**3GPP TSG-RAN WG2 Meeting #119-e R2-22XXXXX**

**Online, 17th – 29th Aug 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | **3422** | **rev** | **1** | **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 correction of NR RRC support for MUSIM | | | | | | | | | |
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| ***Source to WG:*** | vivo | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | LTE\_NR\_MUSIM-Core | | | | |  | ***Date:*** | | | 2022-08-29 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | |  |
|  | *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. Some editorial issues 2. In current ASN.1, the Need code of *musim-GapLength* is defined as “Need S”. However, there is no corresponding description in the field description for the “Need S” behavior. It is unclear that whether the UE should apply some kind of default value if a new MUSIM gap is added without the gap length filed. 3. *MUSIM-GapInfo* is used for both the MUSIM gap preference Indication and the MUSIM gap configuration, however, in the field description of *musim-GapLength/ starting-SFN* and also other elements, it only indicates MUSIM gap preference 4. It is not clear whether the network can configure no aperiodic MUSIM gap if *musim-Starting-SFN-AndSubframe* is not present while *musim-AperiodicGap* is present. 5. For aperodic gap, RAN2 agreed that the field *musim-PrefStarting-SFN-AndSubframe* can be absent in the UAI. This has not been reflected in both the procedural part and the description of the condition of the field. This was only described in *MUSIM-GapConfig* field descriptions. 6. Correct the field description of *musim-GapPreferenceList.* 7. The description for the cond aperiodic is correct when the *MUSIM-GapInfo* is included in the downlink message. However, the *MUSIM-GapInfo* is also used for the MUSIM gap preference Indication and for the MUSIM gap preference Indication, the *musim-Starting-SFN-AndSubframe-r17* optional. 8. Network should follow the gap pattern requested by the UE. *MUSIM-GapConfig* field descriptions cover only aperiodic gap and do not cover *musim-GapLength* and *musim-GapRepetitionAndOffset*. 9. **UE does not need to** **initiate transmission of the UAI message only for the removal of the previously requested aperiodic gap.** | | | | | | | | |
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| ***Summary of change:*** | | 1. Some editorial correstions 2. Change the conditional code of *musim-GapLength* from “Need S” to “Cond setupGap”. Clarify that the gap length is mandatory to configure while adding a new MUSIM gap. 3. Delete “preference” from the field description of *musim-GapLength/ starting-SFN* 4. Add the network behavior when *musim-Starting-SFN-AndSubframe* is not present while *musim-AperiodicGap* is present. 5. For aperiodic gap, clarify in both procedural part and the description of the condition of the field that the field *musim-PrefStarting-SFN-AndSubframe* can be absent in the UAI. 6. Add new clause to capture MUSIMgap configuration 7. clarify that for the MUSIM gap preference Indication, the *musim-Starting-SFN-AndSubframe-r17* is optional, 8. Update *MUSIM-GapConfig* field descriptions to cover *musim-GapLength* and *musim-GapRepetitionAndOffset.* 9. Add a note to teflect that UE does not need to initiate transmission of the UAI message if the difference between the current *MUSIM-GapPreferenceList-r17* and the last transmission of the UEAssistanceInformation message including *MUSIM-GapPreferenceList-r17* is only due to removal of the previously requested aperiodic gap. | | | | | | | | |
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| ***Consequences if not approved:*** | | Multi-SIM operations for MUSIM gap configuration is not correctly supported | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.5.3, 5.3.5.x, 5.7.4.2, 5.7.4.3, 6.2.2, 6.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

-------------------------------------------Start Changes -------------------------------------------

# 5 Procedures

-------------------------------------------Skip Unchanged -------------------------------------------

## 5.3 Connection control

-------------------------------------------Skip Unchanged -------------------------------------------

### 5.3.5 RRC reconfiguration

#### 5.3.5.1 General



Figure 5.3.5.1-1: RRC reconfiguration, successful



Figure 5.3.5.1-2: RRC reconfiguration, failure

The purpose of this procedure is to modify an RRC connection, e.g. to establish/modify/release RBs/BH RLC channels, to perform reconfiguration with sync, to setup/modify/release measurements, to add/modify/release SCells and cell groups, to add/modify/release conditional handover configuration, to add/modify/release conditional PSCell change or conditional PSCell addition configuration. As part of the procedure, NAS dedicated information may be transferred from the Network to the UE.

RRC reconfiguration to perform reconfiguration with sync includes, but is not limited to, the following cases:

- reconfiguration with sync and security key refresh, involving RA to the PCell/PSCell, MAC reset, refresh of security and re-establishment of RLC and PDCP triggered by explicit L2 indicators;

- reconfiguration with sync but without security key refresh, involving RA to the PCell/PSCell, MAC reset and RLC re-establishment and PDCP data recovery (for AM DRB or AM MRB) triggered by explicit L2 indicators.

- reconfiguration with sync for DAPS and security key refresh, involving RA to the target PCell, establishment of target MAC, and

- for non-DAPS bearer: refresh of security and re-establishment of RLC and PDCP triggered by explicit L2 indicators;

- for DAPS bearer: establishment of RLC for the target PCell, refresh of security and reconfiguration of PDCP to add the ciphering function, the integrity protection function and ROHC function of the target PCell;

- for SRB: refresh of security and establishment of RLC and PDCP for the target PCell;

- reconfiguration with sync for DAPS but without security key refresh, involving RA to the target PCell, establishment of target MAC, and

- for non-DAPS bearer: RLC re-establishment and PDCP data recovery (for AM DRB or AM MRB) triggered by explicit L2 indicators.

- for DAPS bearer: establishment of RLC for target PCell, reconfiguration of PDCP to add the ciphering function, the integrity protection function and ROHC function of the target PCell;

- for SRB: establishment of RLC and PDCP for the target PCell.

In (NG)EN-DC and NR-DC, SRB3 can be used for measurement configuration and reporting, for UE assistance (re-)configuration and reporting for power savings, for IP address (re-)configuration and reporting for IAB-nodes, to (re-)configure MAC, RLC, BAP, physical layer and RLF timers and constants of the SCG configuration, and to reconfigure PDCP for DRBs associated with the S-KgNB or SRB3, and to reconfigure SDAP for DRBs associated with S-KgNB in NGEN-DC and NR-DC, and to add/modify/release conditional PSCell change configuration, provided that the (re-)configuration does not require any MN involvement, and to transmit RRC messages between the MN and the UE during fast MCG link recovery. In (NG)EN-DC and NR-DC, only *measConfig*, *radioBearerConfig, conditionalReconfiguration, bap-Config*, *iab-IP-AddressConfigurationList, otherConfig* and/or *secondaryCellGroup* are included in *RRCReconfiguration* received via SRB3, except when *RRCReconfiguration* is received within *DLInformationTransferMRDC*.

#### 5.3.5.2 Initiation

The Network may initiate the RRC reconfiguration procedure to a UE in RRC\_CONNECTED. The Network applies the procedure as follows:

- the establishment of RBs (other than SRB1, that is established during RRC connection establishment) is performed only when AS security has been activated;

- the establishment of BH RLC Channels for IAB is performed only when AS security has been activated;

- the establishment of Uu Relay RLC channels for L2 U2N Relay UE is performed only when AS security has been activated;

- the addition of Secondary Cell Group and SCells is performed only when AS security has been activated;

- the *reconfigurationWithSync* is included in *secondaryCellGroup* only when at least one RLC bearer or BH RLC channel is setup in SCG;

- the *reconfigurationWithSync* is included in *masterCellGroup* only when AS security has been activated, and SRB2 with at least one DRB or multicast MRB or, for IAB, SRB2, are setup and not suspended;

- the *conditionalReconfiguration* for CPC is included only when at least one RLC bearer is setup in SCG;

- the *conditionalReconfiguration* for CHO or CPA is included only when AS security has been activated, and SRB2 with at least one DRB or, for IAB, SRB2, are setup and not suspended.

#### 5.3.5.3 Reception of an *RRCReconfiguration* by the UE

The UE shall perform the following actions upon reception of the *RRCReconfiguration,* or upon execution of the conditional reconfiguration (CHO, CPA or CPC):

1> if the *RRCReconfiguration* was received neither within *mrdc-SecondaryCellGroup* nor within E-UTRA *RRCConnectionReconfiguration* nor within E-UTRA *RRCConnectionResume*:

2> if the *RRCReconfiguration* includes the *scg-State*:

3> perform SCG deactivation as specified in 5.3.5.13b;

2> else:

3> perform SCG activation as specified in 5.3.5.13a;

Editor's note: FFS how to ensure that the notification to MAC is only processed at the time the SCG configuration is processed, if included.

1> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution upon cell selection performed while timer T311 was running, as defined in 5.3.7.3:

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

1> if the *RRCReconfiguration* includes the *daps-SourceRelease*:

2> reset the source MAC and release the source MAC configuration;

2> for each DAPS bearer:

3> release the RLC entity or entities as specified in TS 38.322 [4], clause 5.1.3, and the associated logical channel for the source SpCell;

3> reconfigure the PDCP entity to release DAPS as specified in TS 38.323 [5];

2> for each SRB:

3> release the PDCP entity for the source SpCell;

3> release the RLC entity as specified in TS 38.322 [4], clause 5.1.3, and the associated logical channel for the source SpCell;

2> release the physical channel configuration for the source SpCell;

2> discard the keys used in the source SpCell (the KgNB key, the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key), if any;

1> if the *RRCReconfiguration* is received via other RAT (i.e., inter-RAT handover to NR):

2> if the *RRCReconfiguration* does not include the *fullConfig* and the UE is connected to 5GC (i.e., delta signalling during intra 5GC handover):

3> re-use the source RAT SDAP and PDCP configurations if available (i.e., current SDAP/PDCP configurations for all RBs from source E-UTRA RAT prior to the reception of the inter-RAT HO *RRCReconfiguration* message);

1> else:

2> if the RRCReconfiguration includes the fullConfig:

3> perform the full configuration procedure as specified in 5.3.5.11;

1> if the *RRCReconfiguration* includes the *masterCellGroup*:

2> perform the cell group configuration for the received *masterCellGroup* according to 5.3.5.5;

1> if the *RRCReconfiguration* includes the *masterKeyUpdate*:

2> perform AS security key update procedure as specified in 5.3.5.7;

1> if the *RRCReconfiguration* includes the *sk-Counter*:

2> perform security key update procedure as specified in 5.3.5.7;

1> if the *RRCReconfiguration* includes the *secondaryCellGroup*:

2> perform the cell group configuration for the SCG according to 5.3.5.5;

1> if the *RRCReconfiguration* includes the *mrdc-SecondaryCellGroupConfig:*

2> if the *mrdc-SecondaryCellGroupConfig* is set to *setup*:

3> if the *mrdc-SecondaryCellGroupConfig* includes *mrdc-ReleaseAndAdd*:

4> perform MR-DC release as specified in clause 5.3.5.10;

3> if the received *mrdc-SecondaryCellGroup* is set to *nr-SCG*:

4> perform the RRC reconfiguration according to 5.3.5.3 for the *RRCReconfiguration* message included in *nr-SCG*;

3> if the received *mrdc-SecondaryCellGroup* is set to *eutra-SCG*:

4> perform the RRC connection reconfiguration as specified in TS 36.331 [10], clause 5.3.5.3 for the *RRCConnectionReconfiguration* message included in *eutra-SCG*;

2> else (*mrdc-SecondaryCellGroupConfig* is set to *release*):

3> perform MR-DC release as specified in clause 5.3.5.10;

1> if the *RRCReconfiguration* message includes the *radioBearerConfig*:

2> perform the radio bearer configuration according to 5.3.5.6;

1> if the *RRCReconfiguration* message includes the *radioBearerConfig2*:

2> perform the radio bearer configuration according to 5.3.5.6;

1> if the *RRCReconfiguration* message includes the *measConfig*:

2> perform the measurement configuration procedure as specified in 5.5.2;

1> if the *RRCReconfiguration* message includes the *dedicatedNAS-MessageList*:

2> forward each element of the *dedicatedNAS-MessageList* to upper layers in the same order as listed;

1> if the *RRCReconfiguration* message includes the *dedicatedSIB1-Delivery*:

2> perform the action upon reception of *SIB1* as specified in 5.2.2.4.2;

NOTE 0: If this *RRCReconfiguration* is associated to the MCG and includes *reconfigurationWithSync* in *spCellConfig* and *dedicatedSIB1-Delivery*, the UE initiates (if needed) the request to acquire required SIBs, according to clause 5.2.2.3.5, only after the random access procedure towards the target SpCell is completed.

1> if the *RRCReconfiguration* message includes the *dedicatedSystemInformationDelivery*:

2> perform the action upon reception of System Information as specified in 5.2.2.4;

1> if the *RRCReconfiguration* message includes the *dedicatedPosSysInfoDelivery*:

2> perform the action upon reception of the contained posSIB(s), as specified in clause 5.2.2.4.16;

1> if the *RRCReconfiguration* message includes the *otherConfig*:

2> perform the other configuration procedure as specified in 5.3.5.9;

1> if the *RRCReconfiguration* message includes the *bap-Config*:

2> perform the BAP configuration procedure as specified in 5.3.5.12;

1> if the *RRCReconfiguration* message includes the *iab-IP-AddressConfigurationList*:

2> if *iab-IP-AddressToReleaseList* is included:

3> perform release of IP address as specified in 5.3.5.12a.1.1;

2> if *iab-IP-AddressToAddModList* is included:

3> perform IAB IP address addition/update as specified in 5.3.5.12a.1.2;

1> if the *RRCReconfiguration* message includes the *conditionalReconfiguration*:

2> perform conditional reconfiguration as specified in 5.3.5.13;

1> if the *RRCReconfiguration* message includes the *needForGapsConfigNR*:

2> if *needForGapsConfigNR* is set to *setup*:

3> consider itself to be configured to provide the measurement gap requirement information of NR target bands;

2> else:

3> consider itself not to be configured to provide the measurement gap requirement information of NR target bands;

1> if the *RRCReconfiguration* message includes the *needForNCSG-ConfigNR*:

2> if *needForNCSG-ConfigNR* is set to *setup*:

3> consider itself to be configured to provide the measurement gap and NCSG requirement information of NR target bands;

2> else:

3> consider itself not to be configured to provide the measurement gap and NCSG requirement information of NR target bands;

1> if the *RRCReconfiguration* message includes the *needForNCSG-ConfigEUTRA*:

2> if *needForNCSG-ConfigEUTRA* is set to *setup*:

3> consider itself to be configured to provide the measurement gap and NCSG requirement information of E‑UTRA target bands;

2> else:

3> consider itself not to be configured to provide the measurement gap and NCSG requirement information of E‑UTRA target bands;

1> if the *RRCReconfiguration* message includes the *sl-ConfigDedicatedNR*:

2> perform the sidelink dedicated configuration procedure as specified in 5.3.5.14;

NOTE 0a: If the *sl-ConfigDedicatedNR* was received embedded within an E-UTRA *RRCConnectionReconfiguration* message, the UE does not build an NR *RRCReconfigurationComplete* message for the received *sl-ConfigDedicatedNR*.

1> if the *RRCReconfiguration* message includes the *sl-L2RelayUEConfig*:

2> perform the L2 U2N Relay UE configuration procedure as specified in 5.3.5.15;

1> if the *RRCReconfiguration* message includes the *sl-L2RemoteUEConfig*:

2> perform the L2 U2N Remote UE configuration procedure as specified in 5.3.5.16;

1> if the *RRCReconfiguration* message includes the *dedicatedPagingDelivery*:

2> if the *ue-Identity* included in the *PagingRecord* in the *Paging* message matches the UE identity in *sl-PagingIdentity-RemoteUE* in *sl-PagingInfo-RemoteUE* received in *RemoteUEInformationSidelink* message in accordance with 5.8.9.8.3:

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

1> if the *RRCReconfiguration* message includes the *sl-ConfigDedicatedEUTRA-Info*:

2> perform related procedures for V2X sidelink communication in accordance with TS 36.331 [10], clause 5.3.10 and clause 5.5.2;

1> if the *RRCReconfiguration* message includes the *ul-GapFR2-Config*:

2> perform the FR2 UL gap configuration procedure as specified in 5.3.5.13c;

1> if the *RRCReconfiguration* message includes the *musim-GapConfig*:

2> perform the MUSIM gap configuration procedure as specified in 5.3.5.x;

1> if the *RRCReconfiguration* message includes the *appLayerMeasConfig*:

2> perform the application layer measurement configuration procedure as specified in 5.3.5.13d;

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

2> if the *RRCReconfiguration* includes the *masterCellGroup* containing the *reportUplinkTxDirectCurrent*:

3> include the *uplinkTxDirectCurrentList* for each MCG serving cell with UL;

3> include *uplinkDirectCurrentBWP-SUL* for each MCG serving cell configured with SUL carrier, if any, within the *uplinkTxDirectCurrentList*;

2> if the *RRCReconfiguration* includes the *masterCellGroup* containing the *reportUplinkTxDirectCurrentTwoCarrier*:

3> include in the *uplinkTxDirectCurrentTwoCarrierList* the list of uplink Tx DC locations for the configured intra-band uplink carrier aggregation in the MCG;

2> if the *RRCReconfiguration* includes the *secondaryCellGroup* containing the *reportUplinkTxDirectCurrent*:

3> include the *uplinkTxDirectCurrentList* for each SCG serving cell with UL;

3> include *uplinkDirectCurrentBWP-SUL* for each SCG serving cell configured with SUL carrier, if any, within the *uplinkTxDirectCurrentList*;

2> if the *RRCReconfiguration* includes the *secondaryCellGroup* containing the *reportUplinkTxDirectCurrentTwoCarrier*:

3> include in the *uplinkTxDirectCurrentTwoCarrierList* the list of uplink Tx DC locations for the configured intra-band uplink carrier aggregation in the SCG;

NOTE 0b: It is expected that the *reportUplinkTxDirectCurrentTwoCarrier* is only received either in *masterCellGroup* or in *secondaryCellGroup* but not both.

2> if the *RRCReconfiguration* message includes the *mrdc-SecondaryCellGroupConfig* with *mrdc-SecondaryCellGroup* set to *eutra-SCG*:

3> include in the *eutra-SCG-Response* the E-UTRA *RRCConnectionReconfigurationComplete* message in accordance with TS 36.331 [10] clause 5.3.5.3;

2> if the *RRCReconfiguration* message includes the *mrdc-SecondaryCellGroupConfig* with *mrdc-SecondaryCellGroup* set to *nr-SCG*:

3> include in the *nr-SCG-Response* the SCG *RRCReconfigurationComplete* message;

3> if the *RRCReconfiguration* message is applied due to conditional reconfiguration execution:

4> include in the *selectedCondRRCReconfig* the *condReconfigId* for the selected cell of conditional reconfiguration execution;

2> if the *RRCReconfiguration* includes the *reconfigurationWithSync* in *spCellConfig* of an MCG:

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

4> if the *sigLoggedMeasType* in *VarLogMeasReport* is included:

5> include the *sigLogMeasConfigAvailable* in the *RRCReconfigurationComplete* message and set it according to the following:

6> if T330 timer is running:

7> set *sigLogMeasConfigAvailable* to *true* in the *RRCReconfigurationComplete* message;

6> else:

7> set *sigLogMeasConfigAvailable* to false in the *RRCReconfigurationComplete* message;

4> include the *logMeasAvailable* in the *RRCReconfigurationComplete* message;

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

5> include the *logMeasAvailableBT* in the *RRCReconfigurationComplete* message;

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

5> include the *logMeasAvailableWLAN* in the *RRCReconfigurationComplete* message;

3> if the *sigLoggedMeasType* in *VarLogMeasReport* is included:

4> if T330 timer is running:

5> set *sigLogMeasConfigAvailable* to *true* in the *RRCReconfigurationComplete* message;

4> else:

5> if the UE has logged measurements available for NR:

6> set *sigLogMeasConfigAvailable* to false in the *RRCReconfigurationComplete* message;

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

4> include *connEstFailInfoAvailable* in the *RRCReconfigurationComplete* message;

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

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

4> include *rlf-InfoAvailable* in the *RRCReconfigurationComplete* message;

3> if the UE was configured with *successHO-Config* when connected to the source PCell; and

3> if the applied *RRCReconfiguration* is not due to a conditional reconfiguration execution upon cell selection performed while timer T311 was running, as defined in 5.3.7.3:

4> perform the actions for the successful handover report determination as specified in clause 5.7.10.6, upon successfully completing the Random Access procedure triggered for the *reconfigurationWithSync* in *spCellConfig* of the MCG;

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

4> include *successHO-InfoAvailable* in the *RRCReconfigurationComplete* message;

2> if the *RRCReconfiguration* message was received via SRB1, but not within *mrdc-SecondaryCellGroup* or E-UTRA *RRCConnectionReconfiguration* or E-UTRA *RRCConnectionResume*:

3> if the UE is configured to provide the measurement gap requirement information of NR target bands:

4> if the *RRCReconfiguration* message includes the *needForGapsConfigNR*; or

4> if the *NeedForGapsInfoNR* information is changed compared to last time the UE reported this information:

5> include the *NeedForGapsInfoNR* and set the contents as follows:

6> include *intraFreq-needForGap* and set the gap requirement information of intra-frequency measurement for each NR serving cell;

6> if *requestedTargetBandFilterNR* is configured, for each supported NR band that is also included in *requestedTargetBandFilterNR*, include an entry in *interFreq-needForGap* and set the gap requirement information for that band; otherwise, include an entry in *interFreq-needForGap* and set the corresponding gap requirement information for each supported NR band;

3> if the UE is configured to provide the measurement gap and NCSG requirement information of NR target bands:

4> if the *RRCReconfiguration* message includes the *needForNCSG-ConfigNR*; or

4> if the *needForNCSG-InfoNR* information is changed compared to last time the UE reported this information:

5> include the *NeedForNCSG-InfoNR* and set the contents as follows:

6> include *intraFreq-needForNCSG* and set the gap and NCSG requirement information of intra-frequency measurement for each NR serving cell;

6> if *requestedTargetBandFilterNCSG-NR* is configured, for each supported NR band included in *requestedTargetBandFilterNCSG-NR*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band; otherwise, include an entry for each supported NR band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

3> if the UE is configured to provide the measurement gap and NCSG requirement information of E‑UTRA target bands:

4> if the *RRCReconfiguration* message includes the *needForNCSG-ConfigEUTRA*; or

4> if the *needForNCSG-InfoEUTRA* information is changed compared to last time the UE reported this information:

5> include the *NeedForNCSG-InfoEUTRA* and set the contents as follows:

6> if *requestedTargetBandFilterNCSG-EUTRA* is configured, for each supported E-UTRA band included in *requestedTargetBandFilterNCSG-EUTRA*, include an entry in *needForNCSG-EUTRA* and set the NCSG requirement information for that band; otherwise, include an entry for each supported E-UTRA band in *needForNCSG-EUTRA* and set the corresponding NCSG requirement information;

1> if the UE is configured with E-UTRA *nr-SecondaryCellGroupConfig* (UE in (NG)EN-DC):

2> if the *RRCReconfiguration* message was received via E-UTRA SRB1 as specified in TS 36.331 [10]; or

2> if the *RRCReconfiguration* message was received via E-UTRA RRC message *RRCConnectionReconfiguration* within *MobilityFromNRCommand* (handover from NR standalone to (NG)EN-DC);

3> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution for CPC which is configured via *conditionalReconfiguration* contained in *nr-SecondaryCellGroupConfig* specified in TS 36.331 [10]:

4> submit the *RRCReconfigurationComplete* message via the E-UTRA MCG embedded in E-UTRA RRC message *ULInformationTransferMRDC* as specified in TS 36.331 [10], clause 5.6.2a.

