measurement BW in PRBs. See TS 38.211 [16], clause 7.4.1. |
| ***startPRB***  Starting PRB index of the measurement bandwidth. See TS 38.211 [16], clause 7.4.1. |

|  |
| --- |
| *CSI-RS-ResourceConfigMobility* field descriptions |
| ***csi-RS-CellList-Mobility***  List of cells for CSI-RS based RRM measurements. |
| ***refServCellIndex***  Indicates the serving cell providing the timing reference for CSI-RS resources without *associatedSSB*. The field may be present only if there is at least one CSI-RS resource configured without *associatedSSB*. If this field is absent, the UE shall use the timing of the PCell for measurements on the CSI-RS resources without *associatedSSB*. The CSI-RS resources and the serving cell indicated by *refServCellIndex* for timing reference should be located in the same band. |
| ***subcarrierSpacing***  Subcarrier spacing of CSI-RS.  Only the following values are applicable depending on the used frequency:  FR1: 15, 30, or 60 kHz  FR2-1: 120 or 240 kHz  FR2-2: 120, 480, or 960 kHz |

|  |
| --- |
| *CSI-RS-Resource-Mobility* field descriptions |
| ***associatedSSB***  If this field is present, the UE may base the timing of the CSI-RS resource indicated in *CSI-RS-Resource-Mobility* on the timing of the cell indicated by the *cellId* in the *CSI-RS-CellMobility*. In this case, the UE is not required to monitor that CSI-RS resource if the UE cannot detect the SS/PBCH block indicated by this *associatedSSB* and *cellId*. If this field is absent, the UE shall base the timing of the CSI-RS resource indicated in *CSI-RS-Resource-Mobility* on the timing of the serving cell indicated by *refServCellIndex*. In this case, the UE is required to measure the CSI-RS resource even if SS/PBCH block(s) with *cellId* in the *CSI-RS-CellMobility* are not detected.  CSI-RS resources with and without *associatedSSB* may be configured in accordance with the rules in TS 38.214 [19], clause 5.1.6.1.3. |
| ***csi-RS-Index***  CSI-RS resource index associated to the CSI-RS resource to be measured (and used for reporting). |
| ***firstOFDMSymbolInTimeDomain***  Time domain allocation within a physical resource block. The field indicates the first OFDM symbol in the PRB used for CSI-RS, see TS 38.211 [16], clause 7.4.1.5.3. Value 2 is supported only when *dmrs-TypeA-Position* equals *pos3*. |
| ***frequencyDomainAllocation***  Frequency domain allocation within a physical resource block in accordance with TS 38.211 [16], clause 7.4.1.5.3 including table 7.4.1.5.2-1. The number of bits that may be set to one depend on the chosen row in that table. |
| ***isQuasiColocated***  Indicates that the CSI-RS resource is quasi co-located with the associated SS/PBCH block, see TS 38.214 [19], clause 5.1.6.1.3. |
| ***sequenceGenerationConfig***  Scrambling ID for CSI-RS (see TS 38.211 [16], clause 7.4.1.5.2). |
| ***slotConfig***  Indicates the CSI-RS periodicity (in milliseconds) and for each periodicity the offset (in number of slots). When *subcarrierSpacing* is set to *kHz15*, the maximum offset values for periodicities *ms4/ms5/ms10/ms20/ms40* are 3/4/9/19/39 slots. When *subcarrierSpacing* is set to *kHz30*, the maximum offset values for periodicities *ms4/ms5/ms10/ms20/ms40* are 7/9/19/39/79 slots. When *subcarrierSpacing* is set to *kHz60*, the maximum offset values for periodicities *ms4/ms5/ms10/ms20/ms40* are 15/19/39/79/159 slots. When *subcarrierSpacing* is set *kHz120*, the maximum offset values for periodicities *ms4/ms5/ms10/ms20/ms40* are 31/39/79/159/319 slots. |

#### – *CSI-RS-ResourceMapping*

The IE *CSI-RS-ResourceMapping* is used to configure the resource element mapping of a CSI-RS resource in time- and frequency domain.

*CSI-RS-ResourceMapping* information element

-- ASN1START

-- TAG-CSI-RS-RESOURCEMAPPING-START

CSI-RS-ResourceMapping ::= SEQUENCE {

frequencyDomainAllocation CHOICE {

row1 BIT STRING (SIZE (4)),

row2 BIT STRING (SIZE (12)),

row4 BIT STRING (SIZE (3)),

other BIT STRING (SIZE (6))

},

nrofPorts ENUMERATED {p1,p2,p4,p8,p12,p16,p24,p32},

firstOFDMSymbolInTimeDomain INTEGER (0..13),

firstOFDMSymbolInTimeDomain2 INTEGER (2..12) OPTIONAL, -- Need R

cdm-Type ENUMERATED {noCDM, fd-CDM2, cdm4-FD2-TD2, cdm8-FD2-TD4},

density CHOICE {

dot5 ENUMERATED {evenPRBs, oddPRBs},

one NULL,

three NULL,

spare NULL

},

freqBand CSI-FrequencyOccupation,

...

}

-- TAG-CSI-RS-RESOURCEMAPPING-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-RS-ResourceMapping* field descriptions |
| ***cdm-Type***  CDM type (see TS 38.214 [19], clause 5.2.2.3.1). |
| ***density***  Density of CSI-RS resource measured in RE/port/PRB (see TS 38.211 [16], clause 7.4.1.5.3).  Values 0.5 (*dot5*), 1 (*one*) and 3 (*three*) are allowed for X=1, values 0.5 (*dot5*) and 1 (*one*) are allowed for X=2, 16, 24 and 32, value 1 (*one*) is allowed for X=4, 8, 12.  For density = 1/2, includes 1-bit indication for RB level comb offset indicating whether odd or even RBs are occupied by CSI-RS. |
| ***firstOFDMSymbolInTimeDomain2***  Time domain allocation within a physical resource block. See TS 38.211 [16], clause 7.4.1.5.3. |
| ***firstOFDMSymbolInTimeDomain***  Time domain allocation within a physical resource block. The field indicates the first OFDM symbol in the PRB used for CSI-RS. See TS 38.211 [16], clause 7.4.1.5.3. Value 2 is supported only when *dmrs-TypeA-Position* equals *pos3*. |
| ***freqBand***  Wideband or partial band CSI-RS, (see TS 38.214 [19], clause 5.2.2.3.1). |
| ***frequencyDomainAllocation***  Frequency domain allocation within a physical resource block in accordance with TS 38.211 [16], clause 7.4.1.5.3. The applicable row number in table 7.4.1.5.3-1 is determined by the *frequencyDomainAllocation* for rows 1, 2 and 4, and for other rows by matching the values in the column Ports, Density and CDMtype in table 7.4.1.5.3-1 with the values of *nrofPorts*, *cdm-Type* and density below and, when more than one row has the 3 values matching, by selecting the row where the column (k bar, l bar) in table 7.4.1.5.3-1 has indexes for k ranging from 0 to 2\*n-1 where n is the number of bits set to 1 in *frequencyDomainAllocation*. |
| ***nrofPorts***  Number of ports (see TS 38.214 [19], clause 5.2.2.3.1). |

#### – *CSI-SemiPersistentOnPUSCH-TriggerStateList*

The *CSI-SemiPersistentOnPUSCH-TriggerStateList* IE is used to configure the UE with list of trigger states for semi-persistent reporting of channel state information on L1. See also TS 38.214 [19], clause 5.2.

*CSI-SemiPersistentOnPUSCH-TriggerStateList* information element

-- ASN1START

-- TAG-CSI-SEMIPERSISTENTONPUSCHTRIGGERSTATELIST-START

CSI-SemiPersistentOnPUSCH-TriggerStateList ::= SEQUENCE(SIZE (1..maxNrOfSemiPersistentPUSCH-Triggers)) OF CSI-SemiPersistentOnPUSCH-TriggerState

CSI-SemiPersistentOnPUSCH-TriggerState ::= SEQUENCE {

associatedReportConfigInfo CSI-ReportConfigId,

...,

[[

sp-CSI-MultiplexingMode-r17 ENUMERATED {enabled} OPTIONAL -- Need R

]]

}

-- TAG-CSI-SEMIPERSISTENTONPUSCHTRIGGERSTATELIST-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-SemiPersistentOnPUSCH-TriggerStateList* field descriptions |
| ***sp-CSI-MultiplexingMode***  Indicates if the behavior of transmitting SP-CSI on the first PUSCH repetitions coresponding to two SRS resource sets configured in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage 'codebook' or 'noncodebook' is enabled or not. |

#### – *CSI-SSB-ResourceSet*

The IE *CSI-SSB-ResourceSet* is used to configure one SS/PBCH block resource set which refers to SS/PBCH as indicated in *ServingCellConfigCommon* and *ServingCellConfig*.

*CSI-SSB-ResourceSet* information element

-- ASN1START

-- TAG-CSI-SSB-RESOURCESET-START

CSI-SSB-ResourceSet ::= SEQUENCE {

csi-SSB-ResourceSetId CSI-SSB-ResourceSetId,

csi-SSB-ResourceList SEQUENCE (SIZE(1..maxNrofCSI-SSB-ResourcePerSet)) OF SSB-Index,

...,

[[

servingAdditionalPCIList-r17 SEQUENCE (SIZE(1..maxNrofCSI-SSB-ResourcePerSet)) OF ServingAdditionalPCIIndex-r17 OPTIONAL -- Need R

]]

}

ServingAdditionalPCIIndex-r17 ::= INTEGER(0..maxNrofAdditionalPCI-r17)

-- TAG-CSI-SSB-RESOURCESET-STOP

-- ASN1STOP

|  |
| --- |
| *CSI-SSB-ResourceSet* field descriptions |
| ***servingAdditionalPCIList***  Indicates the physical cell IDs (PCI) of the SSBs in the *csi-SSB-ResourceList*. If present, the list has the same number of entries as *csi-SSB-ResourceList*. The first entry of the list indicates the value of the PCI for the first entry of *csi-SSB-ResourceList*, the second entry of this list indicates the value of the PCI for the second entry of *csi-SSB-ResourceList*, and so on. For each entry, the following applies:  - If the value is zero, the PCI is the PCI of the serving cell in which this *CSI-SSB-ResourceSet* is defined;  - otherwise, the value is *additionalPCIIndex-r17* of an *SSB-MTC-AdditionalPCI-r17* in the *additionalPCIList-r17* in *ServingCellConfig*, and the PCI is the *additionalPCI-r17* in this *SSB-MTC-AdditionalPCI-r17*. |

#### – *CSI-SSB-ResourceSetId*

The IE *CSI-SSB-ResourceSetId* is used to identify one SS/PBCH block resource set.

*CSI-SSB-ResourceId* information element

-- ASN1START

-- TAG-CSI-SSB-RESOURCESETID-START

CSI-SSB-ResourceSetId ::= INTEGER (0..maxNrofCSI-SSB-ResourceSets-1)

-- TAG-CSI-SSB-RESOURCESETID-STOP

-- ASN1STOP

#### – *DedicatedNAS-Message*

The IE *DedicatedNAS-Message* is used to transfer UE specific NAS layer information between the 5GC CN and the UE. The RRC layer is transparent for this information.

*DedicatedNAS-Message* information element

-- ASN1START

-- TAG-DEDICATED-NAS-MESSAGE-START

DedicatedNAS-Message ::= OCTET STRING

-- TAG-DEDICATED-NAS-MESSAGE-STOP

-- ASN1STOP

#### – *DL-PPW-PreConfig*

The IE *DL-PPW-PreConfig* provides configuration for a measurement window where a UE is expected to measure the DL PRS, if it is inside the active DL BWP and with the same numerology as the active DL BWP. Based upon the indication received in the configuration, the UE identifies whether the DL PRS priority is higher than that of the other DL signals or channels and accordingly determines, for example, the UE is expected to measure the DL PRS and is not expected to receive other DL signals and channels.

*DL-PPW-PreConfig* information element

-- ASN1START

-- TAG-DL-PPW-PRECONFIG-START

DL-PPW-PreConfig-r17 ::= SEQUENCE {

dl-PPW-ID-r17 DL-PPW-ID-r17,

dl-PPW-Periodicity-and-StartSlot-r17 DL-PPW-Periodicity-and-StartSlot-r17,

length-r17 INTEGER (1..160),

type-r17 ENUMERATED {type1A, type1B, type2} OPTIONAL, -- Cond MultiType

priority-r17 ENUMERATED {st1, st2, st3} OPTIONAL -- Cond MultiState

}

DL-PPW-ID-r17 ::= INTEGER (0..maxNrofPPW-ID-1-r17)

DL-PPW-Periodicity-and-StartSlot-r17 ::= CHOICE {

scs15-r17 CHOICE {

n4-r17 INTEGER (0..3),

n5-r17 INTEGER (0..4),

n8-r17 INTEGER (0..7),

n10-r17 INTEGER (0..9),

n16-r17 INTEGER (0..15),

n20-r17 INTEGER (0..19),

n32-r17 INTEGER (0..31),

n40-r17 INTEGER (0..39),

n64-r17 INTEGER (0..63),

n80-r17 INTEGER (0..79),

n160-r17 INTEGER (0..159),

n320-r17 INTEGER (0..319),

n640-r17 INTEGER (0..639),

n1280-r17 INTEGER (0..1279),

n2560-r17 INTEGER (0..2559),

n5120-r17 INTEGER (0..5119),

n10240-r17 INTEGER (0..10239),

...

},

scs30-r17 CHOICE {

n8-r17 INTEGER (0..7),

n10-r17 INTEGER (0..9),

n16-r17 INTEGER (0..15),

n20-r17 INTEGER (0..19),

n32-r17 INTEGER (0..31),

n40-r17 INTEGER (0..39),

n64-r17 INTEGER (0..63),

n80-r17 INTEGER (0..79),

n128-r17 INTEGER (0..127),

n160-r17 INTEGER (0..159),

n320-r17 INTEGER (0..319),

n640-r17 INTEGER (0..639),

n1280-r17 INTEGER (0..1279),

n2560-r17 INTEGER (0..2559),

n5120-r17 INTEGER (0..5119),

n10240-r17 INTEGER (0..10239),

n20480-r17 INTEGER (0..20479),

...

},

scs60-r17 CHOICE {

n16-r17 INTEGER (0..15),

n20-r17 INTEGER (0..19),

n32-r17 INTEGER (0..31),

n40-r17 INTEGER (0..39),

n64-r17 INTEGER (0..63),

n80-r17 INTEGER (0..79),

n128-r17 INTEGER (0..127),

n160-r17 INTEGER (0..159),

n256-r17 INTEGER (0..255),

n320-r17 INTEGER (0..319),

n640-r17 INTEGER (0..639),

n1280-r17 INTEGER (0..1279),

n2560-r17 INTEGER (0..2559),

n5120-r17 INTEGER (0..5119),

n10240-r17 INTEGER (0..10239),

n20480-r17 INTEGER (0..20479),

n40960-r17 INTEGER (0..40959),

...

},

scs120-r17 CHOICE {

n32-r17 INTEGER (0..31),

n40-r17 INTEGER (0..39),

n64-r17 INTEGER (0..63),

n80-r17 INTEGER (0..79),

n128-r17 INTEGER (0..127),

n160-r17 INTEGER (0..159),

n256-r17 INTEGER (0..255),

n320-r17 INTEGER (0..319),

n512-r17 INTEGER (0..511),

n640-r17 INTEGER (0..639),

n1280-r17 INTEGER (0..1279),

n2560-r17 INTEGER (0..2559),

n5120-r17 INTEGER (0..5119),

n10240-r17 INTEGER (0..10239),

n20480-r17 INTEGER (0..20479),

n40960-r17 INTEGER (0..40959),

n81920-r17 INTEGER (0..81919),

...

},

...

}

-- TAG-DL-PPW-PRECONFIG-STOP

-- ASN1STOP

| *DL-PPW-PreConfig* field descriptions |
| --- |
| ***dl-PPW-ID***  Indicates the pre-configured ID for DL-PRS processing window configuration. |
| ***length***  Indicates the length of DL-PRS-processing window in slots. Value 1 indicates *length* of one slot, value 2 indicates *length* of two slots and so on. |
| ***periodicity***  Indicates the periodicty of the DL-PRS\_processing window. |
| ***priority***  Indicates the priority between PDCCH/PDSCH/CSI-RS and PRS as specified in TS 38.214 [19]. |
| ***type***  Indicates the DL-PRS processing window type as specified in TS 38.214 [19]. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *MultiType* | The field is mandatory present when the UE reports its capability on supporting multiple processing types, otherwise it is absent. |
| *MultiState* | The field is mandatory present when the UE reports its capability on supporting option 1 or option 2 for the configured type, otherwise it is absent |

#### – *DMRS-BundlingPUCCH-Config*

The IE *DMRS-BundlingPUCCH-Config-r17* is used to configure DMRS bundling for PUCCH.

*DMRS-BundlingPUCCH-Config* information element

-- ASN1START

-- TAG-DMRS-BUNDLINGPUCCH-CONFIG-START

DMRS-BundlingPUCCH-Config-r17 ::= SEQUENCE {

pucch-DMRS-Bundling-r17 ENUMERATED {enabled} OPTIONAL, -- Need S

pucch-TimeDomainWindowLength-r17 INTEGER (2..8) OPTIONAL, -- Need S

pucch-WindowRestart-r17 ENUMERATED {enabled} OPTIONAL, -- Need S

pucch-FrequencyHoppingInterval-r17 ENUMERATED {s2, s4, s5, s10} OPTIONAL, -- Need S

...

}

-- TAG-DMRS-BUNDLINGPUCCH-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *DMRS-BundlingPUCCH-Config* field descriptions |
| ***pucch-DMRS-Bundling***  Indicates whether DMRS bundling and time domain window for PUCCH are jointly enabled. If the field is absent, DMRS bundling and time domain window for PUCCH are jointly disabled. |
| ***pucch-FrequencyHoppingInterval***  Configures the number of consecutive slots for the UE to perform inter-slot frequency hopping with inter-slot bundling for PUCCH. When both inter-frequency hopping and DMRS bundling are enabled for PUCCH repetitions, the UE is expected to be configured with at least one *pucch-FrequencyHoppingInterval-r17* and *pucch-TimeDomainWindowLength-r17*. When DMRS bundling for PUCCH is enabled by *pucch-DMRS-Bundling-r17,* PUCCH frequency hopping interval is only determined by the configuration of PUCCH hopping interval if PUCCH hopping interval is configured. If the field is absent, the number of consecutive slots for the UE to perform inter-slot PUCCH frequency hopping is indicated by *pucch-TimeDomainWindowLength-r17.* |
| ***pucch-TimeDomainWindowLength***  Configures the length of a nominal time domain window in slots for DMRS bundling for PUCCH. The value shall not exceed the maximum duration for DMRS bundling for PUCCH as specified in TS 38.306 [26]. If this field is absent, the UE shall apply the default value that is the minimum value in the unit of consecutive slots of the time duration for the transmission of all PUCCH repetitions and the maximum duration for DMRS bundling for PUCCH as specified in TS 38.306 [26]. |
| ***pucch-WindowRestart***  Indicates whether UE bundles PUCCH DMRS remaining in a nominal time domain window after event(s) triggered by DCI or MAC CE that violate power consistency and phase continuity requirements is enabled. If the field is absent, PUCCH DMRS bundling remaining in a bundling window after event(s) triggered by DCI or MAC CE that violate power consistency and phase continuity requirements is disabled (see 38.214 [19], clause 6.1.7).  NOTE: Events, which are triggered by DCI or MAC CE, but regarded as semi-static events, e.g. frequency hopping, UL beam switching for multi-TRP operation, or other if defined, are excluded. |

#### – *DMRS-BundlingPUSCH-Config*

The IE *DMRS-BundlingPUSCH-Config-r17* is used to configure DMRS bundling for PUSCH.

*DMRS-BundlingPUSCH-Config* information element

-- ASN1START

-- TAG-DMRS-BUNDLINGPUSCH-CONFIG-START

DMRS-BundlingPUSCH-Config-r17 ::= SEQUENCE {

pusch-DMRS-Bundling-r17 ENUMERATED {enabled} OPTIONAL, -- Need S

pusch-TimeDomainWindowLength-r17 INTEGER (2..32) OPTIONAL, -- Need S

pusch-WindowRestart-r17 ENUMERATED {enabled} OPTIONAL, -- Need S

pusch-FrequencyHoppingInterval-r17 ENUMERATED {s2, s4, s5, s6, s8, s10, s12, s14, s16, s20} OPTIONAL, -- Need S

...

}

-- TAG-DMRS-BUNDLINGPUSCH-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *DMRS-BundlingPUSCH-Config* field descriptions |
| ***pusch-DMRS-Bundling***  Indicates whether DMRS bundling and time domain window for PUSCH are jointly enabled. If the field is absent, DMRS bundling and time domain window for PUSCH are jointly disabled. |
| ***pusch-FrequencyHoppingInterval***  Configures the number of consecutive slots for the UE to perform inter-slot frequency hopping with inter-slot bundling for PUSCH. When both inter-frequency hopping and DMRS bundling are enabled for PUSCH repetitions, the UE is expected to be configured with at least one *pusch-FrequencyHoppingInterval-r17* and *pusch-TimeDomainWindowLength-r17*. This parameter is shared for both DG-PUSCH and CG-PUSCH. When DMRS bundling for PUSCH is enabled by *pusch-DMRS-Bundling-r17,* PUSCH frequency hopping interval is only determined by the configuration of PUSCH hopping interval if PUSCH hopping interval is configured. If the field is absent, the number of consecutive slots for the UE to perform inter-slot PUSCH frequency hopping is indicated by *pusch-TimeDomainWindowLength-r17.*  Note: For unpaired spectrum, the UE is not expected to be configured the value of s6, s8, s12, s14 and s16. |
| ***pusch-TimeDomainWindowLength***  Configures the length of a nominal time domain window in number of consecutive slots for DMRS bundling for PUSCH. The value shall not exceed the maximum duration for DMRS bundling for PUSCH as specified in TS 38.306 [26]. For PUSCH repetition type A/B, if this field is absent, the UE shall apply the default value that is the minimum value in the unit of consecutive slots of the time duration for the transmission of all PUSCH repetitions and the maximum duration for DMRS bundling for PUSCH as specified in TS 38.306 [26]. For TBoMS, if this field is absent, the UE shall apply the default value that is the minimum value in the unit of consecutive slots of the duration of TBoMS transmission (including repetition of TBoMS) and the maximum duration for DMRS bundling for PUSCH as specified in TS 38.306 [26]. |
| ***pusch-WindowRestart***  Indicates whether UE bundles PUSCH DMRS remaining in a nominal time domain window after event(s) triggered by DCI or MAC CE that violate power consistency and phase continuity requirements is enabled. If the field is absent, PUSCH DMRS bundling remaining in a bundling window after event(s) triggered by DCI or MAC CE that violate power consistency and phase continuity requirements is disabled (see 38.214 [19], clause 6.1.7).  Note: Events, which are triggered by DCI or MAC CE, but regarded as semi-static events, e.g. frequency hopping, UL beam switching for multi-TRP operation, or other if defined, are excluded. |

#### – *DMRS-DownlinkConfig*

The IE *DMRS-DownlinkConfig* is used to configure downlink demodulation reference signals for PDSCH.

*DMRS-DownlinkConfig* information element

-- ASN1START

-- TAG-DMRS-DOWNLINKCONFIG-START

DMRS-DownlinkConfig ::= SEQUENCE {

dmrs-Type ENUMERATED {type2} OPTIONAL, -- Need S

dmrs-AdditionalPosition ENUMERATED {pos0, pos1, pos3} OPTIONAL, -- Need S

maxLength ENUMERATED {len2} OPTIONAL, -- Need S

scramblingID0 INTEGER (0..65535) OPTIONAL, -- Need S

scramblingID1 INTEGER (0..65535) OPTIONAL, -- Need S

phaseTrackingRS SetupRelease { PTRS-DownlinkConfig } OPTIONAL, -- Need M

...,

[[

dmrs-Downlink-r16 ENUMERATED {enabled} OPTIONAL -- Need R

]]

}

-- TAG-DMRS-DOWNLINKCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *DMRS-DownlinkConfig* field descriptions |
| ***dmrs-AdditionalPosition***  Position for additional DM-RS in DL, see Tables 7.4.1.1.2-3 and 7.4.1.1.2-4 in TS 38.211 [16]. If the field is absent, the UE applies the value pos2. See also clause 7.4.1.1.2 for additional constraints on how the network may set this field depending on the setting of other fields. |
| ***dmrs-Downlink***  This field indicates whether low PAPR DMRS is used, as specified in TS38.211 [16], clause 7.4.1.1.1. |
| ***dmrs-Type***  Selection of the DMRS type to be used for DL (see TS 38.211 [16], clause 7.4.1.1.1). If the field is absent, the UE uses DMRS type 1. |
| ***maxLength***  The maximum number of OFDM symbols for DL front loaded DMRS. *len1* corresponds to value 1. *len2* corresponds to value 2. If the field is absent, the UE applies value *len1*. If set to *len2*, the UE determines the actual number of DM-RS symbols by the associated DCI. (see TS 38.211 [16], clause 7.4.1.1.2). |
| ***phaseTrackingRS***  Configures downlink PTRS. If the field is not configured, the UE assumes that downlink PTRS are absent. See TS 38.214 [19] clause 5.1.6.3. |
| ***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. |
| ***scramblingID1***  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. |

#### – *DMRS-UplinkConfig*

The IE *DMRS-UplinkConfig* is used to configure uplink demodulation reference signals for PUSCH.

*DMRS-UplinkConfig* information element

-- ASN1START

-- TAG-DMRS-UPLINKCONFIG-START

DMRS-UplinkConfig ::= SEQUENCE {

dmrs-Type ENUMERATED {type2} OPTIONAL, -- Need S

dmrs-AdditionalPosition ENUMERATED {pos0, pos1, pos3} OPTIONAL, -- Need S

phaseTrackingRS SetupRelease { PTRS-UplinkConfig } OPTIONAL, -- Need M

maxLength ENUMERATED {len2} OPTIONAL, -- Need S

transformPrecodingDisabled SEQUENCE {

scramblingID0 INTEGER (0..65535) OPTIONAL, -- Need S

scramblingID1 INTEGER (0..65535) OPTIONAL, -- Need S

...,

[[

dmrs-Uplink-r16 ENUMERATED {enabled} OPTIONAL -- Need R

]]

} OPTIONAL, -- Need R

transformPrecodingEnabled SEQUENCE {

nPUSCH-Identity INTEGER(0..1007) OPTIONAL, -- Need S

sequenceGroupHopping ENUMERATED {disabled} OPTIONAL, -- Need S

sequenceHopping ENUMERATED {enabled} OPTIONAL, -- Need S

...,

[[

dmrs-UplinkTransformPrecoding-r16 SetupRelease {DMRS-UplinkTransformPrecoding-r16} OPTIONAL -- Need M

]]

} OPTIONAL, -- Need R

...

}

DMRS-UplinkTransformPrecoding-r16 ::= SEQUENCE {

pi2BPSK-ScramblingID0 INTEGER(0..65535) OPTIONAL, -- Need S

pi2BPSK-ScramblingID1 INTEGER(0..65535) OPTIONAL -- Need S

}

-- TAG-DMRS-UPLINKCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *DMRS-UplinkConfig* field descriptions |
| ***dmrs-AdditionalPosition***  Position for additional DM-RS in UL (see TS 38.211 [16], clause 6.4.1.1.3). If the field is absent, the UE applies the value pos2. See also clause 6.4.1.1.3 for additional constraints on how the network may set this field depending on the setting of other fields. |
| ***dmrs-Type***  Selection of the DMRS type to be used for UL (see TS 38.211 [16], clause 6.4.1.1.3) If the field is absent, the UE uses DMRS type 1. |
| ***dmrs-Uplink***  This field indicates whether low PAPR DMRS is used, as specified in TS38.211 [16], clause 6.4.1.1.1.1. |
| ***dmrs-UplinkTransformPrecoding***  This field indicates whether low PAPR DMRS is used for PUSCH with pi/2 BPSK modulation, as specified in TS38.211 [16], clause 6.4.1.1.1.2. The network configures this field only if *tp-pi2BPSK* is configured in *PUSCH-Config*. |
| ***maxLength***  The maximum number of OFDM symbols for UL front loaded DMRS. *len1* corresponds to value 1. *len2* corresponds to value 2. If the field is absent, the UE applies value *len1*. If set to *len2*, the UE determines the actual number of DM-RS symbols by the associated DCI. (see TS 38.211 [16], clause 6.4.1.1.3). |
| ***nPUSCH-Identity***  Parameter: N\_ID^(PUSCH) for DFT-s-OFDM DMRS. If the value is absent or released, the UE uses the value Physical cell ID (*physCellId*). See TS 38.211 [16]. |
| ***phaseTrackingRS***  Configures uplink PTRS (see TS 38.211 [16]). |
| ***pi2BPSK-ScramblingID0, pi2BPSK-ScramblingID1***  UL DMRS scrambling initialization for pi/2 BPSK DMRS for PUSCH (see TS 38.211 [16], Clause 6.4.1.1.2). When the field is absent the UE applies the value Physical cell ID (physCellId) of the serving cell. |
| ***scramblingID0***  UL DMRS scrambling initialization for CP-OFDM (see TS 38.211 [16], clause 6.4.1.1.1.1). When the field is absent the UE applies the value Physical cell ID (*physCellId*). |
| ***scramblingID1***  UL DMRS scrambling initialization for CP-OFDM. (see TS 38.211 [16], clause 6.4.1.1.1.1). When the field is absent the UE applies the value Physical cell ID (*physCellId*). |
| ***sequenceGroupHopping***  For DMRS transmission with transform precoder the NW may configure group hopping by the cell-specific parameter *groupHoppingEnabledTransformPrecoding* in *PUSCH-ConfigCommon*. In this case, the NW may include this UE specific field to disable group hopping for PUSCH transmission except for Msg3, i.e., to override the configuration in *PUSCH-ConfigCommon* (see TS 38.211 [16]). If the field is absent, the UE uses the same hopping mode as for Msg3. |
| ***sequenceHopping***  Determines if sequence hopping is enabled for DMRS transmission with transform precoder for PUSCH transmission other than Msg3 (sequence hopping is always disabled for Msg3). If the field is absent, the UE uses the same hopping mode as for msg3. The network does not configure simultaneous group hopping and sequence hopping. See TS 38.211 [16], clause 6.4.1.1.1.2. |
| ***transformPrecodingDisabled***  DMRS related parameters for Cyclic Prefix OFDM. |
| ***transformPrecodingEnabled***  DMRS related parameters for DFT-s-OFDM (Transform Precoding). |

#### *– DownlinkConfigCommon*

The IE *DownlinkConfigCommon* provides common downlink parameters of a cell.