3> else if the *RRCReconfiguration* message was included in E-UTRA *RRCConnectionResume* message:

4> submit the *RRCReconfigurationComplete* message via E-UTRA embedded in E-UTRA RRC message *RRCConnectionResumeComplete* as specified in TS 36.331 [10], clause 5.3.3.4a;

3> else:

4> submit the *RRCReconfigurationComplete* via E-UTRA embedded in E-UTRA RRC message *RRCConnectionReconfigurationComplete* as specified in TS 36.331 [10], clause 5.3.5.3/5.3.5.4/5.4.2.3;

3> if the *scg-State* is not included in the E-UTRA *RRCConnectionReconfiguration* message containing the *RRCReconfiguration* message:

4> if *reconfigurationWithSync* was included in *spCellConfig* of an SCG; or

4> if the SCG was deactivated before the reception of the E-UTRA RRC message containing the *RRCReconfiguration* message and lower layers consider that a Random Access procedure is needed for SCG activation:

5> initiate the Random Access procedure on the SpCell, as specified in TS 38.321 [3];

4> else:

5> the procedure ends;

3> else:

4> the procedure ends;

2> if the *RRCReconfiguration* message was received within *nr-SecondaryCellGroupConfig* in *RRCConnectionReconfiguration* message received via SRB3 within *DLInformationTransferMRDC*:

3> submit the *RRCReconfigurationComplete* via E-UTRA embedded in E-UTRA RRC message *RRCConnectionReconfigurationComplete* as specified in TS 36.331 [10], clause 5.3.5.3/5.3.5.4;

3> if *reconfigurationWithSync* was included in *spCellConfig* of an SCG:

4> initiate the Random Access procedure on the SpCell, as specified in TS 38.321 [3];

3> else:

4> the procedure ends;

NOTE 1: The order the UE sends the *RRCConnectionReconfigurationComplete* message and performs the Random Access procedure towards the SCG is left to UE implementation.

2> else (*RRCReconfiguration* was received via SRB3) but not within *DLInformationTransferMRDC*:

3> submit the *RRCReconfigurationComplete* message via SRB3 to lower layers for transmission using the new configuration;

NOTE 2: In (NG)EN-DC and NR-DC, in the case *RRCReconfiguration* is received via SRB1 or within *DLInformationTransferMRDC* via SRB3, the random access is triggered by RRC layer itself as there is not necessarily other UL transmission. In the case *RRCReconfiguration* is received via SRB3 but not within *DLInformationTransferMRDC*, the random access is triggered by the MAC layer due to arrival of *RRCReconfigurationComplete*.

1> else if the *RRCReconfiguration* message was received via SRB1 within the *nr-SCG* within *mrdc-SecondaryCellGroup* (UE in NR-DC, *mrdc-SecondaryCellGroup* was received in *RRCReconfiguration* or *RRCResume* via SRB1):

2> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution for CPC which is configured via *conditionalReconfiguration* contained in *nr-SCG* within *mrdc-SecondaryCellGroup*:

3> submit the *RRCReconfigurationComplete* message via the NR MCG embedded in NR RRC message *ULInformationTransferMRDC* as specified in clause 5.7.2a.3.

2> if the *scg-State* is not included in the *RRCReconfiguration* or *RRCResume* message containing the *RRCReconfiguration* message:

3> if *reconfigurationWithSync* was included in *spCellConfig* in nr-SCG; or

3> if the SCG was deactivated before the reception of the NR RRC message containing the *RRCReconfiguration* message and lower layers consider that a Random Access procedure is needed for SCG activation:

4> initiate the Random Access procedure on the PSCell, as specified in TS 38.321 [3];

3> else:

4> the procedure ends;

2> else

3> the procedure ends;

NOTE 2a: The order in which the UE sends the *RRCReconfigurationComplete* message and performs the Random Access procedure towards the SCG is left to UE implementation.

1> else if the *RRCReconfiguration* message was received via SRB3 (UE in NR-DC):

2> if the *RRCReconfiguration* message was received within *DLInformationTransferMRDC*:

3> if the *RRCReconfiguration* message was received within the *nr-SCG* within *mrdc-SecondaryCellGroup* (NR SCG RRC Reconfiguration):

4> if *reconfigurationWithSync* was included in *spCellConfig* in *nr-SCG*:

5> initiate the Random Access procedure on the PSCell, as specified in TS 38.321 [3];

4> else:

5> the procedure ends;

3> else:

4> submit the *RRCReconfigurationComplete* message via SRB1 to lower layers for transmission using the new configuration;

2> else:

3> submit the *RRCReconfigurationComplete* message via SRB3 to lower layers for transmission using the new configuration;

1> else(*RRCReconfiguration* was received via SRB1):

2> submit the *RRCReconfigurationComplete* message via SRB1 to lower layers for transmission using the new configuration;

2> if this is the first *RRCReconfiguration* message after successful completion of the RRC re-establishment procedure:

3> resume SRB2, SRB4, and DRBs, multicast MRB, and BH RLC channels for IAB-MT, that are suspended;

1> if *reconfigurationWithSync* was included in *spCellConfig* of an MCG or SCG, and when MAC of an NR cell group successfully completes a Random Access procedure triggered above:

2> stop timer T304 for that cell group;

2> stop timer T310 for source SpCell if running;

2> apply the parts of the CSI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the respective target SpCell, if any;

2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the respective target SpCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of that target SpCell;

2> for each DRB configured as DAPS bearer, request uplink data switching to the PDCP entity, as specified in TS 38.323 [5];

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an MCG:

3> if T390 is running:

4> stop timer T390 for all access categories;

4> perform the actions as specified in 5.3.14.4.

3> if T350 is running:

4> stop timer T350;

3> if *RRCReconfiguration* does not include *dedicatedSIB1-Delivery* and

3> if the active downlink BWP, which is indicated by the *firstActiveDownlinkBWP-Id* for the target SpCell of the MCG, has a common search space configured by *searchSpaceSIB1*:

4> acquire the *SIB1*, which is scheduled as specified in TS 38.213 [13], of the target SpCell of the MCG;

4> upon acquiring *SIB1*, perform the actions specified in clause 5.2.2.4.2;

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an MCG; or

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an SCG and the CPA or CPC was configured

3> remove all the entries within *VarConditionalReconfig*, if any;

3> remove all the entries within *VarConditionalReconfiguration* as specified in TS 36.331 [10], clause 5.3.5.9.6, if any;

3> for each *measId* of the source SpCell configuration, if the associated *reportConfig* has a *reportType* set to *condTriggerConfig*:

4> for the associated *reportConfigId*:

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

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

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

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

2> if *reconfigurationWithSync* was included in *masterCellGroup* or *secondaryCellGroup*:

3> if the UE initiated transmission of a *UEAssistanceInformation* message for the corresponding cell group during the last 1 second, and the UE is still configured to provide the concerned UE assistance information for the corresponding cell group; or

3> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution, and the UE is configured to provide UE assistance information for the corresponding cell group, and the UE has initiated transmission of a *UEAssistanceInformation* message for the corresponding cell group since it was configured to do so in accordance with 5.7.4.2:

4> initiate transmission of a *UEAssistanceInformation* message for the corresponding cell group in accordance with clause 5.7.4.3 to provide the concerned UE assistance information;

4> start or restart the prohibit timer (if exists) or the leave without response timer for the MUSIM associated with the concerned UE assistance information with the timer value set to the value in corresponding configuration;

3> if *SIB12* is provided by the target PCell; and the UE initiated transmission of a *SidelinkUEInformationNR* message indicating a change of NR sidelink communication related parameters relevant in target PCell (i.e. change of *sl-RxInterestedFreqList* or *sl-TxResourceReqList*) during the last 1 second preceding reception of the *RRCReconfiguration* message including *reconfigurationWithSync* in *spCellConfig* of an MCG; or

3> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution and the UE is capable of NR sidelink communication and *SIB12* is provided by the target PCell, and the UE has initiated transmission of a *SidelinkUEInformationNR* message since it was configured to do so in accordance with 5.8.3.2:

4> initiate transmission of the *SidelinkUEInformationNR* message in accordance with 5.8.3.3;

2> the procedure ends.

NOTE 3: The UE is only required to acquire broadcasted *SIB1* if the UE can acquire it without disrupting unicast or MBS multicast data reception, i.e. the broadcast and unicast/MBS multicast beams are quasi co-located.

NOTE 4: The UE sets the content of *UEAssistanceInformation* according to latest configuration (i.e. the configuration after applying the *RRCReconfiguration* message) and latest UE preference. The UE may include more than the concerned UE assistance information within the *UEAssistanceInformation* according to 5.7.4.2. Therefore, the content of *UEAssistanceInformation* message might not be the same as the content of the previous *UEAssistanceInformation* message.

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#### 5.3.5.9 Other configuration

The UE shall:

1> if the received *otherConfig* includes the *delayBudgetReportingConfig*:

2> if *delayBudgetReportingConfig* is set to *setup*:

3> consider itself to be configured to send delay budget reports in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to send delay budget reports and stop timer T342, if running.

1> if the received *otherConfig* includes the *overheatingAssistanceConfig*:

2> if *overheatingAssistanceConfig* is set to *setup*:

3> consider itself to be configured to provide overheating assistance information in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide overheating assistance information and stop timer T345, if running;

1> if the received *otherConfig* includes the *idc-AssistanceConfig*:

2> if *idc-AssistanceConfig* is set to *setup*:

3> consider itself to be configured to provide IDC assistance information in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide IDC assistance information;

1> if the received *otherConfig* includes the *drx-PreferenceConfig*:

2> if *drx-PreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide its preference on DRX parameters for power saving for the cell group in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide its preference on DRX parameters for power saving for the cell group and stop timer T346a associated with the cell group, if running;

1> if the received *otherConfig* includes the *maxBW-PreferenceConfig*:

2> if *maxBW-PreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide its preference on the maximum aggregated bandwidth for power saving for the cell group in accordance with 5.7.4;

3> if *otherConfig* includes *maxBW-PreferenceConfigFR2-2*:

4> consider itself to be configured to provide its preference on the maximum aggregated bandwidth for FR2-2 for power saving for the cell group in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide its preference on the maximum aggregated bandwidth for power saving for the cell group and stop timer T346b associated with the cell group, if running;

1> if the received *otherConfig* includes the *maxCC-PreferenceConfig*:

2> if *maxCC-PreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide its preference on the maximum number of secondary component carriers for power saving for the cell group in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide its preference on the maximum number of secondary component carriers for power saving for the cell group and stop timer T346c associated with the cell group, if running;

1> if the received *otherConfig* includes the *maxMIMO-LayerPreferenceConfig*:

2> if *maxMIMO-LayerPreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide its preference on the maximum number of MIMO layers for power saving for the cell group in accordance with 5.7.4;

3> if *otherConfig* includes *maxMIMO-LayerPreferenceConfigFR2-2*:

4> consider itself to be configured to provide its preference on the maximum number of MIMO layers for FR2-2 for power saving for the cell group in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide its preference on the maximum number of MIMO layers for power saving for the cell group and stop timer T346d associated with the cell group, if running;

1> if the received *otherConfig* includes the *minSchedulingOffsetPreferenceConfig*:

2> if *minSchedulingOffsetPreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide its preference on the minimum scheduling offset for cross-slot scheduling for power saving for the cell group in accordance with 5.7.4;

3> if *otherConfig* includes *minSchedulingOffsetPreferenceConfigExt*:

4> consider itself to be configured to provide its preference on the minimum scheduling offset for 480 kHz SCS and/or 960 kHz SCS for cross-slot scheduling for power saving for the cell group in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide its preference on the minimum scheduling offset for cross-slot scheduling for power saving for the cell group and stop timer T346e associated with the cell group, if running;

1> if the received *otherConfig* includes the *releasePreferenceConfig*:

2> if *releasePreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide assistance information to transition out of RRC\_CONNECTED in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide assistance information to transition out of RRC\_CONNECTED and stop timer T346f, if running.

1> if the received *otherConfig* includes the *obtainCommonLocation*:

2> include available detailed location information for any subsequent measurement report or any subsequent RLF report and SCGFailureInformation;

NOTE 1: The UE is requested to attempt to have valid detailed location information available whenever sending a measurement report for which it is configured to include available detailed location information. The UE may not succeed e.g. because the user manually disabled the GPS hardware, due to no/poor satellite coverage. Further details, e.g. regarding when to activate GNSS, are up to UE implementation.

1> if the received *otherConfig* includes the *btNameList*:

2> if *btNameList* is set to *setup*, include available Bluetooth measurement results for any subsequent measurement report or any subsequent RLF report and SCGFailureInformation;

1> if the received *otherConfig* includes the *wlanNameList*:

2> if *wlanNameList* is set to *setup*, include available WLAN measurement results for any subsequent measurement report or any subsequent RLF report and SCGFailureInformation;

1> if the received *otherConfig* includes the *sensorNameList*:

2> if *sensorNameList* is set to *setup*, include available Sensor measurement results for any subsequent measurement report or any subsequent RLF report and SCGFailureInformation;

NOTE 2: The UE is requested to attempt to have valid Bluetooth measurements, WLAN measurements and Sensor measurements whenever sending a measurement report for which it is configured to include these measurements. The UE may not succeed e.g. because the user manually disabled the WLAN or Bluetooth or Sensor hardware. Further details, e.g. regarding when to activate WLAN or Bluetooth or Sensor, are up to UE implementation.

1> if the received *otherConfig* includes the *sl-AssistanceConfigNR*:

2> consider itself to be configured to provide configured grant assistance information for NR sidelink communication in accordance with 5.7.4;

1> if the received *otherConfig* includes the *referenceTimePreferenceReporting*:

2> consider itself to be configured to provide UE reference time assistance information in accordance with 5.7.4;

1> else:

2> consider itself not to be configured to provide UE reference time assistance information;

1> if the received *otherConfig* includes the *successHO-Config*:

2> consider itself to be configured to provide the successful handover information in accordance with 5.7.10.6;

1> else:

2> consider itself not to be configured to provide the successful handover information.

1> if the received *otherConfig* includes the *ul-GapFR2-PreferenceConfig*:

2> consider itself to be configured to provide its preference on FR2 UL gap in accordance with 5.7.4;

1> else:

2> consider itself not to be configured to provide its preference on FR2 UL gap;

1> if the received *otherConfig* includes the *musim-GapAssistanceConfig*:

2> if *musim-GapAssistanceConfig* is set to *setup*:

3> consider itself to be configured to provide MUSIM assistance information for gap preference in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide MUSIM assistance information for gap preference and stop timer T346h, if running;

1> if the received *otherConfig* includes the *musim-LeaveAssistanceConfig:*

2> if *musim-LeaveAssistanceConfig* is set to *setup*:

3> consider itself to be configured to provide MUSIM assistance information for leaving RRC\_CONNECTED in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide MUSIM assistance information for leaving RRC\_CONNECTED and stop timer T346g, if running.

1> if the received *otherConfig* includes the *rlm-RelaxationReportingConfig*:

2> if *rlm-RelaxationReportingConfig* is set to *setup*:

3> consider itself to be configured to report the relaxation state of RLM measurements with 5.7.4;

2> else:

3> consider itself not to be configured to report the relaxation state of RLM measurements;

1> if the received *otherConfig* includes the *bfd-RelaxationReportingConfig*:

2> if *bfd-RelaxationReportingConfig* is set to *setup*:

3> consider itself to be configured to report the relaxation state of BFD measurements with 5.7.4;

2> else:

3> consider itself not to be configured to report the relaxation state of BFD measurements;

1> if the received *otherConfig* includes the *scg-DeactivationPreferenceConfig*:

2> if the *scg-DeactivationPreferenceConfig* is set to *setup*:

3> consider itself to be configured to provide its SCG deactivation preference in accordance with 5.7.4;

2> else:

3> consider itself not to be configured to provide its SCG deactivation preference and stop timer T346i, if running.

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#### 5.3.5.x MUSIM gap configuration

The UE shall:

1> if *musim-GapConfig* is set to *setup*:

2> for each *musim-GapId* included in the received *musim-GapToReleaseList*:

3> release the periodic MUSIM gap configuration associated with the *musim-GapId*;

2> for each *MUSIM-Gap* included in the received *musim-GapToAddModList*;

3> setup periodic MUSIM gap configuration indicated by the *MUSIM-Gap* in accordance with the received *musim-GapRepetitionAndOffset* (providing *musim-GapRepetition* and *Offset* value for the following condition) i.e. the first subframe of each periodic MUSIM gap occurs at an SFN and subframe of the NR PCell meeting the following condition:

SFN mod *T* = FLOOR(*Offset*/10);

subframe = *Offset* mod 10;

with *T* = *musim-GapRepetition*/10;

2> if *musim-AperiodicGap* is included;

3> setup aperiodic MUSIM gap configuration indicated by the *musim-AperiodicGap* in accordance with the received *musim-Starting-SFN-AndSubframe*, i.e. the first subframe of aperiodic MUSIM gap occurs at an SFN and subframe of the NR PCell meeting the following condition:

SFN = *starting-SFN*;

subframe = *startingSubframe*;

1> else if *musim-GapConfig* is set to *release*:

2> release the MUSIM gap configuration.

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### 5.3.7 RRC connection re-establishment

#### 5.3.7.1 General



Figure 5.3.7.1-1: RRC connection re-establishment, successful



Figure 5.3.7.1-2: RRC re-establishment, fallback to RRC establishment, successful

The purpose of this procedure is to re-establish the RRC connection. A UE in RRC\_CONNECTED, for which AS security has been activated with SRB2 and at least one DRB/multicast MRB setup or, for IAB, SRB2, may initiate the procedure in order to continue the RRC connection. The connection re-establishment succeeds if the network is able to find and verify a valid UE context or, if the UE context cannot be retrieved, and the network responds with an *RRCSetup* according to clause 5.3.3.4.

The network applies the procedure e.g as follows:

- When AS security has been activated and the network retrieves or verifies the UE context:

- to re-activate AS security without changing algorithms;

- to re-establish and resume the SRB1;

- When UE is re-establishing an RRC connection, and the network is not able to retrieve or verify the UE context:

- to discard the stored AS Context and release all RBs and BH RLC channels and Uu Relay RLC channels;

- to fallback to establish a new RRC connection.

If AS security has not been activated, the UE shall not initiate the procedure but instead moves to RRC\_IDLE directly, with release cause 'other'. If AS security has been activated, but SRB2 and at least one DRB or multicast MRB or, for IAB, SRB2, are not setup, the UE does not initiate the procedure but instead moves to RRC\_IDLE directly, with release cause 'RRC connection failure'.

#### 5.3.7.2 Initiation

The UE initiates the procedure when one of the following conditions is met:

1> upon detecting radio link failure of the MCG and *t316* is not configured, in accordance with 5.3.10; or

1> upon detecting radio link failure of the MCG while SCG transmission is suspended, in accordance with 5.3.10; or

1> upon detecting radio link failure of the MCG while PSCell change or PSCell addition is ongoing, in accordance with 5.3.10; or

1> upon re-configuration with sync failure of the MCG, in accordance with clause 5.3.5.8.3; or

1> upon mobility from NR failure, in accordance with clause 5.4.3.5; or

1> upon integrity check failure indication from lower layers concerning SRB1 or SRB2, except if the integrity check failure is detected on the *RRCReestablishment* message; or

1> upon an RRC connection reconfiguration failure, in accordance with clause 5.3.5.8.2; or

1> upon detecting radio link failure for the SCG while MCG transmission is suspended, in accordance with clause 5.3.10.3 in NR-DC or in accordance with TS 36.331 [10] clause 5.3.11.3 in NE-DC; or

1> upon reconfiguration with sync failure of the SCG while MCG transmission is suspended in accordance with clause 5.3.5.8.3; or

1> upon SCG change failure while MCG transmission is suspended in accordance with TS 36.331 [10] clause 5.3.5.7a; or

1> upon SCG configuration failure while MCG transmission is suspended in accordance with clause 5.3.5.8.2 in NR-DC or in accordance with TS 36.331 [10] clause 5.3.5.5 in NE-DC; or

1> upon integrity check failure indication from SCG lower layers concerning SRB3 while MCG is suspended; or

1> upon T316 expiry, in accordance with clause 5.7.3b.5; or

1> upon detecting sidelink radio link failure by L2 U2N Remote UE in RRC\_CONNECTED, in accordance with clause 5.8.9.3; or

1> upon reception of *NotificationMessageSidelink* including *indicationType* by L2 U2N Remote UE in RRC\_CONNECTED, in accordance with clause 5.8.9.10.

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

1> stop timer T312, if running;

1> stop timer T304, if running;

1> start timer T311;

1> stop timer T316, if running;

1> if UE is not configured with *conditionalReconfiguration*:

2> reset MAC;

2> release *spCellConfig*, if configured;

2> suspend all RBs, and BH RLC channels for IAB-MT, and Uu Relay RLC channels for L2 U2N Relay UE, except SRB0;

2> release the MCG SCell(s), if configured;

2> if MR-DC is configured:

3> perform MR-DC release, as specified in clause 5.3.5.10;

2> release *delayBudgetReportingConfig*, if configured and stop timer T342, if running;

2> release *overheatingAssistanceConfig*, if configured and stop timer T345, if running;

2> release *idc-AssistanceConfig*, if configured;

2> release *btNameList*, if configured;

2> release *wlanNameList*, if configured;

2> release *sensorNameList*, if configured;

2> release *drx-PreferenceConfig* for the MCG, if configured and stop timer T346a associated with the MCG, if running;

2> release *maxBW-PreferenceConfig* for the MCG, if configured and stop timer T346b associated with the MCG, if running;

2> release *maxCC-PreferenceConfig* for the MCG, if configured and stop timer T346c associated with the MCG, if running;

2> release *maxMIMO-LayerPreferenceConfig* for the MCG, if configured and stop timer T346d associated with the MCG, if running;

2> release *minSchedulingOffsetPreferenceConfig* for the MCG, if configured stop timer T346e associated with the MCG, if running;

2> release *rlm-RelaxationReportingConfig* for the MCG, if configured and stop timer T346j associated with the MCG, if running;

2> release *bfd-RelaxationReportingConfig* for the MCG, if configured and stop timer T346k associated with the MCG, if running;

2> release *releasePreferenceConfig*, if configured stop timer T346f, if running;

2> release *onDemandSIB-Request* if configured, and stop timer T350, if running;

2> release *referenceTimePreferenceReporting*, if configured;

2> release *sl-AssistanceConfigNR*, if configured;

2> release *obtainCommonLocation*, if configured;

2> release *musim-GapAssistanceConfig*, if configured and stop timer T346h, if running;

2> release *musim-LeaveAssistanceConfig*, if configured;

2> release *scg-DeactivationPreferenceConfig*, if configured, and stop timer T346i, if running;

1> release *successHO-Config*, if configured;

1> if any DAPS bearer is configured:

2> reset the source MAC and release the source MAC configuration;

2> for each DAPS bearer:

3> release the RLC entity or entities as specified in TS 38.322 [4], clause 5.1.3, and the associated logical channel for the source SpCell;

3> reconfigure the PDCP entity to release DAPS as specified in TS 38.323 [5];

2> for each SRB:

3> release the PDCP entity for the source SpCell;

3> release the RLC entity as specified in TS 38.322 [4], clause 5.1.3, and the associated logical channel for the source SpCell;

2> release the physical channel configuration for the source SpCell;

2> discard the keys used in the source SpCell (the KgNB key, the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key), if any;

1> release *sl-L2RelayUEConfig*, if configured;

1> release *sl-L2RemoteUEConfig*, if configured;

1> release the SRAP entity, if configured;

1> if the UE is connected with a L2 U2N Relay UE via PC5-RRC connection (i.e. the UE is a L2 U2N Remote UE):

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

3> perform the PC5-RRC connection release as specified in 5.8.9.5;

3> perform either cell selection in accordance with the cell selection process as specified in TS 38.304 [20], or relay selection as specified in clause 5.8.15.3, or both;

2> else maintain the PC5 RRC connection and stop T311 if running;

NOTE 1: It is up to Remote UE implementation whether to release or keep the current unicast PC5 link.

1> else:

2> perform cell selection in accordance with the cell selection process as specified in TS 38.304 [20].

NOTE 2: For L2 U2N Remote UE, if both a suitable cell and a suitable relay are available, the UE can select either one based on its implementation.

#### 5.3.7.3 Actions following cell selection while T311 is running

Upon selecting a suitable NR cell, the UE shall:

1> ensure having valid and up to date essential system information as specified in clause 5.2.2.2;

1> stop timer T311;

1> if T390 is running:

2> stop timer T390 for all access categories;

2> perform the actions as specified in 5.3.14.4;

1> if the cell selection is triggered by detecting radio link failure of the MCG or re-configuration with sync failure of the MCG or mobility from NR failure, and

1> if *attemptCondReconfig* is configured; and

1> if the selected cell is one of the candidate cells for which the *reconfigurationWithSync* is included in the *masterCellGroup* in *VarConditionalReconfig*:

2> set the *choCellId* in the *VarRLF-Report* to the global cell identity and tracking area code, if available, otherwise to the physical cell identity and carrier frequency of the selected cell;

2> apply the stored *condRRCReconfig* associated to the selected cell and perform actions as specified in 5.3.5.3;

NOTE 1: It is left to network implementation to how to avoid keystream reuse in case of CHO based recovery after a failed handover without key change.

1> else:

2> if UE is configured with *conditionalReconfiguration*:

3> reset MAC;

3> release *spCellConfig*, if configured;

3> release the MCG SCell(s), if configured;

3> release *delayBudgetReportingConfig*, if configured and stop timer T342, if running;

3> release *overheatingAssistanceConfig* , if configured and stop timer T345, if running;

3> if MR-DC is configured:

4> perform MR-DC release, as specified in clause 5.3.5.10;

3> release *idc-AssistanceConfig*, if configured;

3> release *btNameList*, if configured;

3> release *wlanNameList*, if configured;

3> release *sensorNameList*, if configured;

3> release *drx-PreferenceConfig* for the MCG, if configured and stop timer T346a associated with the MCG, if running;

3> release *maxBW-PreferenceConfig* for the MCG, if configured and stop timer T346b associated with the MCG, if running;

3> release *maxCC-PreferenceConfig* for the MCG, if configured and stop timer T346c associated with the MCG, if running;

3> release *maxMIMO-LayerPreferenceConfig* for the MCG, if configured and stop timer T346d associated with the MCG, if running;

3> release *minSchedulingOffsetPreferenceConfig* for the MCG, if configured and stop timer T346e associated with the MCG, if running;

3> release *rlm-RelaxationReportingConfig* for the MCG, if configured and stop timer T346j associated with the MCG, if running;

3> release *bfd-RelaxationReportingConfig* for the MCG, if configured and stop timer T346k associated with the MCG, if running;

3> release *releasePreferenceConfig*, if configured and stop timer T346f, if running;

3> release *onDemandSIB-Request* if configured, and stop timer T350, if running;

3> release referenceTimePreferenceReporting, if configured;

3> release *sl-AssistanceConfigNR*, if configured;

3> release *obtainCommonLocation*, if configured;

3> release *scg-DeactivationPreferenceConfig*, if configured, and stop timer T346i, if running;

3> release *musim-GapAssistanceConfig*, if configured and stop timer T346h, if running;

3> release *musim-LeaveAssistanceConfig*, if configured;

3> suspend all RBs, except SRB0;

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

2> for each *measId*, if the associated *reportConfig* has a *reportType* set to *condTriggerConfig*:

3> for the associated *reportConfigId*:

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

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

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

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

2> start timer T301;

2> apply the default L1 parameter values as specified in corresponding physical layer specifications except for the parameters for which values are provided in *SIB1*;

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

2> apply the CCCH configuration as specified in 9.1.1.2;

2> apply the *timeAlignmentTimerCommon* included in *SIB1*;

2> initiate transmission of the *RRCReestablishmentRequest* message in accordance with 5.3.7.4;

NOTE 2: This procedure applies also if the UE returns to the source PCell.

Upon selecting an inter-RAT cell, the UE shall:

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

#### 5.3.7.3a Actions following relay selection while T311 is running

Upon selecting a suitable L2 U2N Relay UE, the L2 U2N Remote UE shall:

1> ensure having valid and up to date essential system information as specified in clause 5.2.2.2;

1> stop timer T311;

1> if T390 is running:

2> stop timer T390 for all access categories;

2> perform the actions as specified in 5.3.14.4;

1> start timer T301;

1> apply the specified configuration of SL-RLC0 as specified in 9.1.1.4;

1> apply the SDAP configuration and PDCP configuration as specified in 9.1.1.2 for SRB0;

1> initiate transmission of the *RRCReestablishmentRequest* message in accordance with 5.3.7.4.

#### 5.3.7.4 Actions related to transmission of *RRCReestablishmentRequest* message

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

1> if the procedure was initiated due to radio link failure as specified in 5.3.10.3 or reconfiguration with sync failure as specified in 5.3.5.8.3:

2> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

1> set the *ue-Identity* as follows:

2> set the *c-RNTI* to the C-RNTI used in the source PCell (reconfiguration with sync or mobility from NR failure) or used in the PCell in which the trigger for the re-establishment occurred (other cases);

2> set the *physCellId* to the physical cell identity of the source PCell (reconfiguration with sync or mobility from NR failure) or of the PCell in which the trigger for the re-establishment occurred (other cases);

2> set the *shortMAC-I* to the 16 least significant bits of the MAC-I calculated:

3> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) *VarShortMAC-Input*;

3> with the KRRCint key and integrity protection algorithm that was used in the source PCell (reconfiguration with sync or mobility from NR failure) or of the PCell in which the trigger for the re-establishment occurred (other cases); and

3> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;

1> set the *reestablishmentCause* as follows:

2> if the re-establishment procedure was initiated due to reconfiguration failure as specified in 5.3.5.8.2:

3> set the *reestablishmentCause* to the value *reconfigurationFailure*;

2> else if the re-establishment procedure was initiated due to reconfiguration with sync failure as specified in 5.3.5.8.3 (intra-NR handover failure) or 5.4.3.5 (inter-RAT mobility from NR failure):

3> set the *reestablishmentCause* to the value *handoverFailure*;

2> else:

3> set the *reestablishmentCause* to the value *otherFailure*;

1> re-establish PDCP for SRB1;

1> if the UE is connected with a L2 U2N Relay UE via PC5-RRC connection (i.e. the UE is a L2 U2N Remote UE):

2> apply the default configuration of SL-RLC1 as defined in 9.2.4 for SRB1;

2> apply the default configuration of PDCP defined in 9.2.1 for SRB1;

1> else:

2> re-establish RLC for SRB1;

2> apply the default configuration defined in 9.2.1 for SRB1;

1> configure lower layers to suspend integrity protection and ciphering for SRB1;

NOTE: Ciphering is not applied for the subsequent *RRCReestablishment* message used to resume the connection. An integrity check is performed by lower layers, but merely upon request from RRC.

1> resume SRB1;

1> submit the *RRCReestablishmentRequest* message to lower layers for transmission.

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

The UE shall:

1> stop timer T301;

1> if the *RRCReestablishment* message includes the *sl-L2RemoteUEConfig* (i.e. the UE is a L2 U2N Remote UE):

2> perform the L2 U2N Remote UE configuration procedure as specified in 5.3.5.16;

1> else:

2> consider the current cell to be the PCell;

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

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

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

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

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

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

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

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

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

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

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

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

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

3> if the *sigLoggedMeasType* in *VarLogMeasReport* is included:

4> include the *sigLogMeasConfigAvailable* in the *RRCReestablishmentComplete* message and set it according to the following:

5> if T330 timer is running:

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

5> else:

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

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

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

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

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

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

2> if the *sigLoggedMeasType* in *VarLogMeasReport* is included:

3> if T330 timer is running:

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

3> else:

4> if the UE has logged measurements available for NR:

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

2> if the UE has connection establishment failure or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport* or *VarConnEstFailReportList*:

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

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

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

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

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

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

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

1> the procedure ends.

#### 5.3.7.6 T311 expiry

Upon T311 expiry, the UE shall:

1> if the procedure was initiated due to radio link failure or handover failure:

2> set the *noSuitableCellFound* in the *VarRLF-Report* to *true*;

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

#### 5.3.7.7 T301 expiry or selected cell no longer suitable

The UE shall:

1> if timer T301 expires; or

1> if the selected cell becomes no longer suitable according to the cell selection criteria as specified in TS 38.304 [20]:

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

#### 5.3.7.8 Reception of the *RRCSetup* by the UE

The UE shall:

1> perform the RRC connection establishment procedure as specified in 5.3.3.4.

### 5.3.8 RRC connection release

#### 5.3.8.1 General



Figure 5.3.8.1-1: RRC connection release, successful

The purpose of this procedure is:

- to release the RRC connection, which includes the release of the established radio bearers (except for broadcast MRBs), BH RLC channels, Uu Relay RLC channels as well as all radio resources; or

- to suspend the RRC connection only if SRB2 and at least one DRB or multicast MRB or, for IAB, SRB2, are setup, which includes the suspension of the established radio bearers.

#### 5.3.8.2 Initiation

The network initiates the RRC connection release procedure to transit a UE in RRC\_CONNECTED to RRC\_IDLE; or to transit a UE in RRC\_CONNECTED to RRC\_INACTIVE only if SRB2 and at least one DRB or multicast MRB or, for IAB, SRB2, is setup in RRC\_CONNECTED; or to transit a UE in RRC\_INACTIVE back to RRC\_INACTIVE when the UE tries to resume; or to transit a UE in RRC\_INACTIVE to RRC\_IDLE when the UE tries to resume. The procedure can also be used to release and redirect a UE to another frequency.

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

The UE shall:

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

1> stop timer T380, if running;

1> stop timer T320, if running;

1> if timer T316 is running;

2> stop timer T316;

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

1> stop timer T350, if running;

1> stop timer T346g, if running;

1> if theAS security is not activated:

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

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

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

2> if *cnType* is included:

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

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

2> if *voiceFallbackIndication* is included:

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

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

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

2> if the *t320* is included:

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

1> else:

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

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

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

2> store the *deprioritisationReq* until T325 expiry;

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

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

2> if T331 is running:

3> stop timer T331;

3> perform the actions as specified in 5.7.8.3;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4> consider the DRB to be configured for SDT;

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

4> consider the SRB2 to be configured for SDT;

3> for each of the RLC bearer that is part of the UE configuration:

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

3> for SRB2, if it is resumed and for SRB1:

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

3> if configured grant resources for SDT are configured:

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

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

2> for each *measId*, if the associated *reportConfig* has a *reportType* set to *condTriggerConfig*:

3> for the associated *reportConfigId*:

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

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

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

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

2> re-establish RLC entities for SRB1;

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

3> stop the timer T319 if running;

3> stop timer T319a if running;

3> in the stored UE Inactive AS context:

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

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

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

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

5> replace the physical cell identitywith the value of the *sl-PhysCellId*;

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

4> else:

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

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

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

2> else:

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

- parameters within *ReconfigurationWithSync* of the PCell;

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

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

- *servingCellConfigCommonSIB*;

- *sl-L2RelayUEConfig*, if configured;

- *sl-L2RemoteUEConfig*, if configured;

3> store any previously or subsequently received application layer measurement reports for which no segment, or full message, has been submitted to lower layers for transmission;

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

2> suspend all SRB(s) and DRB(s) and multicast MRB(s), except SRB0;

2> indicate PDCP suspend to lower layers of all DRBs and multicast MRBs;

2> if the *t380* is included:

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

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

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

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

2> if T390 is running:

3> stop timer T390 for all access categories;

3> perform the actions as specified in 5.3.14.4;

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

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

1> else

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

#### 5.3.8.4 T320 expiry

The UE shall:

1> if T320 expires:

2> if stored, discard the cell reselection priority information provided by the *cellReselectionPriorities* or inherited from another RAT;

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

#### 5.3.8.5 UE actions upon the expiry of *DataInactivityTimer*

Upon receiving the expiry of *DataInactivityTimer* from lower layers while in RRC\_CONNECTED, the UE shall:

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

#### 5.3.8.6 T346g expiry

The UE shall:

1> if T346g expires:

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

### 5.3.9 RRC connection release requested by upper layers

#### 5.3.9.1 General

The purpose of this procedure is to release the RRC connection. Access to the current PCell may be barred as a result of this procedure.

#### 5.3.9.2 Initiation

The UE initiates the procedure when upper layers request the release of the RRC connection as specified in TS 24.501 [23]. The UE shall not initiate the procedure for power saving purposes.

The UE shall:

1> if the upper layers indicate barring of the PCell:

2> treat the PCell used prior to entering RRC\_IDLE as barred according to TS 38.304 [20];

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

-------------------------------------------Skip Unchanged -------------------------------------------

## 5.7 Other

-------------------------------------------Skip Unchanged -------------------------------------------

### 5.7.4 UE Assistance Information

#### 5.7.4.1 General



Figure 5.7.4.1-1: UE Assistance Information

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

- its delay budget report carrying desired increment/decrement in the connected mode DRX cycle length, or;

- its overheating assistance information, or;

- its IDC assistance information, or;

- its preference on DRX parameters for power saving, or;

- its preference on the maximum aggregated bandwidth for power saving, or;

- its preference on the maximum number of secondary component carriers for power saving, or;

- its preference on the maximum number of MIMO layers for power saving, or;

- its preference on the minimum scheduling offset for cross-slot scheduling for power saving, or;

- its preference on the RRC state, or;

- configured grant assistance information for NR sidelink communication, or;

- its preference in being provisioned with reference time information, or;

- its preference for FR2 UL gap, or;

- its preference to transition out of RRC\_CONNECTED state for MUSIM operation, or;

- its preference on the MUSIM gaps, or;

- its relaxation state for RLM measurements, or;

- its relaxation state for BFD measurements, or;

- availability of data mapped to radio bearers which are not configured for SDT, or;

- its preference for the SCG to be deactivated, or;

- indicate that the UE has uplink data to transmit for a DRB for which there is no MCG RLC bearer while the SCG is deactivated, or;

- change of its fulfilment status for RRM measurement relaxation criterion.

#### 5.7.4.2 Initiation

A UE capable of providing delay budget report in RRC\_CONNECTED may initiate the procedure in several cases, including upon being configured to provide delay budget report and upon change of delay budget preference.

A UE capable of providing overheating assistance information in RRC\_CONNECTED may initiate the procedure if it was configured to do so, upon detecting internal overheating, or upon detecting that it is no longer experiencing an overheating condition.

A UE capable of providing IDC assistance information in RRC\_CONNECTED may initiate the procedure if it was configured to do so, upon detecting IDC problem if the UE did not transmit an IDC assistance information since it was configured to provide IDC indications, or upon change of IDC problem information.

A UE capable of providing its preference on DRX parameters of a cell group for power saving in RRC\_CONNECTED may initiate the procedure in several cases, if it was configured to do so, including upon having a preference on DRX parameters and upon change of its preference on DRX parameters.

A UE capable of providing its preference on the maximum aggregated bandwidth of a cell group for power saving in RRC\_CONNECTED may initiate the procedure in several cases, if it was configured to do so, including upon having a maximum aggregated bandwidth preference and upon change of its maximum aggregated bandwidth preference.

A UE capable of providing its preference on the maximum number of secondary component carriers of a cell group for power saving in RRC\_CONNECTED may initiate the procedure in several cases, if it was configured to do so, including upon having a maximum number of secondary component carriers preference and upon change of its maximum number of secondary component carriers preference.

A UE capable of providing its preference on the maximum number of MIMO layers of a cell group for power saving in RRC\_CONNECTED may initiate the procedure in several cases, if it was configured to do so, including upon having a maximum number of MIMO layers preference and upon change of its maximum number of MIMO layers preference.

A UE capable of providing its preference on the minimum scheduling offset for cross-slot scheduling of a cell group for power saving in RRC\_CONNECTED may initiate the procedure in several cases, if it was configured to do so, including upon having a minimum scheduling offset preference and upon change of its minimum scheduling offset preference.

A UE capable of providing assistance information to transition out of RRC\_CONNECTED state may initiate the procedure if it was configured to do so, upon determining that it prefers to transition out of RRC\_CONNECTED state, or upon change of its preferred RRC state.