*DownlinkConfigCommon* information element

-- ASN1START

-- TAG-DOWNLINKCONFIGCOMMON-START

DownlinkConfigCommon ::= SEQUENCE {

frequencyInfoDL FrequencyInfoDL OPTIONAL, -- Cond InterFreqHOAndServCellAdd

initialDownlinkBWP BWP-DownlinkCommon OPTIONAL, -- Cond ServCellAdd

...,

[[

initialDownlinkBWP-RedCap-r17 BWP-DownlinkCommon OPTIONAL -- Need R

]]

}

-- TAG-DOWNLINKCONFIGCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| *DownlinkConfigCommon* field descriptions |
| ***frequencyInfoDL***  Basic parameters of a downlink carrier and transmission thereon. |
| ***initialDownlinkBWP***  The initial downlink BWP configuration for a serving cell. The network configures the *locationAndBandwidth* so that the initial downlink BWP contains the entire CORESET#0 of this serving cell in the frequency domain. |
| ***initialDownlinkBWP-RedCap***  If present, RedCap UEs use this DL BWP instead of *initialDownlinkBWP*.  If absent, RedCap UEs use *initialDownlinkBWP* provided that it does not exceed the RedCap UE maximum bandwidth (see also clause 5.2.2.4.2). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *InterFreqHOAndServCellAdd* | This field is mandatory present for inter-frequency handover, and upon serving cell (PSCell/SCell) addition. Otherwise, the field is optionally present, Need M. |
| *ServCellAdd* | This field is mandatory present upon serving cell addition (for PSCell and SCell) and upon handover from E-UTRA to NR. It is optionally present, Need M otherwise. |

#### – *DownlinkConfigCommonSIB*

The IE *DownlinkConfigCommonSIB* provides common downlink parameters of a cell.

*DownlinkConfigCommonSIB* information element

-- ASN1START

-- TAG-DOWNLINKCONFIGCOMMONSIB-START

DownlinkConfigCommonSIB ::= SEQUENCE {

frequencyInfoDL FrequencyInfoDL-SIB,

initialDownlinkBWP BWP-DownlinkCommon,

bcch-Config BCCH-Config,

pcch-Config PCCH-Config,

...,

[[

pei-Config-r17 PEI-Config-r17 OPTIONAL, -- Need R

initialDownlinkBWP-RedCap-r17 BWP-DownlinkCommon OPTIONAL -- Need R

]]

}

BCCH-Config ::= SEQUENCE {

modificationPeriodCoeff ENUMERATED {n2, n4, n8, n16},

...

}

PCCH-Config ::= SEQUENCE {

defaultPagingCycle PagingCycle,

nAndPagingFrameOffset CHOICE {

oneT NULL,

halfT INTEGER (0..1),

quarterT INTEGER (0..3),

oneEighthT INTEGER (0..7),

oneSixteenthT INTEGER (0..15)

},

ns ENUMERATED {four, two, one},

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),

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

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

sCS480KHZquarterT-SCS120KHZoneSixteenthT SEQUENCE (SIZE (1..maxPO-perPF)) OF INTEGER (0..17919)

} OPTIONAL, -- Need R

...,

[[

nrofPDCCH-MonitoringOccasionPerSSB-InPO-r16 INTEGER (2..4) OPTIONAL -- Cond SharedSpectrum2

]],

[[

ranPagingInIdlePO-r17 ENUMERATED {true} 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-Config-r17 ::= SEQUENCE {

po-NumPerPEI-r17 ENUMERATED {po1, po2, po4, po8},

payloadSizeDCI-2-7-r17 INTEGER (1..maxDCI-2-7-Size-r17),

pei-FrameOffset-r17 INTEGER (0..16),

subgroupConfig-r17 SubgroupConfig-r17,

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

...

}

SubgroupConfig-r17 ::= SEQUENCE {

subgroupsNumPerPO-r17 INTEGER (1.. maxNrofPagingSubgroups-r17),

subgroupsNumForUEID-r17 INTEGER (1.. maxNrofPagingSubgroups-r17) OPTIONAL, -- Need S

...

}

-- TAG-DOWNLINKCONFIGCOMMONSIB-STOP

-- ASN1STOP

|  |
| --- |
| *DownlinkConfigCommonSIB* field descriptions |
| ***bcch-Config***  The modification period related configuration. |
| ***frequencyInfoDL-SIB***  Basic parameters of a downlink carrier and transmission thereon. |
| ***initialDownlinkBWP***  The initial downlink BWP configuration for a PCell. The network configures the *locationAndBandwidth* so that the initial downlink BWP contains the entire CORESET#0 of this serving cell in the frequency domain. The UE applies the *locationAndBandwidth* upon reception of this field (e.g. to determine the frequency position of signals described in relation to this *locationAndBandwidth*) but it keeps CORESET#0 until after reception of *RRCSetup*/*RRCResume/RRCReestablishment*. |
| ***initialDownlinkBWP-RedCap***  If present, RedCap UEs use this DL BWP instead of *initialDownlinkBWP*. If the *locationAndBandwidth* of this BWP contains the entire CORESET#0, the UE applies the *locationAndBandwidth* upon reception of this field (e.g. to determine the frequency position of signals described in relation to this *locationAndBandwidth*) but it keeps CORESET#0 until after reception of *RRCSetup*/*RRCResume/RRCReestablishment*. Otherwise, i.e., if the *locationAndBandwidth* of this BWP does not contain the entire CORESET#0, the UE uses this BWP for receiving DL messages during initial access (Msg2, MsgB, Msg4) and after initial access.  If absent, RedCap UEs use *initialDownlinkBWP* provided that it does not exceed the RedCap UE maximum bandwidth (see also clause 5.2.2.4.2). |
| ***lastUsedCellOnly***  When present, the field indicates that the UE monitors PEI only if the latest received *RRCRelease* without *noLastCellUpdate* is from this cell. A PEI-capable UE stores its last used cell information. |
| ***nrofPDCCH-MonitoringOccasionPerSSB-InPO***  The number of PDCCH monitoring occasions corresponding to an SSB within a Paging Occasion, see TS 38.304 [20], clause 7.1. |
| ***pcch-Config***  The paging related configuration. |
| ***pei-Config***  The PEI related configuration. |
| ***subgroupConfig***  The paging subgroup related configuration. |

|  |
| --- |
| *BCCH-Config* field descriptions |
| ***modificationPeriodCoeff***  Actual modification period, expressed in number of radio frames m = *modificationPeriodCoeff* \* *defaultPagingCycle*, see clause 5.2.2.2.2. *n2* corresponds to value 2, *n4* corresponds to value 4, and so on. |

|  |
| --- |
| *PCCH-Config* field descriptions |
| ***defaultPagingCycle***  Default paging cycle, used to derive 'T' in TS 38.304 [20]. Value *rf32* corresponds to 32 radio frames, value *rf64* corresponds to 64 radio frames and so on. |
| ***firstPDCCH-MonitoringOccasionOfPO***  Points out the first PDCCH monitoring occasion for paging of each PO of the PF, see TS 38.304 [20]. |
| ***nAndPagingFrameOffset***  Used to derive the number of total paging frames in T (corresponding to parameter N in TS 38.304 [20]) and paging frame offset (corresponding to parameter PF\_offset in TS 38.304 [20]). A value of *oneSixteenthT* corresponds to T / 16, a value of oneEighthT corresponds to T / 8, and so on.  If *pagingSearchSpace* is set to zero and if SS/PBCH block and CORESET multiplexing pattern is 2 or 3 (as specified in TS 38.213 [13]):  - for *ssb-periodicityServingCell* of 5 or 10 ms, N can be set to one of {*oneT, halfT, quarterT, oneEighthT, oneSixteenthT*}  - for *ssb-periodicityServingCell* of 20 ms, N can be set to one of {*halfT, quarterT, oneEighthT, oneSixteenthT*}  - for *ssb-periodicityServingCell* of 40 ms, N can be set to one of {*quarterT, oneEighthT, oneSixteenthT*}  - for *ssb-periodicityServingCell* of 80 ms, N can be set to one of {*oneEighthT, oneSixteenthT*}  - for *ssb-periodicityServingCell* of 160 ms, N can be set to *oneSixteenthT*  If *pagingSearchSpace* is set to zero and if SS/PBCH block and CORESET multiplexing pattern is 1 (as specified in TS 38.213 [13]), N can be set to one of {*halfT, quarterT, oneEighthT, oneSixteenthT*}  If *pagingSearchSpace* is not set to zero, N can be configured to one of {*oneT, halfT, quarterT, oneEighthT, oneSixteenthT*} |
| ***ns***  Number of paging occasions per paging frame. |
| ***ranPagingInIdlePO***  Indicates that the network supports to send RAN paging in PO that corresponds to the i\_s as determined by UE in RRC\_IDLE state, see TS38.304 [20]. |

|  |
| --- |
| *PEI-Config* field descriptions |
| ***payloadSizeDCI-2-7***  Payload size of PEI DCI, i.e., DCI format 2\_7. The size is no larger than the payload size of paging DCI which has maximum of 41 bits and 43 bits for licensed and unlicensed spectrums, respectively. |
| ***pei-FrameOffset***  Offset, in number of frames from the start of a reference frame for PEI-O to the start of a first paging frame of the paging frames associated with the PEI-O, see TS 38.213 [13], clause 10.4A. |
| ***po-NumPerPEI***  The number of PO(s) associated with one PEI monitoring occasion. It is a factor of the total PO number in a paging cycle, i.e N x Ns, as specified in TS 38.304 [20]. The maximum number of PF associated with one PEI monitoring occasion is 2. The number of PO mapping to one PEI should be multiple of Ns when *po-NumPerPEI* is larger than Ns. |

|  |
| --- |
| *SubgroupConfig* field descriptions |
| ***subgroupsNumPerPO***  Total number of subgroups per Paging Occasion (PO) for UE to read subgroups indication from physical-layer signaling. The field represents the sum of CN-assigned and UEID-based subgroups supported by the network. When *PEI-Config* is configured, there is always at least one subgroup (UEID-based subgroup or CN-assigned subgroup) configured. |
| ***subgroupsNumForUEID***  Number of subgroups per Paging Occasion (PO) for UE to read subgroups indication from physical-layer signaling, for UEID-based subgrouping method. When present, the fieldis set to an integer smaller than or equal to *subgroupsNumPerPO. subgroupsNumPerPO* equals to *subgroupsNumForUEID* when the network does not support CN-assigned subgrouping. The field is absent when the network only supports CN-assigned subgrouping. Both this field and *subgroupsNumPerPO* are equal to 1 when the network does not support subgrouping. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SharedSpectrum2* | The field is optional present, Need R, if this cell operates with shared spectrum channel access. Otherwise, it is absent, Need R. |

#### – *DownlinkPreemption*

The IE *DownlinkPreemption* is used to configure the UE to monitor PDCCH for the INT-RNTI (interruption).

*DownlinkPreemption* information element

-- ASN1START

-- TAG-DOWNLINKPREEMPTION-START

DownlinkPreemption ::= SEQUENCE {

int-RNTI RNTI-Value,

timeFrequencySet ENUMERATED {set0, set1},

dci-PayloadSize INTEGER (0..maxINT-DCI-PayloadSize),

int-ConfigurationPerServingCell SEQUENCE (SIZE (1..maxNrofServingCells)) OF INT-ConfigurationPerServingCell,

...

}

INT-ConfigurationPerServingCell ::= SEQUENCE {

servingCellId ServCellIndex,

positionInDCI INTEGER (0..maxINT-DCI-PayloadSize-1)

}

-- TAG-DOWNLINKPREEMPTION-STOP

-- ASN1STOP

|  |
| --- |
| *DownlinkPreemption* field descriptions |
| ***dci-PayloadSize***  Total length of the DCI payload scrambled with INT-RNTI (see TS 38.213 [13], clause 11.2). |
| ***int-ConfigurationPerServingCell***  Indicates (per serving cell) the position of the 14 bit INT values inside the DCI payload (see TS 38.213 [13], clause 11.2). |
| ***int-RNTI***  RNTI used for indication pre-emption in DL (see TS 38.213 [13], clause 10). |
| ***timeFrequencySet***  Set selection for DL-preemption indication (see TS 38.213 [13], clause 11.2) The set determines how the UE interprets the DL preemption DCI payload. |

|  |
| --- |
| *INT-ConfigurationPerServingCell* field descriptions |
| ***positionInDCI***  Starting position (in number of bit) of the 14 bit INT value applicable for this serving cell (*servingCellId*) within the DCI payload (see TS 38.213 [13], clause 11.2). Must be multiples of 14 (bit). |

#### – *DRB-Identity*

The IE *DRB-Identity* is used to identify a DRB used by a UE.

*DRB-Identity* information element

-- ASN1START

-- TAG-DRB-IDENTITY-START

DRB-Identity ::= INTEGER (1..32)

-- TAG-DRB-IDENTITY-STOP

-- ASN1STOP

#### – *DRX-Config*

The IE *DRX-Config* is used to configure DRX related parameters.

*DRX-Config* information element

-- ASN1START

-- TAG-DRX-CONFIG-START

DRX-Config ::= SEQUENCE {

drx-onDurationTimer 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-InactivityTimer 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 INTEGER (0..56),

drx-HARQ-RTT-TimerUL INTEGER (0..56),

drx-RetransmissionTimerDL 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},

drx-RetransmissionTimerUL 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 },

drx-LongCycleStartOffset 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)

},

shortDRX SEQUENCE {

drx-ShortCycle ENUMERATED {

ms2, ms3, ms4, ms5, ms6, ms7, ms8, ms10, ms14, ms16, ms20, ms30, ms32,

ms35, ms40, ms64, ms80, ms128, ms160, ms256, ms320, ms512, ms640, spare9,

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

drx-ShortCycleTimer INTEGER (1..16)

} OPTIONAL, -- Need R

drx-SlotOffset INTEGER (0..31)

}

DRX-ConfigExt-v1700 ::= SEQUENCE {

drx-HARQ-RTT-TimerDL-r17 INTEGER (0..448),

drx-HARQ-RTT-TimerUL-r17 INTEGER (0..448)

}

-- TAG-DRX-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *DRX-Config* field descriptions |
| ***drx-HARQ-RTT-TimerDL***  Value in number of symbols of the BWP where the transport block was received. *drx-HARQ-RTT-TimerDL-r17* is only applicable for SCS 480 kHz and 960 kHz. If configured, the UE shall ignore *drx-HARQ-RTT-TimerDL* (without suffix) for SCS 480 kHz and 960 kHz. |
| ***drx-HARQ-RTT-TimerUL***  Value in number of symbols of the BWP where the transport block was transmitted. *drx-HARQ-RTT-TimerUL-r17* is only applicable for SCS 480 kHz and 960 kHz. If configured, the UE shall ignore *drx-HARQ-RTT-TimerUL* (without suffix) for SCS 480 kHz and 960 kHz. |
| ***drx-InactivityTimer***  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-LongCycleStartOffset***  *drx-LongCycle* in ms and *drx-StartOffset* in multiples of 1 ms. If *drx-ShortCycle* is configured, the value of *drx-LongCycle* shall be a multiple of the *drx-ShortCycle* value. |
| ***drx-onDurationTimer***  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-RetransmissionTimerDL***  Value in number of slot lengths of the BWP 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-RetransmissionTimerUL***  Value in number of slot lengths of the BWP where the transport block was transmitted. *sl0* corresponds to 0 slots, *sl1* corresponds to 1 slot, *sl2* corresponds to 2 slots, and so on. |
| ***drx-ShortCycleTimer***  Value in multiples of *drx-ShortCycle*. A value of 1 corresponds to *drx-ShortCycle*, a value of 2 corresponds to 2 \* *drx-ShortCycle* and so on. |
| ***drx-ShortCycle***  Value in ms. *ms1* corresponds to 1 ms, *ms2* corresponds to 2 ms, and so on. |
| ***drx-SlotOffset***  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. |

#### – *DRX-ConfigSecondaryGroup*

The IE *DRX-ConfigSecondaryGroup* is used to configure DRX related parameters for the second DRX group as specified in TS 38.321 [3].

DRX-ConfigSecondaryGroup information element

-- ASN1START

-- TAG-DRX-CONFIGSECONDARYGROUP-START

DRX-ConfigSecondaryGroup ::= SEQUENCE {

drx-onDurationTimer 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-InactivityTimer 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}

}

-- TAG-DRX-CONFIGSECONDARYGROUP-STOP

-- ASN1STOP

|  |
| --- |
| *DRX-ConfigSecondaryGroup* field descriptions |
| ***drx-InactivityTimer***  Value in multiple integers of 1 ms. *ms0* corresponds to 0, *ms1* corresponds to 1 ms, *ms2* corresponds to 2 ms, and so on, as specified in TS 38.321 [3]. The network configures a *drx-InactivityTimer* value for the second DRX group that is smaller than the *drx-InactivityTimer* configured for the default DRX group in IE *DRX-Config*. |
| **drx-onDurationTimer**  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, as specified in TS 38.321 [3]. The network configures a *drx-onDurationTimer* value for the second DRX group that is smaller than the *drx-onDurationTimer* configured for the default DRX group in IE *DRX-Config*. |

#### *– DRX-ConfigSL*

The IE *DRX-ConfigSL* is used to configure additional DRX parameters for the UE performing sidelink operation with resource allocation mode 1, as specified in TS 38.321 [3].

*DRX-ConfigSL information element*

-- ASN1START

-- TAG-DRX-CONFIGSL-START

DRX-ConfigSL-r17 ::= SEQUENCE {

drx-HARQ-RTT-TimerSL-r17 INTEGER (0..56),

drx-RetransmissionTimerSL-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}

}

-- TAG-DRX-CONFIGSL-STOP

-- ASN1STOP

|  |
| --- |
| *DRX-ConfigSL field descriptions* |
| ***drx-HARQ-RTT-TimerSL***  Value in number of symbols of the BWP where the PDCCH was transmitted. |
| *drx-RetransmissionTimerSL*  Value in number of slot lengths of the BWP where the PDCCH was transmitted. *sl0* corresponds to 0 slots, *sl1* corresponds to 1 slot, *sl2* corresponds to 2 slots, and so on. |

#### – *EphemerisInfo*

The IE *EphemerisInfo* provides satellite ephemeris. Ephemeris may be expressed either in format of position and velocity state vector or in format of orbital parameters. FFS more detailed description.

*EphemerisInfo* information element

-- ASN1START

-- TAG-EPHEMERISINFO-START

EphemerisInfo-r17 ::= CHOICE {

positionVelocity-r17 PositionVelocity-r17,

orbital-r17 Orbital-r17

}

PositionVelocity-r17 ::= SEQUENCE {

positionX-r17 PositionStateVector-r17,

positionY-r17 PositionStateVector-r17,

positionZ-r17 PositionStateVector-r17,

velocityVX-r17 VelocityStateVector-r17,

velocityVY-r17 VelocityStateVector-r17,

velocityVZ-r17 VelocityStateVector-r17

}

Orbital-r17 ::= SEQUENCE {

semiMajorAxis-r17 INTEGER (0..8589934591),

eccentricity-r17 INTEGER (0..1048575),

periapsis-r17 INTEGER (0..268435455),

longitude-r17 INTEGER (0..268435455),

inclination-r17 INTEGER (-67108864..67108863),

meanAnomaly-r17 INTEGER (0..268435455)

}

PositionStateVector-r17 ::= INTEGER (-33554432..33554431)

VelocityStateVector-r17 ::= INTEGER (-131072..131071)

-- TAG-EPHEMERISINFO-STOP

-- ASN1STOP

|  |
| --- |
| *EphemerisInfo* field descriptions |
| ***anomaly***  Satellite orbital parameter: Mean anomaly M at epoch time, see NIMA TR 8350.2 [71]. Unit is radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***eccentricity***  Satellite orbital parameter: eccentricity e, see NIMA TR 8350.2 [71].  Step 1.431 \* 10-8. Actual value = field value \* (1.431 \* 10-8). |
| ***inclination***  Satellite orbital parameter: inclination i, see NIMA TR 8350.2 [71]. Unit is radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***longitude***  Satellite orbital parameter: longitude of ascending node Ω, see NIMA TR 8350.2 [71]. Unit is radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***periapsis***  Satellite orbital parameter: argument of periapsis ω, see NIMA TR 8350.2 [71]. Unit is radian.  Step of 2.341\* 10-8 rad. Actual value = field value \* (2.341\* 10-8). |
| ***positionX, positionY, positionZ***  X, Y, Z coordinate of satellite position state vector in ECEF. Unit is meter.  Step of 1.3 m. Actual value = field value \* 1.3. |
| ***semiMajorAxis***  Satellite orbital parameter: semi major axis α, see NIMA TR 8350.2 [71]. Unit is meter.  Stepof 4.249 \* 10-3 m. Actual value = 6500000 + field value \* (4.249 \* 10-3). |
| ***velocityVX, velocityVY, velocityVZ***  X, Y, Z coordinate of satellite velocity state vector in ECEF. Unit is meter/second.  Step of 0.06 m/s. Actual value = field value \* 0.06. |

#### – *FeatureCombination*

The IE *FeatureCombination* indicates a feature or a combination of features to be associated with a set of Random Access resources (i.e. an instance of *FeatureCombinationPreambles*).

*FeatureCombination* information element

-- ASN1START

-- TAG-FEATURECOMBINATION-START

FeatureCombination-r17 ::= SEQUENCE {

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

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

nsag-r17 NSAG-List-r17 OPTIONAL, -- Need R

msg3-Repetitions-r17 ENUMERATED {true} OPTIONAL, -- Need R

spare4 ENUMERATED {true} OPTIONAL, -- Need R

spare3 ENUMERATED {true} OPTIONAL, -- Need R

spare2 ENUMERATED {true} OPTIONAL, -- Need R

spare1 ENUMERATED {true} OPTIONAL -- Need R

}

NSAG-List-r17 ::= SEQUENCE (SIZE (1.. maxSliceInfo-r17)) OF NSAG-ID-r17

-- TAG-FEATURECOMBINATION-STOP

-- ASN1STOP

|  |
| --- |
| *FeatureCombinationIndication* field descriptions |
| ***redCap***  If present, this field indicates that RedCap is part of this feature combination. |
| ***smallData***  If present, this field indicates that Small Data is part of this feature combination. |
| ***nsag***  If present, this field indicates NSAG(s) that are part of this feature combination. |
| ***msg3-Repetitions***  If present, this field indicates that signalling of msg3 repetition is part of this feature combination. This field is not configured in a set of preambles that is configured with 2-step random-access type. |

#### – *FeatureCombinationPreambles*

The IE *FeatureCombinationPreambles* associatesa set of preambles with a feature combination. For parameters which can be provided in this IE, the UE applies this field value when performing Random Access using a preamble in this featureCombinationPreambles, otherwise the UE applies the corresponding value as determined by applicable Need Code, e.g. Need S. On a specific BWP, there can be at most one set of preambles associated with a given feature combination per RA Type (i.e. 4-step RACH or 2-step RACH).

*FeatureCombinationPreambles* information element

-- ASN1START

-- TAG-FEATURECOMBINATIONPREAMBLES-START

FeatureCombinationPreambles-r17 ::= SEQUENCE {

featureCombination-r17 FeatureCombination-r17,

startPreambleForThisPartition-r17 INTEGER (1..64),

numberOfPreamblesPerSSB-ForThisPartition-r17 INTEGER (1..64),

ssb-SharedRO-MaskIndex-r17 INTEGER (1..15) OPTIONAL, -- Need S

groupBconfigured-r17 SEQUENCE {

ra-SizeGroupA-r17 ENUMERATED {b56, b144, b208, b256, b282, b480, b640,

b800, b1000, b72, spare6, spare5,spare4, spare3, spare2, spare1},

messagePowerOffsetGroupB ENUMERATED { minusinfinity, dB0, dB5, dB8, dB10, dB12, dB15, dB18},

numberOfRA-PreamblesGroupA INTEGER (1..64)

} OPTIONAL, -- Need S

separateMsgA-PUSCH-Config-r17 MsgA-PUSCH-Config-r16 OPTIONAL, -- Cond MsgAConfigCommon

msgA-RSRP-Threshold-r17 RSRP-Range OPTIONAL, -- Need R

rsrp-ThresholdSSB-r17 RSRP-Range OPTIONAL, -- Need R

deltaPreamble-r17 INTEGER (-1..6) OPTIONAL, -- Need R

...

}

-- TAG-FEATURECOMBINATIONPREAMBLES-STOP

-- ASN1STOP

|  |
| --- |
| *FeatureCombinationPreambles* field descriptions |
| ***deltaPreamble***  Power offset between msg3 or msgA-PUSCH and RACH preamble transmission. If configured, this parameter overrides *msg3-DeltaPreamble* or *msgA-DeltaPreamble*, Actual value = field value \* 2 [dB] (see TS 38.213 [13], clause 7.1). If *msgA-DeltaPreamble* is configured in *separateMsgA-PUSCH-Config-r17*, this field is absent. |
| ***featureCombination***  Indicates which combination of features that the preambles indicated by this IE are associated with. The UE ignores a RACH resource defined by this *FeatureCombinationPreambles* if any feature within the *featureCombination* is not supported by the UE or has an unknown value. |
| ***messagePowerOffsetGroupB***  Threshold for preamble selection. Value is in dB. Value *minusinfinity* corresponds to –infinity. Value *dB0* corresponds to 0 dB, *dB5* corresponds to 5 dB and so on (see TS 38.321 [3], clause 5.1.2). |
| ***msgA-RSRP-Threshold***  The UE selects 2-step random access type to perform random access based on this threshold (see TS 38.321 [3], clause 5.1.1). This field is only present if partition specific RSRP threshold for 2-step and 4-step RA type is configured for the BWP. If configured, this parameter overrides *msgA-RSRP-Threshold-r16*. If absent, the UE applies *msgA-RSRP-Threshold-r16*, if configured |
| ***numberOfPreamblesForThisPartition***  It determines how many consecutive preambles are associated to the Feature Combination starting from the starting preamble(s) per SSB. |
| ***numberOfRA-PreamblesGroupA***  It determines how many consecutive preambles per SSB are associated to Group A starting from the starting preamble(s). The remaining preambles associated to the Feature Combination are associated to Group B |
| ***ra-SizeGroupA***  Transport Blocks size threshold in bits below which the UE shall use a contention-based RA preamble of group A. (see TS 38.321 [3], clause 5.1.2). If this feature combination preambles are associated to a *RACH-ConfigCommon-twostepRA*, this field correspond to *ra-MsgA-SizeGroupA*, otherwise it corresponds to *ra-Msg3SizeGroupA*. |
| ***rsrp-ThresholdSSB***  L1-RSRP threshold used for determining whether a candidate beam may be used by the UE. If this parameter is included in *FeatureCombinationPreambles* which is included in *RACH-ConfigCommonTwoStepRA*, it corresponds to *msgA-RSRP-ThresholdSSB*, as defined in TS 38.321 [3]. If this parameter is included in *FeatureCombinationPreambles* which is included in *RACH-ConfigCommon*, it it corresponds to *rsrp-ThresholdSSB*, as defined in TS 38.321 [3]. |
| ***separateMsgA-PUSCH-Config***  If present it specifies how the 2-step RACH preambles identified by this *FeatureCombinationPreambles* are mapped to a PUSCH slot separate from the one defined in MsgA-ConfigCommon-r16. If the field is absent, the UE should apply the corresponding parameter in the *RACH-ConfigCommonTwoStepRA* of the BWP which includes the *FeatureCombinationPreambles IE*. |
| ***ssb-SharedRO-MaskIndex***  Mask index (see TS 38.321 [3]).  Indicates a subset of ROs where preambles are allocated for this feature combination. If this field is configured within *FeatureCombinationPreambles* which is included in *RACH-ConfigCommonTwoStepRA*, it indicates a subset of ROs configured within this *RACH-ConfigCommonTwoStepRA*. This field is configured when there is more than one RO per SSB. If the field is absent, all ROs configured in *RACH-ConfigCommon* or *RACH-ConfigCommonTwoStepRA* containing this *FeatureCombinationPreambles* are shared. |
| ***startPreambleForThisPartition***  It defines the first preamble associated with the Feature Combination. If N<1 the first preamble in each PRACH occasion is the one having the same index indicated by this field. If N>=1 in each PRACH occasion N blocks of preambles associated with the Feature Combination are define, each having start index + startPreambleForThisPartition (see 38.213). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *MsgAConfigCommon* | The field is optionally present, Need S, if *FeatureCombinationPreambles* is included in *RACH-ConfigCommonTwoStepRA*. Otherwise, it is absent. If the field is absent in *FeatureCombinationPreambles* included in *RACH-ConfigCommonTwoStepRA*, the UE applies *MsgA-PUSCH-Config* included in the corresponding *MsgA-ConfigCommon*. |

#### – *FilterCoefficient*

The IE *FilterCoefficient* specifies the measurement filtering coefficient. Value *fc0* corresponds to k = 0, *fc1* corresponds to k = 1, and so on.

*FilterCoefficient* information element

-- ASN1START

-- TAG-FILTERCOEFFICIENT-START

FilterCoefficient ::= ENUMERATED { fc0, fc1, fc2, fc3, fc4, fc5, fc6, fc7, fc8, fc9, fc11, fc13, fc15, fc17, fc19, spare1, ...}

-- TAG-FILTERCOEFFICIENT-STOP

-- ASN1STOP

#### – *FreqBandIndicatorNR*

The IE *FreqBandIndicatorNR* is used to convey an NR frequency band number as defined in TS 38.101-1 [15] and TS 38.101-2 [39].

*FreqBandIndicatorNR* information element

-- ASN1START

-- TAG-FREQBANDINDICATORNR-START

FreqBandIndicatorNR ::= INTEGER (1..1024)

-- TAG-FREQBANDINDICATORNR-STOP

-- ASN1STOP

#### – *FreqPriorityListDedicatedSlicing*

The IE *FreqPriorityListDedicatedSlicing* indicates dedicated cell reselection priorities for slicing.