A UE capable of providing configured grant assistance information for NR sidelink communication in RRC\_CONNECTED may initiate the procedure in several cases, including upon being configured to provide traffic pattern information and upon change of traffic patterns.

A UE capable of providing an indication of its preference in being provisioned with reference time information may initiate the procedure upon being configured to provide this indication, or if it was configured to provide this indication and upon change of its preference.

A UE capable of providing an indication of its preference in FR2 UL gap may initiate the procedure if it was configured to do so, upon detecting the need of FR2 UL gap activation/deactivation.

A UE capable of providing MUSIM assistance information for gap preference may initiate the procedure if it was configured to do so, upon determining it needs the gaps, or upon change of the gap preference information.

A UE capable of providing MUSIM assistance information for leave indication may initiate the procedure if it was configured to do so upon determining that it needs to leave RRC\_CONNECTED state.

A UE capable of relaxing its RLM measurements of a cell group in RRC\_CONNECTED state shall initiate the procedure for providing an indication of its relaxation state for RLM measurements upon being configured to do so, and upon change of its relaxation state for RLM measurements in RRC\_CONNECTED state.

A UE capable of relaxing its BFD measurements in serving cells of a cell group in RRC\_CONNECTED shall initiate the procedure for providing an indication of its relaxation state for BFD measurements upon being configured to do so, and upon change of its relaxation state for BFD measurements in RRC\_CONNECTED state.

Editor's NOTE: How to / whether to limit or remove impact of prohibit timer w.r.t. consistency between UE relaxation state and the corresponding knowledge at gNB.

A UE capable of SDT initiates this procedure when data and/or signalling mapped to radio bearers that are not configured for SDT becomes available during SDT (i.e. while T319a is running).

A UE capable of providing its preference for SCG deactivation may initiate the procedure if it was configured to do so, upon determining that it prefers or does no more prefer the SCG to be deactivated.

A UE capable of providing an indication of fulfilment of the RRM measurement relaxation criterion in connected mode may initiate the procedure upon change of its fulfilment status for RRM measurement relaxation criterion for connected mode.

Upon initiating the procedure, the UE shall:

1> if configured to provide delay budget report:

2> if the UE did not transmit a *UEAssistanceInformation* message with *delayBudgetReport* since it was configured to provide delay budget report; or

2> if the current delay budget is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *delayBudgetReport* and timer T342 is not running:

3> start or restart timer T342 with the timer value set to the *delayBudgetReportingProhibitTimer*;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide a delay budget report;

1> if configured to provide overheating assistance information:

2> if the overheating condition has been detected and T345 is not running; or

2> if the current overheating assistance information is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *overheatingAssistance* and timer T345 is not running:

3> start timer T345 with the timer value set to the *overheatingIndicationProhibitTimer*;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide overheating assistance information;

1> if configured to provide IDC assistance information:

2> if the UE did not transmit a *UEAssistanceInformation* message with *idc-Assistance* since it was configured to provide IDC assistance information:

3> if on one or more frequencies included in *candidateServingFreqListNR*, the UE is experiencing IDC problems that it cannot solve by itself; or

3> if on one or more supported UL CA combination comprising of carrier frequencies included in *candidateServingFreqListNR*, the UE is experiencing IDC problems that it cannot solve by itself:

4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide IDC assistance information;

2> else if the current IDC assistance information is different from the one indicated in the last transmission of the *UEAssistanceInformation* message:

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide IDC assistance information;

NOTE 1: The term "IDC problems" refers to interference issues applicable across several subframes/slots where not necessarily all the subframes/slots are affected.

NOTE 2: For the frequencies on which a serving cell or serving cells is configured that is activated, IDC problems consist of interference issues that the UE cannot solve by itself, during either active data exchange or upcoming data activity which is expected in up to a few hundred milliseconds.  
For frequencies on which a SCell or SCells is configured that is deactivated, reporting IDC problems indicates an anticipation that the activation of the SCell or SCells would result in interference issues that the UE would not be able to solve by itself.  
For a non-serving frequency, reporting IDC problems indicates an anticipation that if the non-serving frequency or frequencies became a serving frequency or serving frequencies then this would result in interference issues that the UE would not be able to solve by itself.

1> if configured to provide its preference on DRX parameters of a cell group for power saving:

2> if the UE has a preference on DRX parameters of the cell group and the UE did not transmit a *UEAssistanceInformation* message with *drx-Preference* for the cell group since it was configured to provide its preference on DRX parameters of the cell group for power saving; or

2> if the current *drx-Preference* information for the cell group is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *drx-Preference* for the cell group and timer T346a associated with the cell group is not running:

3> start the timer T346a with the timer value set to the *drx-PreferenceProhibitTimer* of the cell group;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the current *drx-Preference*;

1> if configured to provide its preference on the maximum aggregated bandwidth of a cell group for power saving:

2> if the UE has a preference on the maximum aggregated bandwidth of the cell group and the UE did not transmit a *UEAssistanceInformation* message with *maxBW-Preference* and/or *maxBW-PreferenceFR2-2* for the cell group since it was configured to provide its preference on the maximum aggregated bandwidth of the cell group for power saving; or

2> if the current *maxBW-Preference* information for the cell group is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *maxBW-Preference* and/or *maxBW-PreferenceFR2-2*for the cell group and timer T346b associated with the cell group is not running:

3> start the timer T346b with the timer value set to the *maxBW-PreferenceProhibitTimer* of the cell group;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the current *maxBW-Preference* and/or *maxBW-PreferenceFR2-2*;

1> if configured to provide its preference on the maximum number of secondary component carriers of a cell group for power saving:

2> if the UE has a preference on the maximum number of secondary component carriers of the cell group and the UE did not transmit a *UEAssistanceInformation* message with *maxCC-Preference* for the cell group since it was configured to provide its preference on the maximum number of secondary component carriers of the cell group for power saving; or

2> if the current *maxCC-Preference* information for the cell group is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *maxCC-Preference* for the cell group and timer T346c associated with the cell group is not running:

3> start the timer T346c with the timer value set to the *maxCC-PreferenceProhibitTimer* of the cell group;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the current *maxCC-Preference*;

1> if configured to provide its preference on the maximum number of MIMO layers of a cell group for power saving:

2> if the UE has a preference on the maximum number of MIMO layers of the cell group and the UE did not transmit a *UEAssistanceInformation* message with *maxMIMO-LayerPreference* and/or *maxMIMO-LayerPreferenceFR2-2* for the cell group since it was configured to provide its preference on the maximum number of MIMO layers of the cell group for power saving; or

2> if the current *maxMIMO-LayerPreference* information for the cell group is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *maxMIMO-LayerPreference* and/or *maxMIMO-LayerPreferenceFR2-2* for the cell group and timer T346d associated with the cell group is not running:

3> start the timer T346d with the timer value set to the *maxMIMO-LayerPreferenceProhibitTimer* of the cell group;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the current *maxMIMO-LayerPreference* and/or *maxMIMO-LayerPreferenceFR2-2*;

1> if configured to provide its preference on the minimum scheduling offset for cross-slot scheduling of a cell group for power saving:

2> if the UE has a preference on the minimum scheduling offset for cross-slot scheduling of the cell group and the UE did not transmit a *UEAssistanceInformation* message with *minSchedulingOffsetPreference* and/or *minSchedulingOffsetPreferenceExt* for the cell group since it was configured to provide its preference on the minimum scheduling offset for cross-slot scheduling of the cell group for power saving; or

2> if the current *minSchedulingOffsetPreference* and/or *minSchedulingOffsetPreferenceExt* information for the cell group is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *minSchedulingOffsetPreference* and/or *minSchedulingOffsetPreferenceExt* for the cell group and timer T346e associated with the cell group is not running:

3> start the timer T346e with the timer value set to the *minSchedulingOffsetPreferenceProhibitTimer* of the cell group;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the current *minSchedulingOffsetPreference* and/or *minSchedulingOffsetPreferenceExt*;

1> if configured to provide its release preference and timer T346f is not running:

2> if the UE determines that it would prefer to transition out of RRC\_CONNECTED state; or

2> if the UE is configured with *connectedReporting* and the UE determines that it would prefer to revert an earlier indication to transition out of RRC\_CONNECTED state:

3> start timer T346f with the timer value set to the *releasePreferenceProhibitTimer*;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the release preference;

1> if configured to provide configured grant assistance information for NR sidelink communication:

2> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide configured grant assistance information for NR sidelink communication;

1> if configured to provide preference in being provisioned with reference time information:

2> if the UE did not transmit a *UEAssistanceInformation* message with *referenceTimeInfoPreference* since it was configured to provide preference; or

2> if the UE's preference changed from the last time UE initiated transmission of the *UEAssistanceInformation* message including *referenceTimeInfoPreference*:

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide preference in being provisioned with reference time information.

1> if configured to provide its preference on FR2 UL gap:

2> if the UE did not transmit a *UEAssistanceInformation* message with *ul-GapFR2-Preference* since it was configured to provide its preference on FR2 UL gap information:

3> if the UE has a preference on FR2 UL gap activation/deactivation:

4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide FR2 UL gap preference;

2> else if the current FR2 UL gap preference is different from the one indicated in the last transmission of the *UEAssistanceInformation* message:

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide FR2 UL gap preference.

1> if configured to provide MUSIM assistance information for leaving RRC\_CONNECTED:

2> if the UE needs to leave RRC\_CONNECTED state and the timer T346g is not running:

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide MUSIM assistance information for leaving RRC\_CONNECTED;

3> start the timer T346g with the timer value set to the *musim-LeaveWithoutResponseTimer*;

1> if configured to provide MUSIM assistance information for gap preference:

2> if the UE has a preference on the MUSIM gap(s) and the UE did not transmit a *UEAssistanceInformation* message with *musim-GapPreferenceList* since it was configured to provide MUSIM assistance information for gap preference; or

2> if the current *musim-GapPreferenceList* is different from the one indicated in the last transmission of the *UEAssistanceInformation* message including *musim-GapPreferenceList* and the timer T346h is not running:

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the current *musim-GapPreferenceList*;

3> start or restart the timer T346h with the timer value set to the *musim-GapProhibitTimer*.

NOTE X: The UE does not need to initiate transmission of the UAI message if the difference between the current *musim-GapPreferenceList* and the last transmission of the *UEAssistanceInformation* message including *musim-GapPreferenceList* is only due to removal of an ended aperiodic gap.

1> if configured to provide the relaxation state of RLM measurements of a cell group:

2> if the UE did not transmit a *UEAssistanceInformation* message with *rlm-MeasRelaxationState* since it was configured to provide the relaxation state of RLM measurements for the cell group; or

2> if the relaxation state of RLM measurements for the cell group has changed since the last transmission of the *UEAssistanceInformation* message including *rlm-MeasRelaxationState* of the cell group and timer T346j associated with the cell group is not running:

3> start timer T346j with the timer value set to the *rlm-RelaxtionReportingProhibitTimer*;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the relaxation state of RLM measurements of the cell group;

1> if configured to provide the relaxation state of BFD measurements of serving cells of a cell group:

2> if the UE did not transmit a *UEAssistanceInformation* message with *bfd-MeasRelaxationState* since it was configured to provide the relaxation state of BFD measurements for the cell group; or

2> if the relaxation state of BFD measurements in any serving cell of the cell group has changed since the last transmission of the *UEAssistanceInformation* message including *bfd-MeasRelaxationState* of the cell group and timer T346k associated with the cell group is not running:

3> start timer T346k with the timer value set to the *bfd-RelaxtionReportingProhibitTimer*;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the relaxation state of BFD measurements of serving cells of the cell group.

1> if data and/or signalling mapped to radio bearers not configured for SDT becomes available during SDT (i.e. while T319a is running):

2> if the UE did not transmit a *UEAssistanceInformation* message with *nonSDT-DataIndication* since the initiation of the current resume procedure for SDT:

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide *nonSDT-DataIndication*.

1> if configured to provide its preference for SCG deactivation and timer T346i is not running;

2> if the UE prefers the SCG to be deactivated and did not transmit a *UEAssistanceInformation* message with *scg-DeactivationPreference* since it was configured to provide its SCG deactivation preference; or

2> if the UE preference for SCG deactivation is different from the last indicated *scg-DeactivationPreference* since the UE was configured to provide its SCG deactivation preference:

3> start timer T346i with the timer value set to the *scg-DeactivationPreferenceProhibitTimer*;

3> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to provide the UE preference for SCG deactivation;

1> if the SCG is deactivated, and,

1> the UE has uplink data to send for an SCG RLC entity while the UE previously did not have any uplink data to send for any SCG RLC entity:

2> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to indicate that the UE has uplink data to send for a DRB whose *DRB-Identity* is not included in any *RLC-BearerConfig* in the *CellGroupConfig* associated with the MCG.

1> if configured to send indications of RRM measurement relaxation criterion fulfilment:

2> if the criterion in 5.7.4.4 is met for a period of TSearchDeltaP-StationaryConnected:

3> if the UE did not transmit a *UEAssistanceInformation* message with *rrm-MeasRelaxationFulfilment* as *true* since it was configured to provide indications of RRM measurement relaxation criterion fulfilment; or

3> the last *UEAssistanceInformation* message indicated the criterion in 5.7.4.4 is not fulfilled with *rrm-MeasRelaxationFulfilment* as *false*:

4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to indicate that the criterion for RRM measurement relaxation for connected mode is fulfilled;

2> else:

3> if the last *UEAssistanceInformation* message indicated fulfilment of the criterion in 5.7.4.4 with *rrm-MeasRelaxationFulfilment* as *true*:

4> initiate transmission of the *UEAssistanceInformation* message in accordance with 5.7.4.3 to indicate that the criterion for RRM measurement relaxation for connected mode is not fulfilled.

#### 5.7.4.3 Actions related to transmission of *UEAssistanceInformation* message

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

1> if transmission of the *UEAssistanceInformation* message is initiated to provide a delay budget report according to 5.7.4.2 or 5.3.5.3;

2> set *delayBudgetReport* to *type1* according to a desired value;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide overheating assistance information according to 5.7.4.2 or 5.3.5.3;

2> if the UE experiences internal overheating:

3> if the UE prefers to temporarily reduce the number of maximum secondary component carriers:

4> include *reducedMaxCCs* in the *OverheatingAssistance* IE;

4> set *reducedCCsDL* to the number of maximum SCells the UE prefers to be temporarily configured in downlink;

4> set *reducedCCsUL* to the number of maximum SCells the UE prefers to be temporarily configured in uplink;

3> if the UE prefers to temporarily reduce maximum aggregated bandwidth of FR1:

4> include *reducedMaxBW-FR1* in the *OverheatingAssistance* IE;

4> set *reducedBW-DL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all downlink carriers of FR1;

4> set *reducedBW-UL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all uplink carriers of FR1;

3> if the UE prefers to temporarily reduce maximum aggregated bandwidth of FR2-1:

4> include *reducedMaxBW-FR2* in the *OverheatingAssistance* IE;

4> set *reducedBW-DL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all downlink carriers of FR2-1;

4> set *reducedBW-UL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all uplink carriers of FR2-1;

3> if the UE prefers to temporarily reduce maximum aggregated bandwidth of FR2-2:

4> include *reducedMaxBW-FR2-2* in the *OverheatingAssistance IE*;

4> set *reducedBW-DL-FR2-2* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all downlink carriers of FR2-2;

4> set *reducedBW-UL-FR2-2* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all uplink carriers of FR2-2;

3> if the UE prefers to temporarily reduce the number of maximum MIMO layers of each serving cell operating on FR1:

4> include *reducedMaxMIMO-LayersFR1* in the *OverheatingAssistance* IE;

4> set *reducedMIMO-LayersFR1-DL* to the number of maximum MIMO layers of each serving cell operating on FR1 the UE prefers to be temporarily configured in downlink;

4> set *reducedMIMO-LayersFR1-UL* to the number of maximum MIMO layers of each serving cell operating on FR1 the UE prefers to be temporarily configured in uplink;

3> if the UE prefers to temporarily reduce the number of maximum MIMO layers of each serving cell operating on FR2-1:

4> include *reducedMaxMIMO-LayersFR2* in the *OverheatingAssistance* IE;

4> set *reducedMIMO-LayersFR2-DL* to the number of maximum MIMO layers of each serving cell operating on FR2-1 the UE prefers to be temporarily configured in downlink;

4> set *reducedMIMO-LayersFR2-UL* to the number of maximum MIMO layers of each serving cell operating on FR2-1 the UE prefers to be temporarily configured in uplink;

3> if the UE prefers to temporarily reduce the number of maximum MIMO layers of each serving cell operating on FR2-2:

4> include *reducedMaxMIMO-LayersFR2-2* in the *OverheatingAssistance IE*;

4> set *reducedMIMO-LayersFR2-2-DL* to the number of maximum MIMO layers of each serving cell operating on FR2 the UE prefers to be temporarily configured in downlink;

4> set *reducedMIMO-LayersFR2-2-UL* to the number of maximum MIMO layers of each serving cell operating on FR2 the UE prefers to be temporarily configured in uplink;

2> else (if the UE no longer experiences an overheating condition):

3> do not include *reducedMaxCCs*, *reducedMaxBW-FR1*, *reducedMaxBW-FR2*, *reducedMaxBW-FR2-2*, *reducedMaxMIMO-LayersFR1,* *reducedMaxMIMO-LayersFR2* and *reducedMaxMIMO-LayersFR2-2* in *OverheatingAssistance* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide IDC assistance information according to 5.7.4.2 or 5.3.5.3:

2> if there is at least one carrier frequency included in *candidateServingFreqListNR*, the UE is experiencing IDC problems that it cannot solve by itself:

3> include the field *affectedCarrierFreqList* with an entry for each affected carrier frequency included in *candidateServingFreqListNR*;

3> for each carrier frequency included in the field *affectedCarrierFreqList*, include *interferenceDirection* and set it accordingly;

2> if there is at least one supported UL CA combination comprising of carrier frequencies included in *candidateServingFreqListNR*, the UE is experiencing IDC problems that it cannot solve by itself:

3> include *victimSystemType* for each UL CA combination included in *affectedCarrierFreqCombList*;

3> if the UE sets *victimSystemType* to *wlan* or *bluetooth*:

4> include *affectedCarrierFreqCombList* with an entry for each supported UL CA combination comprising of carrier frequencies included in *candidateServingFreqListNR*, that is affected by IDC problems;

3> else:

4> optionally include *affectedCarrierFreqCombList* with an entry for each supported UL CA combination comprising of carrier frequencies included in *candidateServingFreqListNR*, that is affected by IDC problems;

NOTE 1: When sending an *UEAssistanceInformation* message to inform the IDC problems, the UE includes all IDC assistance information (rather than providing e.g. the changed part(s) of the IDC assistance information).

NOTE 2: Upon not anymore experiencing a particular IDC problem that the UE previously reported, the UE provides an IDC indication with the modified contents of the *UEAssistanceInformation* message (e.g. by not including the IDC assistance information in the *idc-Assistance* field).

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *drx-Preference* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *drx-Preference* in the *UEAssistanceInformation* message;

2> if the UE has a preference on DRX parameters for the cell group:

3> if the UE has a preference for the long DRX cycle:

4> include *preferredDRX-LongCycle* in the *DRX-Preference* IE andset it to the preferred value;

3> if the UE has a preference for the DRX inactivity timer:

4> include *preferredDRX-InactivityTimer* in the *DRX-Preference* IE and set it to the preferred value;

3> if the UE has a preference for the short DRX cycle:

4> include *preferredDRX-ShortCycle* in the *DRX-Preference* IE and set it to the preferred value;

3> if the UE has a preference for the short DRX timer:

4> include *preferredDRX-ShortCycleTimer* in the *DRX-Preference* IE and set it to the preferred value;

2> else (if the UE has no preference on DRX parameters for the cell group):

3> do not include *preferredDRX-LongCycle, preferredDRX-InactivityTimer, preferredDRX-ShortCycle* and *preferredDRX-ShortCycleTimer* in the *DRX-Preference* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *maxBW-Preference* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *maxBW-Preference* in the *UEAssistanceInformation* message;

2> if the UE has a preference on the maximum aggregated bandwidth for the cell group:

3> if the UE prefers to reduce the maximum aggregated bandwidth of FR1:

4> include *reducedMaxBW-FR1* in the *MaxBW-Preference* IE;

4> set *reducedBW-DL* to the maximum aggregated bandwidth the UE desires to have configured across all downlink carriers of FR1in the cell group;

4> set *reducedBW-UL* to the maximum aggregated bandwidth the UE desires to have configured across all uplink carriers of FR1in the cell group;

3> if the UE prefers to reduce the maximum aggregated bandwidth of FR2-1:

4> include *reducedMaxBW-FR2* in the *MaxBW-Preference* IE;

4> set *reducedBW-DL* to the maximum aggregated bandwidth the UE desires to have configured across all downlink carriers of FR2-1in the cell group;

4> set *reducedBW-UL* to the maximum aggregated bandwidth the UE desires to have configured across all uplink carriers of FR2-1in the cell group;

2> else (if the UE has no preference on the maximum aggregated bandwidth for the cell group):

3> do not include *reducedMaxBW-FR1* and *reducedMaxBW-FR2* in the *MaxBW-Preference* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *maxBW-PreferenceFR2-2* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *maxBW-PreferenceFR2-2* in the *UEAssistanceInformation* message;

3> if the UE prefers to reduce the maximum aggregated bandwidth of FR2-2:

4> include *reducedMaxBW-FR2-2* in the M*axBW-PreferenceFR2-2* IE;

4> set *reducedBW-FR2-2-DL* to the maximum aggregated bandwidth the UE desires to have configured across all downlink carriers of FR2-2 in the cell group;

4> set *reducedBW-FR2-2-UL* to the maximum aggregated bandwidth the UE desires to have configured across all uplink carriers of FR2-2 in the cell group;

2> else (if the UE has no preference on the maximum aggregated bandwidth for the cell group):

3> do not include *reducedMaxBW-FR2-2* in the *MaxBW-PreferenceFR2-2* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *maxCC-Preference* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *maxCC-Preference* in the *UEAssistanceInformation* message;

2> if the UE has a preference on the maximum number of secondary component carriers for the cell group:

3> include *reducedMaxCCs* in the *MaxCC-Preference* IE;

3> set *reducedCCsDL* to the number of maximum SCells the UE desires to have configured in downlinkin the cell group;

3> set *reducedCCsUL* to the number of maximum SCells the UE desires to have configured in uplinkin the cell group;

2> else (if the UE has no preference on the maximum number of secondary component carriers for the cell group):

3> do not include *reducedMaxCCs* in the *MaxCC-Preference* IE;

NOTE 3: The UE can implicitly indicate a preference for NR SCG release by reporting the maximum aggregated bandwidth preference for power saving of the cell group, if configured, as zero for both FR1 and FR2, and by reporting the maximum number of secondary component carriers for power saving of the cell group, if configured, as zero for both uplink and downlink.

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *maxMIMO-LayerPreference* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *maxMIMO-LayerPreference* in the *UEAssistanceInformation* message;

2> if the UE has a preference on the maximum number of MIMO layers for the cell group:

3> if the UE prefers to reduce the number of maximum MIMO layers of each serving cell operating on FR1:

4> include *reducedMaxMIMO-LayersFR1* in the *MaxMIMO-LayerPreference* IE;

4> set *reducedMIMO-LayersFR1-DL* to the preferred maximum number of downlink MIMO layers of each BWP of each FR1 serving cell that the UE operates on in the cell group;

4> set *reducedMIMO-LayersFR1-UL* to the preferred maximum number of uplink MIMO layers of each FR1 serving cell that the UE operates on in the cell group;

3> if the UE prefers to reduce the number of maximum MIMO layers of each serving cell operating on FR2-1:

4> include *reducedMaxMIMO-LayersFR2* in the *MaxMIMO-LayerPreference* IE;

4> set *reducedMIMO-LayersFR2-DL* to the preferred maximum number of downlink MIMO layers of each BWP of each FR2-1 serving cell that the UE operates on in the cell group;

4> set *reducedMIMO-LayersFR2-UL* to the preferred maximum number of uplink MIMO layers of each FR2-1 serving cell that the UE operates on in the cell group;

2> else (if the UE has no preference on the maximum number of MIMO layers for the cell group):

3> do not include *reducedMaxMIMO-LayersFR1* and *reducedMaxMIMO-LayersFR2* in the *MaxMIMO-LayerPreference* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *maxMIMO LayerPreferenceFR2* 2 of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *maxMIMO-LayerPreferenceFR2-2* in the *UEAssistanceInformation* message;

2> if the UE has a preference on the maximum number of MIMO layers for the cell group for FR2-2:

3> if the UE prefers to reduce the number of maximum MIMO layers of each serving cell operating on FR2 2:

4> include *reducedMaxMIMO-LayersFR2-2* in the *MaxMIMO-LayerPreferenceFR2 2* IE;

4> set *reducedMIMO-LayersFR2-2-DL* to the preferred maximum number of downlink MIMO layers of each BWP of each FR2-2 serving cell that the UE operates on in the cell group;

4> set *reducedMIMO-LayersFR2-2-UL* to the preferred maximum number of uplink MIMO layers of each FR2-2 serving cell that the UE operates on in the cell group;

2> else (if the UE has no preference on the maximum number of MIMO layers for the cell group):

3> do not include reducedMaxMIMO-LayersFR2-2 in the *MaxMIMO-LayerPreferenceFR2-*2 IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *minSchedulingOffsetPreference* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *minSchedulingOffsetPreference* in the *UEAssistanceInformation* message;

2> if the UE has a preference on the minimum scheduling offset for cross-slot scheduling for the cell group:

3> if the UE has a preference for the value of K0 (TS 38.214 [19], clause 5.1.2.1) for cross-slot scheduling with 15 kHz SCS:

4> include *preferredK0-SCS-15kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*0;

3> if the UE has a preference for the value of K0 for cross-slot scheduling with 30 kHz SCS:

4> include *preferredK0-SCS-30kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*0;

3> if the UE has a preference for the value of K0 for cross-slot scheduling with 60 kHz SCS:

4> include *preferredK0-SCS-60kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*0;

3> if the UE has a preference for the value of K0 for cross-slot scheduling with 120 kHz SCS:

4> include *preferredK0-SCS-120kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*0;

3> if the UE has a preference for the value of K2 (TS 38.214 [19], clause 6.1.2.1) for cross-slot scheduling with 15 kHz SCS:

4> include *preferredK2-SCS-15kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*2;

3> if the UE has a preference for the value of K2 for cross-slot scheduling with 30 kHz SCS:

4> include *preferredK2-SCS-30kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*2;

3> if the UE has a preference for the value of K2 for cross-slot scheduling with 60 kHz SCS:

4> include *preferredK2-SCS-60kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*2;

3> if the UE has a preference for the value of K2 for cross-slot scheduling with 120 kHz SCS:

4> include *preferredK2-SCS-120kHz* in the *MinSchedulingOffsetPreference* IE and set it to the desired value of *K*2;

2> else (if the UE has no preference on the minimum scheduling offset for cross-slot scheduling for the cell group):

3> do not include *preferredK0* and *preferredK2* in the *MinSchedulingOffsetPreference* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide *minSchedulingOffsetPreferenceExt* of a cell group for power saving according to 5.7.4.2 or 5.3.5.3:

2> include *minSchedulingOffsetPreferenceExt* in the *UEAssistanceInformation* message;

2> if the UE has a preference on the minimum scheduling offset for cross-slot scheduling for the cell group for FR2-2:

3> include *minSchedulingOffsetPreferenceExt* in the *UEAssistanceInformation* message;

4> if the UE has a preference for the value of K0 (TS 38.214 [19], clause 5.1.2.1) for cross-slot scheduling with 480 kHz SCS:

5> include *preferredK0-SCS-480kHz* in the *minSchedulingOffsetPreferenceExt* IE and set it to the desired value of K0;

4> if the UE has a preference for the value of K0 for cross-slot scheduling with 960 kHz SCS:

5> include *preferredK0-SCS-960kHz* in the *minSchedulingOffsetPreferenceExt* IE and set it to the desired value of K0;

4> if the UE has a preference for the value of K2 for cross-slot scheduling with 480 kHz SCS:

5> include *preferredK2-SCS-480kHz* in the *minSchedulingOffsetPreferenceExt* IE and set it to the desired value of K2;

4> if the UE has a preference for the value of K2 for cross-slot scheduling with 960 kHz SCS:

5> include *preferredK2-SCS-960kHz* in the *minSchedulingOffsetPreferenceExt* IE and set it to the desired value of K2;

3> else (if the UE has no preference on the minimum scheduling offset for cross-slot scheduling for the cell group):

4> do not include *preferredK0* and *preferredK2* in the *minSchedulingOffsetPreferenceExt* IE;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide a release preference according to 5.7.4.2 or 5.3.5.3:

2> include *releasePreference* in the *UEAssistanceInformation* message;

2> set *preferredRRC-State* to the desired RRC state on transmission of the *UEAssistanceInformation* message;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide an indication of preference in being provisioned with reference time information according to 5.7.4.2 or 5.3.5.3:

2> if the UE has a preference in being provisioned with reference time information:

3> set *referenceTimeInfoPreference* to *true*;

2> else:

3> set *referenceTimeInfoPreference* to *false*.

1> if transmission of the *UEAssistanceInformation* message is initiated to provide preference on FR2 UL gap according to 5.7.4.2 or 5.3.5.3:

2> if the UE has a preference for FR2 UL gap configuration:

3> set *ul-GapFR2-PatternPreference* to the preferred FR2 UL gap pattern;

2> else (if the UE has no preference for the FR2 UL gap configuration):

3> do not include *ul-GapFR2-PatternPreference* in the *UL-GapFR2-Preference* IE.

1> if transmission of the *UEAssistanceInformation* message is initiated to provide MUSIM assistance information according to 5.7.4.2 or 5.3.5.3:

2> if the UE has a preference for MUSIM periodic gap(s):

3> include *musim-GapPreferenceList* with an entry for each periodic gap the UE prefers to be configured;

4> set *musim-GapLength* and *musim-GapRepetitionAndOffset* in the *musim-GapInfo* IEto the values of the length and the repetition/offset of the gap(s), respectively, the UE prefers to be configured with;

2> if the UE has a preference for MUSIM aperiodic gap:

3> include the field *musim-GapPreferenceList*, with one entry for the aperiodic gap the UE prefers to be configured;

4> include *musim-GapLength* in the *musim-GapInfo* IE and set itto the values of the length of the gap the UE prefers to be configured with;

4> optionally include *musim-Starting-SFN-AndSubframe* in the *musim-GapInfo* IE and set it to the starting SFN/subframe of the gap, the UE prefers to be configured with;

2> if the UE has no longer preference for the periodic/aperiodic gaps:

3> do not include *musim-GapPreferenceList* in the *musim-Assistance* IE;

2> if UE has a preference to leave RRC\_CONNECTED state:

3> set *musim-PreferredRRC-State* to the preferred RRC state.

1> if transmission of the *UEAssistanceInformation* message is initiated to provide the relaxation state of RLM measurements of a cell group according to 5.7.4.2:

2> if the UE performs RLM measurement relaxation on the cell group according to TS 38.133 [14]:

3> set the *rlm-MeasRelaxationState* to *true*;

2> else:

3> set the *rlm-MeasRelaxationState* to *false*;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide the relaxation state of BFD measurements of a cell group:

2> for each serving cell of the cell group:

3> if the UE performs BFD measurement relaxation on this serving cell according to TS 38.133 [14]:

4> set the n-th bit of *bfd-MeasRelaxationState* to '1', where n is equal to the *servCellIndex* value + 1 of the serving cell;

3> else:

4> set the n-th bit of *bfd-MeasRelaxationState* to '0', where n is equal to the *servCellIndex* value + 1 of the serving cell.

1> if transmission of the *UEAssistanceInformation* message is initiated to indicate availability of data mapped to radio bearers not configured for SDT according to 5.7.4.2:

2> include and set the *resumeCause* according to the information received from the upper layers, if provided.

1> if transmission of the *UEAssistanceInformation* message is initiated to provide an indication of preference for SCG deactivation according to 5.7.4.2:

2> include *scg-DeactivationPreference* in the *UEAssistanceInformation* message;

2> set the *scg-DeactivationPreference* to *scgDeactivationPreferred* if the UE prefers the SCG to be deactivated, otherwise set it to *noPreference*;

1> if transmission of the *UEAssistanceInformation* message is initiated to provide an indication that the UE has uplink data related to a deactivated SCG according to 5.7.4.2:

2> include *uplinkData* in the *UEAssistanceInformation* message.

1> if transmission of the *UEAssistanceInformation* message is initiated to provide an indication about whether the criterion for RRM relaxation for connected mode is fulfilled or not fulfilled:

2> if the criterion for RRM measurement relaxation for connected mode is fulfilled:

3> set the *rrm-MeasRelaxationFulfilment* to *true*;

2> else:

3> set the *rrm-MeasRelaxationFulfilment* to *false*.

The UE shall set the contents of the *UEAssistanceInformation* message for configured grant assistance information for NR sidelink communication:

1> if configured to provide configured grant assistance information for NR sidelink communication:

2> include the *sl-UE-AssistanceInformationNR*;

NOTE 4: It is up to UE implementation when and how to trigger configured grant assistance information for NR sidelink communication.

The UE shall:

1> if the procedure was triggered to provide configured grant assistance information for NR sidelink communication by an NR *RRCReconfiguration* message that was embedded within an E-UTRA *RRCConnectionReconfiguration*:

2> submit the *UEAssistanceInformation* 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 if the UE is in (NG)EN-DC:

2> if SRB3 is configured:

3> submit the *UEAssistanceInformation* message via SRB3 to lower layers for transmission;

2> else:

3> submit the *UEAssistanceInformation* message via the E-UTRA MCG embedded in E-UTRA RRC message *ULInformationTransferMRDC* as specified in TS 36.331 [10].

1> else if the UE is in NR-DC:

2> if the UE assistance configuration that triggered this UE assistance information is associated with the SCG:

3> if SRB3 is configured:

4> submit the *UEAssistanceInformation* message via SRB3 to lower layers for transmission;

3> else:

4> submit the *UEAssistanceInformation* message via the NR MCG embedded in NR RRC message *ULInformationTransferMRDC* as specified in5.7.2a.3;

2> else:

3> submit the *UEAssistanceInformation* message via SRB1 to lower layers for transmission;

1> else:

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

#### 5.7.4.3a Setting the contents of *OverheatingAssistance* IE

The UE shall set the contents of *OverheatingAssistance* IE if initiated to provide overheating assistance indication for SCG in (NG)EN-DC according to clause 5.6.10.3 as specified in TS 36.331 [10]:

1> if the UE prefers to temporarily reduce the number of maximum secondary component carriers for SCG:

2> include *reducedMaxCCs* in the *OverheatingAssistance* IE;

2> set *reducedCCsDL* to the number of maximum SCells of the SCG the UE prefers to be temporarily configured in downlink;

2> set *reducedCCsUL* to the number of maximum SCells of the SCG the UE prefers to be temporarily configured in uplink;

1> if the UE prefers to temporarily reduce maximum aggregated bandwidth of FR1 for SCG:

2> include *reducedMaxBW-FR1* in the *OverheatingAssistance* IE;

2> set *reducedBW-FR1-DL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all downlink carriers of FR1 of the SCG;

2> set *reducedBW-FR1-UL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all uplink carriers of FR1 of the SCG;

1> if the UE prefers to temporarily reduce maximum aggregated bandwidth of FR2-1 for SCG:

2> include *reducedMaxBW-FR2* in the *OverheatingAssistance* IE;

2> set *reducedBW-FR2-DL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all downlink carriers of FR2-1 of the SCG;

2> set *reducedBW-FR2-UL* to the maximum aggregated bandwidth the UE prefers to be temporarily configured across all uplink carriers of FR2-1 of the SCG;

1> if the UE prefers to temporarily reduce the number of maximum MIMO layers of each serving cell operating on FR1 for SCG:

2> include *reducedMaxMIMO-LayersFR1* in the *OverheatingAssistance* IE;

2> set *reducedMIMO-LayersFR1-DL* to the number of maximum MIMO layers of each serving cell operating on FR1 of the SCG the UE prefers to be temporarily configured in downlink;

2> set *reducedMIMO-LayersFR1-UL* to the number of maximum MIMO layers of each serving cell operating on FR1 of the SCG the UE prefers to be temporarily configured in uplink;

1> if the UE prefers to temporarily reduce the number of maximum MIMO layers of each serving cell operating on FR2-1 for SCG:

2> include *reducedMaxMIMO-LayersFR2* in the *OverheatingAssistance* IE;

2> set *reducedMIMO-LayersFR2-DL* to the number of maximum MIMO layers of each serving cell operating on FR2-1 of the SCG the UE prefers to be temporarily configured in downlink;

2> set *reducedMIMO-LayersFR2-UL* to the number of maximum MIMO layers of each serving cell operating on FR2-1 of the SCG the UE prefers to be temporarily configured in uplink;

#### 5.7.4.4 Relaxed measurement criterion for a stationary UE

The relaxed measurement criterion for a stationary UE is met when:

- (SrxlevRefStationaryConnected – Srxlev) < SSearchDeltaP-StationaryConnected,

Where:

- Srxlev = current Srxlev value of the PCell cell (dB).

- SrxlevRefStationaryConnected = reference Srxlev value of the PCell cell (dB), set as follows:

- At the end of RRC reconfiguration procedure as specified in 5.3.5.3, when *rrm-MeasRelaxationReportingConfig* is included in the *RRCReconfiguration* message; or

- If (Srxlev – SrxlevRefStationaryConnected) > 0; or

- If the relaxed measurement criterion has not been met for TSearchDeltaP-StationaryConnected:

- The UE shall set the value of SrxlevRefStationaryConnected to the current Srxlev value of the serving cell.

### 5.7.4a Void

-------------------------------------------Skip Unchanged -------------------------------------------

# 6 Protocol data units, formats and parameters (ASN.1)

-------------------------------------------Skip Unchanged -------------------------------------------

## 6.2 RRC messages

### 6.2.1 General message structure

#### *– NR-RRC-Definitions*

This ASN.1 segment is the start of the NR RRC PDU definitions.

-- ASN1START

-- TAG-NR-RRC-DEFINITIONS-START

NR-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

BandCombinationParametersSidelinkNR-r16

FROM PC5-RRC-Definitions;

-- Editor's Note: TBD during ASN.1 review whether/how to avoid IMPORTS to NR-RRC-Definitions

-- TAG-NR-RRC-DEFINITIONS-STOP

-- ASN1STOP

#### *– BCCH-BCH-Message*

The *BCCH-BCH-Message* class is the set of RRC messages that may be sent from the network to the UE via BCH on the BCCH logical channel.

-- ASN1START

-- TAG-BCCH-BCH-MESSAGE-START

BCCH-BCH-Message ::= SEQUENCE {

message BCCH-BCH-MessageType

}

BCCH-BCH-MessageType ::= CHOICE {

mib MIB,

messageClassExtension SEQUENCE {}

}

-- TAG-BCCH-BCH-MESSAGE-STOP

-- ASN1STOP

#### *– BCCH-DL-SCH-Message*

The *BCCH-DL-SCH-Message* class is the set of RRC messages that may be sent from the network to the UE via DL-SCH on the BCCH logical channel.

-- ASN1START

-- TAG-BCCH-DL-SCH-MESSAGE-START

BCCH-DL-SCH-Message ::= SEQUENCE {

message BCCH-DL-SCH-MessageType

}

BCCH-DL-SCH-MessageType ::= CHOICE {

c1 CHOICE {

systemInformation SystemInformation,

systemInformationBlockType1 SIB1

},

messageClassExtension SEQUENCE {}

}

-- TAG-BCCH-DL-SCH-MESSAGE-STOP

-- ASN1STOP

#### – *DL-CCCH-Message*

The *DL-CCCH-Message* class is the set of RRC messages that may be sent from the Network to the UE on the downlink CCCH logical channel.

-- ASN1START

-- TAG-DL-CCCH-MESSAGE-START

DL-CCCH-Message ::= SEQUENCE {

message DL-CCCH-MessageType

}

DL-CCCH-MessageType ::= CHOICE {

c1 CHOICE {

rrcReject RRCReject,

rrcSetup RRCSetup,

spare2 NULL,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-DL-CCCH-MESSAGE-STOP

-- ASN1STOP

#### *– DL-DCCH-Message*

The *DL-DCCH-Message* class is the set of RRC messages that may be sent from the network to the UE on the downlink DCCH logical channel.

-- ASN1START

-- TAG-DL-DCCH-MESSAGE-START

DL-DCCH-Message ::= SEQUENCE {

message DL-DCCH-MessageType

}

DL-DCCH-MessageType ::= CHOICE {

c1 CHOICE {

rrcReconfiguration RRCReconfiguration,

rrcResume RRCResume,

rrcRelease RRCRelease,

rrcReestablishment RRCReestablishment,

securityModeCommand SecurityModeCommand,

dlInformationTransfer DLInformationTransfer,

ueCapabilityEnquiry UECapabilityEnquiry,

counterCheck CounterCheck,

mobilityFromNRCommand MobilityFromNRCommand,

dlDedicatedMessageSegment-r16 DLDedicatedMessageSegment-r16,

ueInformationRequest-r16 UEInformationRequest-r16,

dlInformationTransferMRDC-r16 DLInformationTransferMRDC-r16,

loggedMeasurementConfiguration-r16 LoggedMeasurementConfiguration-r16,

spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-DL-DCCH-MESSAGE-STOP

-- ASN1STOP

#### *– MCCH-Message*

The *MCCH-Message* class is the set of RRC messages that may be sent from the network to the UE on the MCCH logical channel.

-- ASN1START

-- TAG-MCCH-MESSAGE-START

MCCH-Message-r17 ::= SEQUENCE {

message MCCH-MessageType-r17

}

MCCH-MessageType-r17 ::= CHOICE {

c1 CHOICE {

mbsBroadcastConfiguration-r17 MBSBroadcastConfiguration-r17,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-MCCH-MESSAGE-STOP

-- ASN1STOP

#### *– PCCH-Message*

The *PCCH-Message* class is the set of RRC messages that may be sent from the Network to the UE on the PCCH logical channel.

-- ASN1START

-- TAG-PCCH-PCH-MESSAGE-START

PCCH-Message ::= SEQUENCE {

message PCCH-MessageType

}

PCCH-MessageType ::= CHOICE {

c1 CHOICE {

paging Paging,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-PCCH-PCH-MESSAGE-STOP

-- ASN1STOP

#### – *UL-CCCH-Message*

The *UL-CCCH-Message* class is the set of 48-bits RRC messages that may be sent from the UE to the Network on the uplink CCCH logical channel.