*FreqPriorityListDedicatedSlicing* information element

-- ASN1START

-- TAG-FREQPRIORITYLISTDEDICATEDSLICING-START

FreqPriorityListDedicatedSlicing-r17 ::= SEQUENCE (SIZE (1.. maxFreq)) OF FreqPriorityDedicatedSlicing-r17

FreqPriorityDedicatedSlicing-r17 ::= SEQUENCE {

dl-ExplicitCarrierFreq-r17 ARFCN-ValueNR,

sliceInfoListDedicated-r17 SliceInfoListDedicated-r17 OPTIONAL -- Need R

}

SliceInfoListDedicated-r17 ::= SEQUENCE (SIZE (1..maxSliceInfo-r17)) OF SliceInfoDedicated-r17

SliceInfoDedicated-r17 ::= SEQUENCE {

nsag-IdentityInfo-r17 NSAG-IdentityInfo-r17,

nsag-CellReselectionPriority-r17 CellReselectionPriority OPTIONAL, -- Need R

nsag-CellReselectionSubPriority-r17 CellReselectionSubPriority OPTIONAL -- Need R

}

-- TAG-FREQPRIORITYLISTDEDICATEDSLICING-STOP

-- ASN1STOP

| *FreqPriorityDedicatedSlicing* field descriptions |
| --- |
| ***dl-ExplicitCarrierFreq***  Indicates the downlink carrier frequency to which *SliceInfoListDedicated* is associated. |

| *SliceInfoDedicated* field descriptions |
| --- |
| ***nsag-IdentityInfo***  This is the NSAG identifier of the NSAG. |

#### – *FreqPriorityListSlicing*

The IE *FreqPriorityListSlicing* indicates cell reselection priorities for slicing in SIB16.

*FreqPriorityListSlicing* information element

-- ASN1START

-- TAG-FREQPRIORITYLISTSLICING-START

FreqPriorityListSlicing-r17 ::= SEQUENCE (SIZE (1..maxFreqPlus1)) OF FreqPrioritySlicing-r17

FreqPrioritySlicing-r17 ::= SEQUENCE {

dl-ImplicitCarrierFreq-r17 INTEGER (0..maxFreq),

sliceInfoList-r17 SliceInfoList-r17 OPTIONAL -- Need R

}

SliceInfoList-r17 ::= SEQUENCE (SIZE (1..maxSliceInfo-r17)) OF SliceInfo-r17

SliceInfo-r17 ::= SEQUENCE {

nsag-IdentityInfo-r17 NSAG-IdentityInfo-r17,

nsag-CellReselectionPriority-r17 CellReselectionPriority OPTIONAL, -- Need R

nsag-CellReselectionSubPriority-r17 CellReselectionSubPriority OPTIONAL, -- Need R

sliceCellListNR-r17 CHOICE {

sliceAllowedCellListNR-r17 SliceCellListNR-r17,

sliceExcludedCellListNR-r17 SliceCellListNR-r17

} OPTIONAL -- Need R

}

SliceCellListNR-r17 ::= SEQUENCE (SIZE (1..maxCellSlice-r17)) OF PCI-Range

-- TAG-FREQPRIORITYLISTSLICING-STOP

-- ASN1STOP

| *FreqPriorityListSlicing* field descriptions |
| --- |
| ***dl-ImplicitCarrierFreq***  Indicates the downlink carrier frequency to which *sliceInfoList* is associated with. The frequency is signalled implicitly, value 0 corresponds to the serving frequency, value 1 corresponds to the first frequency indicated by the *InterFreqCarrierFreqList* in SIB4, and value 2 coresponds to the second frequency indicated by the *InterFreqCarrierFreqList* in SIB4, and so on. |

| *SliceInfo* field descriptions |
| --- |
| ***nsag-IdentityInfo***  This is the NSAG identifier of the NSAG. |
| ***sliceAllowedCellListNR***  List of allow-listed neighbouring cells for slicing. If present, cells not listed in this list do not support the corresponding nsag-frequency pair, according to 38.304 [20], clause 5.2.4.11. |
| ***sliceCellListNR***  Contains either the list of allow-listed or exclude-listed neighbour cells for slicing. |
| ***sliceExcludedCellListNR***  List of exclude-listed neighbouring cells for slicing. If present, cells not listed in this list support the corresponding slice nsag-frequency pair, according to 38.304 [20], clause 5.2.4.11. |

#### – *FrequencyInfoDL*

The IE *FrequencyInfoDL* provides basic parameters of a downlink carrier and transmission thereon.

*FrequencyInfoDL* information element

-- ASN1START

-- TAG-FREQUENCYINFODL-START

FrequencyInfoDL ::= SEQUENCE {

absoluteFrequencySSB ARFCN-ValueNR OPTIONAL, -- Cond SpCellAdd

frequencyBandList MultiFrequencyBandListNR,

absoluteFrequencyPointA ARFCN-ValueNR,

scs-SpecificCarrierList SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

...

}

-- TAG-FREQUENCYINFODL-STOP

-- ASN1STOP

|  |
| --- |
| *FrequencyInfoDL* field descriptions |
| ***absoluteFrequencyPointA***  Absolute frequency position of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A (see TS 38.211 [16], clause 4.4.4.2). Note that the lower edge of the actual carrier is not defined by this field but rather in the *scs-SpecificCarrierList*. |
| ***absoluteFrequencySSB***  Frequency of the SSB to be used for this serving cell. SSB related parameters (e.g. SSB index) provided for a serving cell refer to this SSB frequency unless mentioned otherwise. The cell-defining SSB of the PCell is always on the sync raster. Frequencies are considered to be on the sync raster if they are also identifiable with a GSCN value (see TS 38.101-1 [15]). If the field is absent, the SSB related parameters should be absent, e.g. *ssb-PositionsInBurst*, *ssb-periodicityServingCell* and *subcarrierSpacing* in *ServingCellConfigCommon* IE. If the field is absent, the UE obtains timing reference from the SpCell or an SCell if applicable as described in TS 38.213 [13], clause 4.1. This is only supported in case the SCell for which the UE obtains the timing reference is in the same frequency band as the cell (i.e. the SpCell or the SCell, respectively) from which the UE obtains the timing reference.  For cells supporting RedCap, if *FrequencyInfoDL* is included in the *ReconfigurationWithSync*, this field corresponds to the cell-defining SSB. |
| ***frequencyBandList***  List containing only one frequency band to which this carrier(s) belongs. Multiple values are not supported. |
| ***scs-SpecificCarrierList***  A set of carriers for different subcarrier spacings (numerologies). Defined in relation to Point A. The network configures a *scs-SpecificCarrier* at least for each numerology (SCS) that is used e.g. in a BWP (see TS 38.211 [16], clause 5.3). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SpCellAdd* | The field is mandatory present if this *FrequencyInfoDL* is for SpCell. Otherwise the field is optionally present, Need S. |

#### *– FrequencyInfoDL-SIB*

The IE *FrequencyInfoDL-SIB* provides basic parameters of a downlink carrier and transmission thereon.

*FrequencyInfoDL-SIB* information element

-- ASN1START

-- TAG-FREQUENCYINFODL-SIB-START

FrequencyInfoDL-SIB ::= SEQUENCE {

frequencyBandList MultiFrequencyBandListNR-SIB,

offsetToPointA INTEGER (0..2199),

scs-SpecificCarrierList SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier

}

-- TAG-FREQUENCYINFODL-SIB-STOP

-- ASN1STOP

|  |
| --- |
| *FrequencyInfoDL-SIB* field descriptions |
| ***offsetToPointA***  Represents the offset to Point A as defined in TS 38.211 [16], clause 4.4.4.2. |
| ***frequencyBandList***  List of one or multiple frequency bands to which this carrier(s) belongs. |
| ***scs-SpecificCarrierList***  A set of carriers for different subcarrier spacings (numerologies). Defined in relation to Point A (see TS 38.211 [16], clause 5.3). The network configures this for all SCSs that are used in DL BWPs in this serving cell. |

#### – *FrequencyInfoUL*

The IE *FrequencyInfoUL* provides basic parameters of an uplink carrier and transmission thereon.

*FrequencyInfoUL* information element

-- ASN1START

-- TAG-FREQUENCYINFOUL-START

FrequencyInfoUL ::= SEQUENCE {

frequencyBandList MultiFrequencyBandListNR OPTIONAL, -- Cond FDD-OrSUL

absoluteFrequencyPointA ARFCN-ValueNR OPTIONAL, -- Cond FDD-OrSUL

scs-SpecificCarrierList SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

additionalSpectrumEmission AdditionalSpectrumEmission OPTIONAL, -- Need S

p-Max P-Max OPTIONAL, -- Need S

frequencyShift7p5khz ENUMERATED {true} OPTIONAL, -- Cond FDD-TDD-OrSUL-Optional

...

}

-- TAG-FREQUENCYINFOUL-STOP

-- ASN1STOP

|  |
| --- |
| *FrequencyInfoUL* field descriptions |
| ***absoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. Note that the lower edge of the actual carrier is not defined by this field but rather in the *scs-SpecificCarrierList* (see TS 38.211 [16], clause 4.4.4.2). |
| ***additionalSpectrumEmission***  The additional spectrum emission requirements to be applied by the UE on this uplink. If the field is absent, the UE uses value 0 for the *additionalSpectrumEmission* (see TS 38.101-1 [15], table 6.2.3.1-1A, and TS 38.101-2 [39], table 6.2.3.1-2). Network configures the same value in *additionalSpectrumEmission* for all uplink carrier(s) of the same band with UL configured. The *additionalSpectrumEmission* is applicable for all uplink carriers of the same band with UL configured. |
| ***frequencyBandList***  List containing only one frequency band to which this carrier(s) belongs. Multiple values are not supported. |
| ***frequencyShift7p5khz***  Enable the NR UL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***p-Max***  Maximum transmit power allowed in this serving cell. The maximum transmit power that the UE may use on this serving cell may be additionally limited by *p-NR-FR1* (configured for the cell group) and by *p-UE-FR1* (configured total for all serving cells operating on FR1). If absent, the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if p-Max is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39]. Value in dBm. This field is ignored by IAB-MT, the IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [63]. |
| ***scs-SpecificCarrierList***  A set of carriers for different subcarrier spacings (numerologies). Defined in relation to Point A. The network configures a *scs-SpecificCarrier* at least for each numerology (SCS) that is used e.g. in a BWP (see TS 38.211 [16], clause 5.3). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *FDD-OrSUL* | The field is mandatory present if this *FrequencyInfoUL* is for the paired UL for a DL (defined in a *FrequencyInfoDL*) or if this *FrequencyInfoUL* is for a supplementary uplink (SUL). It is absent, Need R, otherwise (if this *FrequencyInfoUL* is for an unpaired UL (TDD). |
| *FDD-TDD-OrSUL-Optional* | The field is optionally present, Need R, if this *FrequencyInfoUL* is for the paired UL for a DL (defined in a *FrequencyInfoDL*), or if this *FrequencyInfoUL* is for an unpaired UL (TDD) in certain bands (as defined in clause 5.4.2.1 of TS 38.101-1 and in clause 5.4.2.1 of TS 38.104 [12]), or if this *FrequencyInfoUL* is for a supplementary uplink (SUL). It is absent, Need R, otherwise. |

#### *– FrequencyInfoUL-SIB*

The IE *FrequencyInfoUL-SIB* provides basic parameters of an uplink carrier and transmission thereon.

*FrequencyInfoUL-SIB* information element

-- ASN1START

-- TAG-FREQUENCYINFOUL-SIB-START

FrequencyInfoUL-SIB ::= SEQUENCE {

frequencyBandList MultiFrequencyBandListNR-SIB OPTIONAL, -- Cond FDD-OrSUL

absoluteFrequencyPointA ARFCN-ValueNR OPTIONAL, -- Cond FDD-OrSUL

scs-SpecificCarrierList SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

p-Max P-Max OPTIONAL, -- Need S

frequencyShift7p5khz ENUMERATED {true} OPTIONAL, -- Cond FDD-TDD-OrSUL-Optional

...

}

-- TAG-FREQUENCYINFOUL-SIB-STOP

-- ASN1STOP

|  |
| --- |
| *FrequencyInfoUL-SIB* field descriptions |
| ***absoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. Note that the lower edge of the actual carrier is not defined by this field but rather in the *scs-SpecificCarrierList* (see TS 38.211 [16], clause 4.4.4.2). |
| ***frequencyBandList***  Provides the frequency band indicator and a list of *additionalPmax* and *additionalSpectrumEmission* values as defined in TS 38.101-1 [15], table 6.2.3.1-1, and TS 38.101-2 [39], table 6.2.3.1-2. The UE shall apply the first listed band which it supports in the *frequencyBandList* field. |
| ***frequencyShift7p5khz***  Enable the NR UL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***p-Ma***x  Value in dBm applicable for the cell. If absent the UE applies the maximum power according to TS 38.101-1 [15] in case of an FR1 cell or TS 38.101-2 [39] in case of an FR2 cell. In this release of the specification, if p-Max is present on a carrier frequency in FR2, the UE shall ignore the field and applies the maximum power according to TS 38.101-2 [39]. This field is ignored by IAB-MT, the IAB-MT applies output power and emissions requirements, as specified in TS 38.174 [63]. |
| ***scs-SpecificCarrierList***  A set of carriers for different subcarrier spacings (numerologies). Defined in relation to Point A (see TS 38.211 [16], clause 5.3). The network configures this for all SCSs that are used in UL BWPs configured in this serving cell. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *FDD-OrSUL* | The field is mandatory present if this *FrequencyInfoUL-SIB* is for the paired UL for a DL (defined in a *FrequencyInfoDL-SIB*) or if this *FrequencyInfoUL-SIB* is for a supplementary uplink (SUL). It is absent otherwise (if this *FrequencyInfoUL-SIB* is for an unpaired UL (TDD). |
| *FDD-TDD-OrSUL-Optional* | The field is optionally present, Need R, if this *FrequencyInfoUL-SIB* is for the paired UL for a DL (defined in a *FrequencyInfoDL-SIB*), or if this *FrequencyInfoUL-SIB* is for an unpaired UL (TDD) in certain bands (as defined in clause 5.4.2.1 of TS 38.101-1 and in clause 5.4.2.1 of TS 38.104 [12]), or if this *FrequencyInfoUL-SIB* is for a supplementary uplink (SUL). It is absent otherwise. |

#### – *GapPriority*

The IE *GapPriority* is used to identify the priority of a gap configuration.

*GapPriority* information element

-- ASN1START

-- TAG-GAPPRIORITY-START

GapPriority-r17 ::= INTEGER (1..maxNrOfGapPri-r17)

-- TAG-GAPPRIORITY-STOP

-- ASN1STOP

#### – *HighSpeedConfig*

The IE *HighSpeedConfig* is used to configure parameters for high speed scenarios.

*HighSpeedConfig* information element

-- ASN1START

-- TAG-HIGHSPEEDCONFIG-START

HighSpeedConfig-r16 ::= SEQUENCE {

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

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

...

}

HighSpeedConfig-v1700 ::= SEQUENCE {

highSpeedMeasCA-Scell-r17 ENUMERATED {true} OPTIONAL, -- Need R

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

highSpeedDemodCA-Scell-r17 ENUMERATED {true} OPTIONAL, -- Need R

...

}

HighSpeedConfigFR2-r17 ::= SEQUENCE {

highSpeedMeasFlagFR2-r17 ENUMERATED {set1, set2} OPTIONAL, -- Need R

highSpeedDeploymentTypeFR2-r17 ENUMERATED {unidirectional, bidirectional} OPTIONAL, -- Need R

highSpeedLargeOneStepUL-TimingFR2-r17 ENUMERATED {true} OPTIONAL, -- Need R

...

}

-- TAG-HIGHSPEEDCONFIG-STOP

-- ASN1STOP

| *HighSpeedConfig* field descriptions |
| --- |
| ***HighSpeedDemodCA-Scell***  If the field is present and UE supports *demodulationEnhancementCA-r17*, the UE shall apply the enhanced demodulation processing for HST-SFN joint transmission scheme with velocity up to 500km/h as specified in TS 38.101-4 [59]. This parameter only applies to SCell. |
| ***highSpeedDemodFlag***  If the field is present and UE supports *demodulationEnhancement-r16*, the UE shall apply the enhanced demodulation processing for HST-SFN joint transmission scheme with velocity up to 500km/h as specified in TS 38.101-4 [59]. This parameter only applies to SpCell. |
| ***highSpeedDeploymentTypeFR2***  If the field is present, and field value is *unidirectional*, the UE shall assume uni-directional deployment or if field value is *birectional* the UE shall assume bidirectional deployment for FR2 up to 350km/h as specified in TS 38.133 [14]. |
| ***highSpeedLargeOneSteptUL-TimingFR2***  If the field is present, large one step UE autonomous uplink transmit timing adjustment for FR2 up to 350km/h as specified in TS 38.133 [14] is enabled. |
| ***highSpeedMeasCA-Scell***  If the field is present and UE supports *measurementEnhancementCA-r17*, the UE shall apply the enhanced RRM requirements to SCell for carrier aggregation to support high speed up to 500 km/h as specified in TS 38.133 [14]. This parameter only applies to SCell. |
| ***highSpeedMeasFlag***  If the field is present and UE supports *measurementEnhancement-r16*, the UE shall apply the enhanced intra-NR and inter-RAT EUTRAN RRM requirements to support high speed up to 500 km/h as specified in TS 38.133 [14].  If the field is present and UE supports *intraNR-MeasurementEnhancement-r16*, the UE shall apply enhanced intra-NR RRM requirement to support high speed up to 500 km/h as specified in TS 38.133 [14].  If the field is present and UE supports *interRAT-MeasurementEnhancement-r16*, the UE shall apply enhanced inter-RAT EUTRAN RRM requirement to support high speed up to 500 km/h as specified in TS 38.133 [14].  This parameter only applies to SpCell. |
| ***highSpeedMeasFlagFR2***  If the field is present, the UE shall apply enhanced intra-NR RRM requirement set one to support high speed up to 350 km/h for FR2 as specified in TS 38.133 [14], if the field value is set1 or RRM requirement set two if the field value is set2. |
| ***highSpeedMeasInterFreq***  If the field is present and UE supports *measurementEnhancementInterFreq-r17*, the UE shall apply the enhanced RRM requirements for inter-frequency measurement in RRC\_CONNECTED to support high speed up to 500 km/h as specified in TS 38.133 [14]. |

#### – *Hysteresis*

The IE *Hysteresis* is a parameter used within the entry and leave condition of an event triggered reporting condition. The actual value is field value \* 0.5 dB.

*Hysteresis* information element

-- ASN1START

-- TAG-HYSTERESIS-START

Hysteresis ::= INTEGER (0..30)

-- TAG-HYSTERESIS-STOP

-- ASN1STOP

#### – *HysteresisLocation*

The *HysteresisLocation* is a parameter used within entry and leave condition of a location based event triggered reporting condition. The actual value of field *HysteresisLocation* is field value \* 10 meters.

*HysteresisLocation* information element

-- ASN1START

-- TAG-HYSTERESISLOCATION-START

HysteresisLocation-r17 ::= INTEGER (0..32768)

-- TAG-HYSTERESISLOCATION-STOP

-- ASN1STOP

#### – *InvalidSymbolPattern*

The IE *InvalidSymbolPattern* is used to configure one invalid symbol pattern for PUSCH transmission repetition type B applicable for both DCI format 0\_1 and 0\_2, see TS 38.214 [19], clause 6.1.

*InvalidSymbolPattern* information element

-- ASN1START

-- TAG-INVALIDSYMBOLPATTERN-START

InvalidSymbolPattern-r16 ::= SEQUENCE {

symbols-r16 CHOICE {

oneSlot BIT STRING (SIZE (14)),

twoSlots BIT STRING (SIZE (28))

},

periodicityAndPattern-r16 CHOICE {

n2 BIT STRING (SIZE (2)),

n4 BIT STRING (SIZE (4)),

n5 BIT STRING (SIZE (5)),

n8 BIT STRING (SIZE (8)),

n10 BIT STRING (SIZE (10)),

n20 BIT STRING (SIZE (20)),

n40 BIT STRING (SIZE (40))

} OPTIONAL, -- Need M

...

}

-- TAG-INVALIDSYMBOLPATTERN-STOP

-- ASN1STOP

|  |
| --- |
| *InvalidSymbolPattern* field descriptions |
| ***periodicityAndPattern***  A time domain repetition pattern at which the pattern defined by *symbols* recurs. This slot pattern repeats itself continuously. When the field is not configured, the UE uses the value n1 (see TS 38.214 [19], clause 6.1). |
| ***symbols***  A symbol level bitmap in time domain (see TS 38.214[19], clause 6.1).  For *oneSlot*, if ECP is configured, the first 12 bits represent the symbols within the slot and the last two bits within the bitstring are ignored by the UE; Otherwise, the 14 bits represent the symbols within the slot.  For *twoSlots*, if ECP is configured, the first 12 bits represent the symbols within the first slot and the next 12 bits represent the symbols in the second slot and the last four bits within the bit string are ignored by the UE; Otherwise, the first 14 bits represent the symbols within the first slot and the next 14 bits represent the symbols in the second slot.  For the bits representing symbols in a slot, the most significant bit of the bit string represents the first symbol in the slot and the second most significant bit represents the second symbol in the slot and so on.  This pattern recurs (in time domain) with the configured *periodicityAndPattern*. |

#### – *I-RNTI-Value*

The IE *I-RNTI-Value* is used to identify the suspended UE context of a UE in RRC\_INACTIVE.

*I-RNTI-Value* information element

-- ASN1START

-- TAG-I-RNTI-VALUE-START

I-RNTI-Value ::= BIT STRING (SIZE(40))

-- TAG-I-RNTI-VALUE-STOP

-- ASN1STOP

#### – *LBT-FailureRecoveryConfig*

The IE *LBT-FailureRecoveryConfig-r16* is used to configure the parameters used for detection of consistent uplink LBT failures for operation with shared spectrum channel access, as specified in TS 38.321 [3].

*LBT-FailureRecoveryConfig* information element

-- ASN1START

-- TAG-LBT-FAILURERECOVERYCONFIG-START

LBT-FailureRecoveryConfig-r16 ::= SEQUENCE {

lbt-FailureInstanceMaxCount-r16 ENUMERATED {n4, n8, n16, n32, n64, n128},

lbt-FailureDetectionTimer-r16 ENUMERATED {ms10, ms20, ms40, ms80, ms160, ms320},

...

}

-- TAG-LBT-FAILURERECOVERYCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *LBT-FailureRecoveryConfig* field descriptions |
| ***lbt-FailureDetectionTimer***  Timer for consistent uplink LBT failure detection (see TS 38.321 [3]). Value *ms10* corresponds to 10 ms, value *ms20* corresponds to 20 ms, and so on. |
| ***lbt-FailureInstanceMaxCount***  This field determines after how many LBT failure indications received from the physical layer the UE triggers uplink LBT failure recovery (see TS 38.321 [3]). Value *n4* corresponds to 4, value *n8* corresponds to 8, and so on. |

#### – *LocationInfo*

The IE *LocationInfo* is used to transfer available detailed location information, Bluetooth, WLAN and sensor available measurement results at the UE.

*LocationInfo* information element

-- ASN1START

-- TAG-LOCATIONINFO-START

LocationInfo-r16 ::= SEQUENCE {

commonLocationInfo-r16 CommonLocationInfo-r16 OPTIONAL,

bt-LocationInfo-r16 LogMeasResultListBT-r16 OPTIONAL,

wlan-LocationInfo-r16 LogMeasResultListWLAN-r16 OPTIONAL,

sensor-LocationInfo-r16 Sensor-LocationInfo-r16 OPTIONAL,

...

}

-- TAG-LOCATIONINFO-STOP

-- ASN1STOP

#### – *LocationMeasurementInfo*

The IE *LocationMeasurementInfo* defines the information sent by the UE to the network to assist with the configuration of measurement gaps for location related measurements.

*LocationMeasurementInfo* information element

-- ASN1START

-- TAG-LOCATIONMEASUREMENTINFO-START

LocationMeasurementInfo ::= CHOICE {

eutra-RSTD EUTRA-RSTD-InfoList,

...,

eutra-FineTimingDetection NULL,

nr-PRS-Measurement-r16 NR-PRS-MeasurementInfoList-r16

}

EUTRA-RSTD-InfoList ::= SEQUENCE (SIZE (1..maxInterRAT-RSTD-Freq)) OF EUTRA-RSTD-Info

EUTRA-RSTD-Info ::= SEQUENCE {

carrierFreq ARFCN-ValueEUTRA,

measPRS-Offset INTEGER (0..39),

...

}

NR-PRS-MeasurementInfoList-r16 ::= SEQUENCE (SIZE (1..maxFreqLayers)) OF NR-PRS-MeasurementInfo-r16

NR-PRS-MeasurementInfo-r16 ::= SEQUENCE {

dl-PRS-PointA-r16 ARFCN-ValueNR,

nr-MeasPRS-RepetitionAndOffset-r16 CHOICE {

ms20-r16 INTEGER (0..19),

ms40-r16 INTEGER (0..39),

ms80-r16 INTEGER (0..79),

ms160-r16 INTEGER (0..159),

...

},

nr-MeasPRS-length-r16 ENUMERATED {ms1dot5, ms3, ms3dot5, ms4, ms5dot5, ms6, ms10, ms20},

...

}

-- TAG-LOCATIONMEASUREMENTINFO-STOP

-- ASN1STOP

| *LocationMeasurementInfo* field descriptions |
| --- |
| ***carrierFreq***  The EARFCN value of the carrier received from upper layers for which the UE needs to perform the inter-RAT RSTD measurements. |
| ***measPRS-Offset***  Indicates the requested gap offset for performing RSTD measurements towards E-UTRA. It is the smallest subframe offset from the beginning of subframe 0 of SFN=0 of the serving cell of the requested gap for measuring PRS positioning occasions in the carrier frequency *carrierFreq* for which the UE needs to perform the inter-RAT RSTD measurements. The PRS positioning occasion information is received from upper layers. The value of *measPRS-Offset* is obtained by mapping the starting subframe of the PRS positioning occasion in the measured cell onto the corresponding subframe in the serving cell and is calculated as the serving cell's number of subframes from SFN=0 mod 40.  The UE shall take into account any additional time required by the UE to start PRS measurements on the other carrier when it does this mapping for determining the *measPRS-Offset*.  NOTE: Figure 6.2.2-1 in TS 36.331[10] illustrates the *measPRS-Offset* field. |
| ***dl-PRS-PointA***  The ARFCN value of the carrier received from upper layers for which the UE needs to perform the NR DL-PRS measurements. |
| ***nr-MeasPRS-RepetitionAndOffset***  Indicates the gap periodicity in ms and offset in number of subframes of the requested measurement gap for performing NR DL-PRS measurements. |
| ***nr-MeasPRS-length***  Indicates measurement gap length in ms of the requested measurement gap for performing NR DL-PRS measurements. The measurement gap length is according to in Table 9.1.2-1 in TS 38.133 [14]. |

#### – *LogicalChannelConfig*

The IE *LogicalChannelConfig* is used to configure the logical channel parameters.

*LogicalChannelConfig* information element

-- ASN1START

-- TAG-LOGICALCHANNELCONFIG-START

LogicalChannelConfig ::= SEQUENCE {

ul-SpecificParameters SEQUENCE {

priority INTEGER (1..16),

prioritisedBitRate ENUMERATED {kBps0, kBps8, kBps16, kBps32, kBps64, kBps128, kBps256, kBps512,

kBps1024, kBps2048, kBps4096, kBps8192, kBps16384, kBps32768, kBps65536, infinity},

bucketSizeDuration ENUMERATED {ms5, ms10, ms20, ms50, ms100, ms150, ms300, ms500, ms1000,

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

allowedServingCells SEQUENCE (SIZE (1..maxNrofServingCells-1)) OF ServCellIndex

OPTIONAL, -- Cond PDCP-CADuplication

allowedSCS-List SEQUENCE (SIZE (1..maxSCSs)) OF SubcarrierSpacing OPTIONAL, -- Need R

maxPUSCH-Duration ENUMERATED {ms0p02, ms0p04, ms0p0625, ms0p125, ms0p25, ms0p5, ms0p01-v1700, spare1}

OPTIONAL, -- Need R

configuredGrantType1Allowed ENUMERATED {true} OPTIONAL, -- Need R

logicalChannelGroup INTEGER (0..maxLCG-ID) OPTIONAL, -- Need R

schedulingRequestID SchedulingRequestId OPTIONAL, -- Need R

logicalChannelSR-Mask BOOLEAN,

logicalChannelSR-DelayTimerApplied BOOLEAN,

...,

bitRateQueryProhibitTimer ENUMERATED {s0, s0dot4, s0dot8, s1dot6, s3, s6, s12, s30} OPTIONAL, -- Need R

[[

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

OPTIONAL, -- Need S

allowedPHY-PriorityIndex-r16 ENUMERATED {p0, p1} OPTIONAL -- Need S

]],

[[

logicalChannelGroupIAB-Ext-r17 INTEGER (0..maxLCG-ID-IAB-r17) OPTIONAL, -- Need R

allowedHARQ-mode-r17 ENUMERATED {harqModeA, harqModeB} OPTIONAL -- Need R

]]

} OPTIONAL, -- Cond UL

...,

[[

channelAccessPriority-r16 INTEGER (1..4) OPTIONAL, -- Need R

bitRateMultiplier-r16 ENUMERATED {x40, x70, x100, x200} OPTIONAL -- Need R

]]

}

-- TAG-LOGICALCHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *LogicalChannelConfig* field descriptions |
| ***allowedCG-List***  This restriction applies only when the UL grant is a configured grant. If present, UL MAC SDUs from this logical channel can only be mapped to the indicated configured grant configuration. If the size of the sequence is zero, then UL MAC SDUs from this logical channel cannot be mapped to any configured grant configurations. If the field is not present, UL MAC SDUs from this logical channel can be mapped to any configured grant configurations. If the field configuredGrantType1Allowed is present, only those configured grant type 1 configuration indicated in this sequence are allowed for use by this logical channel; otherwise, this sequence shall not include any configured grant type 1 configuration. Corresponds to "allowedCG-List" as specified in TS 38.321 [3]. |
| ***allowedHARQ-mode***  Indicates the allowed HARQ mode of a HARQ process mapped to this logical channel. If the parameter is absent, there is no restriction for HARQ mode for the mapping. This field applies to SRB1, SRB2 and DRBs. |
| ***allowedPHY-PriorityIndex***  This restriction applies only when the UL grant is a dynamic grant. If the field is present and the dynamic grant has a PHY-priority index, UL MAC SDUs from this logical channel can only be mapped to the dynamic grants indicating PHY-priority index equal to the values configured by this field. If the field is present and the dynamic grant does not have a PHY-priority index, UL MAC SDUs from this logical channel can only be mapped to this dynamic grant if the value of the field is *p0*, see TS 38.213 [13], clause 9. If the field is not present, UL MAC SDUs from this logical channel can be mapped to any dynamic grants. Corresponds to "allowedPHY-PriorityIndex" as specified in TS 38.321 [3]. |
| ***allowedSCS-List***  If present, UL MAC SDUs from this logical channel can only be mapped to the indicated numerology. Otherwise, UL MAC SDUs from this logical channel can be mapped to any configured numerology. Corresponds to *'allowedSCS-List'* as specified in TS 38.321 [3].  Only the following values are applicable depending on the used frequency:  FR1: 15, 30, or 60 kHz  FR2-1: 60 or 120 kHz  FR2-2: 120, 480, or 960 kHz |
| ***allowedServingCells***  If present, UL MAC SDUs from this logical channel can only be mapped to the serving cells indicated in this list. Otherwise, UL MAC SDUs from this logical channel can be mapped to any configured serving cell of this cell group. Corresponds to 'allowedServingCells' in TS 38.321 [3]. |
| ***bitRateMultiplier***  Bit rate multiplier for recommended bit rate MAC CE as specified in TS 38.321 [3]. Value *x40* indicates bit rate multiplier 40, value *x70* indicates bit rate multiplier 70 and so on. |
| ***bitRateQueryProhibitTimer***  The timer is used for bit rate recommendation query in TS 38.321 [3], in seconds. Value *s0* means 0 s, *s0dot4* means 0.4 s and so on. |
| ***bucketSizeDuration***  Value in ms. *ms5* corresponds to 5 ms, value *ms10* corresponds to 10 ms, and so on. |
| ***channelAccessPriority***  Indicates the Channel Access Priority Class (CAPC), as specified in TS 38.300 [2], to be used on uplink transmissions for operation with shared spectrum channel access. The network configures this field only for SRB2 and DRBs. |
| ***configuredGrantType1Allowed***  If present, or if the capability *lcp-Restriction* as specified in TS 38.306 [26] is not supported, UL MAC SDUs from this logical channel can be transmitted on a configured grant type 1. Otherwise, UL MAC SDUs from this logical channel cannot be transmitted on a configured grant type 1. Corresponds to 'configuredGrantType1Allowed' in TS 38.321 [3]. |
| ***logicalChannelGroup, logicalChannelGroupIAB-Ext***  ID of the logical channel group, as specified in TS 38.321 [3], which the logical channel belongs to. The *logicalChannelGroupIAB-Ext* is only applicable to the IAB-MT. When *logicalChannelGroupIAB-Ext* is configured, *logicalChannelGroup* shall be ignored. |
| ***logicalChannelSR-Mask***  Controls SR triggering when a configured uplink grant of *type1* or *type2* is configured. *true* indicates that SR masking is configured for this logical channel as specified in TS 38.321 [3]. |
| ***logicalChannelSR-DelayTimerApplied***  Indicates whether to apply the delay timer for SR transmission for this logical channel. Set to *false* if *logicalChannelSR-DelayTimer* is not included in *BSR-Config*. |
| ***maxPUSCH-Duration***  If present, UL MAC SDUs from this logical channel can only be transmitted using uplink grants that result in a PUSCH duration shorter than or equal to the duration indicated by this field. Otherwise, UL MAC SDUs from this logical channel can be transmitted using an uplink grant resulting in any PUSCH duration. Corresponds to "maxPUSCH-Duration" in TS 38.321 [3]. The PUSCH duration is calculated based on the same length of all symbols, and the shortest length applies if the symbol lengths are different. |
| ***priority***  Logical channel priority, as specified in TS 38.321 [3]. |
| ***prioritisedBitRate***  Value in kiloBytes/s. Value *kBps0* corresponds to 0 kiloBytes/s, value *kBps8* corresponds to 8 kiloBytes/s, value *kBps16* corresponds to 16 kiloBytes/s, and so on. For SRBs, the value can only be set to *infinity*. |
| ***schedulingRequestId***  If present, it indicates the scheduling request configuration applicable for this logical channel, as specified in TS 38.321 [3]. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *PDCP-CADuplication* | The field is mandatory present if the DRB/SRB associated with this logical channel is configured with PDCP CA duplication in UL in the cell group in which this IE is included (i.e. the PDCP entity is associated with multiple RLC entities belonging to this cell group). Otherwise the field is optionally present, need R. |
| *UL* | The field is mandatory present for a logical channel with uplink if it serves DRB. It is optionally present, Need R, for a logical channel with uplink if it serves an SRB. Otherwise it is absent. |

#### – *LogicalChannelIdentity*

The IE *LogicalChannelIdentity* is used to identify one logical channel (*LogicalChannelConfig*) and the corresponding RLC bearer (*RLC-BearerConfig*) or BH RLC channel (*BH-RLC-ChannelConfig*) or Uu Relay RLC channel (*Uu-RelayRLC-ChannelConfig*) or PC5 Relay RLC channel (*SL-RLC-ChannelConfig*).

*LogicalChannelIdentity* information element

-- ASN1START

-- TAG-LOGICALCHANNELIDENTITY-START

LogicalChannelIdentity ::= INTEGER (1..maxLC-ID)

-- TAG-LOGICALCHANNELIDENTITY-STOP

-- ASN1STOP

#### – LTE-NeighCellsCRS-AssistInfoList

The IE *LTE-NeighCellsCRS-AssistInfoList-r17* is used to provide configuration information of neighbour LTE cells to assist the UE to perform CRS interference mitigation (CRS-IM) in scenarios with overlapping spectrum for LTE and NR.

*LTE-NeighCellsCRS-AssistInfoList* information element

-- ASN1START

-- TAG-LTE-NEIGHCELLSCRS-ASSISTINFOLIST-START

LTE-NeighCellsCRS-AssistInfoList-r17 ::= SEQUENCE (SIZE (1..maxNrofCRS-IM-InterfCell-r17)) OF LTE-NeighCellsCRS-AssistInfo-r17

LTE-NeighCellsCRS-AssistInfo-r17 ::= SEQUENCE {

neighCarrierBandwidthDL-r17 ENUMERATED {n6, n15, n25, n50, n75, n100, spare2, spare1} OPTIONAL, -- Cond CRS-IM

neighCarrierFreqDL-r17 INTEGER (0..16383) OPTIONAL, -- Need S

neighCellId-r17 EUTRA-PhysCellId OPTIONAL, -- Need M

neighCRS-muting-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

neighMBSFN-SubframeConfigList-r17 EUTRA-MBSFN-SubframeConfigList OPTIONAL, -- Need S

neighNrofCRS-Ports–r17 ENUMERATED {n1, n2, n4} OPTIONAL, -- Need S

neighV-Shift-r17 ENUMERATED {n0, n1, n2, n3, n4, n5} OPTIONAL -- Cond NotCellID

}

-- TAG-LTE-NEIGHCELLSCRS-ASSISTINFOLIST-STOP

-- ASN1STOP

|  |
| --- |
| LTE-NeighCellsCRS-AssistInfoList field descriptions |
| ***neighCarrierBandwidthDL***  Indicates the channel bandwidth of the neighbour LTE cell in number of PRBs. If the field is absent, the UE applies the value of *carrierBandwidthDL* indicated in *RateMatchPatternLTE-CRS* for this serving cell, if configured. |
| ***neighCarrierFreqDL***  Indicates the downlink centre frequency of the neighbour LTE cell. If the field is absent, the UE applies the value of *carrierFreqDL* indicated in *RateMatchPatternLTE-CRS* for this serving cell, if configured. |
| ***neighCellId***  Indicates the physciall cell ID the neighbour LTE cell. |
| ***neighCRS-muting***  Indicates whether the CRS interference mitigation is enabled in the neighbour LTE cell, as specified in TS 36.133 [40], clause 3.6.1.1. |
| ***neighMBSFN-SubframeConfigList***  Indicates the MBSFN subframe configuration of the neighbour LTE cell. If *RateMatchPatternLTE-CRS* is configured for this serving cell and the field is absent, the UE applies the value of *mbsfn-SubframeConfigList* indicated in *RateMatchPatternLTE-CRS* for this serving cell if configured; otherwise, if the field is absent, the UE assumes MBSFN is not configured in the neighbour LTE cell. |
| ***neighNrofCRS-Ports***  Indicates the CRS antenna ports number of the neighbour LTE cell. If the field is absent, the UE applies the value of *nrofCRS-Ports* indicated in *RateMatchPatternLTE-CRS* for this serving cell, if configured. If *RateMatchPatternLTE-CRS* is not configured for this serving cell and the field is absent, the UE applies the default value n4. |
| ***neighV-Shift***  Indicates the shifting value v-shift of the neighbour LTE cell. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *CRS-IM* | For the serving cell with 15kHz SCS, this field is mandatory present for the UE supporting the capability of *CRS-IM-nonDSS-NWA-15kHzSCS-r17*, but not supporting *CRS-IM-nonDSS-15kHzSCS-r17*, if *RateMatchPatternLTE-CRS* is not configured for this serving cell. Otherwise it is optionally present, Need S if *RateMatchPatternLTE-CRS* is configured for this serving cell; Need M otherwise.  For the serving cell with 30kHz SCS, this field is mandatory present for the UE supporting the capability of *CRS-IM-nonDSS-NWA-30kHzSCS-r17*, but not supporting *CRS-IM-nonDSS-30kHzSCS-r17*, if *RateMatchPatternLTE-CRS* is not configured for this serving cell. Otherwise it is optionally present, Need S if *RateMatchPatternLTE-CRS* is configured for this serving cell; Need M otherwise. |
| *NotCellID* | If the field *neighCellId* is present, this field shall be absent; otherwise, it is optionally present, Need M. |

#### – *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 } 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

]]

}

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-AggregationFactorMulticast-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. |
| ***g-RNTI-ConfigToAddModList***  List of G-RNTI configurations to add or modify. |
| ***g-RNTI-ConfigToReleaseList***  List of G-RNTI configurations to release. |
| ***g-CS-RNTI-ConfigToAddModList***  List of G-CS-RNTI configurations to add or modify. |
| ***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 BFDset of a serving cell but not on resources configured in BFDset2 of the same serving cell.  *Editor's note: BFDset and BFDset2 configuration is pending on LS response from RAN1.* |
| ***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 BFDset2 of a serving cell but not on resources configured in BFDset of the same serving cell.  *Editor's note: BFDset and BFDset2 configuration is pending on LS response from RAN1.* |
| ***schedulingRequestID-LBT-SCell***  Indicates the scheduling request configuration applicable for consistent uplink LBT recovery on SCell, 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]. |

|  |
| --- |
| *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. Value *enabled* means the UE shall always provide HARQ feedback for MBS multicast. When the field is absent, the value "*disabled*" is used as defined in TS 38.213 [3]. |
| ***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-AggregationFactorMulticast***  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. |

## <<<<Unchanged parts skipped>>>>

### 6.3.5 Sidelink information elements

#### – *SL-BWP-Config*

The IE *SL-BWP-Config* is used to configure the UE specific NR sidelink communication on one particular sidelink bandwidth part.

*SL-BWP-Config* information element

-- ASN1START

-- TAG-SL-BWP-CONFIG-START

SL-BWP-Config-r16 ::= SEQUENCE {

sl-BWP-Id BWP-Id,

sl-BWP-Generic-r16 SL-BWP-Generic-r16 OPTIONAL, -- Need M

sl-BWP-PoolConfig-r16 SL-BWP-PoolConfig-r16 OPTIONAL, -- Need M

...,

[[

sl-BWP-PoolConfigPS-r17 SetupRelease {SL-BWP-PoolConfig-r16} OPTIONAL, -- Need M

sl-BWP-DiscPoolConfig-r17 SetupRelease {SL-BWP-DiscPoolConfig-r17} OPTIONAL -- Need M

]]

}

SL-BWP-Generic-r16 ::= SEQUENCE {

sl-BWP-r16 BWP OPTIONAL, -- Need M

sl-LengthSymbols-r16 ENUMERATED {sym7, sym8, sym9, sym10, sym11, sym12, sym13, sym14} OPTIONAL, -- Need M

sl-StartSymbol-r16 ENUMERATED {sym0, sym1, sym2, sym3, sym4, sym5, sym6, sym7} OPTIONAL, -- Need M

sl-PSBCH-Config-r16 SetupRelease {SL-PSBCH-Config-r16} OPTIONAL, -- Need M

sl-TxDirectCurrentLocation-r16 INTEGER (0..3301) OPTIONAL, -- Need M

...

}

-- TAG-SL-BWP-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *SL-BWP-Config* field descriptions |
| ***sl-BWP-DiscPoolConfig***  This field indicates the NR sidelink discovery dedicated resource pool configurations on the configured sidelink BWP. The total number of Rx/Tx resource pools configured for communication and discovery does not exceed the maximum number of Rx/Tx resource pool for NR sidelink communication (i.e. *maxNrofRXPool-r16/maxNrofTXPool-r16*). |
| ***sl-BWP-Generic***  This field indicates the generic parameters on the configured sidelink BWP. |
| ***sl-BWP-PoolConfig***  This field indicates the resource pool configurations on the configured sidelink BWP. |
| ***sl-BWP-Id***  An identifier for this sidelink bandwidth part. |
| ***sl-BWP-PoolConfigPS***  This field indicates the resource pool configurations for power saving on the configured sidelink BWP. This field does not include *sl-TxPoolExceptional*. |

|  |
| --- |
| *SL-BWP-Generic* field descriptions |
| ***sl-LengthSymbols***  This field indicates the number of symbols used for sidelink in a slot without SL-SSB. A single value can be (pre)configured per sidelink bandwidth part. |
| ***sl-StartSymbol***  This field indicates the starting symbol used for sidelink in a slot without SL-SSB. A single value can be (pre)configured per sidelink bandwidth part. |
| ***sl-TxDirectCurrentLocation***  The sidelink Tx/Rx Direct Current location for the carrier. Only values in the value range of this field between 0 and 3299, which indicate the subcarrier index within the carrier corresponding to the numerology of the corresponding sidelink BWP and value 3300, which indicates "Outside the carrier" and value 3301, which indicates "Undetermined position within the carrier" are used in this version of the specification. |

#### – *SL-BWP-ConfigCommon*

The IE *SL-BWP-ConfigCommon* is used to configure the cell-specific configuration information on one particular sidelink bandwidth part.

*SL-BWP-ConfigCommon* information element

-- ASN1START

-- TAG-SL-BWP-CONFIGCOMMON-START

SL-BWP-ConfigCommon-r16 ::= SEQUENCE {

sl-BWP-Generic-r16 SL-BWP-Generic-r16 OPTIONAL, -- Need R

sl-BWP-PoolConfigCommon-r16 SL-BWP-PoolConfigCommon-r16 OPTIONAL, -- Need R

...,

[[

sl-BWP-PoolConfigCommonPS-r17 SL-BWP-PoolConfigCommon-r16 OPTIONAL, -- Need R

sl-BWP-DiscPoolConfigCommon-r17 SL-BWP-DiscPoolConfigCommon-r17 OPTIONAL -- Need R

]]

}

-- TAG-SL-BWP-CONFIGCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| *SL-BWP-ConfigCommon* field descriptions |
| ***sl-BWP-DiscPoolConfigCommon***  This field indicates the NR sidelink discovery dedicated resource pool configurations on the configured sidelink BWP. The total number of Rx/Tx resource pools configured for communication and discovery does not exceed the maximum number of Rx/Tx resource pool for NR sidelink communication (i.e. *maxNrofRXPool-r16/maxNrofTXPool-r16*). |
| ***sl-BWP-Generic***  This field indicates the generic parameters on the configured sidelink BWP. |
| ***sl-BWP-PoolConfigCommon***  This field indicates the resource pool configurations on the configured sidelink BWP. |
| ***sl-BWP-PoolConfigCommonPS***  This field indicates the resource pool configurations for power saving on the configured sidelink BWP. This field does not include *sl-TxPoolExceptional*. |

#### – *SL-BWP-DiscPoolConfig*

The IE *SL-BWP-DiscPoolConfig* is used to configure UE specific NR sidelink discovery dedicated resource pool.

*SL-BWP-DiscPoolConfig* information element

-- ASN1START

-- TAG-SL-BWP-DISCPOOLCONFIG-START

SL-BWP-DiscPoolConfig-r17 ::= SEQUENCE {

sl-DiscRxPool-r17 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-ResourcePool-r16 OPTIONAL, -- Cond HO

sl-DiscTxPoolSelected-r17 SL-TxPoolDedicated-r16 OPTIONAL, -- Need M

sl-DiscTxPoolScheduling-r17 SL-TxPoolDedicated-r16 OPTIONAL -- Need N

}

-- TAG-SL-BWP-DISCPOOLCONFIG-STOP

-- ASN1STOP

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *HO* | This field is optionally present, need M, in an *RRCReconfiguration* message including *reconfigurationWithSync*; otherwise it is absent, need M. |

#### – *SL-BWP-DiscPoolConfigCommon*

The IE *SL-BWP-DiscPoolConfigCommon* is used to configure the cell-specific NR sidelink discovery dedicated resource pool.

*SL-BWP-DiscPoolConfigCommon* information element

-- ASN1START

-- TAG-SL-BWP-DISCPOOLCONFIGCOMMON-START

SL-BWP-DiscPoolConfigCommon-r17 ::= SEQUENCE {

sl-DiscRxPool-r17 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-ResourcePool-r16 OPTIONAL, -- Need R

sl-DiscTxPoolSelected-r17 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolConfig-r16 OPTIONAL, -- Need R

...

}

-- TAG-SL-BWP-DISCPOOLCONFIGCOMMON-STOP

-- ASN1STOP

#### – *SL-BWP-PoolConfig*

The IE *SL-BWP-PoolConfig* is used to configure NR sidelink communication resource pool.

*SL-BWP-PoolConfig* information element

-- ASN1START

-- TAG-SL-BWP-POOLCONFIG-START

SL-BWP-PoolConfig-r16 ::= SEQUENCE {

sl-RxPool-r16 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-ResourcePool-r16 OPTIONAL, -- Cond HO

sl-TxPoolSelectedNormal-r16 SL-TxPoolDedicated-r16 OPTIONAL, -- Need M

sl-TxPoolScheduling-r16 SL-TxPoolDedicated-r16 OPTIONAL, -- Need N

sl-TxPoolExceptional-r16 SL-ResourcePoolConfig-r16 OPTIONAL -- Need M

}

SL-TxPoolDedicated-r16 ::= SEQUENCE {

sl-PoolToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolID-r16 OPTIONAL, -- Need N

sl-PoolToAddModList-r16 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolConfig-r16 OPTIONAL -- Need N

}

SL-ResourcePoolConfig-r16 ::= SEQUENCE {

sl-ResourcePoolID-r16 SL-ResourcePoolID-r16,

sl-ResourcePool-r16 SL-ResourcePool-r16 OPTIONAL -- Need M

}

SL-ResourcePoolID-r16 ::= INTEGER (1..maxNrofPoolID-r16)

-- TAG-SL-BWP-POOLCONFIG-STOP

-- ASN1STOP

| *SL-BWP-PoolConfig* field descriptions |
| --- |
| ***sl-RxPool***  Indicates the receiving resource pool on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. If the field is included, it replaces any previous list, i.e. all the entries of the list are replaced and each of the *SL-ResourcePool* entries is considered to be newly created. |
| ***sl-TxPoolExceptional***  Indicates the resources by which the UE is allowed to transmit NR sidelink communication in exceptional conditions on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |
| ***sl-TxPoolScheduling***  Indicates the resources by which the UE is allowed to transmit NR sidelink communication based on network scheduling on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |
| ***sl-TxPoolSelectedNormal***  Indicates the resources by which the UE is allowed to transmit NR sidelink communication by UE autonomous resource selection on the configured BWP. For the PSFCH related configuration, if configured, will be used for PSFCH transmission/reception. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *HO* | This field is optionally present, need M, in an *RRCReconfiguration* message including *reconfigurationWithSync*; otherwise it is absent, Need M. |

#### – *SL-BWP-PoolConfigCommon*

The IE *SL-BWP-PoolConfigCommon* is used to configure the cell-specific NR sidelink communication resource pool.

*SL-BWP-PoolConfigCommon* information element

-- ASN1START

-- TAG-SL-BWP-POOLCONFIGCOMMON-START

SL-BWP-PoolConfigCommon-r16 ::= SEQUENCE {

sl-RxPool-r16 SEQUENCE (SIZE (1..maxNrofRXPool-r16)) OF SL-ResourcePool-r16 OPTIONAL, -- Need R

sl-TxPoolSelectedNormal-r16 SEQUENCE (SIZE (1..maxNrofTXPool-r16)) OF SL-ResourcePoolConfig-r16 OPTIONAL, -- Need R

sl-TxPoolExceptional-r16 SL-ResourcePoolConfig-r16 OPTIONAL -- Need R

}

-- TAG-SL-BWP-POOLCONFIGCOMMON-STOP

-- ASN1STOP

#### – *SL-CBR-PriorityTxConfigList*

The IE *SL-CBR-PriorityTxConfigList* indicates the mapping between PSSCH transmission parameter (such as MCS, PRB number, retransmission number, CR limit) sets by using the indexes of the configurations provided in *sl-CBR-PSSCH-TxConfigList*, CBR ranges by an index to the entry of the CBR range configuration in *sl-CBR-RangeConfigList*, and priority ranges. It also indicates the default PSSCH transmission parameters to be used when CBR measurement results are not available, and MCS range for the MCS tables used in the resource pool.

*SL-CBR-PriorityTxConfigList* information element

-- ASN1START

-- TAG-SL-CBR-PRIORITYTXCONFIGLIST-START

SL-CBR-PriorityTxConfigList-r16 ::= SEQUENCE (SIZE (1..8)) OF SL-PriorityTxConfigIndex-r16

SL-CBR-PriorityTxConfigList-v1650 ::= SEQUENCE (SIZE (1..8)) OF SL-PriorityTxConfigIndex-v1650

SL-PriorityTxConfigIndex-r16 ::= SEQUENCE {

sl-PriorityThreshold-r16 INTEGER (1..8) OPTIONAL, -- Need M

sl-DefaultTxConfigIndex-r16 INTEGER (0..maxCBR-Level-1-r16) OPTIONAL, -- Need M

sl-CBR-ConfigIndex-r16 INTEGER (0..maxCBR-Config-1-r16) OPTIONAL, -- Need M

sl-Tx-ConfigIndexList-r16 SEQUENCE (SIZE (1.. maxCBR-Level-r16)) OF SL-TxConfigIndex-r16 OPTIONAL -- Need M

}

SL-PriorityTxConfigIndex-v1650 ::= SEQUENCE {

sl-MCS-RangeList-r16 SEQUENCE (SIZE (1..maxCBR-Level-r16)) OF SL-MinMaxMCS-List-r16 OPTIONAL -- Need M

}

SL-TxConfigIndex-r16 ::= INTEGER (0..maxTxConfig-1-r16)

-- TAG-SL-CBR-PRIORITYTXCONFIGLIST-STOP

-- ASN1STOP

| *SL-CBR-PriorityTxConfigList* field descriptions |
| --- |
| ***sl-CBR-ConfigIndex***  Indicates the CBR ranges to be used by an index to the entry of the CBR range configuration in *sl-CBR-RangeConfigList*. |
| ***sl-DefaultTxConfigIndex***  Indicates the PSSCH transmission parameters to be used by the UEs which do not have available CBR measurement results, by means of an index to the corresponding entry in *sl-Tx-ConfigIndexList*. Value 0 indicates the first entry in *sl-Tx-ConfigIndexList*. The field is ignored if the UE has available CBR measurement results. |
| ***sl-MCS-RangeList***  Indicates the minimum MCS value and maximum MCS value for the associated MCS table(s). UE shall ignore the minimum MCS value and maximum MCS value used for table of 64QAM indicated in *SL-CBR-PriorityTxConfigList-r16* if *SL-CBR-PriorityTxConfigList-v1650* is present. |
| ***sl-PriorityThreshold***  Indicates the upper bound of priority range which is associated with the configurations in *sl-CBR-ConfigIndex* and in *sl-Tx-ConfigIndexList*. The upper bounds of the priority ranges are configured in ascending order for consecutive entries of *SL-PriorityTxConfigIndex* in *SL-CBR-PriorityTxConfigList*. For the first entry of S*L-PriorityTxConfigIndex*, the lower bound of the priority range is 1. |
| ***SL-CBR-PriorityTxConfigList-v1650***  If included, it includes the same number of entries, and listed in the same order, as in *SL-CBR-PriorityTxConfigList-r16*. |

#### – *SL-CBR-CommonTxConfigList*

The IE *SL-CBR-CommonTxConfigList* indicates the list of PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number, CR limit) in *sl-CBR-PSSCH-TxConfigList*, and the list of CBR ranges in *sl-CBR-RangeConfigList*, to configure congestion control to the UE for sidelink communication.

*SL-CBR-CommonTxConfigList* information element

-- ASN1START

-- TAG-SL-CBR-COMMONTXCONFIGLIST-START

SL-CBR-CommonTxConfigList-r16 ::= SEQUENCE {

sl-CBR-RangeConfigList-r16 SEQUENCE (SIZE (1..maxCBR-Config-r16)) OF SL-CBR-LevelsConfig-r16 OPTIONAL, -- Need M

sl-CBR-PSSCH-TxConfigList-r16 SEQUENCE (SIZE (1.. maxTxConfig-r16)) OF SL-CBR-PSSCH-TxConfig-r16 OPTIONAL -- Need M

}

SL-CBR-LevelsConfig-r16 ::= SEQUENCE (SIZE (1..maxCBR-Level-r16)) OF SL-CBR-r16

SL-CBR-PSSCH-TxConfig-r16 ::= SEQUENCE {

sl-CR-Limit-r16 INTEGER(0..10000) OPTIONAL, -- Need M

sl-TxParameters-r16 SL-PSSCH-TxParameters-r16 OPTIONAL -- Need M

}

SL-CBR-r16 ::= INTEGER (0..100)

-- TAG-SL-CBR-COMMONTXCONFIGLIST-STOP

-- ASN1STOP

| *SL-CBR-CommonTxConfigList* field descriptions |
| --- |
| ***sl-CBR-RangeConfigList***  Indicates the list of CBR ranges. Each entry of the list indicates in *SL-CBR-LevelsConfig* the upper bound of the CBR range for the respective entry. The upper bounds of the CBR ranges are configured in ascending order for consecutive entries of *sl-CBR-RangeConfigList.* For the first entry of *sl-CBR-RangeConfigList* the lower bound of the CBR range is 0. Value 0 corresponds to 0, value 1 to 0.01, value 2 to 0.02, and so on. |
| ***sl-CR-Limit***  Indicates the maximum limit on the occupancy ratio. Value 0 corresponds to 0, value 1 to 0.0001, value 2 to 0.0002, and so on (i.e. in steps of 0.0001) until value 10000, which corresponds to 1. |
| ***sl-CBR-PSSCH-TxConfigList***  Indicates the list of available PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number and CR limit) configurations. |
| ***sl-TxParameters***  Indicates PSSCH transmission parameters. |

#### – *SL-ConfigDedicatedNR*

The IE *SL-ConfigDedicatedNR* specifies the dedicated configuration information for NR sidelink communication.

*SL-ConfigDedicatedNR* information element

-- ASN1START

-- TAG-SL-CONFIGDEDICATEDNR-START

SL-ConfigDedicatedNR-r16 ::= SEQUENCE {

sl-PHY-MAC-RLC-Config-r16 SL-PHY-MAC-RLC-Config-r16 OPTIONAL, -- Need M

sl-RadioBearerToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-Uu-ConfigIndex-r16 OPTIONAL, -- Need N

sl-RadioBearerToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL, -- Need N

sl-MeasConfigInfoToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DestinationIndex-r16 OPTIONAL, -- Need N

sl-MeasConfigInfoToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-MeasConfigInfo-r16 OPTIONAL, -- Need N

t400-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need M

...,

[[

sl-PHY-MAC-RLC-Config-v1700 SetupRelease { SL-PHY-MAC-RLC-Config-v1700 } OPTIONAL, -- Need M

sl-DiscConfig-r17 SetupRelease { SL-DiscConfig-r17} OPTIONAL -- Need M

]]

}

SL-DestinationIndex-r16 ::= INTEGER (0..maxNrofSL-Dest-1-r16)

SL-PHY-MAC-RLC-Config-r16::= SEQUENCE {

sl-ScheduledConfig-r16 SetupRelease { SL-ScheduledConfig-r16 } OPTIONAL, -- Need M

sl-UE-SelectedConfig-r16 SetupRelease { SL-UE-SelectedConfig-r16 } OPTIONAL, -- Need M

sl-FreqInfoToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-Freq-Id-r16 OPTIONAL, -- Need N

sl-FreqInfoToAddModList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfig-r16 OPTIONAL, -- Need N

sl-RLC-BearerToReleaseList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfigIndex-r16 OPTIONAL, -- Need N

sl-RLC-BearerToAddModList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need N

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL, -- Need M

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-CSI-SchedulingRequestId-r16 SetupRelease {SchedulingRequestId} OPTIONAL, -- Need M

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL, -- Need R

networkControlledSyncTx-r16 ENUMERATED {on, off} OPTIONAL -- Need M

}

SL-PHY-MAC-RLC-Config-v1700 ::= SEQUENCE {

sl-DRX-Config-r17 SL-DRX-Config-r17 OPTIONAL, -- Need M

sl-RLC-ChannelToReleaseList-r17 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-ChannelID-r17 OPTIONAL, -- Cond L2U2N

sl-RLC-ChannelToAddModList-r17 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-ChannelConfig-r17 OPTIONAL, -- Cond L2U2N

...