-- ASN1START

-- TAG-UL-CCCH-MESSAGE-START

UL-CCCH-Message ::= SEQUENCE {

message UL-CCCH-MessageType

}

UL-CCCH-MessageType ::= CHOICE {

c1 CHOICE {

rrcSetupRequest RRCSetupRequest,

rrcResumeRequest RRCResumeRequest,

rrcReestablishmentRequest RRCReestablishmentRequest,

rrcSystemInfoRequest RRCSystemInfoRequest

},

messageClassExtension SEQUENCE {}

}

-- TAG-UL-CCCH-MESSAGE-STOP

-- ASN1STOP

#### *– UL-CCCH1-Message*

The *UL-CCCH1-Message* class is the set of 64-bits RRC messages that may be sent from the UE to the Network on the uplink CCCH1 logical channel.

-- ASN1START

-- TAG-UL-CCCH1-MESSAGE-START

UL-CCCH1-Message ::= SEQUENCE {

message UL-CCCH1-MessageType

}

UL-CCCH1-MessageType ::= CHOICE {

c1 CHOICE {

rrcResumeRequest1 RRCResumeRequest1,

spare3 NULL,

spare2 NULL,

spare1 NULL

},

messageClassExtension SEQUENCE {}

}

-- TAG-UL-CCCH1-MESSAGE-STOP

-- ASN1STOP

#### *– UL-DCCH-Message*

The *UL-DCCH-Message* class is the set of RRC messages that may be sent from the UE to the network on the uplink DCCH logical channel.

-- ASN1START

-- TAG-UL-DCCH-MESSAGE-START

UL-DCCH-Message ::= SEQUENCE {

message UL-DCCH-MessageType

}

UL-DCCH-MessageType ::= CHOICE {

c1 CHOICE {

measurementReport MeasurementReport,

rrcReconfigurationComplete RRCReconfigurationComplete,

rrcSetupComplete RRCSetupComplete,

rrcReestablishmentComplete RRCReestablishmentComplete,

rrcResumeComplete RRCResumeComplete,

securityModeComplete SecurityModeComplete,

securityModeFailure SecurityModeFailure,

ulInformationTransfer ULInformationTransfer,

locationMeasurementIndication LocationMeasurementIndication,

ueCapabilityInformation UECapabilityInformation,

counterCheckResponse CounterCheckResponse,

ueAssistanceInformation UEAssistanceInformation,

failureInformation FailureInformation,

ulInformationTransferMRDC ULInformationTransferMRDC,

scgFailureInformation SCGFailureInformation,

scgFailureInformationEUTRA SCGFailureInformationEUTRA

},

messageClassExtension CHOICE {

c2 CHOICE {

ulDedicatedMessageSegment-r16 ULDedicatedMessageSegment-r16,

dedicatedSIBRequest-r16 DedicatedSIBRequest-r16,

mcgFailureInformation-r16 MCGFailureInformation-r16,

ueInformationResponse-r16 UEInformationResponse-r16,

sidelinkUEInformationNR-r16 SidelinkUEInformationNR-r16,

ulInformationTransferIRAT-r16 ULInformationTransferIRAT-r16,

iabOtherInformation-r16 IABOtherInformation-r16,

mbsInterestIndication-r17 MBSInterestIndication-r17,

uePositioningAssistanceInfo-r17 UEPositioningAssistanceInfo-r17,

measurementReportAppLayer-r17 MeasurementReportAppLayer-r17,

spare6 NULL, spare5 NULL, spare4 NULL, spare3 NULL, spare2 NULL, spare1 NULL

},

messageClassExtensionFuture-r16 SEQUENCE {}

}

}

-- TAG-UL-DCCH-MESSAGE-STOP

-- ASN1STOP

### 6.2.2 Message definitions

-------------------------------------------Skip Unchanged -------------------------------------------

#### – *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 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-ServingCellInfo-r17 SL-ServingCellInfo-r17 OPTIONAL, -- Cond L2RemoteUE

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

srs-PosRRC-InactiveConfig-r17 SRS-PosRRC-InactiveConfig-r17 OPTIONAL, -- Need M

ran-ExtendedPagingCycle-r17 ExtendedPagingCycle-r17 OPTIONAL -- Need R

]]

}

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

...,

[[

freqPriorityListNRSlicing-r17 FreqPriorityListNRSlicing-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 R

}

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

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

-- CG-SDT specific configuration

-- FFS on BSR configuration (e.g. i.e. for the FFS on the logicalChannelSR-DelayTimer)

-- FFS on delta signalling (We need to clarify how this works, for instance, whether initial BWP dedicated can be considered as

-- baseline to enable delta configuration or not etc).

cg-SDT-Config-LCH-restrictionToAddModList-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF CG-SDT-Config-LCH-restriction-r17 OPTIONAL, -- Need N

cg-SDT-Config-LCH-restrictionToReleaseList-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity OPTIONAL, -- Need N

cg-SDT-Config-Initial-BWP-NUL-r17 SetupRelease {BWP-Uplink-Dedicated-SDT-r17} OPTIONAL, -- Need M

cg-SDT-Config-Initial-BWP-SUL-r17 SetupRelease {BWP-Uplink-Dedicated-SDT-r17} OPTIONAL, -- Need M

cg-SDT-Config-Initial-BWP-DL-r17 BWP-Downlink-Dedicated-SDT-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-ValiditationConfig-r17 SetupRelease { CG-SDT-TA-ValiditationConfig-r17 } OPTIONAL, -- Need M

...

}

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

cg-SDT-RSRP-ChangeThreshold-r17 RSRP-Range

}

BWP-Downlink-Dedicated-SDT-r17 ::= SEQUENCE {

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

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

...

}BWP-Uplink-Dedicated-SDT-r17 ::= SEQUENCE {

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

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

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

...

}

ConfiguredGrantConfigToAddModList-r17 ::= SEQUENCE (SIZE (1..maxNrofConfiguredGrantConfig-r16)) OF ConfiguredGrantConfig

ConfiguredGrantConfigToReleaseList-r17 ::= SEQUENCE (SIZE (1..maxNrofConfiguredGrantConfig-r16)) OF ConfiguredGrantConfigIndex-r16

CG-SDT-Config-LCH-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-InactiveConfig-r17 ::= SEQUENCE {

srs-PosConfig-r17 SRS-PosConfig-r17,

bwp-r17 BWP OPTIONAL, -- Need S

srs-TimeAlignmentTimer-r17 TimeAlignmentTimer OPTIONAL, -- Need R

inactivePosSRS-RSRP-changeThresh-r17 RSRP-ChangeThresh-r17 OPTIONAL, -- Need R

srs-NrofSS-BlocksToAverage-r17 INTEGER (1..ffsUpperLimit) OPTIONAL, -- Need R

-- FFS upper limit

inactivePosSRS-AbsThreshSS-BlocksConsolidation-r17 RSRP-Range OPTIONAL -- Need R

}

--Editor's Note: Following temporary constant is introduced only for ASN.1 syntax purposes. Actual upper limit of the ranges using this constant throughout the specification are FFS.

ffsUpperLimit INTEGER ::= 9999

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

--Editor's Note: To be updated to align with SDT, to further update SUL/NUL and BWP--

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. |
| ***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]. |

|  |
| --- |
| *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. |

|  |
| --- |
| *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. |

|  |
| --- |
| *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 for 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 is 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 when the RRCRelease message is received. If the field is absent PDCP entity for the radio bearers configured for SDT reset the ROHC header compression protocol during PDCP re-establishment during SDT procedure, 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-RSRP-ThresholdSSB***  An RSRP threshold configured for SSB selection for CG-SDT as specified in TS 38.321 [3]. |
| ***CG-SDT-TA-ValiditationConfig***  Configuration for the RSRP based TA validation. If this IE 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-ValiditationConfig* field descriptions |
| ***cg-SDT-RSRP-ChangeThreshold***  The RSRP threshold for TA validation for CG-SDT as specified in TS 38.321 [3]. |

|  |
| --- |
| *SRS-PosRRC-InactiveConfig* field descriptions |
| ***bwp***  BWP configuration for SRS for Positioning during the RRC\_INACTIVE state. 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-AbsThreshSS-BlocksConsolidation***  absolute RSRP threshold for determining the set of SSBs for derivation of downlink pathloss reference for TA validation. |
| ***inactivePosSRS-NrofSS-BlocksToAverage***  number of SSBs with highest RSRPs for derivation of downlink pathloss reference for TA validation |
| ***inactivePosSRS-RSRP-changeThresh***  RSRP threshold for the increase/decrease of RSRP for time alignment validation |
| ***srs-TimeAlignmnetTimer***  TA timer for SRS for positioning transmission during RRC\_INACTIVE State.  Editor's Note: Range to be taken from SDT |

|  |  |
| --- | --- |
| *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. The field is only included when the UE is configured with eDRX in RRC\_IDLE, see TS 24.401 [23]. 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. | |
| ***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. | |
| ***sl-ServingCellInfo***  Indicates the Uu serving Cell related related information. | |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE, need M; otherwise it is absent. |
| *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-L2RemoteUEConfig-r17 SetupRelease {SL-L2RemoteUEConfig-r17} OPTIONAL, -- Cond L2RemoteUE

needForNCSG-ConfigNR-r17 SetupRelease {NeedForNCSG-ConfigNR-r17} OPTIONAL, -- Need M

needForNCSG-ConfigEUTRA-r17 SetupRelease {NeedForNCSG-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. |
| ***needForNCSG-ConfigEUTRA***  Configuration for the UE to report measurement gap and NCSG requirement information of E‑UTRA target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForNCSG-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-L2RemoteUEConfig***  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, need M; 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 {

needForNCSG-InfoNR-r17 NeedForNCSG-InfoNR-r17 OPTIONAL,

needForNCSG-InfoEUTRA-r17 NeedForNCSG-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. |
| ***needForNCSG-InfoEUTRA***  This field is used to indicate the measurement gap and NCSG requirement information of the UE for E‑UTRA target bands |
| ***needForNCSG-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 SetupRelease {SL-ConfigDedicatedNR-r16 } OPTIONAL, -- Cond L2RemoteUE

sl-L2RemoteUEConfig-r17 SetupRelease {SL-L2RemoteUEConfig-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***  The network configures only the PC5 Relay RLC channel and *sl-PHY-MAC-RLC-Config* for the SRB1. |
| ***sl-L2RemoteUEConfig***  The network configures only the *sl-ServingCellInfo* and SRAP configuration for the SRB1. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE, need M; 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-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. |

#### *– 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 SN 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. |
| ***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

ue-TimersAndConstants-RemoteUE-r17 UE-TimersAndConstants-RemoteUE-r17 OPTIONAL, -- Need R

uac-BarringInfo-v1700 SEQUENCE {

uac-BarringInfoSetList-v1700 UAC-BarringInfoSetList-v1700 OPTIONAL -- Cond MINT

} OPTIONAL, -- Need R

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

featurePriorities-r17 SEQUENCE {

redCapPriority-r17 FeaturePriority-r17 OPTIONAL,

slicingPriority-r17 FeaturePriority-r17 OPTIONAL,

ce-Priority-r17 FeaturePriority-r17 OPTIONAL,

sdt-Priority-r17 FeaturePriority-r17 OPTIONAL,

...

} OPTIONAL, -- Need R

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

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

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

-- FFS whether eDRX-allowed is one or two bits, i.e. separate for idle/inactive

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

-- FFS whether halfDuplexRedCapAllowed is kept, remove also from related procedure

cellBarredRedCap-r17 SEQUENCE {

cellBarredRedCap1Rx-r17 ENUMERATED {barred, notBarred},

cellBarredRedCap2Rx-r17 ENUMERATED {barred, notBarred}

} OPTIONAL, -- Need R

intraFreqReselectionRedCap-r17 ENUMERATED {allowed, notAllowed} 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,

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},

...

}

FeaturePriority-r17 ::= INTEGER (0..15)

-- TAG-SIB1-STOP

-- ASN1STOP

|  |
| --- |
| *SIB1* field descriptions |
| ***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-Allowed***  The presence of this field indicates that extended DRX is allowed in the cell for UEs in RRC\_IDLE and in RRC\_INACTIVE. The UE shall stop using extended DRX if *eDRX-Allowed* is not present. |
| ***featurePriorities***  Indicates priorities for features, such as RedCap, Slicing, etc. 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***  FFS: 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 for UE to determine whether to perform SDT procedure, 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 |
| *MINT* | The field is optionally present, Need R, in a cell that provides a configuration for disaster roaming, otherwise it is absent. |
| *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-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-SourceIdentity-RemoteUE-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-InfoFromRx-List-r17 SEQUENCE (SIZE (1..maxNrofSL-Rx-InfoSet-r17)) OF SL-DRX-ConfigUC-SemiStatic-r17 OPTIONAL

}

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

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

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

}

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

SL-TxResourceReqDisc-r17 ::= SEQUENCE {

sl-DestinationIdentityDisc-r17 SL-DestinationIdentity-r16,

sl-SourceIdentity-RelayUE-r17 SL-SourceIdentity-r17 OPTIONAL,

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

sl-TxInterestedFreqListDisc-r17 SL-TxInterestedFreqList-r16,

sl-TypeTxSyncListDis-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-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-PagingIdentity-RemoteUE-r17 SL-PagingIdentity-RemoteUE-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, spare6, spare5, spare4, spare3, spare2, spare1}

}

-- TAG-SIDELINKUEINFORMATIONNR-STOP

-- ASN1STOP

Editor's Note 1: the content of assistance information for determining sidelink DRX configuration, is FFS.

Editor's Note 2: FFS on inactivity timer to be included in assistance information from RX UE to TX UE.

| *SidelinkUEinformationNR* field descriptions |
| --- |
| ***sl-RxDRX-ReportList***  Indicates the reported DRX configuration received from peer UE and the reported QoS profile for which service UE is interested 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-SourceIdentity-RemoteUE***  This field is used to indicate the Source Layer-2 ID to be used to establish PC5 link with L2 U2N Relay UE. |
| ***sl-TxResourceReq***  Parameters to request the transmission resources for NR sidelink communication to the network in the Sidelink UE Information report. |
| ***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-InfoFromRx-List***  Indicates list of the sidelink DRX assistance information received from 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 failure cause for the sidelink RLF (value *rlf*) and sidelink AS configuration failure (value *configFailure*) for the associated destination for unicast. |

| *SL-RxDRX-Report* field descriptions |
| --- |
| ***sl-DRX-ConfigFromTx***  Indicates the sidelink DRX configuration received from peer UE for NR sidelink unicast communication. |
| ***sl-RxInterestedQoS-InfoList***  Indicates the QoS profile for which UE reports its interested service to the network, for NR sidelink groupcast or broadcast communication. |
| *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 discovery by L2 U2N Remote UE, or L2 U2N Relay UE, or L3 U2N Relay UE, or L3 U2N Remote UE. |
| ***sl-SourceIdentity-RelayUE***  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-TxResourceReqCommRelay* field descriptions |
| --- |
| ***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-PagingIdentity-RemoteUE***  This field is used to indicate the paging UE ID for the corresponding destination 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 OPTIONAL,

reducedBW-FR2-2-UL-r17 ReducedAggregatedBandwidth-r17 OPTIONAL

} 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 (32)) 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,

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 BIT STRING (SIZE (4)) OPTIONAL

--Editor's note: This is to indicate the preferred UL gap pattern, as defined in TS38.133.

}

-- 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 performs BFD measurements relaxation on the serving cell mapped on the bit. A bit that is set to 0 indicates that the UE does not perform BFD measurements relaxation on the serving cell mapped on the bit. |
| ***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 the UE’s MUSIM gap preference and related MUSIM gap configuration, as defined in TS 38.133 [14] section 9.1.10. |
| ***musim-PreferredRRC-State***  Indicates the UE's preferred RRC state when leaving RRC\_CONNECTED. |
| ***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*. |
| ***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.  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*. |
| ***rlm-MeasRelaxationState***  Indicates the relaxation state of RLM measurements. Value *true* indicates that the UE performs relaxation of RLM measurements, and value *false* indicates that the UE does not perform 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. |
| ***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. |

|  |
| --- |
| *nonSDT-Data-Indication field descriptions* |
| ***nonSDT-DataIndication***  Informs the network about the arrival of data mapped to radio bearers not configured for SDT data during SDT. |
| ***resumeCause***  Provides the resume cause based on the information received from the upper layers. |

|  |
| --- |
| *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

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UEINFORMATIONREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationRequest-IEs* field descriptions |
| ***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,

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 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

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

]],

[[

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 (3)) OPTIONAL,

onDemandSISuccess-r17 BOOLEAN 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 BOOLEAN 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 SEQUENCE {

physCellId-r16 PhysCellId,

carrierFreq-r16 ARFCN-ValueNR

}

},

eutraFailedPCellId-r16 CHOICE {

cellGlobalId-r16 CGI-InfoEUTRALogging,

pci-arfcn-r16 SEQUENCE {

physCellId-r16 EUTRA-PhysCellId,

carrierFreq-r16 ARFCN-ValueEUTRA

}

}

},

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 SEQUENCE {

physCellId-r17 PhysCellId,

carrierFreq-r17 ARFCN-ValueNR

}

} OPTIONAL,

choCandidateCellList-r17 ChoCandidateCellList-r17 OPTIONAL

]]

},

eutra-RLF-Report-r16 SEQUENCE {

failedPCellId-EUTRA CGI-InfoEUTRALogging,

measResult-RLF-Report-EUTRA-r16 OCTET STRING,

...

}

}

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 ChoCandidate-r17

ChoCandidate-r17 ::= CHOICE {

cellGlobalId-r17 CGI-Info-Logging-r16,

pci-arfcn-r17 SEQUENCE {

physCellId-r17 PhysCellId,

carrierFreq-r17 ARFCN-ValueNR

}

}

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

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| --- |
| *UEInformationResponse-IEs* field descriptions |
| ***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. |
| ***rlf-Report***  This field is used to indicate the RLF report related contents. |

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| --- |
| *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 or is set to *false*). |
| ***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 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 attempts 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 attempts 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* when the *msgA-SubcarrierSpacing* is absent; 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. |
| ***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 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]. |
| ***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. |
| ***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 for this target cell. 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, prior to a DAPS handover failure. |
| ***shr-Cause***  This field is used to indicate the cause of the successful HO 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 and the time of arrival of the first non-duplicate PDCP PDU received from the target cell, and it is measured at the time of arrival of the first non-duplicate PDCP PDU received from the target cell only in DAPS HO scenario.  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-IEs-r17,

criticalExtensionsFuture SEQUENCE {}

}

}

UEPositioningAssistanceInfo-IEs-r17 ::= SEQUENCE {

ue-TxTEG-AssociationList-r17 UE-TxTEG-AssociationList-r17 OPTIONAL,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-TxTEG-AssociationList-r17 ::= SEQUENCE (SIZE (1..maxUE-Tx-TEG-ID-r17)) OF UE-TxTEG-Association-r17

UE-TxTEG-Association-r17 ::= SEQUENCE {

ue-TxTEG-ID-r17 INTEGER (1.. maxUE-Tx-TEG-ID-r17),

nr-TimeStamp-r17 NR-TimeStamp-r17,

srs-PosResSetAssociationList-r17 SEQUENCE (SIZE (1.. maxNrofSRS-PosResourceSets-r16)) OF SRS-PosResSetAssociation-r17

}

SRS-PosResSetAssociation-r17 ::= SEQUENCE {

associatedSRS-PosResourceSetID-r17 INTEGER (0.. maxNrofSRS-PosResourceSets-r16),

associatedSRS-PosResourceIdList-r17 SEQUENCE (SIZE(1.. maxNrofSRS-PosResources-r16)) OF AssociatedSRS-PosResourceId-r17 OPTIONAL

}

AssociatedSRS-PosResourceId-r17 ::= INTEGER (0.. maxNrofSRS-PosResources-1-r16)

----------Editor Notes: maxNrOfTEG-ID-r17 should be decided by RAN1/4.

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)

},

...

}

----------Editor Notes: RAN2 to decide on Event Driven Reporting, noChange, DeltaChange and update based upon RAN1 agreement on SRS-ResourceSet and rest.----

-- TAG-UEPOSITIONINGASSISTANCEINFO-STOP

-- ASN1STOP

|  |
| --- |
| *UEPositioningAssistanceInfo* field descriptions |
| ***AssociatedSRS-PosResourceId***  The ID of SRS Positioning Resource (*SRS-PosResource*) which is associted to a specific UE Tx TEG. |
| ***AssociatedSRS-PosResourceSetID***  The ID of SRS Positioning Resource Set (*SRS-PosResourceSet*) which is associted to a specific UE Tx TEG. |
| ***nr-TimeSTamp***  This field specifies the latest time instance at which the association is valid prior to the reporting. |
| ***ueTxTEG-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

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* and *FailureInformation* 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

-------------------------------------------Skip Unchanged -------------------------------------------

### 6.3.2 Radio resource control information elements

-------------------------------------------Skip Unchanged -------------------------------------------

#### – *MUSIM-GapConfig*

The IE *MUSIM-GapConfig* specifies the MUSIM gap configuration and controls setup/release of MUSIM gaps.