}

SL-DiscConfig-r17::= SEQUENCE {

sl-RelayUE-Config-r17 SetupRelease { SL-RelayUE-Config-r17} OPTIONAL, -- Cond L2RelayUE

sl-RemoteUE-Config-r17 SetupRelease { SL-RemoteUE-Config-r17} OPTIONAL -- Cond L2RemoteUE

}

-- TAG-SL-CONFIGDEDICATEDNR-STOP

-- ASN1STOP

| *SL-ConfigDedicatedNR* field descriptions |
| --- |
| ***sl-MeasConfigInfoToAddModList***  This field indicates the RSRP measurement configurations for unicast destinations to add and/or modify. |
| ***sl-MeasConfigInfoToReleaseList***  This field indicates the RSRP measurement configurations for unicast destinations to remove. |
| ***sl-PHY-MAC-RLC-Config***  This field indicates the lower layer sidelink radio bearer configurations. |
| ***sl-RadioBearerToAddModList***  This field indicates one or multiple sidelink radio bearer configurations to add and/or modify. This field is not configured to the PC5 connection used for L2 U2N relay operation. |
| ***sl-RadioBearerToReleaseList***  This field indicates one or multiple sidelink radio bearer configurations to remove. This field is not configured to the PC5 connection used for L2 U2N relay operation. |

| *SL-PHY-MAC-RLC-Config* field descriptions |
| --- |
| ***networkControlledSyncTx***  This field indicates whether the UE shall transmit synchronisation information (i.e. become synchronisation source). Value *on* indicates the UE to transmit synchronisation information while value *off* indicates the UE to not transmit such information. |
| ***sl-DRX-Config***  This field indicates the sidelink DRX configuration(s) for unicast, groupcast and/or broadcast communication, as specified in TS 38.321 [3]. |
| ***sl-MaxNumConsecutiveDTX***  This field indicates the maximum number of consecutive HARQ DTX before triggering sidelink RLF. Value n1 corresponds to 1, value n2 corresponds to 2, and so on. |
| ***sl-FreqInfoToAddModList***  This field indicates the NR sidelink communication configuration on some carrier frequency (ies) to add and/or modify. In this release, only one entry can be configured in the list. |
| ***sl-FreqInfoToReleaseList***  This field indicates the NR sidelink communication configuration on some carrier frequency (ies) to remove. In this release, only one entry can be configured in the list. |
| ***sl-RLC-BearerToAddModList***  This field indicates one or multiple sidelink RLC bearer configurations to add and/or modify. |
| ***sl-RLC-BearerToReleaseList***  This field indicates one or multiple sidelink RLC bearer configurations to remove. |
| ***sl-ScheduledConfig***  Indicates the configuration for UE to transmit NR sidelink communication based on network scheduling. This field is not configured simultaneously with sl-UE-SelectedConfig. This field is not configured to a L2 U2N Remote UE. |
| ***sl-UE-SelectedConfig***  Indicates the configuration used for UE autonomous resource selection. This field is not configured simultaneously with *sl-ScheduledConfig*. |
| ***sl-CSI-Acquisition***  Indicates whether CSI reporting is enabled in sidelink unicast. If the field is absent, sidelink CSI reporting is disabled. |
| ***sl-CSI-SchedulingRequestId***  If present, it indicates the scheduling request configuration applicable for sidelink CSI report MAC CE, as specified in TS 38.321 [3]. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RelayUE* | For L2 U2N Relay UE, the field is optionally present, Need M. Otherwise, it is absent. |
| *L2RemoteUE* | For L2 U2N Remote UE, the field is optionally present, Need M. Otherwise, it is absent. |
| *L2U2N* | The field is optional present for L2 U2N Relay UE and L2 U2N Remote UE, need N. Otherwise, it is absent. |

#### – *SL-ConfiguredGrantConfig*

The IE *SL-ConfiguredGrantConfig* specifies the configured grant configuration information for NR sidelink communication.

*SL-ConfiguredGrantConfig* information element

-- ASN1START

-- TAG-SL-CONFIGUREDGRANTCONFIG-START

SL-ConfiguredGrantConfig-r16 ::= SEQUENCE {

sl-ConfigIndexCG-r16 SL-ConfigIndexCG-r16,

sl-PeriodCG-r16 SL-PeriodCG-r16 OPTIONAL, -- Need M

sl-NrOfHARQ-Processes-r16 INTEGER (1..16) OPTIONAL, -- Need M

sl-HARQ-ProcID-offset-r16 INTEGER (0..15) OPTIONAL, -- Need M

sl-CG-MaxTransNumList-r16 SL-CG-MaxTransNumList-r16 OPTIONAL, -- Need M

rrc-ConfiguredSidelinkGrant-r16 SEQUENCE {

sl-TimeResourceCG-Type1-r16 INTEGER (0..496) OPTIONAL, -- Need M

sl-StartSubchannelCG-Type1-r16 INTEGER (0..26) OPTIONAL, -- Need M

sl-FreqResourceCG-Type1-r16 INTEGER (0..6929) OPTIONAL, -- Need M

sl-TimeOffsetCG-Type1-r16 INTEGER (0..7999) OPTIONAL, -- Need R

sl-N1PUCCH-AN-r16 PUCCH-ResourceId OPTIONAL, -- Need M

sl-PSFCH-ToPUCCH-CG-Type1-r16 INTEGER (0..15) OPTIONAL, -- Need M

sl-ResourcePoolID-r16 SL-ResourcePoolID-r16 OPTIONAL, -- Need M

sl-TimeReferenceSFN-Type1-r16 ENUMERATED {sfn512} OPTIONAL -- Need S

} OPTIONAL, -- Need M

...,

[[

sl-N1PUCCH-AN-Type2-r16 PUCCH-ResourceId OPTIONAL -- Need M

]]

}

SL-ConfigIndexCG-r16 ::= INTEGER (0..maxNrofCG-SL-1-r16)

SL-CG-MaxTransNumList-r16 ::= SEQUENCE (SIZE (1..8)) OF SL-CG-MaxTransNum-r16

SL-CG-MaxTransNum-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-MaxTransNum-r16 INTEGER (1..32)

}

SL-PeriodCG-r16 ::= CHOICE{

sl-PeriodCG1-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000, spare6,

spare5, spare4, spare3, spare2, spare1},

sl-PeriodCG2-r16 INTEGER (1..99)

}

-- TAG-SL-CONFIGUREDGRANTCONFIG-STOP

-- ASN1STOP

| *SL-ConfiguredGrantConfig* field descriptions |
| --- |
| ***sl-ConfigIndexCG***  This field indicates the ID to identify configured grant for sidelink. |
| ***sl-CG-MaxTransNumList***  This field indicates the maximum number of times that a TB can be transmitted using the resources provided by the configured grant. *sl-Priority* corresponds to the logical channel priority. |
| ***sl-FreqResourceCG-Type1***  Indicates the frequency resource location of sidelink configured grant type 1. An index giving valid combinations of one or two starting sub-channel and length (jointly encoded) as resource indicator (RIV), as defined in TS 38.214 [19]. |
| ***sl-HARQ-ProcID-Offset***  Indicates the offset used in deriving the HARQ process IDs for SL configured grant type 1 or SL configured type 2, see TS 38.321 [3], clause 5.8.3. |
| ***sl-N1PUCCH-AN***  This field indicates the HARQ resource for PUCCH for sidelink configured grant type 1. The actual PUCCH-Resource is configured in *sl-PUCCH-Config* and referred to by its ID. |
| ***sl-N1PUCCH-AN-Type2***  This field indicates the HARQ resource for PUCCH for PSCCH/PSSCH transmissions without a corresponding PDCCH on sidelink configured grant type 2. The actual PUCCH-Resource is configured in *sl-PUCCH-Config* and referred to by its ID. |
| ***sl-NrOfHARQ-Processes***  This field indicates the number of HARQ processes configured for a specific configured grant. It applies for both Type 1 and Type 2. |
| ***sl-PeriodCG***  This field indicates the period of sidelink configured grant in the unit of ms. |
| ***sl-PSFCH-ToPUCCH-CG-Type1***  This field, for configured grant type 1, indicates slot offset between the PSFCH associated with the last PSSCH resource of each period and the PUCCH occasion used for reporting sidelink HARQ. |
| ***sl-ResourcePoolID***  Indicates the resource pool in which the configured sidelink grant Type 1 is applied. |
| ***sl-StartSubchannelCG-Type1***  This field indicates the starting sub-channel of sidelink configured grant Type 1. An index giving valid sub-channel index. |
| ***sl-TimeOffsetCG-Type1***  This field indicates the slot offset with respect to logical slot defined by *sl-TimeReferenceSFN-Type1*, as specified in TS 38.321 [3]. |
| ***sl-TimeReferenceSFN-Type1***  Indicates SFN used for determination of the offset of a resource in time domain. If it is present, the UE uses the 1st logical slot of associated resource pool after the starting time of the closest SFN with the indicated number preceding the reception of the sidelink configured grant configuration Type 1 as reference logical slot, see TS 38.321 [3], clause 5.8.3. If it is not present, the reference SFN is 0. |
| ***sl-TimeResourceCG-Type1***  This field indicates the time resource location of sidelink configured grant Type 1. An index giving valid combinations of up to two slot positions (jointly encoded) as time resource indicator (TRIV), as defined in TS 38.212 [17]. |

#### – *SL-DestinationIdentity*

The IE *SL-DestinationIdentity* is used to identify a destination of a NR sidelink communication.

*SL-DestinationIdentity* information element

-- ASN1START

-- TAG-SL-DESTINATIONIDENTITY-START

SL-DestinationIdentity-r16 ::= BIT STRING (SIZE (24))

-- TAG-SL-DESTINATIONIDENTITY-STOP

-- ASN1STOP

#### *– SL-DRX-Config*

The IE *SL-DRX-Config* is used to configure DRX related parameters for NR sidelink communication. The SL DRX timers should be calculated in the unit of physical slot.

*SL-DRX-Config information element*

-- ASN1START

-- TAG-SL-DRX-CONFIG-START

SL-DRX-Config-r17 ::= SEQUENCE {

sl-DRX-ConfigGC-BC-r17 SL-DRX-ConfigGC-BC-r17 OPTIONAL, -- Cond HO

sl-DRX-ConfigUC-ToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DestinationIndex-r16 OPTIONAL, -- Need N

sl-DRX-ConfigUC-ToAddModList-r17 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DRX-ConfigUC-Info-r17 OPTIONAL, -- Need N

...

}

SL-DRX-ConfigUC-Info-r17 ::= SEQUENCE {

sl-DestinationIndex-r17 SL-DestinationIndex-r16 OPTIONAL, -- Need N

sl-DRX-ConfigUC-r17 SL-DRX-ConfigUC-r17 OPTIONAL, -- Need N

...

}

-- TAG-SL-DRX-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *SL-DRX-Config* field descriptions |
| ***sl-DRX-ConfigGC-BC***  This field indicates the sidelink DRX configurations for groupcast and broadcast communication, as specified in TS 38.321 [3]. |
| ***sl-DRX-ConfigUC-ToReleaseList***  This field indicates the sidelink DRX configurations for corresponding unicast destinations to remove. |
| ***sl-DRX-ConfigUC-ToAddModList***  This field indicates the sidelink DRX configurations for corresponding unicast destinations to add and/or modify. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *HO* | This field is optionally present, need M, in an *RRCReconfiguration* message including *reconfigurationWithSync*; otherwise it is absent, Need M. |

#### *– SL-DRX-ConfigGC-BC*

The IE *SL-DRX-ConfigGC-BC* is used to configure DRX related parameters for NR sidelink groupcast and broadcast communication and unicast/broadcast based communication of Direct Link Establishment Request (TS 24.587 [57]).

*SL-DRX-ConfigGC-BC* information element

-- ASN1START

-- TAG-SL-DRX-CONFIGGC-BC-START

SL-DRX-ConfigGC-BC-r17 ::= SEQUENCE {

sl-DRX-GC-BC-PerQoS-List-r17 SEQUENCE (SIZE (1..maxSL-GC-BC-DRX-QoS-r17)) OF SL-DRX-GC-BC-QoS-r17 OPTIONAL, -- Need M

sl-DRX-GC-generic-r17 SL-DRX-GC-Generic-r17 OPTIONAL, -- Need M

sl-DefaultDRX-GC-BC-r17 SL-DRX-GC-BC-QoS-r17 OPTIONAL, -- Need M

...

}

SL-DRX-GC-BC-QoS-r17 ::= SEQUENCE {

sl-DRX-GC-BC-MappedQoS-FlowList-r17 SEQUENCE (SIZE (1..maxNrofSL-QFIs-r16)) OF SL-QoS-Profile-r16 OPTIONAL, -- Need M

sl-DRX-GC-BC-OnDurationTimer-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}

},

sl-DRX-GC-InactivityTimer-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},

sl-DRX-GC-BC-Cycle-r17 ENUMERATED {

ms10, ms20, ms32, ms40, ms60, ms64, ms70, ms80, ms128, ms160, ms256, ms320, ms512,

ms640, ms1024, ms1280, ms2048, ms2560, ms5120, ms10240, spare12, spare11, spare10,

spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1},

...

}

SL-DRX-GC-Generic-r17 ::= SEQUENCE {

sl-DRX-GC-HARQ-RTT-Timer1-r17 ENUMERATED {sl0, sl1, sl2, sl4, spare4, spare3, spare2, spare1} OPTIONAL, -- Need M

sl-DRX-GC-HARQ-RTT-Timer2-r17 ENUMERATED {sl0, sl1, sl2, sl4, spare4, spare3, spare2, spare1} OPTIONAL, -- Need M

sl-DRX-GC-RetransmissionTimer-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}

}

-- TAG-SL-DRX-CONFIGGC-BC-STOP

-- ASN1STOP

|  |
| --- |
| *SL-DRX-ConfigGC-BC field descriptions* |
| ***sl-DefaultDRX-GC-BC-r17***  Indicates the default sidelink DRX configuration for groupcast and broadcast communications, which is used for QoS profile(s) that cannot be mapped into DRX configuration(s) configured for dedicated QoS profile(s). This field can be applied for the broadcast based or unicast based communication of Direct Link Establishment Request as described in TS 24.587 [57]. |
| ***sl-DRX-GC-BC-PerQoS-List***  List of one or multiple sidelink DRX configurations for groupcast and broadcast communication, which are mapped from QoS profile(s). |
| ***sl-DRX-GC-BC-Cycle***  Value in ms, ms10 corresponds to 10ms, ms20 corresponds to 20 ms, ms32 corresponds to 32 ms, and so on. |
| ***sl-DRX-GC-BC-MappedQoS-FlowsList***  List of QoS profiles of the NR sidelink communication, which are mapped to a sidelink DRX configuration. |
| ***sl-DRX-GC-BC-OnDurationTimer***  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. |
| ***sl-DRX-GC-HARQ-RTT-Timer1, sl-DRX-GC-HARQ-RTT-Timer2***  Value in number of slot lengths of the BWP 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. *sl-DRX-GC-HARQ-RTT-Timer1* is used for feedback enabled sidelink HARQ transmission if SCI does not indicate retransmission resource(s). *sl-DRX-GC-HARQ-RTT-Timer2* is used for feedback disabled sidelink HARQ transmission in resource pool configured with PSFCH if SCI does not indicate retransmission resource(s). |
| ***sl-DRX-GC-Generic***  Indicates a sidelink DRX configuration, which is applicable to any QoS profile or any Destination Layer-2 ID. |
| ***sl-DRX-GC-InactivityTimer***  Value in multiple integers of 1 ms, ms0 corresponds to 0, ms1 corresponds to 1 ms, ms2 corresponds to 2 ms, and so on. This field is only valid for groupcast communication. |
| ***sl-DRX-GC-RetransmissionTimer***  Value in number of slot lengths of the BWP 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. |

#### *– SL-DRX-ConfigUC*

The IE SL-*DRX-ConfigUC* is used to configure sidelink DRX related parameters for unicast communication.

*SL-DRX-ConfigUC* information element

-- ASN1START

-- TAG-DRX-CONFIGUC-START

SL-DRX-ConfigUC-r17 ::= SEQUENCE {

sl-drx-onDurationTimer-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}

},

sl-drx-InactivityTimer-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},

sl-drx-HARQ-RTT-Timer1-r17 ENUMERATED {sl0, sl1, sl2, sl4, spare4, spare3, spare2, spare1} OPTIONAL, -- Need M

sl-drx-HARQ-RTT-Timer2-r17 ENUMERATED {sl0, sl1, sl2, sl4, spare4, spare3, spare2, spare1} OPTIONAL, -- Need M

sl-drx-RetransmissionTimer-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},

sl-drx-CycleStartOffset-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)

},

sl-drx-SlotOffset INTEGER (0..31)

}

-- TAG-SL-DRX-CONFIGUC-STOP

-- ASN1STOP

|  |
| --- |
| *SL-DRX-ConfigUC* field descriptions |
| ***sl-drx-CycleStartOffset***  *drx-Cycle* in ms and *drx-StartOffset* in multiples of 1 ms. |
| ***sl-drx-HARQ-RTT-Timer1, sl-drx-HARQ-RTT-Timer2***  Value in number of slot lengths of the BWP 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. *sl-drx-HARQ-RTT-Timer1* is used for HARQ enabled sidelink transmission if SCI does not indicate retransmission resource(s). *sl-drx-HARQ-RTT-Timer2* is used for HARQ disabled sidelink transmission in resource pool configured with PSFCH if SCI does not indicate retransmission resource(s). |
| ***sl-drx-InactivityTimer***  Value in number of slot lengths of the BWP where the transport block was received, sl0 corresponds to 0, sl1 corresponds to 1 slot, sl2 corresponds to 2 slots, and so on. |
| ***sl-drx-onDurationTimer***  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. |
| ***sl-drx-RetransmissionTimer***  Value in number of slot lengths of the BWP 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. |
| ***sl-drx-SlotOffset***  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. |

#### *– SL-DRX-ConfigUC-SemiStatic*

The IE SL-*DRX-ConfigUC-SemiStatic* is used to indicate the semi-static sidelink DRX related parameters for unicast communication.

*SL-DRX-ConfigUC*-SemiStatic information element

-- ASN1START

-- TAG-DRX-CONFIGUCSEMISTATIC-START

SL-DRX-ConfigUC-SemiStatic-r17 ::= SEQUENCE {

sl-drx-onDurationTimer-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}

},

sl-drx-CycleStartOffset-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)

},

sl-drx-SlotOffset-r17 INTEGER (0..31)

}

-- TAG-SL-DRX-CONFIGUCSEMISTATIC-STOP

-- ASN1STOP

#### – *SL-FreqConfig*

The IE *SL-FreqConfig* specifies the dedicated configuration information on one particular carrier frequency for NR sidelink communication.

*SL-FreqConfig* information element

-- ASN1START

-- TAG-SL-FREQCONFIG-START

SL-FreqConfig-r16 ::= SEQUENCE {

sl-Freq-Id-r16 SL-Freq-Id-r16,

sl-SCS-SpecificCarrierList-r16 SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

sl-AbsoluteFrequencyPointA-r16 ARFCN-ValueNR OPTIONAL, -- Need M

sl-AbsoluteFrequencySSB-r16 ARFCN-ValueNR OPTIONAL, -- Need R

frequencyShift7p5khzSL-r16 ENUMERATED {true} OPTIONAL, -- Cond V2X-SL-Shared

valueN-r16 INTEGER (-1..1),

sl-BWP-ToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSL-BWPs-r16)) OF BWP-Id OPTIONAL, -- Need N

sl-BWP-ToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSL-BWPs-r16)) OF SL-BWP-Config-r16 OPTIONAL, -- Need N

sl-SyncConfigList-r16 SL-SyncConfigList-r16 OPTIONAL, -- Need M

sl-SyncPriority-r16 ENUMERATED {gnss, gnbEnb} OPTIONAL -- Need M

}

SL-Freq-Id-r16 ::= INTEGER (1.. maxNrofFreqSL-r16)

-- TAG-SL-FREQCONFIG-STOP

-- ASN1STOP

| *SL-FreqConfig* field descriptions |
| --- |
| ***frequencyShift7p5khzSL***  Enable the NR SL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***sl-AbsoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. |
| ***sl-AbsoluteFrequencySSB***  Indicates the frequency location of sidelink SSB. The transmission bandwidth for sidelink SSB is within the bandwidth of this sidelink BWP. |
| ***sl-BWP-ToAddModList***  This field indicates the list of sidelink BWP(s) on which the NR sidelink communication configuration is to be added or reconfigured. In this release, only one BWP is allowed to be configured for NR sidelink communication. |
| ***sl-BWP-ToReleaseList***  This field indicates the list of sidelink BWP(s) on which the NR sidelink communication configuration is to be released. |
| ***sl-Freq-Id***  This field indicates the identity of the dedicated configuration information on the carrier frequency for NR sidelink communication. |
| ***sl-SCS-SpecificCarrierList***  A set of UE specific channel bandwidth and location configurations for different subcarrier spacings (numerologies). Defined in relation to Point A. The UE uses the configuration provided in this field only for the purpose of channel bandwidth and location determination. In this release, only one *SCS-SpecificCarrier* is allowed to be configured for NR sidelink communication. |
| ***sl-SyncPriority***  This field indicates synchronization priority order, as specified in clause 5.8.6. |
| ***valueN***  Indicate the NR SL transmission with a valueN \*5kHz shift to the LTE raster. (see TS 38.101-1 [15], clause 5.4E.2). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *V2X-SL-Shared* | This field is mandatory present if the carrier frequency configured for NR sidelink communication is shared by V2X sidelink communication. It is absent, Need R, otherwise. |

#### – *SL-FreqConfigCommon*

The IE *FreqConfigCommon* specifies the cell-specific configuration information on one particular carrier frequency for NR sidelink communication.

*SL-FreqConfigCommon* information element

-- ASN1START

-- TAG-SL-FREQCONFIGCOMMON-START

SL-FreqConfigCommon-r16 ::= SEQUENCE {

sl-SCS-SpecificCarrierList-r16 SEQUENCE (SIZE (1..maxSCSs)) OF SCS-SpecificCarrier,

sl-AbsoluteFrequencyPointA-r16 ARFCN-ValueNR,

sl-AbsoluteFrequencySSB-r16 ARFCN-ValueNR OPTIONAL, -- Need R

frequencyShift7p5khzSL-r16 ENUMERATED {true} OPTIONAL, -- Cond V2X-SL-Shared

valueN-r16 INTEGER (-1..1),

sl-BWP-List-r16 SEQUENCE (SIZE (1..maxNrofSL-BWPs-r16)) OF SL-BWP-ConfigCommon-r16 OPTIONAL, -- Need R

sl-SyncPriority-r16 ENUMERATED {gnss, gnbEnb} OPTIONAL, -- Need R

sl-NbAsSync-r16 BOOLEAN OPTIONAL, -- Need R

sl-SyncConfigList-r16 SL-SyncConfigList-r16 OPTIONAL, -- Need R

...

}

-- TAG-SL-FREQCONFIGCOMMON-STOP

-- ASN1STOP

| *SL-FreqConfigCommon* field descriptions |
| --- |
| ***frequencyShift7p5khzSL***  Enable the NR SL transmission with a 7.5 kHz shift to the LTE raster. If the field is absent, the frequency shift is disabled. |
| ***sl-AbsoluteFrequencyPointA***  Absolute frequency of the reference resource block (Common RB 0). Its lowest subcarrier is also known as Point A. |
| ***sl-AbsoluteFrequencySSB***  Indicates the frequency location of sidelink SSB. The transmission bandwidth for sidelink SSB is within the bandwidth of this sidelink BWP. |
| ***sl-BWP-List***  This field indicates the list of sidelink BWP(s) on which the NR sidelink communication configuration. In this release, only one BWP is allowed to be configured for NR sidelink communication. |
| ***sl-NbAsSync***  This field indicates whether the network can be selected as synchronization reference directly/indirectly only, if *sl-SyncPriority* is set to gnss. If this field is set to TRUE, the network is enabled to be selected as synchronization reference directly/indirectly. The field is only present in *SidelinkPreconfigNR*. Otherwise it is absent. |
| ***sl-SyncPriority***  This field indicates synchronization priority order, as specified in clause 5.8.6.. |
| ***sl-SyncConfigList***  This field indicates the configuration by which the UE is allowed to receive and transmit synchronisation information for NR sidelink communication. Network configures *sl-SyncConfig* including *txParameters* when configuring UEs to transmit synchronisation information. If this field is configured in *SL-PreconfigurationNR-r16*, only one entry is configured in *sl-SyncConfigList*. |
| ***valueN***  Indicate the NR SL transmission with a valueN \*5kHz shift to the LTE raster (see TS 38.101-1 [15], clause 5.4E.2). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *V2X-SL-Shared* | This field is mandatory present if the carrier frequency configured for NR sidelink communication is shared by V2X sidelink communication. It is absent, Need R, otherwise. |

#### – *SL-InterUE-CoordinationConfig*

The IE *SL*-*InterUE-CoordinationConfig* is used to configure the sidelink inter-UE coordination parameters.

*SL-InterUE-CoordinationConfig* information element

-- ASN1START

-- TAG-SL-INTERUE-COORDINATIONCONFIG-START

SL-InterUE-CoordinationConfig-r17 ::= SEQUENCE {

sl-InterUE-CoordinationScheme1-r17 SL-InterUE-CoordinationScheme1-r17 OPTIONAL, -- Need M

sl-InterUE-CoordinationScheme2-r17 SL-InterUE-CoordinationScheme2-r17 OPTIONAL, -- Need M

...

}

SL-InterUE-CoordinationScheme1-r17 ::= SEQUENCE {

sl-IUC-Explicit-r17 ENUMERATED {enabled, disabled} OPTIONAL, -- Need M

sl-IUC-Condition-r17 ENUMERATED {enabled, disabled} OPTIONAL, -- Need M

sl-Condition1-A-2-r17 ENUMERATED {disabled} OPTIONAL, -- Need M

sl-ThresholdRSRP-Condition1-B-1-Option1List-r17 SEQUENCE (SIZE (1..8)) OF SL-ThresholdRSRP-Condition1-B-1-r17 OPTIONAL, -- Need M

sl-ThresholdRSRP-Condition1-B-1-Option2List-r17 SEQUENCE (SIZE (1..8)) OF SL-ThresholdRSRP-Condition1-B-1-r17 OPTIONAL, -- Need M

sl-ContainerCoordInfo-r17 ENUMERATED {enabled, disabled} OPTIONAL, -- Need M

sl-ContainerRequest-r17 ENUMERATED {enabled, disabled} OPTIONAL, -- Need M

sl-TriggerConditionCoordInfo-r17 INTEGER (0..1) OPTIONAL, -- Need M

sl-TriggerConditionRequest-r17 INTEGER (0..1) OPTIONAL, -- Need M

sl-PriorityCoordInfoExplicit-r17 INTEGER (1..8) OPTIONAL, -- Need M

sl-PriorityCoordInfoCondition-r17 INTEGER (1..8) OPTIONAL, -- Need M

sl-PriorityRequest-r17 INTEGER (1..8) OPTIONAL, -- Need M

sl-PriorityPreferredResourceSet-r17 INTEGER (1..8) OPTIONAL, -- Need M

sl-MaxSlotOffsetTRIV-r17 INTEGER (1..8000) OPTIONAL, -- Need M

sl-NumSubCH-PreferredResourceSet-r17 INTEGER (1..27) OPTIONAL, -- Need M

sl-ReservedPeriodPreferredResourceSet-r17 INTEGER (1..16) OPTIONAL, -- Need M

sl-DetermineResourceType-r17 ENUMERATED {uea, ueb} OPTIONAL, -- Need M

...

}

SL-InterUE-CoordinationScheme2-r17 ::= SEQUENCE {

sl-IUC-Scheme2-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-RB-SetPSFCH-r17 BIT STRING (SIZE (10..275)) OPTIONAL, -- Need M

sl-TypeUE-A-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-PSFCH-Occasion-r17 INTEGER (0..1) OPTIONAL, -- Need M

sl-SlotLevelResourceExclusion-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-OptionForCondition2-A-1-r17 INTEGER (0..1) OPTIONAL, -- Need M

sl-IndicationUE-B-r17 ENUMERATED {enabled, disabled} OPTIONAL, -- Need M

...,

[[

sl-DeltaRSRP-Thresh-v17xy INTEGER (-30..30) OPTIONAL -- Need M

]]

}

SL-ThresholdRSRP-Condition1-B-1-r17 ::= SEQUENCE {

sl-Priority-r17 INTEGER (1..8),

sl-ThresholdRSRP-Condition1-B-1-r17 INTEGER (0..66)

}

-- TAG-SL-INTERUE-COORDINATIONCONFIG-STOP

-- ASN1STOP

| *SL-InterUE-CoordinationScheme1* field descriptions |
| --- |
| ***sl-Condition1-A-2***  Indicates disabling the use of condition of excluding from preferred resource set resource(s) in slot(s) where UE-A, when it is intended receiver of UE-B, does not expect to perform SL reception from UE-B due to half duplex operation. |
| ***sl-ContainerCoordInfo***  Indicates whether a SCI format 2-C can be used as the container of inter-UE coordination information transmission from UE-A to UE-B in Scheme 1 in addition to using MAC CE. |
| ***sl-ContainerRequest***  Indicates whether a SCI format 2-C can be used as the container of an explicit request for inter-UE coordination information transmission form UE-B to UE-A in Scheme 1 in addition to using MAC CE. |
| ***sl-DetermineResourceType***  Indicates how to determine the resource set type to be provided by inter-UE coordination information transmission. Value "*uea*" means the resource set type is determined by UE-A's implementation. Value "*ueb*" means the resource set type is determined by UE-B's request. |
| ***sl-IUC-Condition***  Indicates whether inter-UE coordination information triggered by a condition is enabled or not other than explicit request reception. |
| ***sl-IUC-Explicit***  Indicates whether inter-UE coordination information triggered by an explicit request is enabled or not. |
| ***sl-MaxSlotOffsetTRIV***  Indicates the maximum value of logical slot offset with respect to a reference slot that is used for representing the first resource location of each TRIV to indicate the set of resources in Scheme 1 as specified in TS 38.214 [19]. |
| ***sl-NumSubCH-PreferredResousrceSet***  Indicates the number of sub-channels used for determining the preferred resource set in Scheme 1 when the inter-UE coordination information transmission is triggered by a condition other than explicit request reception. |
| ***sl-PriorityCoordInfoCondition***  Parameter used to determine the the priority value for the purpose defined in TS 38.213 [13] and TS 38.214 [19] including sensing and candidate resource (re-)selection for transmitting the TB carrying the IUC MAC CE and the priority value in the SCI Format 1-A corresponding to the TB carrying the IUC MAC CE, triggered by a condition other than explicit request reception in Scheme 1. The priority value of IUC MAC CE used in LCP procedure (see TS 38.321 [3]) is fixed as "1". |
| ***sl-PriorityCoordInfoExplicit***  Parameter used to determine the the priority value for the purpose defined in TS 38.213 [13] and TS 38.214 [19] including sensing and candidate resource (re-)selection for transmitting the TB carrying the IUC MAC CE and the priority value in the SCI Format 1-A corresponding to the TB carrying the IUC MAC CE , triggered by an explicit request in Scheme 1. |
| ***sl-PriorityPreferredResourceSet***  Indicates the priority value used for determining the preferred resource set in Scheme 1 when the inter-UE coordination information transmission is triggered by a condition other than explicit request reception. |
| ***sl-PriorityRequest***  Parameter used to determine the priority value for the purpose defined in TS 38.213 [13] and TS 38.214 [19] including sensing and candidate resource (re-)selection for transmitting the TB carrying the IUC request MAC CE and the priority value in the SCI Format 1-A corresponding to the TB carrying the IUC request MAC CE, in an explicit request for inter-UE coordination information in Scheme 1. The priority value of IUC request MAC CE used in LCP procedure (see TS 38.321 [3]) is fixed as "1". |
| ***sl-ReservedPeriodPreferredResourceSet***  Indicates the resource reservation interval used for determining the preferred resource set in Scheme 1 when the inter-UE coordination information transmission is triggered by a condition, by means of an index to the corresponding entry of *sl-ResourceReservePeriodList-r16*. |
| ***sl-TriggerConditionCoordInfo***  Indicates the additional alternative trigger condition of inter-UE coordination informationtriggered by a condition rather than request reception in Scheme-1 from UE-A to UE-B. Value 0 means inter-UE coordination information is triggered by UE-A's implementation. Value 1 means inter-UE coordination information can be triggered only when UE-A has data to be transmitted together with the inter-UE coordination information to UE-B. |
| ***sl-TriggerConditionRequest***  Indicates the trigger condition of an explicit request from UE-B to UE-A. Value 0 means the explicit request is triggered by UE-B's implementation. Value 1 means the explicit request can be triggered only when UE-B has data to be transmitted to UE-A. |
| ***sl-ThresholdRSRP-Condition1-B-1-Option1List***  Indicates the RSRP threshold used to determine reserved resource(s) of other UE(s) whose RSRP measurement is larger than it as the set of resource(s) non-preferred for UE-B's transmission for Condition 1-B-1 of Scheme 1, as specified in TS 38.214 [19]. Value 0 corresponds to minus infinity dBm, value 1 corresponds to -128dBm, value 2 corresponds to -126dBm, value n corresponds to (-128 + (n-1)\*2) dBm and so on, value 66 corresponds to infinity dBm. |
| ***sl-ThresholdRSRP-Condition1-B-1-Option2List***  Indicates the RSRP threshold used to determine reserved resource(s) of other UE(s) whose RSRP measurement is smaller than it as the set of resource(s) non-preferred for UE-B's transmission for Condition 1-B-1 of Scheme 1, as specified in TS 38.214 [19]. Value 0 corresponds to minus infinity dBm, value 1 corresponds to -128dBm, value 2 corresponds to -126dBm, value n corresponds to (-128 + (n-1)\*2) dBm and so on, value 66 corresponds to infinity dBm. |

| *SL-InterUE-CoordinationScheme2* field descriptions |
| --- |
| ***sl-DeltaRSRP-Thresh***  Indicates the RSRP threshold delta value corresponding to *deltaRSRPThresh* specified in clause 16.3.0 of TS 38.213 [13] used to determine reserved resource(s) of other UE(s). Value in dB. Only even values (step size 2) allowed. |
| ***sl-IndicationUE-B***  Indicates whether to enable or disable the usage of 1 LSB of reserved bits of a SCI format 1-A to indicate of whether UE scheduling a conflict TB can be UE-B or not. |
| ***sl-IUC-Scheme2***  Indicates whether inter-UE coordination scheme 2 is enabled or not. |
| ***sl-OptionForCondition2-A-1***  Indicates the RSRP threshold used to consider additional criteria for condition 2-A-1. Value 0 corresponds to using the RSRP threshold according to the priorities included in the SCI, UE uses thresholds *sl-Thres-RSRP-List*, in its resource pool configuration *sl-UE-SelectedConfigRP*, corresponding to *ThresPSSCH-RSRP-List* specified in clause 16.3.0 of TS 38.213 [13]. Value 1 corresponds to using a (pre)configured RSRP threshold delta value *sl-DeltaRSRP-Thresh,* corresponding to *deltaRSRPThresh* specified in clause 16.3.0 of TS 38.213 [13]. |
| ***sl-PSFCH-Occasion***  Indicates the reference slot from which a PSFCH occasion for inter-UE coordination information transmission is derived. Value 0 corresponds to the slot where UE-B's SCI is transmitted and value 1 corresponds to the slot where expected/potential resource conflict occurs on PSSCH resource indicated by UE-B's SCI. |
| ***sl-RB-SetPSFCH***  Indicates the set of PRBs that are actually used for inter-UE coordination information transmission and reception in Scheme 2. The leftmost bit of the bitmap refers to the lowest RB index in the resource pool, and so on. |
| ***sl-SlotLevelResourceExclusion***  Indicates that physical layer of UE-B reports resources in a slot including the next reserved resource indicated by the corresponding UE-B's SCI for current TB transmission to higher layer. |
| ***sl-TypeUE-A***  Indicates that a non-destination UE of a TB transmitted by UE-B can be UE-A which sends inter-UE coordination information to UE-B, when UE-A is a destination UE of another TB conflicting with the TB transmitted by UE-B. |

#### – *SL-LogicalChannelConfig*

The IE *SL*-*LogicalChannelConfig* is used to configure the sidelink logical channel parameters.

*SL-LogicalChannelConfig* information element

-- ASN1START

-- TAG-SL-LOGICALCHANNELCONFIG-START

SL-LogicalChannelConfig-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-PrioritisedBitRate-r16 ENUMERATED {kBps0, kBps8, kBps16, kBps32, kBps64, kBps128, kBps256, kBps512,

kBps1024, kBps2048, kBps4096, kBps8192, kBps16384, kBps32768, kBps65536, infinity},

sl-BucketSizeDuration-r16 ENUMERATED {ms5, ms10, ms20, ms50, ms100, ms150, ms300, ms500, ms1000,

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

sl-ConfiguredGrantType1Allowed-r16 ENUMERATED {true} OPTIONAL, -- Need R

sl-HARQ-FeedbackEnabled-r16 ENUMERATED {enabled, disabled } OPTIONAL, -- Need R

sl-AllowedCG-List-r16 SEQUENCE (SIZE (0.. maxNrofCG-SL-1-r16)) OF SL-ConfigIndexCG-r16

OPTIONAL, -- Need R

sl-AllowedSCS-List-r16 SEQUENCE (SIZE (1..maxSCSs)) OF SubcarrierSpacing OPTIONAL, -- Need R

sl-MaxPUSCH-Duration-r16 ENUMERATED {ms0p02, ms0p04, ms0p0625, ms0p125, ms0p25, ms0p5, spare2, spare1}

OPTIONAL, -- Need R

sl-LogicalChannelGroup-r16 INTEGER (0..maxLCG-ID) OPTIONAL, -- Need R

sl-SchedulingRequestId-r16 SchedulingRequestId OPTIONAL, -- Need R

sl-LogicalChannelSR-DelayTimerApplied-r16 BOOLEAN OPTIONAL, -- Need R

...

}

-- TAG-SL-LOGICALCHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *SL-LogicalChannelConfig field* descriptions |
| ***sl-AllowedCG-List***  This restriction applies only when the SL grant is a configured grant. If present, SL MAC SDUs from this logical channel can only be mapped to the indicated configured grant configuration. If the size of the sequence is zero, then SL MAC SDUs from this logical channel cannot be mapped to any configured grant configurations. If the field is not present, SL MAC SDUs from this logical channel can be mapped to any configured grant configurations. If the field *sl-ConfiguredGrantType1Allowed* is present, only those sidelink configured grant type 1 configurations indicated in this sequence are allowed for use by this sidelink logical channel; otherwise, this sequence shall not include any sidelink configured grant type 1 configuration. Corresponds to "sl-AllowedCG-List" as specified in TS 38.321 [3]. |
| ***sl-AllowedSCS-List***  If present, indicate the numerology of UL-SCH resources that this sidelink logical channel is mapped to, when checking the SR trigger condition. Corresponds to ' sl-AllowedSCS-List' in TS 38.321 [3]. |
| ***sl-BucketSizeDuration***  Value in ms. *ms5* corresponds to 5 ms, value *ms10* corresponds to 10 ms, and so on. |
| ***sl-ConfiguredGrantType1Allowed***  If present and set to true, or if the capability *lcp-RestrictionSidelink* as specified in TS 38.306 [26] is not indicated, SL MAC SDUs from this sidelink logical channel can be transmitted on a sidelink configured grant type 1. Otherwise, SL MAC SDUs from this logical channel cannot be transmitted on a sidelink configured grant type 1. Corresponds to 'sl-configuredGrantType1Allowed' in TS 38.321 [3]. |
| ***sl-HARQ-FeedbackEnabled***  Network always includes this field. It indicates the HARQ feedback enabled/disabled restriction in LCP for this sidelink logical channel. If set to *enabled*, the sidelink logical channel will be multiplexed only with a logical channel which enabling the HARQ feedback. If set to *disabled*, the sidelink logical channel cannot be multiplexed with a logical channel which enabling the HARQ feedback. Corresponds to 'sl-HARQ-FeedbackEnabled' in TS 38.321 [3]. If this field of at least one sidelink logical channel for the UE is set to enabled, *sl-PSFCH-Config* should be mandatory present in at least one of the *SL-ResourcePool*. |
| ***sl-LogicalChannelGroup***  ID of the sidelink logical channel group, as specified in TS 38.321 [3], which the sidelink logical channel belongs to. |
| ***sl-LogicalChannelSR-DelayTimerApplied***  Indicates whether to apply the delay timer for SR transmission for this sidelink logical channel. Set to false if *logicalChannelSR-DelayTimer* is not included in *sl-BSR-Config*. |
| ***sl-MaxPUSCH-Duration***  If present, indicate the maximum PUSCH duration of UL-SCH resources that this sidelink logical channel is mapped to, when checking the SR trigger condition. Corresponds to "sl-MaxPUSCH-Duration" in TS 38.321 [3]. |
| ***sl-PrioritisedBitRate***  Value in kiloBytes/s. Value *kBps0* corresponds to 0 kiloBytes/s, value *kBps8* corresponds to 8 kiloBytes/s, value *kBps16* corresponds to 16 kiloBytes/s, and so on. |
| ***sl-Priority***  Sidelink logical channel priority, as specified in TS 38.321 [3]. |
| ***sl-SchedulingRequestId***  If present, it indicates the scheduling request configuration applicable for this sidelink logical channel, as specified in TS 38.321 [3]. |

#### – *SL-L2RelayUE-Config*

The IE *SL*-*L2RelayUE-Config* is used to configure L2 U2N relay operation related configurations used by L2 U2N Relay UE, e.g. *SRAP-Config*.

*SL-L2RelayUE-Config* information element

-- ASN1START

-- TAG-SL-L2RELAYUE-CONFIG-START

SL-L2RelayUE-Config-r17 ::= SEQUENCE {

sl-RemoteUE-ToAddModList-r17 SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-RemoteUE-ToAddMod-r17 OPTIONAL, -- Need N

sl-RemoteUE-ToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-DestinationIdentity-r16 OPTIONAL, -- Need N

...

}

SL-RemoteUE-ToAddMod-r17 ::= SEQUENCE {

sl-L2IdentityRemote-r17 SL-DestinationIdentity-r16,

sl-SRAP-Config-Relay-r17 SL-SRAP-Config-r17 OPTIONAL, -- Need M

...

}

-- TAG-SL-L2RELAYUE-CONFIG-STOP

-- ASN1STOP

| *SL-L2RelayUE-Config* field descriptions |
| --- |
| ***sl-RemoteUE-ToAddModList***  List of L2 U2N Remote UEs to be added and modified to the L2 U2N Relay UE. |
| ***sl-RemoteUE-ToReleaseList***  List of L2 U2N Remote UEs to be released by the L2 U2N Relay UE. |

#### – *SL-L2RemoteUE-Config*

The IE *SL*-*L2RemoteUE-Config* is used to configure L2 U2N relay operation related configurations used by L2 U2N Remote UE, e.g. *SRAP-Config*.

*SL-L2RemoteUE-Config* information element

-- ASN1START

-- TAG-SL-L2REMOTEUE-CONFIG-START

SL-L2RemoteUE-Config-r17 ::= SEQUENCE {

sl-SRAP-ConfigRemote-r17 SL-SRAP-Config-r17 OPTIONAL, --Need M

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

...

}

-- TAG-SL-L2REMOTEUE-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *SL-L2RemoteUE-Config* field descriptions |
| ***sl-SRAP-ConfigRemote***  Indicates SRAP configuration used for L2 U2N Remote UE. |
| ***sl-UEIdentityRemote***  Indicates the C-RNTI to the L2 U2N Remote UE. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *FirstRRCReconfig* | This field is mandatory present in the first *RRCReconfiguration*. Otherwise the field is absent. |

#### – *SL-MeasConfigCommon*

The IE *SL-MeasConfigCommon* is used to set the cell specific SL RSRP measurement configurations for unicast destinations.

*SL-MeasConfigCommon* information element

-- ASN1START

-- TAG-SL-MEASCONFIGCOMMON-START

SL-MeasConfigCommon-r16 ::= SEQUENCE {

sl-MeasObjectListCommon-r16 SL-MeasObjectList-r16 OPTIONAL, -- Need R

sl-ReportConfigListCommon-r16 SL-ReportConfigList-r16 OPTIONAL, -- Need R

sl-MeasIdListCommon-r16 SL-MeasIdList-r16 OPTIONAL, -- Need R

sl-QuantityConfigCommon-r16 SL-QuantityConfig-r16 OPTIONAL, -- Need R

...

}

-- TAG-SL-MEASCONFIGCOMMON-STOP

-- ASN1STOP

| *SL-MeasConfigCommon* field descriptions |
| --- |
| ***sl-MeasIdListCommon***  List of sidelink measurement identities |
| ***sl-MeasObjectListCommon***  List of sidelink measurement objects. |
| ***sl-QuantityConfigCommon***  Indicates the layer 3 filtering coefficient for sidelink measurement. |
| ***sl-ReportConfigListCommon***  List of sidelink measurement reporting configurations. |

#### – *SL-MeasConfigInfo*

The IE *SL*-*MeasConfigInfo* is used to set RSRP measurement configurations for unicast destinations.

*SL-MeasConfigInfo* information element

-- ASN1START

-- TAG-SL-MEASCONFIGINFO-START

SL-MeasConfigInfo-r16 ::= SEQUENCE {

sl-DestinationIndex-r16 SL-DestinationIndex-r16,

sl-MeasConfig-r16 SL-MeasConfig-r16,

...

}

SL-MeasConfig-r16 ::= SEQUENCE {

sl-MeasObjectToRemoveList-r16 SL-MeasObjectToRemoveList-r16 OPTIONAL, -- Need N

sl-MeasObjectToAddModList-r16 SL-MeasObjectList-r16 OPTIONAL, -- Need N

sl-ReportConfigToRemoveList-r16 SL-ReportConfigToRemoveList-r16 OPTIONAL, -- Need N

sl-ReportConfigToAddModList-r16 SL-ReportConfigList-r16 OPTIONAL, -- Need N

sl-MeasIdToRemoveList-r16 SL-MeasIdToRemoveList-r16 OPTIONAL, -- Need N

sl-MeasIdToAddModList-r16 SL-MeasIdList-r16 OPTIONAL, -- Need N

sl-QuantityConfig-r16 SL-QuantityConfig-r16 OPTIONAL, -- Need M

...

}

SL-MeasObjectToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ObjectId-r16)) OF SL-MeasObjectId-r16

SL-ReportConfigToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ReportConfigId-r16)) OF SL-ReportConfigId-r16

SL-MeasIdToRemoveList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-MeasId-r16)) OF SL-MeasId-r16

-- TAG-SL-MEASCONFIGINFO-STOP

-- ASN1STOP

| *SL-MeasConfigInfo* field descriptions |
| --- |
| ***sl-MeasIdToAddModList***  List of sidelink measurement identities to add and/or modify. |
| ***sl-MeasIdToRemoveList***  List of sidelink measurement identities to remove. |
| ***sl-MeasObjectToAddModList***  List of sidelink measurement objects to add and/or modify. |
| ***sl-MeasObjectToRemoveList***  List of sidelink measurement objects to remove. |
| ***sl-QuantityConfig***  Indicates the layer 3 filtering coefficient for sidelink measurement. |
| ***sl-ReportConfigToAddModList***  List of sidelink measurement reporting configurations to add and/or modify. |
| ***sl-ReportConfigToRemoveList***  List of sidelink measurement reporting configurations to remove. |

#### – *SL-MeasIdList*

The IE *SL*-*MeasIdList* concerns a list of SL measurement identities to add or modify for a destination, with for each entry the *sl-MeasId*, the associated *sl-MeasObjectId* and the associated *sl-ReportConfigId*.

*SL-MeasIdList* information element

-- ASN1START

-- TAG-SL-MEASIDLIST-START

SL-MeasIdList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-MeasId-r16)) OF SL-MeasIdInfo-r16

SL-MeasIdInfo-r16 ::= SEQUENCE {

sl-MeasId-r16 SL-MeasId-r16,

sl-MeasObjectId-r16 SL-MeasObjectId-r16,

sl-ReportConfigId-r16 SL-ReportConfigId-r16,

...

}

SL-MeasId-r16 ::= INTEGER (1..maxNrofSL-MeasId-r16)

-- TAG-SL-MEASIDLIST-STOP

-- ASN1STOP

#### – *SL-MeasObjectList*

The IE *SL*-*MeasObjectList* concerns a list of SL measurement objects to add or modify for a destination.

*SL-MeasObjectList* information element

-- ASN1START

-- TAG-SL-MEASOBJECTLIST-START

SL-MeasObjectList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ObjectId-r16)) OF SL-MeasObjectInfo-r16

SL-MeasObjectInfo-r16 ::= SEQUENCE {

sl-MeasObjectId-r16 SL-MeasObjectId-r16,

sl-MeasObject-r16 SL-MeasObject-r16,

...

}

SL-MeasObjectId-r16 ::= INTEGER (1..maxNrofSL-ObjectId-r16)

SL-MeasObject-r16 ::= SEQUENCE {

frequencyInfoSL-r16 ARFCN-ValueNR,

...

}

-- TAG-SL-MEASOBJECTLIST-STOP

-- ASN1STOP

| *SL-MeasObjectList* field descriptions |
| --- |
| ***sl-MeasObjectId***  It is used to identify a sidelink measurement object configuration. |
| ***sl-MeasObject***  It specifies information applicable for sidelink DMRS measurement. |

#### – *SL-PagingIdentityRemoteUE*

The IE *SL-PagingIdentityRemoteUE* includes the Remote UE's paging UE ID.

*SL-PagingIdentityRemoteUE* information element

-- ASN1START

-- TAG-SL-PAGINGIDENTITYREMOTEUE-START

SL-PagingIdentityRemoteUE-r17 ::= SEQUENCE {

ng-5G-S-TMSI-r17 NG-5G-S-TMSI,

fullI-RNTI-r17 I-RNTI-Value OPTIONAL -- Need R

}

-- TAG-SL-PAGINGIDENTITYREMOTEUE-STOP

-- ASN1STOP

#### – *SL-PBPS-CPS-Config*

The IE *SL-PBPS-CPS-Config* specifies the operation information for a resource pool which can be (pre-)configured to enable full sensing only, partial sensing only, random resource selection only, or any combination(s) thereof.

*SL-PBPS-CPS-Config* information element

-- ASN1START

-- TAG-SL-PBPS-CPS-CONFIG-START

SL-PBPS-CPS-Config-r17 ::= SEQUENCE {

sl-AllowedResourceSelectionConfig-r17 ENUMERATED {c1, c2, c3, c4, c5, c6, c7} OPTIONAL, -- Need M

sl-MinNumCandidateSlotsPeriodic-r17 INTEGER (1..32) OPTIONAL, -- Need M

sl-PBPS-OccasionReservePeriodList-r17 SEQUENCE (SIZE (1..16)) OF INTEGER (1..16) OPTIONAL, -- Need M

sl-Additional-PBPS-Occasion-r17 ENUMERATED { monitored } OPTIONAL, -- Need M

sl-CPS-WindowPeriodic-r17 INTEGER (5..30) OPTIONAL, -- Need M

sl-MinNumCandidateSlotsAperiodic-r17 INTEGER (1..32) OPTIONAL, -- Need M

sl-MinNumRssiMeasurementSlots-r17 INTEGER (1..800) OPTIONAL, -- Need M

sl-DefaultCBR-RandomSelection-r17 INTEGER (0..100) OPTIONAL, -- Need M

sl-DefaultCBR-PartialSensing-r17 INTEGER (0..100) OPTIONAL, -- Need M

sl-CPS-WindowAperiodic-r17 INTEGER (0..30) OPTIONAL, -- Need M

sl-PartialSensingInactiveTime-r17 ENUMERATED { enabled, disabled } OPTIONAL, -- Need M

...

}

-- TAG-SL-PBPS-CPS-CONFIG-STOP

-- ASN1STOP

| *SL-PBPS-CPS-Config* field descriptions |
| --- |
| ***sl-Additional-PBPS-Occasion***  Indicates that UE additionally monitors periodic sensing occasions that correspond to a set of values. (see TS 38.214 [19], clause 8.1.4). |
| ***sl-AllowedResourceSelectionConfig***  Indicates the allowed resource selection mechanism(s), i.e. full sensing only, partial sensing only, random resource selection only, or any combination(s) thereof. (see TS 38.214 [19], clause 8.1.4). Only c1, c4 , c5 or c7 can be configured for a Rel-16 resource pool.  c1: only full sensing allowed  c2: only partial sensing allowed  c3: only random selection allowed  c4: full sensing+random selection allowed  c5: full sensing+ partial sensing allowed  c6: partial sensing + random selection allowed  c7: full sensing+ partial sensing + random selection allowed. |
| ***sl-CPS-WindowAperiodic***  Parameter that indicates the minimum size of contiguous partial sensing window in logical slot units for a resource (re)selection procedure and re-evaluation/pre-emption checking triggered by aperiodic transmission. (see TS 38.214 [19], clause 8.1.4). If not configured, the size of contiguous partial sensing window in logical slot units is 31. |
| ***sl-CPS-WindowPeriodic***  Indicates the size of contiguous partial sensing window in logical slot units when UE performs periodic-based and contiguous partial sensing for a resource (re)selection procedure triggered by periodic transmission. If not configured, the size of contiguous partial sensing window in logical slot units is 31. |
| ***sl-DefaultCBR-PartialSensing***  Indicates default value of SL CBR measurement for a UE that is configured to perform partial sensing by its higher layer (including when SL DRX is configured) if the number of SL RSSI measurement slots over CBR measurement window is below *sl-MinNumRssiMeasurementSlots*, (see TS 38.214 [19], clause 8.1.6). Value 0 corresponds to 0, value 1 to 0.01, value 2 to 0.02, and so on. |
| ***sl-DefaultCBR-RandomSelection***  Indicates default value of CBR measurement for a UE that performs random resource selection if no SL CBR measurement result over SL CBR measurement window, (see TS 38.214 [19], clause 8.1.6). Value 0 corresponds to 0, value 1 to 0.01, value 2 to 0.02, and so on. |
| ***sl-MinNumCandidateSlotsAperiodic***  Indicates the minimum number of Y' slots that are included in the possible candidate resources corresponding to periodic-based partial sensing and/or contiguous partial sensing for resource (re)selection triggered by aperiodic transmission. (see TS 38.214 [19], clause 8.1.4). |
| ***sl-MinNumCandidateSlotsPeriodic***  Indicates the minimum number of Y slots that are included in the possible candidate resources corresponding to periodic-based partial sensing for resource (re)selection triggered by periodic transmission. (see TS 38.214 [19], clause 8.1.4). |
| ***sl-MinNumRssiMeasurementSlots***  Indicates a threshold for a minimum number of SL RSSI measurement slots over CBR measurement window for which the SL RSSI is measured for a UE that is configured to perform partial sensing by its higher layer (including when SL DRX is configured). (see TS 38.214 [19], clause 8.1.6). |
| ***sl-PartialSensingInactiveTime***  Indicates whether or not UE is required to perform SL reception of PSCCH and RSRP measurement for partial sensing on slots in SL DRX inactive time when partial sensing is configured by its higher layer. (see TS 38.214 [19], clause 8.1.4). |
| ***sl-PBPS-OccasionReservePeriodList***  Indicates the subset of periodicity values from *sl-ResourceReservePeriodList* used to determine periodic sensing occasions in periodic-based partial sensing, by means of an index to the corresponding entry in *sl-ResourceReservePeriodList-r16*. If not configured, all periodicity values from *sl-ResourceReservePeriodList* are used to determine periodic sensing occasions in periodic-based partial sensing. (see TS 38.214 [19], clause 8.1.4). |

#### – *SL-PDCP-Config*

The IE *SL*-*PDCP-Config* is used to set the configurable PDCP parameters for a sidelink radio bearer.

*SL-PDCP-Config* information element

-- ASN1START

-- TAG-SL-PDCP-CONFIG-START

SL-PDCP-Config-r16 ::= SEQUENCE {

sl-DiscardTimer-r16 ENUMERATED {ms3, ms10, ms20, ms25, ms30, ms40, ms50, ms60, ms75, ms100, ms150, ms200,

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

sl-PDCP-SN-Size-r16 ENUMERATED {len12bits, len18bits} OPTIONAL, -- Cond Setup2

sl-OutOfOrderDelivery ENUMERATED { true } OPTIONAL, -- Need R

...

}

-- TAG-SL-PDCP-CONFIG-STOP

-- ASN1STOP

| *SL-PDCP-Config* field descriptions |
| --- |
| ***sl-DiscardTimer***  Value in ms of *discardTimer* specified in TS 38.323 [5]. Value *ms50* corresponds to 50 ms, value *ms100* corresponds to 100 ms and so on. |
| ***sl-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. |
| ***sl-PDCP-SN-Size***  PDCP sequence number size for unicast NR sidelink communication, 12 or 18 bits, as specified in TS 38.323 [5]. For groupcast and broadcast NR sidelink communication, only 12 bits is applicable, as specified in 9.1.1.5. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Setup* | The field is mandatory present in case of sidelink DRB setup via dedicated signaling and in case of sidelink DRB configuration via system information and pre-configuration; otherwise the field is optionally present, need M. |
| *Setup2* | The field is mandatory present in case of sidelink DRB setup via dedicated signaling and in case of sidelink DRB configuration via system information and pre-configuration for RLC-AM and RLC-UM for unicast NR sidelink communication; otherwise the field is not present, Need M. |

– *SL-PSBCH-Config*

The IE *SL-PSBCH-Config* indicates PSBCH transmission parameters on each sidelink bandwidth part.

***SL-PSBCH-Config* information element**

-- ASN1START

-- TAG-SL-PSBCH-CONFIG-START

SL-PSBCH-Config-r16 ::= SEQUENCE {

dl-P0-PSBCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

dl-Alpha-PSBCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need M

...,

[[

dl-P0-PSBCH-r17 INTEGER (-202..24) OPTIONAL -- Need M

]]

}

-- TAG-SL-PSBCH-CONFIG-STOP

-- ASN1STOP

| *SL-PSBCH-Config* field descriptions |
| --- |
| ***dl-Alpha-PSBCH***  Indicates alpha value for DL pathloss based power control for PSBCH. When the field is not configured the UE applies the value 1 |
| ***dl-P0-PSBCH***  Indicates P0 value for DL pathloss based power control for PSBCH. If not configured, DL pathloss based power control is disabled for PSBCH. |

#### – *SL-PSSCH-TxConfigList*

The IE *SL-PSSCH-TxConfigList* indicates PSSCH transmission parameters. When lower layers select parameters from the range indicated in IE *SL-PSSCH-TxConfigList*, the UE considers both configurations in IE *SL-PSSCH-TxConfigList* and the CBR-dependent configurations represented in IE *SL-CBR-PriorityTxConfigList*. Only one IE *SL-PSSCH-TxConfig* is provided per *SL-TypeTxSync*.

*SL-PSSCH-TxConfigList* information element

-- ASN1START

-- TAG-SL-PSSCH-TXCONFIGLIST-START

SL-PSSCH-TxConfigList-r16 ::= SEQUENCE (SIZE (1..maxPSSCH-TxConfig-r16)) OF SL-PSSCH-TxConfig-r16

SL-PSSCH-TxConfig-r16 ::= SEQUENCE {

sl-TypeTxSync-r16 SL-TypeTxSync-r16 OPTIONAL, -- Need R

sl-ThresUE-Speed-r16 ENUMERATED {kmph60, kmph80, kmph100, kmph120,

kmph140, kmph160, kmph180, kmph200},

sl-ParametersAboveThres-r16 SL-PSSCH-TxParameters-r16,

sl-ParametersBelowThres-r16 SL-PSSCH-TxParameters-r16,

...,

[[

sl-ParametersAboveThres-v1650 SL-MinMaxMCS-List-r16 OPTIONAL, -- Need R

sl-ParametersBelowThres-v1650 SL-MinMaxMCS-List-r16 OPTIONAL -- Need R

]]

}

SL-PSSCH-TxParameters-r16 ::= SEQUENCE {

sl-MinMCS-PSSCH-r16 INTEGER (0..27),

sl-MaxMCS-PSSCH-r16 INTEGER (0..31),

sl-MinSubChannelNumPSSCH-r16 INTEGER (1..27),

sl-MaxSubchannelNumPSSCH-r16 INTEGER (1..27),

sl-MaxTxTransNumPSSCH-r16 INTEGER (1..32),

sl-MaxTxPower-r16 SL-TxPower-r16 OPTIONAL -- Cond CBR

}

-- TAG-SL-PSSCH-TXCONFIGLIST-STOP

-- ASN1STOP

| *SL-PSSCH-TxConfigList* field descriptions |
| --- |
| ***sl-MaxTxTransNumPSSCH***  Indicates the maximum transmission number (including new transmission and retransmission) for PSSCH. |
| ***sl-MaxTxPower***  This field indicates the maximum transmission power for transmission on PSSCH and PSCCH. |
| ***sl-MinMCS-PSSCH, sl-MaxMCS-PSSCH***  This field indicates the minimum and maximum MCS values used for transmissions on PSSCH. The UE shall ignore the minimum and maximum MCS values used for the associated MCS table(s) in *sl-ParametersAboveThres-r16* and *sl-ParametersBelowThres-r16* if *sl-ParametersAboveThres-v1650* and *sl-ParametersBelowThres-v1650*are present, respectively. |
| ***sl-MinSubChannelNumPSSCH, sl-MaxSubChannelNumPSSCH***  This field indicates the minimum and maximum number of sub-channels which may be used for transmissions on PSSCH. |
| ***sl-TypeTxSync***  This field indicates the synchronization reference type. For configurations by the eNB/gNB, only *gnbEnb* can be configured; and for pre-configuration or when this field is absent, the configuration is applicable for all synchronization reference types. |
| ***sl-ThresUE-Speed***  This field indicates a UE absolute speed threshold. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *CBR* | The field is optionally present, Need R, when the IE *SL-PSSCH-TxParameters* is present in *SL-CBR-CommonTxConfigList,* *SL-UE-SelectedConfig,* *SIB12* or *SidelinkPreconfigNR*; otherwise the field is not present, need R. |

#### – *SL-QoS-FlowIdentity*

The IE *SL-QoS-FlowIdentity* is used to identify a sidelink QoS flow.