*MUSIM-GapConfig* information element

-- ASN1START

-- TAG-MUSIM-GAPCONFIG-START

MUSIM-GapConfig-r17 ::= SEQUENCE {

musim-GapToReleaseList-r17 SEQUENCE (SIZE (1..3)) OF MUSIM-GapId-r17 OPTIONAL, -- Need N

musim-GapToAddModList-r17 SEQUENCE (SIZE (1..3)) OF MUSIM-Gap-r17 OPTIONAL, -- Need N

musim-AperiodicGap-r17 MUSIM-GapInfo-r17 OPTIONAL, -- Need N

...

}

MUSIM-Gap-r17 ::= SEQUENCE {

musim-GapId-r17 MUSIM-GapId-r17,

musim-GapInfo-r17 MUSIM-GapInfo-r17}

-- TAG-MUSIM-GAPCONFIG-STOP

-- ASN1STOP

| *MUSIM-GapConfig* field descriptions |
| --- |
| ***musim-AperiodicGap***  Indicates the MUSIM aperiodic gap as specified in TS 38.133 [14] section 9.1.10. |
| ***musim-GapToAddModList***  List of MUSIM periodic gap patterns to add or modify. |
| ***musim-GapToReleaseList***  List of MUSIM periodic gap patterns to release. |
| ***musim-GapInfo***  Indicates the values for *musim-GapLength*, *musim-GapRepetitionAndOffset*, *starting-SFN*, and *startingSubframe*. If UE indicates the *musim-Starting-SFN-AndSubframe*when requesting aperiodic gap the network can only configure the aperiodic gap with the same start point or no aperiodic gap. If the field *musim-musim-Starting-SFN-AndSubframe*is absent for aperiodic gap, network can configure any timing as the starting point for aperiodic or configure no aperiodic gap. When network provides periodic gap, network always signals the *musim-GapLength* and *musim-GapRepetitionAndOffset* as indicated by the UE’s preferred MUSIM gap configuration. |
| ***musim-GapToAddModList***  ***List of MUSIM periodic gap patterns to add or modify.*** |
| ***musim-GapToReleaseList***  ***List of MUSIM periodic gap patterns to release.*** |

#### – *MUSIM-GapId*

The *MUSIM-GapId* is used to identify UE periodic MUSIM gap(s) to add, modify or release.

*MUSIM-GapId* information element

-- ASN1START

-- TAG-MUSIM-GAPID-START

MUSIM-GapId-r17 ::= INTEGER (0..2)

-- TAG-MUSIM-GAPID-STOP

-- ASN1STOP

#### – *MUSIM-GapInfo*

The IE *MUSIM-GapInfo* is used to indicate MUSIM gap parameters.

*MUSIM-GapInfo* information element

-- ASN1START

-- TAG-MUSIM-GAPINFO-START

MUSIM-GapInfo-r17 ::= SEQUENCE {

musim-Starting-SFN-AndSubframe-r17 MUSIM-Starting-SFN-AndSubframe-r17 OPTIONAL, -- Cond aperiodic

musim-GapLength-r17 ENUMERATED {ms3, ms4, ms6, ms10, ms20} OPTIONAL, -- Cond gapSetup

musim-GapRepetitionAndOffset-r17 CHOICE {

ms20-r17 INTEGER (0..19),

ms40-r17 INTEGER (0..39),

ms80-r17 INTEGER (0..79),

ms160-r17 INTEGER (0..159),

ms320-r17 INTEGER (0..319),

ms640-r17 INTEGER (0..639),

ms1280-r17 INTEGER (0..1279),

ms2560-r17 INTEGER (0..2559),

ms5120-r17 INTEGER (0..5119),

...

} OPTIONAL -- Cond periodic

}

MUSIM-Starting-SFN-AndSubframe-r17 ::= SEQUENCE {

starting-SFN-r17 INTEGER (0..1023),

startingSubframe-r17 INTEGER (0..9)

}

-- TAG-MUSIM-GAPINFO-STOP

-- ASN1STOP

| *MUSIM-GapInfo* field descriptions |
| --- |
| ***musim-GapLength***  Indicates the length of the UE's MUSIM gap as specified in TS 38.133 [14] section 9.1.10. |
| ***musim-GapRepetitionAndOffset***  Indicates the gap repetition period in ms and gap offset in number of subframes for the periodic MUSIM gap preference as specified in TS 38.133 [14] section 9.1.2D. |
| ***musim-Starting-SFN-AndSubframe***  Indicates gap starting position for the aperiodic MUSIM gap. This field is optional present for the aperiodic MUSIM Gap preference indication. |
| ***starting-SFN***  indicates gap starting SFN number for the aperiodic MUSIM gap preference. |
| ***startingSubframe***  indicates gap starting subframe number for the aperiodic MUSIM gap. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| a*periodic* | This field is mandatory present in case of aperiodic MUSIM gap configuration. Otherwise it is absent. |
| *periodic* | This field is mandatory present in case of periodic MUSIM gap configuration. Otherwise it is absent. |
| *gapSetup* | The field is mandatory present upon configuration of a new MUSIM gap. The field is optionally present, Need M, otherwise. |

#### – *NeedForGapsConfigNR*

The IE *NeedForGapsConfigNR* contains configuration related to the reporting of measurement gap requirement information.

*NeedForGapsConfigNR* information element

-- ASN1START

-- TAG-NeedForGapsConfigNR-START

NeedForGapsConfigNR-r16 ::= SEQUENCE {

requestedTargetBandFilterNR-r16 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL -- Need R

}

-- TAG-NeedForGapsConfigNR-STOP

-- ASN1STOP

|  |
| --- |
| *NeedForGapsConfigNR field descriptions* |
| ***requestedTargetBandFilterNR***  Indicates the target NR bands that the UE is requested to report the gap requirement information. |

– *NeedForGapsInfoNR*

The IE *NeedForGapsInfoNR* indicates whether measurement gap is required for the UE to perform SSB based measurements on an NR target band while NR-DC or NE-DC is not configured.

*NeedForGapsInfoNR* information element

-- ASN1START

-- TAG-NeedForGapsInfoNR-START

NeedForGapsInfoNR-r16 ::= SEQUENCE {

intraFreq-needForGap-r16 NeedForGapsIntraFreqList-r16,

interFreq-needForGap-r16 NeedForGapsBandListNR-r16

}

NeedForGapsIntraFreqList-r16 ::= SEQUENCE (SIZE (1.. maxNrofServingCells)) OF NeedForGapsIntraFreq-r16

NeedForGapsBandListNR-r16 ::= SEQUENCE (SIZE (1..maxBands)) OF NeedForGapsNR-r16

NeedForGapsIntraFreq-r16 ::= SEQUENCE {

servCellId-r16 ServCellIndex,

gapIndicationIntra-r16 ENUMERATED {gap, no-gap}

}

NeedForGapsNR-r16 ::= SEQUENCE {

bandNR-r16 FreqBandIndicatorNR,

gapIndication-r16 ENUMERATED {gap, no-gap}

}

-- TAG-NeedForGapsInfoNR-STOP

-- ASN1STOP

|  |
| --- |
| *NeedForGapsInfoNR* field descriptions |
| ***intraFreq-needForGap***  Indicates the measurement gap requirement information for NR intra-frequency measurement. |
| ***interFreq-needForGap***  Indicates the measurement gap requirement information for NR inter-frequency measurement. |

|  |
| --- |
| *NeedForGapsIntraFreq field descriptions* |
| ***servCellId***  Indicates the serving cell which contains the target SSB (associated with the initial DL BWP) to be measured. |
| ***gapIndicationIntra***  Indicates whether measurement gap is required for the UE to perform intra-frequency SSB based measurements on the concerned serving cell. Value *gap* indicates that a measurement gap is needed if any of the UE configured BWPs do not contain the frequency domain resources of the SSB associated to the initial DL BWP. Value *no-gap* indicates a measurement gap is not needed to measure the SSB associated to the initial DL BWP for all configured BWPs, no matter the SSB is within the configured BWP or not. |

|  |
| --- |
| *NeedForGapsNR* field descriptions |
| ***bandNR***  Indicates the NR target band to be measured. |
| ***gapIndication***  Indicates whether measurement gap is required for the UE to perform SSB based measurements on the concerned NR target band while NR-DC or NE-DC is not configured. The UE determines this information based on the resultant configuration of the *RRCReconfiguration* or *RRCResume* message that triggers this response. Value *gap* indicates that a measurement gap is needed, value *no-gap* indicates a measurement gap is not needed. |

#### – *NeedForNCSG-ConfigEUTRA*

The IE *NeedForNCSG-ConfigEUTRA* contains configuration related to the reporting of measurement gap and NCSG requirement information.

*NeedForNCSG-ConfigEUTRA* information element

-- ASN1START

-- TAG-NeedForNCSG-ConfigEUTRA-START

NeedForNCSG-ConfigEUTRA-r17 ::= SEQUENCE {

requestedTargetBandFilterNCSG-EUTRA-r17 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF FreqBandIndicatorEUTRA OPTIONAL -- Need R

}

-- TAG-NeedForNCSG-ConfigEUTRA-STOP

-- ASN1STOP

|  |
| --- |
| *NeedForNCSG-ConfigEUTRA field descriptions* |
| ***requestedTargetBandFilterNCSG-EUTRA***  Indicates the target E-UTRA bands that the UE is requested to report the measurement gap and NCSG requirement information. |

#### – *NeedForNCSG-ConfigNR*

The IE *NeedForNCSG-ConfigNR* contains configuration related to the reporting of measurement gap and NCSG requirement information.

*NeedForNCSG-ConfigNR* information element

-- ASN1START

-- TAG-NeedForNCSG-ConfigNR-START

NeedForNCSG-ConfigNR-r17 ::= SEQUENCE {

requestedTargetBandFilterNCSG-NR-r17 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL -- Need R

}

-- TAG-NeedForNCSG-ConfigNR-STOP

-- ASN1STOP

|  |
| --- |
| *NeedForNCSG-ConfigNR field descriptions* |
| ***requestedTargetBandFilterNCSG-NR***  Indicates the target NR bands that the UE is requested to report the measurement gap and NCSG requirement information. |

#### – *NeedForNCSG-InfoEUTRA*

The IE *NeedForNCSG-InfoEUTRA* indicates whether measurement gap or NCSG is required for the UE to perform measurements on an E‑UTRA target band while NR-DC or NE-DC is not configured.

*NeedForNCSG-InfoEUTRA* information element

-- ASN1START

-- TAG-NeedForNCSG-InfoEUTRA-START

NeedForNCSG-InfoEUTRA-r17 ::= SEQUENCE {

needForNCSG-EUTRA-r17 NeedForNSCG-BandListEUTRA-r17

}

NeedForNSCG-BandListEUTRA-r17 ::= SEQUENCE (SIZE (1..maxBandsEUTRA)) OF NeedForNCSG-EUTRA-r17

NeedForNCSG-EUTRA-r17 ::= SEQUENCE {

bandEUTRA-r17 FreqBandIndicatorEUTRA,

gapIndication-r17 ENUMERATED {gap, ncsg, nogap-noncsg}

}

-- TAG-NeedForNCSG-InfoEUTRA-STOP

-- ASN1STOP

|  |
| --- |
| *NeedForNCSG-InfoEUTRA* field descriptions |
| ***needForNCSG-EUTRA***  Indicates the measurement gap and NCSG requirement information for E-UTRA measurement. |

|  |
| --- |
| *NeedForNCSG-EUTRA* field descriptions |
| ***bandEUTRA***  Indicates the E‑UTRA target band to be measured. |
| ***gapIndication***  Indicates whether measurement gap or NCSG is required for the UE to perform measurements on the concerned E‑UTRA target band while NR-DC or NE-DC is not configured. The UE determines this information based on the resultant configuration of the *RRCReconfiguration* message or *RRCResume* message that triggers this response. Value *gap* indicates that a measurement gap is needed, value *ncsg* indicates that NCSG is needed, value *nogap-noncsg* indicates neither a measurement gap nor a NCSG is needed. |

#### – *NeedForNCSG-InfoNR*

The IE *NeedForNCSG-InfoNR* indicates whether measurement gap or NCSG is required for the UE to perform SSB based measurements on an NR target band while NR-DC or NE-DC is not configured.

*NeedForNCSG-InfoNR* information element

-- ASN1START

-- TAG-NeedForNCSG-InfoNR-START

NeedForNCSG-InfoNR-r17 ::= SEQUENCE {

intraFreq-needForNCSG-r17 NeedForNCSG-IntraFreqList-r17,

interFreq-needForNCSG-r17 NeedForNCSG-BandListNR-r17

}

NeedForNCSG-IntraFreqList-r17 ::= SEQUENCE (SIZE (1.. maxNrofServingCells)) OF NeedForNCSG-IntraFreq-r17

NeedForNCSG-BandListNR-r17 ::= SEQUENCE (SIZE (1..maxBands)) OF NeedForNCSG-NR-r17

NeedForNCSG-IntraFreq-r17 ::= SEQUENCE {

servCellId-r17 ServCellIndex,

gapIndicationIntra-r17 ENUMERATED {gap, ncsg, nogap-noncsg}

}

NeedForNCSG-NR-r17 ::= SEQUENCE {

bandNR-r17 FreqBandIndicatorNR,

gapIndication-r17 ENUMERATED {gap, ncsg, nogap-noncsg}

}

-- TAG-NeedForNCSGInfoNR-STOP

-- ASN1STOP

|  |
| --- |
| *NeedForNCSG-InfoNR* field descriptions |
| ***intraFreq-needForNCSG***  Indicates the measurement gap and NCSG requirement information for NR intra-frequency measurement. |
| ***interFreq-needForNCSG***  Indicates the measurement gap and NCSG requirement information for NR inter-frequency measurement. |

|  |
| --- |
| *NeedForNCSG-IntraFreq field descriptions* |
| ***servCellId***  Indicates the serving cell which contains the target SSB (associated with the initial DL BWP) to be measured. |
| ***gapIndicationIntra***  Indicates whether measurement gap or NCSG is required for the UE to perform intra-frequency SSB based measurements on the concerned serving cell. Value *gap* indicates that a measurement gap is needed if any of the UE configured BWPs do not contain the frequency domain resources of the SSB associated to the initial DL BWP. Value *ncsg* indicates that a NCSG is needed if any of the UE configured BWPs do not contain the frequency domain resources of the SSB associated to the initial DL BWP. Value *nogap-noncsg* indicates that neither a measurement gap nor a NCSG is needed to measure the SSB associated to the initial DL BWP for all configured BWPs, no matter the SSB is within the configured BWP or not. |

|  |
| --- |
| *NeedForNCSG-NR* field descriptions |
| ***bandNR***  Indicates the NR target band to be measured. |
| ***gapIndication***  Indicates whether measurement gap or NCSG is required for the UE to perform SSB based measurements on the concerned NR target band while NR-DC or NE-DC is not configured. The UE determines this information based on the resultant configuration of the *RRCReconfiguration* or *RRCResume* message that triggers this response. Value *gap* indicates that a measurement gap is needed, value *ncsg* indicates that a NCSG is needed, and value *nogap-noncsg* indicates neither a measurement gap nor a NCSG is needed. |

-------------------------------------------Skip Unchanged -------------------------------------------

#### – *RejectWaitTime*

The IE *RejectWaitTime* is used to provide the value in seconds for timer T302.

*RejectWaitTime* information element

-- ASN1START

-- TAG-REJECTWAITTIME-START

RejectWaitTime ::= INTEGER (1..16)

-- TAG-REJECTWAITTIME-STOP

-- ASN1STOP

#### – *RepetitionSchemeConfig*

The IE *RepetitionSchemeConfig* is used to configure the UE with repetition schemes as specified in TS 38.214 [19] clause 5.1.

*RepetitionSchemeConfig* information element

-- ASN1START

-- TAG-REPETITIONSCHEMECONFIG-START

RepetitionSchemeConfig-r16 ::= CHOICE {

fdm-TDM-r16 SetupRelease { FDM-TDM-r16 },

slotBased-r16 SetupRelease { SlotBased-r16 }

}

RepetitionSchemeConfig-v1630 ::= SEQUENCE {

slotBased-v1630 SetupRelease { SlotBased-v1630 }

}

FDM-TDM-r16 ::= SEQUENCE {

repetitionScheme-r16 ENUMERATED {fdmSchemeA, fdmSchemeB,tdmSchemeA },

startingSymbolOffsetK-r16 INTEGER (0..7) OPTIONAL -- Need R

}

SlotBased-r16 ::= SEQUENCE {

tciMapping-r16 ENUMERATED {cyclicMapping, sequentialMapping},

sequenceOffsetForRV-r16 INTEGER (1..3)

}

SlotBased-v1630 ::= SEQUENCE {

tciMapping-r16 ENUMERATED {cyclicMapping, sequentialMapping},

sequenceOffsetForRV-r16 INTEGER (0)

}

-- TAG-REPETITIONSCHEMECONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *RepetitionSchemeConfig* field descriptions |
| ***fdm-TDM***  Configures UE with a repetition scheme among fdmSchemeA, fdmSchemeB and tdmSchemeA as specified in clause 5.1 of TS 38.214 [19]. The network does not set this field to *release*. Upon reception of this field in *RepetitionSchemeConfig-r16*, the UE shall release *slotBased* if previously configured in the same instance of *RepetitionSchemeConfig-r16*. |
| ***sequenceOffsetForRV***  For slot-based repetition scheme, selected RV sequence is applied to transmission occasions associated to the first TCI state. The RV sequence associated to the second TCI state is determined by a RV offset from that selected RV sequence. |
| ***slotBased***  Configures UE with slot-based repetition scheme. Network always configures this field when the parameter *repetitionNumber* is present in IE *PDSCH-TimeDomainResourceAllocationList.* The network does not set this field to *release*. Upon reception of this field in *RepetitionSchemeConfig-r16*, the UE shall release *fdm-TDM* if previously configured in the same instance of *RepetitionSchemeConfig-r16*. |
| ***startingSymbolOffsetK***  The starting symbol of the second transmission occasion has K symbol offset relative to the last symbol of the first transmission occasion. When UE is configured with *tdmSchemeA,* the parameter *startingSymbolOffsetK* is present, otherwise absent. |
| ***tciMapping***  Enables TCI state mapping method to PDSCH transmission occasions. |

#### – *ReportConfigId*

The IE *ReportConfigId* is used to identify a measurement reporting configuration.

*ReportConfigId* information element

-- ASN1START

-- TAG-REPORTCONFIGID-START

ReportConfigId ::= INTEGER (1..maxReportConfigId)

-- TAG-REPORTCONFIGID-STOP

-- ASN1STOP

#### *– ReportConfigInterRAT*

The IE *ReportConfigInterRAT* specifies criteria for triggering of an inter-RAT measurement reporting event, or an L2 U2N relay measurement reporting event. The inter-RAT measurement reporting events for E-UTRA and UTRA-FDD and L2 U2N Relay UE are labelled B*N* with *N* equal to 1, 2 and so on.

Event B1: Neighbour becomes better than absolute threshold;

Event B2: PCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute threshold2;

Event Y1: PCell becomes worse than absolute threshold1 AND candidate L2 U2N Relay UE becomes better than another absolute threshold2;

Event Y2: Candidate L2 U2N Relay UE becomes better than absolute threshold;

*ReportConfigInterRAT* information element

-- ASN1START

-- TAG-REPORTCONFIGINTERRAT-START

ReportConfigInterRAT ::= SEQUENCE {

reportType CHOICE {

periodical PeriodicalReportConfigInterRAT,

eventTriggered EventTriggerConfigInterRAT,

reportCGI ReportCGI-EUTRA,

...,

reportSFTD ReportSFTD-EUTRA

}

}

ReportCGI-EUTRA ::= SEQUENCE {

cellForWhichToReportCGI EUTRA-PhysCellId,

...,

[[

useAutonomousGaps-r16 ENUMERATED {setup} OPTIONAL -- Need R

]]

}

ReportSFTD-EUTRA ::= SEQUENCE {

reportSFTD-Meas BOOLEAN,

reportRSRP BOOLEAN,

...

}

EventTriggerConfigInterRAT ::= SEQUENCE {

eventId CHOICE {

eventB1 SEQUENCE {

b1-ThresholdEUTRA MeasTriggerQuantityEUTRA,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

...

},

eventB2 SEQUENCE {

b2-Threshold1 MeasTriggerQuantity,

b2-Threshold2EUTRA MeasTriggerQuantityEUTRA,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

...

},

...,

[[

eventB1-UTRA-FDD-r16 SEQUENCE {

b1-ThresholdUTRA-FDD-r16 MeasTriggerQuantityUTRA-FDD-r16,

reportOnLeave-r16 BOOLEAN,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger,

...

},

eventB2-UTRA-FDD-r16 SEQUENCE {

b2-Threshold1-r16 MeasTriggerQuantity,

b2-Threshold2UTRA-FDD-r16 MeasTriggerQuantityUTRA-FDD-r16,

reportOnLeave-r16 BOOLEAN,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger,

...

}

]],

[[

eventY1-Relay-r17 SEQUENCE {

y1-Threshold1-r17 MeasTriggerQuantity,

y1-Threshold2-Relay-r17 SL-MeasTriggerQuantity-r16,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger,

...

},

eventY2-Relay-r17 SEQUENCE {

y2-Threshold-Relay-r17 SL-MeasTriggerQuantity-r16,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger,

...