*SL-QoS-FlowIdentity* information element

-- ASN1START

-- TAG-SL-QOS-FLOWIDENTITY-START

SL-QoS-FlowIdentity-r16 ::= INTEGER (1..maxNrofSL-QFIs-r16)

-- TAG-SL-QOS-FLOWIDENTITY-STOP

-- ASN1STOP

#### – *SL-QoS-Profile*

The IE *SL-QoS-Profile* is used to give the QoS parameters for a sidelink QoS flow. Need codes or conditions specified for *SL-QoS-Profile* do not apply, in case *SL-QoS-Profile* is included in *SidelinkUEInformationNR*.

*SL-QoS-Profile* information element

-- ASN1START

-- TAG-SL-QOS-PROFILE-START

SL-QoS-Profile-r16 ::= SEQUENCE {

sl-PQI-r16 SL-PQI-r16 OPTIONAL, -- Need R

sl-GFBR-r16 INTEGER (0..4000000000) OPTIONAL, -- Need R

sl-MFBR-r16 INTEGER (0..4000000000) OPTIONAL, -- Need R

sl-Range-r16 INTEGER (1..1000) OPTIONAL, -- Need R

...

}

SL-PQI-r16 ::= CHOICE {

sl-StandardizedPQI-r16 INTEGER (0..255),

sl-Non-StandardizedPQI-r16 SEQUENCE {

sl-ResourceType-r16 ENUMERATED {gbr, non-GBR, delayCriticalGBR, spare1} OPTIONAL, -- Need R

sl-PriorityLevel-r16 INTEGER (1..8) OPTIONAL, -- Need R

sl-PacketDelayBudget-r16 INTEGER (0..1023) OPTIONAL, -- Need R

sl-PacketErrorRate-r16 INTEGER (0..9) OPTIONAL, -- Need R

sl-AveragingWindow-r16 INTEGER (0..4095) OPTIONAL, -- Need R

sl-MaxDataBurstVolume-r16 INTEGER (0..4095) OPTIONAL, -- Need R

...

}

}

-- TAG-SL-QOS-PROFILE-STOP

-- ASN1STOP

| *SL-QoS-Profile* field descriptions |
| --- |
| ***sl-GFBR***  Indicate the guaranteed bit rate for a GBR QoS flow. The unit is: Kbit/s |
| ***sl-MFBR***  Indicate the maximum bit rate for a GBR QoS flow. The unit is: Kbit/s |
| ***sl-PQI***  This field indicates either the PQI for standardized PQI or non-standardized QoS parameters. |
| ***sl-Range***  This field indicates the range parameter of the Qos flow, as defined in clause 5.4.1.1.1, TS 23.287 [55]. It is present only for groupcast. The unit is meter. |

| *SL-PQI* field descriptions |
| --- |
| ***sl-AveragingWindow***  Indicates the Averaging Window for a QoS flow, and applies to GBR QoS flows only. Unit: ms. The default value of the IE is 2000ms. |
| ***sl-MaxDataBurstVolume***  Indicates the Maximum Data Burst Volume for a QoS flow, and applies to delay critical GBR QoS flows only. Unit: byte. |
| ***sl-PacketDelayBudget***  Indicates the Packet Delay Budget for a QoS flow. Upper bound value for the delay that a packet may experience expressed in unit of 0.5ms. |
| ***sl-PacketErrorRate***  Indicates the Packet Error Rate for a QoS flow. The packet error rate is expressed as Scalar x 10-k where k is the Exponent. |
| ***sl-PriorityLevel***  Indicates the Priority Level for a QoS flow. Values ordered in decreasing order of priority, i.e. with 1 as the highest priority and 8 as the lowest priority. |
| ***sl-StandardizedPQI***  Indicate the PQI for standardized PQI. |

#### – *SL-QuantityConfig*

The IE *SL*-*QuantityConfig* specifies the layer 3 filtering coefficients for NR SL RSRP measurement for a destination.

*SL-QuantityConfig* information element

-- ASN1START

-- TAG-SL-QUANTITYCONFIG-START

SL-QuantityConfig-r16 ::= SEQUENCE {

sl-FilterCoefficientDMRS-r16 FilterCoefficient DEFAULT fc4,

...

}

-- TAG-SL-QuantityConfig-STOP

-- ASN1STOP

| *SL-QuantityConfig* field descriptions |
| --- |
| ***sl-FilterCoefficientDMRS***  DMRS based L3 filter configuration:  Specifies L3 filter configuration for sidelink RSRP measurement result from the L1 fiter(s), as defined in TS 38.215 [9]. |

#### – *SL-RadioBearerConfig*

The IE *SL-RadioBearerConfig* specifies the sidelink DRB configuration information for NR sidelink communication.

*SL-RadioBearerConfig* information element

-- ASN1START

-- TAG-SL-RADIOBEARERCONFIG-START

SL-RadioBearerConfig-r16 ::= SEQUENCE {

slrb-Uu-ConfigIndex-r16 SLRB-Uu-ConfigIndex-r16,

sl-SDAP-Config-r16 SL-SDAP-Config-r16 OPTIONAL, -- Cond SLRBSetup

sl-PDCP-Config-r16 SL-PDCP-Config-r16 OPTIONAL, -- Cond SLRBSetup

sl-TransRange-r16 ENUMERATED {m20, m50, m80, m100, m120, m150, m180, m200, m220, m250, m270, m300, m350, m370,

m400, m420, m450, m480, m500, m550, m600, m700, m1000, spare9, spare8, spare7, spare6,

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

...

}

-- TAG-SL-RADIOBEARERCONFIG-STOP

-- ASN1STOP

| *SL-RadioBearerConfig* field descriptions |
| --- |
| ***sl-PDCP-Config***  This field indicates the PDCP parameters for the sidelink DRB. |
| ***sl-SDAP-Config***  This field indicates how to map sidelink QoS flows to sidelink DRB. |
| ***slrb-Uu-ConfigIndex***  This field indicates the index of sidelink DRB configuration. |
| ***sl-TransRange***  This field indicates the transmission range of the sidelink DRB. The unit is meter. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SLRBSetup* | The field is mandatory present in case of sidelink DRB setup via the dedicated signalling and in case of sidelink DRB configuration via system information and pre-configuration; otherwise the field is optionally present, need M. |

– *SL-RelayUE-Config*

The IE *SL-RelayUE-Config* specifies the configuration information for NR sidelink U2N Relay UE.

***SL-RelayUE-Config* information element**

-- ASN1START

-- TAG-SL-RELAYUE-CONFIG-START

SL-RelayUE-Config-r17::= SEQUENCE {

threshHighRelay-r17 RSRP-Range OPTIONAL, -- Need R

threshLowRelay-r17 RSRP-Range OPTIONAL, -- Need R

hystMaxRelay-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRelay

hystMinRelay-r17 Hysteresis OPTIONAL -- Cond ThreshLowRelay

}

-- TAG-SL-RELAYUE-CONFIG-STOP

-- ASN1STOP

| *SL-RelayUE-Config* field descriptions |
| --- |
| ***threshHighRelay***  Indicates the upper threshold of Uu RSRP for a UE that is in network coverage to evaluate AS layer conditions for U2N relay UE operation, |
| ***threshLowRelay***  Indicates the lower threshold of Uu RSRP for a UE that is in network coverage to evaluate AS layer conditions for U2N relay UE operation. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *ThreshHighRelay* | This field is mandatory present if threshHighRelay is included. Otherwise, the field is absent, Need R. |
| *ThreshLowRelay* | This field is mandatory present if threshLowRelay is included. Otherwise, the field is absent, Need R. |

#### – *SL-RemoteUE-Config*

The IE *SL-RemoteUE-Config* specifies the configuration information for NR sidelink U2N Remote UE.

*SL-RemoteUE-Config* information element

-- ASN1START

-- TAG-SL-REMOTEUE-CONFIG-START

SL-RemoteUE-Config-r17::= SEQUENCE {

threshHighRemote-r17 RSRP-Range OPTIONAL, -- Need R

hystMaxRemote-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRemote

sl-ReselectionConfig-r17 SL-ReselectionConfig-r17 OPTIONAL -- Need R

}

SL-ReselectionConfig-r17::= SEQUENCE {

sl-RSRP-Thresh-r17 SL-RSRP-Range-r16 OPTIONAL, -- Need R

sl-FilterCoefficientRSRP-r17 FilterCoefficient OPTIONAL, -- Need R

sl-HystMin-r17 Hysteresis OPTIONAL -- Cond SL-RSRP-Thresh

}

-- TAG-SL-REMOTEUE-CONFIG-STOP

-- ASN1STOP

| *SL-RemoteUE-Config* field descriptions |
| --- |
| ***sl-ReselectionConfig***  Includes the parameters used by the U2N remote UE when selecting/ reselecting a U2N relay UE. |
| ***thresHighRemote***  Indicates the threshold of Uu RSRP for a UE that is in network coverage to evaluate AS layer conditions for U2N remote UE operation. |

| *SL-ReselectionConfig* field descriptions |
| --- |
| ***sl-FilterCoefficientRSRP***  Specifies L3 filter coefficient for SL communication/ discovery RSRP measurement results from L1 filter. |
| ***sl-RSRP-Thresh***  Indicates the threshold of SL communication/ discovery RSRP for a U2N remote UE to perform relay UE selection/ reselection. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SL-RSRP-Thresh* | This field is mandatory present if *sl-RSRP-Thresh* is included. Otherwise, the field is absent, Need R. |
| *ThreshHighRemote* | This field is mandatory present if threshHighRemote is included. Otherwise, the field is absent, Need R. |

#### – *SL-ReportConfigList*

The IE *SL*-*ReportConfigList* concerns a list of SL measurement reporting configurations to add or modify for a destination.

*SL-ReportConfigList* information element

-- ASN1START

-- TAG-SL-REPORTCONFIGLIST-START

SL-ReportConfigList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-ReportConfigId-r16)) OF SL-ReportConfigInfo-r16

SL-ReportConfigInfo-r16 ::= SEQUENCE {

sl-ReportConfigId-r16 SL-ReportConfigId-r16,

sl-ReportConfig-r16 SL-ReportConfig-r16,

...

}

SL-ReportConfigId-r16 ::= INTEGER (1..maxNrofSL-ReportConfigId-r16)

SL-ReportConfig-r16 ::= SEQUENCE {

sl-ReportType-r16 CHOICE {

sl-Periodical-r16 SL-PeriodicalReportConfig-r16,

sl-EventTriggered-r16 SL-EventTriggerConfig-r16,

...

},

...

}

SL-PeriodicalReportConfig-r16 ::= SEQUENCE {

sl-ReportInterval-r16 ReportInterval,

sl-ReportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

sl-ReportQuantity-r16 SL-MeasReportQuantity-r16,

sl-RS-Type-r16 SL-RS-Type-r16,

...

}

SL-EventTriggerConfig-r16 ::= SEQUENCE {

sl-EventId-r16 CHOICE {

eventS1-r16 SEQUENCE {

s1-Threshold-r16 SL-MeasTriggerQuantity-r16,

sl-ReportOnLeave-r16 BOOLEAN,

sl-Hysteresis-r16 Hysteresis,

sl-TimeToTrigger-r16 TimeToTrigger,

...

},

eventS2-r16 SEQUENCE {

s2-Threshold-r16 SL-MeasTriggerQuantity-r16,

sl-ReportOnLeave-r16 BOOLEAN,

sl-Hysteresis-r16 Hysteresis,

sl-TimeToTrigger-r16 TimeToTrigger,

...

},

...

},

sl-ReportInterval-r16 ReportInterval,

sl-ReportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

sl-ReportQuantity-r16 SL-MeasReportQuantity-r16,

sl-RS-Type-r16 SL-RS-Type-r16,

...

}

SL-MeasReportQuantity-r16 ::= CHOICE {

sl-RSRP-r16 BOOLEAN,

...

}

SL-MeasTriggerQuantity-r16 ::= CHOICE {

sl-RSRP-r16 RSRP-Range,

...

}

SL-RS-Type-r16 ::= ENUMERATED {dmrs, spare3, spare2, spare1}

-- TAG-SL-REPORTCONFIGLIST-STOP

-- ASN1STOP

| *SL-ReportConfig* field descriptions |
| --- |
| ***sl-ReportType***  Type of the configured sidelink measurement report. |

| *SL-EventTriggerConfig* field descriptions |
| --- |
| ***sl-EventId***  Choice of sidelink measurement event triggered reporting criteria. |
| ***sl-ReportAmount***  Number of sidelink measurement reports applicable for *sl-EventTriggered* report type. |
| ***sl-ReportInterval***  Indicates the interval between periodical reports (i.e., when *sl-ReportAmount* exceeds 1) for *sl-EventTriggered* report type. |
| ***sl-ReportOnLeave***  indicates whether or not the UE shall initiate the sidelink measurement reporting procedure when the leaving condition is met for a frequency in *sl-FrequencyTriggeredList*, as specified in 5.8.10.4.1. |
| ***sl-ReportQuantity***  The sidelink measurement quantities to be included in the sidelink measurement report. |
| ***sl-TimeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a sidelink measurement report. |
| ***sN-Threshold***  Threshold used for events S1 and S2 specified in clauses 5.8.10.4.2 and 5.8.10.4.3, respectively. | |

| *SL-PeriodicalReportConfig* field descriptions |
| --- |
| ***sl-ReportAmount***  Number of sidelink measurement reports applicable for *sl-Periodical* report type. |
| ***sl-ReportInterval***  Indicates the interval between periodical reports (i.e., when *sl-ReportAmount* exceeds 1) for *sl-Periodical* report type. |
| ***sl-ReportQuantity***  The sidelink measurement quantities to be included in the sidelink measurement report. |

#### – *SL-ResourcePool*

The IE *SL-ResourcePool* specifies the configuration information for NR sidelink communication resource pool.

*SL-ResourcePool* information element

-- ASN1START

-- TAG-SL-RESOURCEPOOL-START

SL-ResourcePool-r16 ::= SEQUENCE {

sl-PSCCH-Config-r16 SetupRelease { SL-PSCCH-Config-r16 } OPTIONAL, -- Need M

sl-PSSCH-Config-r16 SetupRelease { SL-PSSCH-Config-r16 } OPTIONAL, -- Need M

sl-PSFCH-Config-r16 SetupRelease { SL-PSFCH-Config-r16 } OPTIONAL, -- Need M

sl-SyncAllowed-r16 SL-SyncAllowed-r16 OPTIONAL, -- Need M

sl-SubchannelSize-r16 ENUMERATED {n10, n12, n15, n20, n25, n50, n75, n100} OPTIONAL, -- Need M

dummy INTEGER (10..160) OPTIONAL, -- Need M

sl-StartRB-Subchannel-r16 INTEGER (0..265) OPTIONAL, -- Need M

sl-NumSubchannel-r16 INTEGER (1..27) OPTIONAL, -- Need M

sl-Additional-MCS-Table-r16 ENUMERATED {qam256, qam64LowSE, qam256-qam64LowSE } OPTIONAL, -- Need M

sl-ThreshS-RSSI-CBR-r16 INTEGER (0..45) OPTIONAL, -- Need M

sl-TimeWindowSizeCBR-r16 ENUMERATED {ms100, slot100} OPTIONAL, -- Need M

sl-TimeWindowSizeCR-r16 ENUMERATED {ms1000, slot1000} OPTIONAL, -- Need M

sl-PTRS-Config-r16 SL-PTRS-Config-r16 OPTIONAL, -- Need M

sl-UE-SelectedConfigRP-r16 SL-UE-SelectedConfigRP-r16 OPTIONAL, -- Need M

sl-RxParametersNcell-r16 SEQUENCE {

sl-TDD-Configuration-r16 TDD-UL-DL-ConfigCommon OPTIONAL, -- Need M

sl-SyncConfigIndex-r16 INTEGER (0..15)

} OPTIONAL, -- Need M

sl-ZoneConfigMCR-List-r16 SEQUENCE (SIZE (16)) OF SL-ZoneConfigMCR-r16 OPTIONAL, -- Need M

sl-FilterCoefficient-r16 FilterCoefficient OPTIONAL, -- Need M

sl-RB-Number-r16 INTEGER (10..275) OPTIONAL, -- Need M

sl-PreemptionEnable-r16 ENUMERATED {enabled, pl1, pl2, pl3, pl4, pl5, pl6, pl7, pl8} OPTIONAL, -- Need R

sl-PriorityThreshold-UL-URLLC-r16 INTEGER (1..9) OPTIONAL, -- Need M

sl-PriorityThreshold-r16 INTEGER (1..9) OPTIONAL, -- Need M

sl-X-Overhead-r16 ENUMERATED {n0,n3, n6, n9} OPTIONAL, -- Need S

sl-PowerControl-r16 SL-PowerControl-r16 OPTIONAL, -- Need M

sl-TxPercentageList-r16 SL-TxPercentageList-r16 OPTIONAL, -- Need M

sl-MinMaxMCS-List-r16 SL-MinMaxMCS-List-r16 OPTIONAL, -- Need M

...,

[[

sl-TimeResource-r16 BIT STRING (SIZE (10..160)) OPTIONAL -- Need M

]],

[[

sl-PBPS-CPS-Config-r17 SetupRelease { SL-PBPS-CPS-Config-r17 } OPTIONAL, -- Need M

sl-InterUE-CoordinationConfig-r17 SetupRelease { SL-InterUE-CoordinationConfig-r17 } OPTIONAL -- Need M

]]

}

SL-ZoneConfigMCR-r16 ::= SEQUENCE {

sl-ZoneConfigMCR-Index-r16 INTEGER (0..15),

sl-TransRange-r16 ENUMERATED {m20, m50, m80, m100, m120, m150, m180, m200, m220, m250, m270, m300, m350,

m370, m400, m420, m450, m480, m500, m550, m600, m700, m1000, spare9, spare8,

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

OPTIONAL, -- Need M

sl-ZoneConfig-r16 SL-ZoneConfig-r16 OPTIONAL, -- Need M

...

}

SL-SyncAllowed-r16 ::= SEQUENCE {

gnss-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

gnbEnb-Sync-r16 ENUMERATED {true} OPTIONAL, -- Need R

ue-Sync-r16 ENUMERATED {true} OPTIONAL -- Need R

}

SL-PSCCH-Config-r16 ::= SEQUENCE {

sl-TimeResourcePSCCH-r16 ENUMERATED {n2, n3} OPTIONAL, -- Need M

sl-FreqResourcePSCCH-r16 ENUMERATED {n10,n12, n15, n20, n25} OPTIONAL, -- Need M

sl-DMRS-ScrambleID-r16 INTEGER (0..65535) OPTIONAL, -- Need M

sl-NumReservedBits-r16 INTEGER (2..4) OPTIONAL, -- Need M

...

}

SL-PSSCH-Config-r16 ::= SEQUENCE {

sl-PSSCH-DMRS-TimePatternList-r16 SEQUENCE (SIZE (1..3)) OF INTEGER (2..4) OPTIONAL, -- Need M

sl-BetaOffsets2ndSCI-r16 SEQUENCE (SIZE (4)) OF SL-BetaOffsets-r16 OPTIONAL, -- Need M

sl-Scaling-r16 ENUMERATED {f0p5, f0p65, f0p8, f1} OPTIONAL, -- Need M

...

}

SL-PSFCH-Config-r16 ::= SEQUENCE {

sl-PSFCH-Period-r16 ENUMERATED {sl0, sl1, sl2, sl4} OPTIONAL, -- Need M

sl-PSFCH-RB-Set-r16 BIT STRING (SIZE (10..275)) OPTIONAL, -- Need M

sl-NumMuxCS-Pair-r16 ENUMERATED {n1, n2, n3, n6} OPTIONAL, -- Need M

sl-MinTimeGapPSFCH-r16 ENUMERATED {sl2, sl3} OPTIONAL, -- Need M

sl-PSFCH-HopID-r16 INTEGER (0..1023) OPTIONAL, -- Need M

sl-PSFCH-CandidateResourceType-r16 ENUMERATED {startSubCH, allocSubCH} OPTIONAL, -- Need M

...

}

SL-PTRS-Config-r16 ::= SEQUENCE {

sl-PTRS-FreqDensity-r16 SEQUENCE (SIZE (2)) OF INTEGER (1..276) OPTIONAL, -- Need M

sl-PTRS-TimeDensity-r16 SEQUENCE (SIZE (3)) OF INTEGER (0..29) OPTIONAL, -- Need M

sl-PTRS-RE-Offset-r16 ENUMERATED {offset01, offset10, offset11} OPTIONAL, -- Need M

...

}

SL-UE-SelectedConfigRP-r16 ::= SEQUENCE {

sl-CBR-PriorityTxConfigList-r16 SL-CBR-PriorityTxConfigList-r16 OPTIONAL, -- Need M

sl-Thres-RSRP-List-r16 SL-Thres-RSRP-List-r16 OPTIONAL, -- Need M

sl-MultiReserveResource-r16 ENUMERATED {enabled} OPTIONAL, -- Need M

sl-MaxNumPerReserve-r16 ENUMERATED {n2, n3} OPTIONAL, -- Need M

sl-SensingWindow-r16 ENUMERATED {ms100, ms1100} OPTIONAL, -- Need M

sl-SelectionWindowList-r16 SL-SelectionWindowList-r16 OPTIONAL, -- Need M

sl-ResourceReservePeriodList-r16 SEQUENCE (SIZE (1..16)) OF SL-ResourceReservePeriod-r16 OPTIONAL, -- Need M

sl-RS-ForSensing-r16 ENUMERATED {pscch, pssch},

...,

[[

sl-CBR-PriorityTxConfigList-v1650 SL-CBR-PriorityTxConfigList-v1650 OPTIONAL -- Need M

]]

}

SL-ResourceReservePeriod-r16 ::= CHOICE {

sl-ResourceReservePeriod1-r16 ENUMERATED {ms0, ms100, ms200, ms300, ms400, ms500, ms600, ms700, ms800, ms900, ms1000},

sl-ResourceReservePeriod2-r16 INTEGER (1..99)

}

SL-SelectionWindowList-r16 ::= SEQUENCE (SIZE (8)) OF SL-SelectionWindowConfig-r16

SL-SelectionWindowConfig-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-SelectionWindow-r16 ENUMERATED {n1, n5, n10, n20}

}

SL-TxPercentageList-r16 ::= SEQUENCE (SIZE (8)) OF SL-TxPercentageConfig-r16

SL-TxPercentageConfig-r16 ::= SEQUENCE {

sl-Priority-r16 INTEGER (1..8),

sl-TxPercentage-r16 ENUMERATED {p20, p35, p50}

}

SL-MinMaxMCS-List-r16 ::= SEQUENCE (SIZE (1..3)) OF SL-MinMaxMCS-Config-r16

SL-MinMaxMCS-Config-r16 ::= SEQUENCE {

sl-MCS-Table-r16 ENUMERATED {qam64, qam256, qam64LowSE},

sl-MinMCS-PSSCH-r16 INTEGER (0..27),

sl-MaxMCS-PSSCH-r16 INTEGER (0..31)

}

SL-BetaOffsets-r16 ::= INTEGER (0..31)

SL-PowerControl-r16 ::= SEQUENCE {

sl-MaxTransPower-r16 INTEGER (-30..33),

sl-Alpha-PSSCH-PSCCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need M

dl-Alpha-PSSCH-PSCCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need S

sl-P0-PSSCH-PSCCH-r16 INTEGER (-16..15) OPTIONAL, -- Need S

dl-P0-PSSCH-PSCCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

dl-Alpha-PSFCH-r16 ENUMERATED {alpha0, alpha04, alpha05, alpha06, alpha07, alpha08, alpha09, alpha1} OPTIONAL, -- Need S

dl-P0-PSFCH-r16 INTEGER (-16..15) OPTIONAL, -- Need M

...,

[[

dl-P0-PSSCH-PSCCH-r17 INTEGER (-202..24) OPTIONAL, -- Need M

sl-P0-PSSCH-PSCCH-r17 INTEGER (-202..24) OPTIONAL, -- Need S

dl-P0-PSFCH-r17 INTEGER (-202..24) OPTIONAL -- Need M

]]

}

-- TAG-SL-RESOURCEPOOL-STOP

-- ASN1STOP

| *SL-ZoneConfigMCR* field descriptions |
| --- |
| ***sl-TransRange***  Indicates the communication range requirement for the corresponding *sl-ZoneConfigMCR-Index*. |
| ***sl-ZoneConfig***  Indicates the zone configuration for the corresponding *sl-ZoneConfigMCR-Index*. |
| ***sl-ZoneConfigMCR-Index***  Indicates the codepoint of the communication range requirement field in SCI. |

|  |
| --- |
| *SL-ResourcePool* field descriptions |
| ***dummy***  This field is not used in the specification. If received it shall be ignored by the UE. |
| ***sl-Additional-MCS-Table***  Indicates the MCS table(s) additionally used in the resource pool. 64QAM table is (pre-)configured as default. Zero, one or two can be additionally (pre-)configured using the 256QAM and/or low-SE MCS tables. If two MCS tables are indicated, 256QAM MCS table is the 1st table and qam64lowSE MCS table is the 2nd table as specified in TS 38.214 [19], clause 8.1.3.1. |
| ***sl-FilterCoefficient***  This field indicates the filtering coefficient for long-term measurement and reference signal power derivation used for sidelink open-loop power control. |
| ***sl-InterUE-CoordinationConfig***  Indicates the configured sidelink inter-UE coordination parameters. |
| ***sl-NumSubchannel***  Indicates the number of subchannels in the corresponding resource pool, which consists of contiguous PRBs only. |
| ***sl-PBPS-CPS-Config***  Indicates the allowed resource allocation schemes of full sensing only, partial sensing only, random resource selection only, or any combination(s), and the related configuration for power saving resource allocation schemes. This field is absent for *sl-TxPoolExceptional*. |
| ***sl-PreemptionEnable***  Indicates whether pre-emption is disabled or enabled in a resource pool. If the field is present and the value is *pl1*, *pl2*, and so on (but not *enabled*), it means that pre-emption is enabled and a priority level p\_preemption is configured. If the field is present and the value is *enabled*, the pre-emption is enabled (but p\_preemption is not configured) and pre-emption is applicable to all levels. |
| ***sl-PriorityThreshold-UL-URLLC***  Indicates the threshold used to determine whether NR sidelink transmission is prioritized over uplink transmission of priority index 1 as specified in TS 38.213[13], clause 16.2.4.3, or whether PUCCH transmission carrying SL HARQ is prioritized over PUCCH transmission carrying UCI of priority index 1 if they overlap in time as specified in TS 38.213 [13], clause 9.2.5.0. |
| ***sl-PriorityThreshold***  Indicates the threshold used to determine whether NR sidelink transmission is prioritized over uplink transmission of priority index 0 as specified in TS 38.213[13], clause 16.2.4.3, or whether PUCCH transmission carrying SL HARQ is prioritized over PUCCH transmission carrying UCI of priority index 0 if they overlap in time as specified in TS 38.213 [13], clause 9.2.5.0. |
| ***sl-RB-Number***  Indicates the number of PRBs in the corresponding resource pool, which consists of contiguous PRBs only. The remaining RB cannot be used (See TS 38.214[19], clause 8). |
| ***sl-StartRB-Subchannel***  Indicates the lowest RB index of the subchannel with the lowest index in the resource pool with respect to the lowest RB index of a SL BWP. |
| ***sl-SubchannelSize***  Indicates the minimum granularity in frequency domain for the sensing for PSSCH resource selection in the unit of PRB. |
| ***sl-SyncAllowed***  Indicates the allowed synchronization reference(s) which is (are) allowed to use the configured resource pool. |
| ***sl-SyncConfigIndex***  Indicates the synchronisation configuration that is associated with a reception pool, by means of an index to the corresponding entry *SL-SyncConfigList* of in *SIB12* for NR sidelink communication. |
| ***sl-TDD-Configuration***  Indicates the TDD configuration associated with the reception pool of the cell indicated by *sl-SyncConfigIndex*. |
| ***sl-ThreshS-RSSI-CBR***  Indicates the S-RSSI threshold for determining the contribution of a sub-channel to the CBR measurement. Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n\*2) dBm, and so on. |
| ***sl-TimeResource***  Indicates the bitmap of the resource pool, which is defined by repeating the bitmap with a periodicity during a SFN or DFN cycle. |
| ***sl-TimeWindowSizeCBR***  Indicates the time window size for CBR measurement. |
| ***sl-TimeWindowSizeCR***  Indicates the time window size for CR evaluation. |
| ***sl-TxPercentageList***  Indicates the portion of candidate single-slot PSSCH resources over the total resources. Value p20 corresponds to 20%, and so on. |
| ***sl-X-Overhead***  Accounts for overhead from CSI-RS, PT-RS. If the field is absent, the UE applies value *n0* (see TS 38.214 [19], clause 5.1.3.2). |

| *SL-SyncAllowed* field descriptions |
| --- |
| ***gnbEnb-Sync***  If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to eNB or gNB (i.e., synchronized to a reference UE which is directly synchronized to eNB or gNB). |
| ***gnss-Sync***  If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to GNSS (i.e., synchronized to a reference UE which is directly synchronized to GNSS). |
| ***ue-Sync***  If configured, the (pre-) configured resources can be used if the UE is synchronized to a reference UE which is not synchronized to eNB, gNB and GNSS directly or indirectly. |

| *SL-PSCCH-Config* field descriptions |
| --- |
| ***sl-FreqResourcePSCCH***  Indicates the number of PRBs for PSCCH in a resource pool where it is not greater than the number PRBs of the subchannel. |
| ***sl-DMRS-ScrambleID***  Indicates the initialization value for PSCCH DMRS scrambling. |
| ***sl-NumReservedBits***  Indicates the number of reserved bits in first stage SCI. |
| ***sl-TimeResourcePSCCH***  Indicates the number of symbols of PSCCH in a resource pool. |

| *SL-PSSCH-Config* field descriptions |
| --- |
| ***sl-BetaOffsets2ndSCI***  Indicates candidates of beta-offset values to determine the number of coded modulation symbols for second stage SCI. The value indicates the index of Table 9.3-2 of TS 38.213 [13]. |
| ***sl-PSSCH-DMRS-TimePatternList***  Indicates the set of PSSCH DMRS time domain patterns in terms of PSSCH DMRS symbols in a slot that can be used in the resource pool. |
| ***sl-Scaling***  Indicates a scaling factor to limit the number of resource elements assigned to the second stage SCI on PSSCH. Value *f0p5* corresponds to 0.5, value *f0p65* corresponds to 0.65, and so on. |

| *SL-PSFCH-Config* field descriptions |
| --- |
| ***sl-MinTimeGapPSFCH***  The minimum time gap between PSFCH and the associated PSSCH in the unit of slots. |
| ***sl-NumMuxCS-Pair***  Indicates the number of cyclic shift pairs used for a PSFCH transmission that can be multiplexed in a PRB. |
| ***sl-PSFCH-CandidateResourceType***  Indicates the number of PSFCH resources available for multiplexing HARQ-ACK information in a PSFCH transmission (see TS 38.213 [13], clause 16.3). |
| ***sl-PSFCH-HopID***  Scrambling ID for sequence hopping of the PSFCH used in the resource pool. |
| ***sl-PSFCH-Period***  Indicates the period of PSFCH resource in the unit of slots within this resource pool. If set to *sl0*, no resource for PSFCH, and HARQ feedback for all transmissions in the resource pool is disabled. |
| ***sl-PSFCH-RB-Set***  Indicates the set of PRBs that are actually used for PSFCH transmission and reception. The leftmost bit of the bitmap refers to the lowest RB index in the resource pool, and so on. Value 0 in the bitmap indicates that the corresponding PRB is not used for PSFCH transmission and reception while value 1 indicates that the corresponding PRB is used for PSFCH transmission and reception (see TS 38.213 [13]). |

| *SL-PTRS-Config* field descriptions |
| --- |
| ***sl-PTRS-FreqDensity***  Presence and frequency density of SL PT-RS as a function of scheduled BW. If the field is not configured, the UE uses K\_PT-RS = 2 |
| ***sl-PTRS-TimeDensity***  Presence and time density of SL PT-RS as a function of MCS. If the field is not configured, the UE uses L\_PT-RS = 1 |
| ***sl-PTRS-RE-Offset***  Indicates the subcarrier offset for SL PT-RS . If the field is not configured, the UE applies the value *offset00* (see TS 38.211 [16], clause 8.4.1.2.2). |

| *SL-UE-SelectedConfigRP* field descriptions |
| --- |
| ***sl-CBR-PriorityTxConfigList***  Indicates the mapping between PSSCH transmission parameter (such as MCS, PRB number, retransmission number, CR limit) sets by using the indexes of the configurations in *sl-CBR-PSSCH-TxConfigList*, CBR ranges by using the indexes to the entry of the CBR range configurations in *sl-CBR-RangeConfigList*, and priority ranges. It also indicates the default PSSCH transmission parameters to be used when CBR measurement results are not available, and MCS range for the MCS tables used in the resource pool. The field *sl-CBR-PriorityTxConfigList-v1650* is present only when *sl-CBR-PriorityTxConfigList-r16* is configured. |
| ***sl-MaxNumPerReserve***  Indicates the maximum number of reserved PSCCH/PSSCH resources that can be indicated by an SCI. |
| ***sl-MultiReserveResource***  Indicates if it is allowed to reserve a sidelink resource for an initial transmission of a TB by an SCI associated with a different TB, based on sensing and resource selection procedure. |
| ***sl-ResourceReservePeriodList***  Set of possible resource reservation period allowed in the resource pool in the unit of ms. Up to 16 values can be configured per resource pool. The value *ms0* is always configured. |
| ***sl-RS-ForSensing***  Indicates whether DMRS of PSCCH or PSSCH is used for L1 RSRP measurement in the sensing operation. |
| ***sl-SensingWindow***  Parameter that indicates the start of the sensing window. |
| ***sl-SelectionWindowList***  Parameter that determines the end of the selection window in the resource selection for a TB with respect to priority indicated in SCI. Value n1 corresponds to 1\*2µ, value n5 corresponds to 5\*2µ, and so on, where µ = 0,1,2,3 refers to SCS 15,30,60,120 kHz respectively. |
| ***sl-Thres-RSRP-List***  Indicates a list of 64 thresholds, and the threshold should be selected based on the priority in the decoded SCI and the priority in the SCI to be transmitted. A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH/PSCCH RSRP in the associated data resource is above a threshold. |

| *SL-PowerControl* field descriptions |
| --- |
| ***sl-MaxTransPower***  Indicates the maximum value of the UE's sidelink transmission power on this resource pool. The unit is dBm. |
| ***sl-Alpha-PSSCH-PSCCH***  Indicates alpha value for sidelink pathloss based power control for PSCCH/PSSCH when *sl-P0-PSSCH-PSCCH* is configured. When the field is absent the UE applies the value 1. |
| ***sl-P0-PSSCH-PSCCH***  Indicates P0 value for sidelink pathloss based power control for PSCCH/PSSCH. If not configured, sidelink pathloss based power control is disabled for PSCCH/PSSCH. |
| ***dl-Alpha-PSSCH-PSCCH***  Indicates alpha value for downlink pathloss based power control for PSCCH/PSSCH when *dl-P0-PSSCH-PSCCH* is configured. When the field is absent the UE applies the value 1. |
| ***dl-P0-PSSCH-PSCCH***  Indicates P0 value for downlink pathloss based power control for PSCCH/PSSCH. If not configured, downlink pathloss based power control is disabled for PSCCH/PSSCH. |
| ***dl-Alpha-PSFCH***  Indicates alpha value for downlink pathloss based power control for PSFCH when *dl-P0-PSFCH* is configured. When the field is absent the UE applies the value 1. |
| ***dl-P0-PSFCH***  Indicates P0 value for downlink pathloss based power control for PSFCH. If not configured, downlink pathloss based power control is disabled for PSFCH. |

| *SL-MinMaxMCS-Config* field descriptions |
| --- |
| ***sl-MaxMCS-PSSCH***  Indicates the maximum MCS value when using the associated MCS table. If no MCS is configured, UE autonomously selects MCS from the full range of values. |
| ***sl-MinMCS-PSSCH***  Indicates the minimum MCS value when using the associated MCS table. If no MCS is configured, UE autonomously selects MCS from the full range of values. |

## <<<<Unchanged parts skipped>>>>

## 6.6 PC5 RRC messages

### 6.6.1 General message structure

#### – *PC5-RRC-Definitions*

This ASN.1 segment is the start of the PC5 RRC PDU definitions.

-- ASN1START

-- TAG-PC5-RRC-DEFINITIONS-START

PC5-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

CellAccessRelatedInfo,

SetupRelease,

RRC-TransactionIdentifier,

SN-FieldLengthAM,

SN-FieldLengthUM,

LogicalChannelIdentity,

maxNrofSLRB-r16,

maxNrofSL-RxInfoSet-r17,

maxNrofSL-QFIs-r16,

maxNrofSL-QFIsPerDest-r16,

PagingCycle,

PagingRecord,

RSRP-Range,

SL-MeasConfig-r16,

SL-MeasId-r16,

FreqBandList,

FreqBandIndicatorNR,

maxNrofRelayMeas-r17,

maxSimultaneousBands,

maxBandComb,

maxBands,

maxSIB-MessagePlus1-r17,

maxSL-LCID-r16,

BandParametersSidelink-r16,

RLC-ParametersSidelink-r16,

SIB1,

SL-DRX-ConfigUC-r17,

SL-DRX-ConfigUC-SemiStatic-r17,

SL-PagingIdentityRemoteUE-r17,

SL-RLC-ChannelID-r17,

SL-SourceIdentity-r17,

SystemInformation

FROM NR-RRC-Definitions;

-- TAG-PC5-RRC-DEFINITIONS-STOP

-- ASN1STOP

#### – *SBCCH-SL-BCH-Message*

The *SBCCH-SL-BCH-Message* class is the set of RRC messages that may be sent from the UE to the UE via SL-BCH on the SBCCH logical channel.

-- ASN1START

-- TAG-SBCCH-SL-BCH-MESSAGE-START

SBCCH-SL-BCH-Message ::= SEQUENCE {

message SBCCH-SL-BCH-MessageType

}

SBCCH-SL-BCH-MessageType::= CHOICE {

c1 CHOICE {

masterInformationBlockSidelink MasterInformationBlockSidelink,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-SBCCH-SL-BCH-MESSAGE-STOP

-- ASN1STOP

#### – *SCCH-Message*

The *SCCH-Message* class is the set of RRC messages that may be sent from the UE to the UE for unicast of NR sidelink communication on SCCH logical channel.

-- ASN1START

-- TAG-SCCH-MESSAGE-START

SCCH-Message ::= SEQUENCE {

message SCCH-MessageType

}

SCCH-MessageType ::= CHOICE {

c1 CHOICE {

measurementReportSidelink MeasurementReportSidelink,

rrcReconfigurationSidelink RRCReconfigurationSidelink,

rrcReconfigurationCompleteSidelink RRCReconfigurationCompleteSidelink,

rrcReconfigurationFailureSidelink RRCReconfigurationFailureSidelink,

ueCapabilityEnquirySidelink UECapabilityEnquirySidelink,

ueCapabilityInformationSidelink UECapabilityInformationSidelink,

uuMessageTransferSidelink-r17 UuMessageTransferSidelink-r17,

remoteUEInformationSidelink-r17 RemoteUEInformationSidelink-r17

},

messageClassExtension CHOICE {

c2 CHOICE {

notificationMessageSidelink-r17 NotificationMessageSidelink-r17,

ueAssistanceInformationSidelink-r17 UEAssistanceInformationSidelink-r17,

spare6 NULL, spare5 NULL, spare4 NULL, spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtensionFuture-r17 SEQUENCE {}

}

}

-- TAG-SCCH-MESSAGE-STOP

-- ASN1STOP

6.6.2 Message definitions

#### – *MasterInformationBlockSidelink*

The *MasterInformationBlockSidelink* includes the system information transmitted by a UE via SL-BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: SBCCH

Direction: UE to UE

*MasterInformationBlockSidelink*

-- ASN1START

-- TAG-MASTERINFORMATIONBLOCKSIDELINK-START

MasterInformationBlockSidelink ::= SEQUENCE {

sl-TDD-Config-r16 BIT STRING (SIZE (12)),

inCoverage-r16 BOOLEAN,

directFrameNumber-r16 BIT STRING (SIZE (10)),

slotIndex-r16 BIT STRING (SIZE (7)),

reservedBits-r16 BIT STRING (SIZE (2))

}

-- TAG-MASTERINFORMATIONBLOCKSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *MasterInformationBlockSidelink* field descriptions |
| ***directFrameNumber***  Indicates the frame number in which S-SSB transmitted. |
| ***inCoverage***  Value true indicates that the UE transmitting the *MasterInformationBlockSidelink* is in network coverage, or UE selects GNSS timing as the synchronization reference source. |
| ***slotIndex***  Indicates the slot index in which S-SSB transmitted. |

#### – *MeasurementReportSidelink*

The *MeasurementReportSidelink* message is used for the indication of measurement results of NR sidelink.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

*MeasurementReportSidelink* message

-- ASN1START

-- TAG-MEASUREMENTREPORTSIDELINK-START

MeasurementReportSidelink ::= SEQUENCE {

criticalExtensions CHOICE {

measurementReportSidelink-r16 MeasurementReportSidelink-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

MeasurementReportSidelink-r16-IEs ::= SEQUENCE {

sl-measResults-r16 SL-MeasResults-r16,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE{} OPTIONAL

}

SL-MeasResults-r16 ::= SEQUENCE {

sl-MeasId-r16 SL-MeasId-r16,

sl-MeasResult-r16 SL-MeasResult-r16,

...

}

SL-MeasResult-r16 ::= SEQUENCE {

sl-ResultDMRS-r16 SL-MeasQuantityResult-r16 OPTIONAL,

...

}

SL-MeasQuantityResult-r16 ::= SEQUENCE {

sl-RSRP-r16 RSRP-Range OPTIONAL,

...

}

SL-MeasResultListRelay-r17 ::= SEQUENCE (SIZE (1..maxNrofRelayMeas-r17)) OF SL-MeasResultRelay-r17

SL-MeasResultRelay-r17 ::= SEQUENCE {

cellIdentity-r17 CellAccessRelatedInfo,

sl-RelayUEIdentity-r17 SL-SourceIdentity-r17,

sl-MeasResult-r17 SL-MeasResult-r16,

...

}

-- TAG-MEASUREMENTREPORTSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *MeasurementReportSidelink* field descriptions |
| ***sl-MeasId***  Identifies the sidelink measurement identity for which the reporting is being performed. |
| ***sl-MeasResult***  Measured RSRP results of a unicast destination. |

#### – *NotificationMessageSidelink*

The *NotificationMessageSidelink* message is used to send notification message from U2N Relay UE to the connected U2N Remote UE.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: U2N Relay UE to U2N Remote UE

*NotificationMessageSidelink* message

-- ASN1START

-- TAG-NOTIFICATIONMESSAGESIDELINK-START

NotificationMessageSidelink-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

notificationMessageSidelink-r17 NotificationMessageSidelink-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

NotificationMessageSidelink-r17-IEs ::= SEQUENCE {

indicationType-r17 ENUMERATED {

relayUE-Uu-RLF, relayUE-HO, relayUE-CellReselection,

relayUE-Uu-RRC-Failure

} OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-NOTIFICATIONMESSAGESIDELINK -STOP

-- ASN1STOP

#### – *RemoteUEInformationSidelink*

The *RemoteUEInformationSidelink* message is used to request SIB(s) or provide paging related information as specified in clause 5.8.9.8.1.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: L2 U2N Remote UE to L2 U2N Relay UE

*RemoteUEInformationSidelink* message

-- ASN1START

-- TAG-REMOTEUEINFORMATIONSIDELINK-START

RemoteUEInformationSidelink-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

remoteUEInformationSidelink-r17 RemoteUEInformationSidelink-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RemoteUEInformationSidelink-r17-IEs ::= SEQUENCE {

sl-RequestedSIB-List-r17 SetupRelease { SL-RequestedSIB-List-r17} OPTIONAL, -- Need M

sl-PagingInfo-RemoteUE-r17 SetupRelease { SL-PagingInfo-RemoteUE-r17} OPTIONAL, -- Need M

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SL-RequestedSIB-List-r17 ::= SEQUENCE (SIZE (maxSIB-MessagePlus1-r17)) OF SL-SIB-ReqInfo-r17

SL-PagingInfo-RemoteUE-r17 ::= SEQUENCE {

sl-PagingIdentityRemoteUE-r17 SL-PagingIdentityRemoteUE-r17,

sl-PagingCycleRemoteUE-r17 PagingCycle OPTIONAL -- Need M

}

SL-SIB-ReqInfo-r17 ::= ENUMERATED { sib1, sib2, sib3, sib4, sib5, sib6, sib7, sib8, sib9, sib10, sib11, sib12, sib13,

sib14, sib15, sib16, sib17, sib18, sib19, sib20, sib21, spare11, spare10, spare9,

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

-- TAG-REMOTEUEINFORMATIONSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *RemoteUEInformationSidelink-IEs* field descriptions |
| ***sl-RequestedSIB-List***  Contains a list of requested SIBs. |
| ***sl-PagingInfo-RemoteUE***  Indicates the paging information used by L2 U2N Relay UE to perform the connected L2 U2N Remote UE's paging monitoring. |
| ***sl-PagingIdentityRemoteUE***  Indicates the L2 U2N Remote UE's paging UE ID. |
| ***sl-PagingCycleRemoteUE***  Indicates the L2 U2N Remote UE's UE specific DRX cycle as the minimum value of the one provided by upper layers (if configured) and the one provided by RRC layer (if configured). Value rf32 corresponds to 32 radio frames, value rf64 corresponds to 64 radio frames and so on. |

#### – *RRCReconfigurationSidelink*

The *RRCReconfigurationSidelink* message is the command to AS configuration of the PC5 RRC connection. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

*RRCReconfigurationSidelink* message

-- ASN1START

-- TAG-RRCRECONFIGURATIONSIDELINK-START

RRCReconfigurationSidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfigurationSidelink-r16 RRCReconfigurationSidelink-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfigurationSidelink-r16-IEs ::= SEQUENCE {

slrb-ConfigToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-Config-r16 OPTIONAL, -- Need N

slrb-ConfigToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-PC5-ConfigIndex-r16 OPTIONAL, -- Need N

sl-MeasConfig-r16 SetupRelease {SL-MeasConfig-r16} OPTIONAL, -- Need M

sl-CSI-RS-Config-r16 SetupRelease {SL-CSI-RS-Config-r16} OPTIONAL, -- Need M

sl-ResetConfig-r16 ENUMERATED {true} OPTIONAL, -- Need N

sl-LatencyBoundCSI-Report-r16 INTEGER (3..160) OPTIONAL, -- Need M

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReconfigurationSidelink-v1700-IEs OPTIONAL

}

RRCReconfigurationSidelink-v1700-IEs ::= SEQUENCE {

sl-DRX-ConfigUC-PC5-r17 SetupRelease { SL-DRX-ConfigUC-r17 } OPTIONAL, -- Need M

sl-LatencyBoundIUC-Report-r17 SetupRelease { SL-LatencyBoundIUC-Report-r17 } OPTIONAL, -- Need M

sl-RLC-ChannelToReleaseListPC5-r17 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-ChannelID-r17 OPTIONAL, -- Need N

sl-RLC-ChannelToAddModListPC5-r17 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-ChannelConfigPC5-r17 OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SL-LatencyBoundIUC-Report-r17::= INTEGER (3..160)

SLRB-Config-r16::= SEQUENCE {

slrb-PC5-ConfigIndex-r16 SLRB-PC5-ConfigIndex-r16,

sl-SDAP-ConfigPC5-r16 SL-SDAP-ConfigPC5-r16 OPTIONAL, -- Need M

sl-PDCP-ConfigPC5-r16 SL-PDCP-ConfigPC5-r16 OPTIONAL, -- Need M

sl-RLC-ConfigPC5-r16 SL-RLC-ConfigPC5-r16 OPTIONAL, -- Need M

sl-MAC-LogicalChannelConfigPC5-r16 SL-LogicalChannelConfigPC5-r16 OPTIONAL, -- Need M

...

}

SLRB-PC5-ConfigIndex-r16 ::= INTEGER (1..maxNrofSLRB-r16)

SL-SDAP-ConfigPC5-r16 ::= SEQUENCE {

sl-MappedQoS-FlowsToAddList-r16 SEQUENCE (SIZE (1.. maxNrofSL-QFIsPerDest-r16)) OF SL-PQFI-r16 OPTIONAL, -- Need N

sl-MappedQoS-FlowsToReleaseList-r16 SEQUENCE (SIZE (1.. maxNrofSL-QFIsPerDest-r16)) OF SL-PQFI-r16 OPTIONAL, -- Need N

sl-SDAP-Header-r16 ENUMERATED {present, absent},

...

}

SL-PDCP-ConfigPC5-r16 ::= SEQUENCE {

sl-PDCP-SN-Size-r16 ENUMERATED {len12bits, len18bits} OPTIONAL, -- Need M

sl-OutOfOrderDelivery-r16 ENUMERATED { true } OPTIONAL, -- Need R

...

}

SL-RLC-ConfigPC5-r16 ::= CHOICE {

sl-AM-RLC-r16 SEQUENCE {

sl-SN-FieldLengthAM-r16 SN-FieldLengthAM OPTIONAL, -- Need M

...

},

sl-UM-Bi-Directional-RLC-r16 SEQUENCE {

sl-SN-FieldLengthUM-r16 SN-FieldLengthUM OPTIONAL, -- Need M

...

},

sl-UM-Uni-Directional-RLC-r16 SEQUENCE {

sl-SN-FieldLengthUM-r16 SN-FieldLengthUM OPTIONAL, -- Need M

...

}

}

SL-LogicalChannelConfigPC5-r16 ::= SEQUENCE {

sl-LogicalChannelIdentity-r16 LogicalChannelIdentity,

...

}

SL-PQFI-r16 ::= INTEGER (1..64)

SL-CSI-RS-Config-r16 ::= SEQUENCE {

sl-CSI-RS-FreqAllocation-r16 CHOICE {

sl-OneAntennaPort-r16 BIT STRING (SIZE (12)),

sl-TwoAntennaPort-r16 BIT STRING (SIZE (6))

} OPTIONAL, -- Need M

sl-CSI-RS-FirstSymbol-r16 INTEGER (3..12) OPTIONAL, -- Need M

...

}

SL-RLC-ChannelConfigPC5-r17::= SEQUENCE {

sl-RLC-ChannelID-PC5-r17 SL-RLC-ChannelID-r17,

sl-RLC-ConfigPC5-r17 SL-RLC-ConfigPC5-r16 OPTIONAL, -- Need M

sl-MAC-LogicalChannelConfigPC5-r17 SL-LogicalChannelConfigPC5-r16 OPTIONAL, -- Need M

...

}

-- TAG-RRCRECONFIGURATIONSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReconfigurationSidelink* field descriptions |
| ***sl-CSI-RS-FreqAllocation***  Indicates the frequency domain position for sidelink CSI-RS. |
| ***sl-CSI-RS-FirstSymbol***  Indicates the position of first symbol of sidelink CSI-RS. |
| ***sl-DRX-ConfigUC-PC5***  Indicates the NR sidelink DRX configuration for unicast communication, as specified in TS 38.321 [3] |
| ***sl-LatencyBoundCSI-Report***  Indicates the latency bound of SL CSI report from the associated SL CSI triggering in terms of number of slots. |
| ***sl-LatencyBoundIUC-Report***  Indicates the latency bound of SL Inter-UE coordination report from the associated SL Inter-UE coordination explicit request triggering in terms of number of slots. |
| ***sl-LogicalChannelIdentity***  Indicates the identity of the sidelink logical channel. |
| ***sl-MappedQoS-FlowsToAddList***  Indicate the QoS flows to be mapped to the configured sidelink DRB. Each entry is indicated by the *SL-PQFI*, which is used between UEs, as defined in TS 23.287 [55]. |
| ***sl-MappedQoS-FlowsToReleaseList***  Indicate the QoS flows to be released from the configured sidelink DRB. Each entry is indicated by the *SL-PQFI*, which is used between UEs, as defined in TS 23.287 [55]. |
| ***sl-MeasConfig***  Indicates the sidelink measurement configuration for the unicast destination. |
| ***sl-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 sidelink radio bearer is established. |
| ***sl-PDCP-SN-Size***  Indicates the PDCP SN size of the configured sidelink DRB. |
| ***sl-Resetconfig***  Indicates that the full configuration should be applicable for the *RRCReconfigurationSidelink* message. |
| ***sl-SDAP-Header***  Indicates whether or not a SDAP header is present on this sidelink DRB. |

#### – *RRCReconfigurationCompleteSidelink*

The *RRCReconfigurationCompleteSidelink* message is used to confirm the successful completion of a PC5 RRC AS reconfiguration. It is only applied to unicast of NR sidelink communication.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: UE to UE

*RRCReconfigurationCompleteSidelink* message

-- ASN1START

-- TAG-RRCRECONFIGURATIONCOMPLETESIDELINK-START

RRCReconfigurationCompleteSidelink ::= SEQUENCE {

rrc-TransactionIdentifier-r16 RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfigurationCompleteSidelink-r16 RRCReconfigurationCompleteSidelink-r16-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfigurationCompleteSidelink-r16-IEs ::= SEQUENCE {

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReconfigurationCompleteSidelink-v1710-IEs OPTIONAL

}

RRCReconfigurationCompleteSidelink-v1710-IEs ::= SEQUENCE {

dummy ENUMERATED {true},

nonCriticalExtension RRCReconfigurationCompleteSidelink-v17xy-IEs OPTIONAL

}

RRCReconfigurationCompleteSidelink-v17xy-IEs ::= SEQUENCE {

sl-DRX-ConfigReject-v17xy ENUMERATED {true} OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRECONFIGURATIONCOMPLETESIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReconfigurationCompleteSidelink* field descriptions |
| ***dummy***  This field is not used in the specification. The UE shall not include this field. If received it shall be ignored by the peer UE. |
| ***sl-DRX-ConfigReject***  Indicates the rejection of sidelink DRX configuration received from the peer UE for the corresponding NR sidelink unicast communication. |

## <<<<Unchanged parts skipped>>>>

## 9.3 Sidelink pre-configured parameters

This ASN.1 segment is the start of the NR definitions of pre-configured sidelink parameters.

#### – *NR-Sidelink-Preconf*

-- ASN1START

-- TAG-NR-SIDELINK-PRECONF-DEFINITIONS-START

NR-Sidelink-Preconf DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

SL-RemoteUE-Config-r17,

SL-DRX-ConfigGC-BC-r17,

ffsUpperLimit, -- to be removed later

SL-FreqConfigCommon-r16,

SL-RadioBearerConfig-r16,

SL-RLC-BearerConfig-r16,

SL-EUTRA-AnchorCarrierFreqList-r16,

SL-NR-AnchorCarrierFreqList-r16,

SL-MeasConfigCommon-r16,

SL-UE-SelectedConfig-r16,

TDD-UL-DL-ConfigCommon,

maxNrofFreqSL-r16,

maxNrofSLRB-r16,

maxSL-LCID-r16

FROM NR-RRC-Definitions;

-- TAG-NR-SIDELINK-PRECONF-DEFINITIONS-STOP

-- ASN1STOP

#### – *SL-PreconfigurationNR*

The IE *SL-PreconfigurationNR* includes the sidelink pre-configured parameters used for NR sidelink communication. Need codes or conditions specified for subfields in *SL-PreconfigurationNR* do not apply.

*SL-PreconfigurationNR* information elements

-- ASN1START

-- TAG-SL-PRECONFIGURATIONNR-START

SL-PreconfigurationNR-r16 ::= SEQUENCE {

sidelinkPreconfigNR-r16 SidelinkPreconfigNR-r16,

...

}

SidelinkPreconfigNR-r16 ::= SEQUENCE {

sl-PreconfigFreqInfoList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommon-r16 OPTIONAL,

sl-PreconfigNR-AnchorCarrierFreqList-r16 SL-NR-AnchorCarrierFreqList-r16 OPTIONAL,

sl-PreconfigEUTRA-AnchorCarrierFreqList-r16 SL-EUTRA-AnchorCarrierFreqList-r16 OPTIONAL,

sl-RadioBearerPreConfigList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL,

sl-RLC-BearerPreConfigList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL,

sl-MeasPreConfig-r16 SL-MeasConfigCommon-r16 OPTIONAL,

sl-OffsetDFN-r16 INTEGER (1..1000) OPTIONAL,

t400-r16 ENUMERATED{ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL,

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL,

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL,

sl-PreconfigGeneral-r16 SL-PreconfigGeneral-r16 OPTIONAL,

sl-UE-SelectedPreConfig-r16 SL-UE-SelectedConfig-r16 OPTIONAL,

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL,

sl-RoHC-Profiles-r16 SL-RoHC-Profiles-r16 OPTIONAL,

sl-MaxCID-r16 INTEGER (1..16383) DEFAULT 15,

...,

[[

sl-DRX-PreConfig-GC-BC-r17 SL-DRX-ConfigGC-BC-r17 OPTIONAL,

sl-TxProfileList-r17 SL-TxProfileList-r17 OPTIONAL,

sl-PreconfigDiscConfig-r17 SL-RemoteUE-Config-r17 OPTIONAL

]]

}

SL-TxProfileList-r17 ::= SEQUENCE (SIZE (1..256)) OF SL-TxProfile-r17

SL-TxProfile-r17 ::= ENUMERATED {drx-Compatible, drx-Incompatible, spare6, spare5, spare4, spare3,spare2, spare1}

SL-PreconfigGeneral-r16 ::= SEQUENCE {

sl-TDD-Configuration-r16 TDD-UL-DL-ConfigCommon OPTIONAL,

reservedBits-r16 BIT STRING (SIZE (2)) OPTIONAL,

...

}

SL-RoHC-Profiles-r16 ::= SEQUENCE {

profile0x0001-r16 BOOLEAN,

profile0x0002-r16 BOOLEAN,

profile0x0003-r16 BOOLEAN,

profile0x0004-r16 BOOLEAN,

profile0x0006-r16 BOOLEAN,

profile0x0101-r16 BOOLEAN,

profile0x0102-r16 BOOLEAN,

profile0x0103-r16 BOOLEAN,

profile0x0104-r16 BOOLEAN

}

-- TAG-SL-PRECONFIGURATIONNR-STOP

-- ASN1STOP

| *SL-PreconfigurationNR* field descriptions |
| --- |
| ***sl-DRX-PreConfig-GC-BC***  This field indicates the sidelink DRX configuration for groupcast and broadcast communication, as specified in TS 38.321 [3]. |
| ***sl-OffsetDFN***  Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference. Value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds, and so on. If the field is absent, no offset is applied. |
| ***sl-PreconfigDiscConfig***  This field indicates the configuration for discovery message transmission used by NR sidelink U2N Remote UE. |
| ***sl-PreconfigEUTRA-AnchorCarrierFreqList***  This field indicates the EUTRA anchor carrier frequency list, which can provide the NR sidelink communication configuration. |
| ***sl-PreconfigFreqInfoList***  This field indicates the NR sidelink communication and/ or NR sidelink discovery configuration some carrier frequency(ies). In this release, only one *SL-FreqConfig* can be configured in the list. |
| ***sl-PreconfigNR-AnchorCarrierFreqList***  This field indicates the NR anchor carrier frequency list, which can provide the NR sidelink communication configuration. |
| ***sl-RadioBearerPreConfigList***  This field indicates one or multiple sidelink radio bearer configurations. |
| ***sl-RLC-BearerPreConfigList***  This field indicates one or multiple sidelink RLC bearer configurations. |
| ***sl-RoHC-Profiles***  This field indicates the supported RoHC profiles for NR sidelink communications. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |
| ***sl-TxProfileList***  List of one or multiple Tx profiles, which are indicated by upper layer in order of increasing Tx profile pointer identities, indicate the compatibility of supporting SL DRX as specified in TS 38.321 [3]. |

#### – *End of NR-Sidelink-Preconf*

-- ASN1START

END

-- ASN1STOP

End of Changes