}

]]

},

rsType NR-RS-Type,

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantity MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

...,

[[

reportQuantityUTRA-FDD-r16 MeasReportQuantityUTRA-FDD-r16 OPTIONAL -- Need R

]],

[[

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

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL -- Need M

]],

[[

reportQuantityRelay-r17 SL-MeasReportQuantity-r16 OPTIONAL -- Need R

]]}

PeriodicalReportConfigInterRAT ::= SEQUENCE {

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantity MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

...,

[[

reportQuantityUTRA-FDD-r16 MeasReportQuantityUTRA-FDD-r16 OPTIONAL -- Need R

]],

[[

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

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL -- Need M

]],

[[

reportQuantityRelay-r17 SL-MeasReportQuantity-r16 OPTIONAL -- Need R

]]

}

MeasTriggerQuantityUTRA-FDD-r16 ::= CHOICE{

utra-FDD-RSCP-r16 INTEGER (-5..91),

utra-FDD-EcN0-r16 INTEGER (0..49)

}

MeasReportQuantityUTRA-FDD-r16 ::= SEQUENCE {

cpich-RSCP BOOLEAN,

cpich-EcN0 BOOLEAN

}

-- TAG-REPORTCONFIGINTERRAT-STOP

-- ASN1STOP

|  |
| --- |
| *ReportConfigInterRAT field descriptions* |
| ***reportType***  Type of the configured measurement report. In (NG)EN-DC, and NR-DC, network does not configure report of type *ReportCGI-EUTRA* for SCG. |

|  |
| --- |
| *ReportCGI-EUTRA field descriptions* |
| ***useAutonomousGaps***  Indicates whether or not the UE is allowed to use autonomous gaps in acquiring system information from the E-UTRAN neighbour cell. When the field is included, the UE applies the corresponding value for T321. |

|  |
| --- |
| *EventTriggerConfigInterRAT* field descriptions |
| ***b2-Threshold1***  NR threshold to be used in inter RAT measurement report triggering condition for event B2. |
| ***bN-ThresholdEUTRA***  E-UTRA threshold value associated with the selected trigger quantity (RSRP, RSRQ, SINR) to be used in inter RAT measurement report triggering condition for event number bN. In the same *eventB2*, the network configures the same CHOICE name (*rsrp*, *rsrq* or *sinr*) for the *MeasTriggerQuantity* of the *b2-Threshold1* and for the *MeasTriggerQuantityEUTRA* of the *b2-Threshold2EUTRA*. |
| ***eventId***  Choice of inter RAT event triggered reporting criteria. |
| ***maxReportCells***  Max number of non-serving cells to include in the measurement report. |
| ***reportAmount***  *Number* of measurement reports applicable for *eventTriggered* as well as for *periodical* report types |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList*, as specified in 5.5.4.1. |
| ***reportQuantity, reportQuantityUTRA-FDD***  The cell measurement quantities to be included in the measurement report. If the field *eventB1-UTRA-FDD* or *eventB2-UTRA-FDD* is present, the UE shall ignore the value(s) provided in *reportQuantity*. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |
| ***bN-ThresholdUTRA-FDD***  UTRA-FDD threshold value associated with the selected trigger quantity (RSCP, EcN0) to be used in inter RAT measurement report triggering condition for event number bN.  *utra-FDD-RSCP* corresponds to CPICH\_RSCP in TS 25.133 [46] for FDD. *utra-FDD-EcN0* corresponds to CPICH\_Ec/No in TS 25.133 [46] for FDD.  For *utra-FDD-RSCP*: The actual value is field value – 115 dBm.  For *utra-FDD-EcN0*: The actual value is (field value – 49)/2 dB. |
| ***y-Threshold1***  NR threshold to be used in measurement report triggering condition for event Y. |
| ***y-Threshold2-Relay***  L2 U2N Relay threshold value associated with the selected trigger quantity (i.e. RSRP) to be used in measurement report triggering condition for event number Y. |

|  |
| --- |
| *PeriodicalReportConfigInterRAT* field descriptions |
| ***maxReportCells***  Max number of non-serving cells to include in the measurement report. |
| ***reportAmount***  Number of measurement reports applicable for *eventTriggered* as well as for *periodical* report types |
| ***reportQuantity, reportQuantityUTRA-FDD***  The cell measurement quantities to be included in the measurement report. If the field *reportQuantityUTRA-FDD* is present, the UE shall ignore the value(s) provided in *reportQuantity*. |

#### – *ReportConfigNR*

The IE *ReportConfigNR* specifies criteria for triggering of an NR measurement reporting event or of a CHO, CPA or CPC event. For events labelled AN with N equal to 1, 2 and so on, measurement reporting events and CHO, CPA or CPC events are based on cell measurement results, which can either be derived based on SS/PBCH block or CSI-RS.

Event A1: Serving becomes better than absolute threshold;

Event A2: Serving becomes worse than absolute threshold;

Event A3: Neighbour becomes amount of offset better than PCell/PSCell;

Event A4: Neighbour becomes better than absolute threshold;

Event A5: PCell/PSCell becomes worse than absolute threshold1 AND Neighbour/SCell becomes better than another absolute threshold2;

Event A6: Neighbour becomes amount of offset better than SCell;

Event D1:Distance between UE and a reference location *referenceLocation1* becomes larger than configured threshold1 *Thresh1* and distance between UE and a reference location *referenceLocation2* becomes shorter than configured threshold *Thresh2*;

CondEvent A3: Conditional reconfiguration candidate becomes amount of offset better than PCell/PSCell;

CondEvent A4: Conditional reconfiguration candidate becomes better than absolute threshold;

CondEvent A5: PCell/PSCell becomes worse than absolute threshold1 AND Conditional reconfiguration candidate becomes better than another absolute threshold2;

CondEvent D1: Distance between UE and a reference location *referenceLocation1* becomes larger than configured threshold *Thresh1* and distance between UE and a reference location *referenceLocation2* of conditional reconfiguration candidate becomes shorter than configured threshold *Thresh2*;

CondEvent T1: Time measured at UE becomes more than configured threshold *Thresh1* but is less than *Thresh2*;

Event X1: Seving L2 U2N Relay UE becomes worse than absolute threshold1 AND NR Cell becomes better than another absolute threshold2;

Event X2: Serving L2 U2N Relay UE becomes worse than absolute threshold;

For event I1, measurement reporting event is based on CLI measurement results, which can either be derived based on SRS-RSRP or CLI-RSSI.

Event I1: Interference becomes higher than absolute threshold.

*ReportConfigNR* information element

-- ASN1START

-- TAG-REPORTCONFIGNR-START

ReportConfigNR ::= SEQUENCE {

reportType CHOICE {

periodical PeriodicalReportConfig,

eventTriggered EventTriggerConfig,

...,

reportCGI ReportCGI,

reportSFTD ReportSFTD-NR,

condTriggerConfig-r16 CondTriggerConfig-r16,

cli-Periodical-r16 CLI-PeriodicalReportConfig-r16,

cli-EventTriggered-r16 CLI-EventTriggerConfig-r16,

rxTxPeriodical-r17 RxTxPeriodical-r17

}

}

ReportCGI ::= SEQUENCE {

cellForWhichToReportCGI PhysCellId,

...,

[[

useAutonomousGaps-r16 ENUMERATED {setup} OPTIONAL -- Need R

]]

}

ReportSFTD-NR ::= SEQUENCE {

reportSFTD-Meas BOOLEAN,

reportRSRP BOOLEAN,

...,

[[

reportSFTD-NeighMeas ENUMERATED {true} OPTIONAL, -- Need R

drx-SFTD-NeighMeas ENUMERATED {true} OPTIONAL, -- Need R

cellsForWhichToReportSFTD SEQUENCE (SIZE (1..maxCellSFTD)) OF PhysCellId OPTIONAL -- Need R

]]

}

CondTriggerConfig-r16 ::= SEQUENCE {

condEventId CHOICE {

condEventA3 SEQUENCE {

a3-Offset MeasTriggerQuantityOffset,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

condEventA5 SEQUENCE {

a5-Threshold1 MeasTriggerQuantity,

a5-Threshold2 MeasTriggerQuantity,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

...,

condEventA4-r17 SEQUENCE {

a4-Threshold-r17 MeasTriggerQuantity,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger,

useAllowedCellList-r17 BOOLEAN

},

condEventD1-r17 SEQUENCE {

distanceThresFromReference1-r17 INTEGER(0.. 65525),

distanceThresFromReference2-r17 INTEGER(0.. 65525) OPTIONAL, --Need R

referenceLocation1-r17 ReferenceLocation-r17,

referenceLocation2-r17 ReferenceLocation-r17 OPTIONAL, --Need R

hysteresis-r17 HysteresisLocation-r17,

timeToTrigger-r17 TimeToTrigger

},

condEventT1-r17 SEQUENCE {

t1-Threshold-r17 INTEGER (0..549755813887),

duration-r17 INTEGER (1..6000)

}

},

rsType-r16 NR-RS-Type,

...

}

EventTriggerConfig::= SEQUENCE {

eventId CHOICE {

eventA1 SEQUENCE {

a1-Threshold MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

eventA2 SEQUENCE {

a2-Threshold MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger

},

eventA3 SEQUENCE {

a3-Offset MeasTriggerQuantityOffset,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

eventA4 SEQUENCE {

a4-Threshold MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

eventA5 SEQUENCE {

a5-Threshold1 MeasTriggerQuantity,

a5-Threshold2 MeasTriggerQuantity,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

eventA6 SEQUENCE {

a6-Offset MeasTriggerQuantityOffset,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

useAllowedCellList BOOLEAN

},

...,

[[

eventX1-r17 SEQUENCE {

x1-Threshold1-Relay-r17 SL-MeasTriggerQuantity-r16,

x1-Threshold2-r17 MeasTriggerQuantity,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger

},

eventX2-r17 SEQUENCE {

x2-Threshold-Relay-r17 SL-MeasTriggerQuantity-r16,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger

},

eventD1-r17 SEQUENCE {

distanceThresFromReference1-r17 INTEGER(1.. 65525),

distanceThresFromReference2-r17 INTEGER(1.. 65525) OPTIONAL, --Need R

referenceLocation1-r17 OCTET STRING,

referenceLocation2-r17 OCTET STRING OPTIONAL, --Need R

hysteresis-r17 HysteresisLocation-r17,

timeToTrigger-r17 TimeToTrigger

}

]]

},

rsType NR-RS-Type,

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantityCell MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

reportQuantityRS-Indexes MeasReportQuantity OPTIONAL, -- Need R

maxNrofRS-IndexesToReport INTEGER (1..maxNrofIndexesToReport) OPTIONAL, -- Need R

includeBeamMeasurements BOOLEAN,

reportAddNeighMeas ENUMERATED {setup} OPTIONAL, -- Need R

...,

[[

measRSSI-ReportConfig-r16 MeasRSSI-ReportConfig-r16 OPTIONAL, -- Need R

useT312-r16 BOOLEAN OPTIONAL, -- Need M

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

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL -- Need M

]]

}

PeriodicalReportConfig ::= SEQUENCE {

rsType NR-RS-Type,

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantityCell MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

reportQuantityRS-Indexes MeasReportQuantity OPTIONAL, -- Need R

maxNrofRS-IndexesToReport INTEGER (1..maxNrofIndexesToReport) OPTIONAL, -- Need R

includeBeamMeasurements BOOLEAN,

useAllowedCellList BOOLEAN,

...,

[[

measRSSI-ReportConfig-r16 MeasRSSI-ReportConfig-r16 OPTIONAL, -- Need R

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

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL, -- Need M

ul-DelayValueConfig-r16 SetupRelease { UL-DelayValueConfig-r16 } OPTIONAL, -- Need M

reportAddNeighMeas-r16 ENUMERATED {setup} OPTIONAL -- Need R

]],

[[

ul-ExcessDelayConfig-r17 SetupRelease { UL-ExcessDelayConfig-r17 } OPTIONAL -- Need M

]]

}

NR-RS-Type ::= ENUMERATED {ssb, csi-rs}

MeasTriggerQuantity ::= CHOICE {

rsrp RSRP-Range,

rsrq RSRQ-Range,

sinr SINR-Range

}

MeasTriggerQuantityOffset ::= CHOICE {

rsrp INTEGER (-30..30),

rsrq INTEGER (-30..30),

sinr INTEGER (-30..30)

}

MeasReportQuantity ::= SEQUENCE {

rsrp BOOLEAN,

rsrq BOOLEAN,

sinr BOOLEAN

}

MeasRSSI-ReportConfig-r16 ::= SEQUENCE {

channelOccupancyThreshold-r16 RSSI-Range-r16 OPTIONAL -- Need R

}

CLI-EventTriggerConfig-r16 ::= SEQUENCE {

eventId-r16 CHOICE {

eventI1-r16 SEQUENCE {

i1-Threshold-r16 MeasTriggerQuantityCLI-r16,

reportOnLeave-r16 BOOLEAN,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger

},

...

},

reportInterval-r16 ReportInterval,

reportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

maxReportCLI-r16 INTEGER (1..maxCLI-Report-r16),

...

}

CLI-PeriodicalReportConfig-r16 ::= SEQUENCE {

reportInterval-r16 ReportInterval,

reportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantityCLI-r16 MeasReportQuantityCLI-r16,

maxReportCLI-r16 INTEGER (1..maxCLI-Report-r16),

...

}

RxTxPeriodical-r17 ::= SEQUENCE {

rxTxReportInterval-r17 RxTxReportInterval-r17,

reportAmount-r17 ENUMERATED {r1, infinity, spare6, spare5, spare4, spare3, spare2, spare1},

...

}

RxTxReportInterval-r17 ::= ENUMERATED {ms80,ms120,ms160,ms240,ms320,ms480,ms640,ms1024,ms1280,ms2048,ms2560,ms5120,spare4,spare3,spare2,spare1}

MeasTriggerQuantityCLI-r16 ::= CHOICE {

srs-RSRP-r16 SRS-RSRP-Range-r16,

cli-RSSI-r16 CLI-RSSI-Range-r16

}

MeasReportQuantityCLI-r16 ::= ENUMERATED {srs-rsrp, cli-rssi}

-- TAG-REPORTCONFIGNR-STOP

-- ASN1STOP

|  |
| --- |
| *CondTriggerConfig* field descriptions |
| ***a3-Offset***  Offset value(s) to be used in NR conditional reconfiguration triggering condition for cond event a3. The actual value is field value \* 0.5 dB. |
| ***a4-Threshold***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR conditional reconfiguration triggering condition for cond event a4. |
| ***a5-Threshold1/ a5-Threshold2***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR conditional reconfiguration triggering condition for cond event a5. In the same *condeventA5*, the network configures the same quantity for the *MeasTriggerQuantity* of the *a5-Threshold1* and for the *MeasTriggerQuantity* of the *a5-Threshold2*. |
| ***condEventId***  Choice of NR conditional reconfiguration event triggered criteria. |
| ***duration***  This field is used for defining the leaving condition T1-2 for conditional HO event condEventT1. Each step represents 100ms. |
| ***t1-Threshold***  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). |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to execute the conditional reconfiguration evaluation. |

|  |
| --- |
| *ReportConfigNR* field descriptions |
| ***reportType***  Type of the configured measurement report. In MR-DC, network does not configure report of type *reportCGI* using SRB3. The *condTriggerConfig is* used for CHO, CPA or CPC configuration. |

|  |
| --- |
| *ReportCGI* field descriptions |
| ***useAutonomousGaps***  Indicates whether or not the UE is allowed to use autonomous gaps in acquiring system information from the NR neighbour cell. When the field is included, the UE applies the corresponding value for T321. |

|  |
| --- |
| *EventTriggerConfig* field descriptions |
| ***a3-Offset/a6-Offset***  Offset value(s) to be used in NR measurement report triggering condition for event a3/a6. The actual value is field value \* 0.5 dB. |
| ***aN-ThresholdM***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR measurement report triggering condition for event number aN. If multiple thresholds are defined for event number aN, the thresholds are differentiated by M. The network configures aN-Threshold1 only for events A1, A2, A4, A5 and a5-Threshold2 only for event A5. In the same *eventA5*, the network configures the same quantity for the *MeasTriggerQuantity* of the *a5-Threshold1* and for the *MeasTriggerQuantity* of the *a5-Threshold2*. |
| ***channelOccupancyThreshold***  RSSI threshold which is used for channel occupancy evaluation. |
| ***distanceThresFromReference1, distanceThresFromReference2***  Distance from a reference location configured with *referenceLocation1* or *referenceLocation2.* Each step represents 50m. |
| ***eventId***  Choice of NR event triggered reporting criteria. If network configured eventD1 network shall configure includeCommonLocationInfo for the UE. |
| ***maxNrofRS-IndexesToReport***  Max number of RS indexes to include in the measurement report for A1-A6 events. |
| ***maxReportCells***  Max number of non-serving cells to include in the measurement report. |
| ***referenceLocation1, referenceLocation2***  Reference locations used for location based event. The *referenceLocation1* is associated to serving cell and *referenceLocation2* is associated to candidate target cell. The value of the field is same as *Ellipsoid-Point* defined in TS37.355. The first/leftmost bit of the first octet contains the most significant bit. |
| ***reportAddNeighMeas***  Indicates that the UE shall include the best neighbour cells per serving frequency. |
| ***reportAmount***  *Number* of measurement reports applicable for *eventTriggered* as well as for *periodical* report types. |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList*, as specified in 5.5.4.1. |
| ***reportQuantityCell***  The cell measurement quantities to be included in the measurement report. |
| ***reportQuantityRS-Indexes***  Indicates which measurement information per RS index the UE shall include in the measurement report. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |
| ***useAllowedCellList***  Indicates whether only the cells included in the allow-list of the associated measObject are applicable as specified in 5.5.4.1. |
| ***useT312***  If value *TRUE* is configured, the UE shall use the timer T312 with the value *t312* as specified in the corresponding *measObjectNR*. If value FALSE is configured, the timer T312 is considered as disabled. Network configures value *TRUE* only if *reportType* is set to *eventTriggered*. |
| ***xN-ThresholdM***  Threshold value associated to the selected trigger quantity (e.g. RSRP, RSRQ, SINR) per RS Type (e.g. SS/PBCH block, CSI-RS) to be used in NR measurement report triggering condition for event xN. If multiple thresholds are defined for event number xN, the thresholds are differentiated by M. x1-Threshold1 and x2-Threshold indicates the threshold value for the serving L2 U2N Relay UE, x1-Threshold2 indicates the threshold value for the NR Cells. |

|  |
| --- |
| *CLI-EventTriggerConfig* field descriptions |
| ***i1-Threshold***  Threshold value associated to the selected trigger quantity (e.g. SRS-RSRP, CLI-RSSI) to be used in CLI measurement report triggering condition for event i1. |
| ***eventId***  Choice of CLI event triggered reporting criteria. |
| ***maxReportCLI***  Max number of CLI measurement resource to include in the measurement report. |
| ***reportAmount***  *Number* of measurement reports. |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a CLI measurement resource in *srsTriggeredList* or *rssiTriggeredList*, as specified in 5.5.4.1. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |

|  |
| --- |
| *CLI-PeriodicalReportConfig* field descriptions |
| ***maxReportCLI***  Max number of CLI measurement resource to include in the measurement report. |
| ***reportAmount***  *Number* of measurement reports. |
| ***reportQuantityCLI***  The CLI measurement quantities to be included in the measurement report. |

|  |
| --- |
| *PeriodicalReportConfig* field descriptions |
| ***maxNrofRS-IndexesToReport***  Max number of RS indexes to include in the measurement report. |
| ***maxReportCells***  Max number of non-serving cells to include in the measurement report. |
| ***reportAddNeighMeas***  Indicates that the UE shall include the best neighbour cells per serving frequency. |
| ***reportAmount***  *Number* of measurement reports applicable for *eventTriggered* as well as for *periodical* report types |
| ***reportQuantityCell***  The cell measurement quantities to be included in the measurement report. |
| ***reportQuantityRS-Indexes***  Indicates which measurement information per RS index the UE shall include in the measurement report. |
| ***ul-DelayValueConfig***  If the field is present, the UE shall perform the actual UL PDCP Packet Average Delay measurement per DRB as specified in TS 38.314 [53] and the UE shall ignore the fields *reportQuantityCell* and *maxReportCells*. The applicable values for the corresponding *reportInterval* are (one of the) {ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1,min6, min12, min30}. The *reportInterval* indicates the periodicity for performing and reporting of UL PDCP Packet Average Delay per DRB measurement as specified in TS 38.314 [53]. |
| ***ul-ExcessDelayConfig***  If the field is present, the UE shall perform the actual UL PDCP Excess Packet Delay per DRB measurement as specified in TS 38.314 [53] and the UE shall ignore the fields *reportQuantityCell* and *maxReportCells*. The applicable values for the corresponding *reportInterval* are (one of the) {ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1,min6, min12, min30}. The *reportInterval* indicates the periodicity for performing and reporting of UL PDCP Excess Packet Delay per DRB measurement as specified in TS 38.314 [53]. |
| ***useAllowedCellList***  Indicates whether only the cells included in the allow-list of the associated measObject are applicable as specified in 5.5.4.1. |

|  |
| --- |
| *ReportSFTD-NR* field descriptions |
| ***cellForWhichToReportSFTD***  Indicates the target NR neighbour cells for SFTD measurement between PCell and NR neighbour cells. |
| ***drx-SFTD-NeighMeas***  Indicates that the UE shall use available idle periods (i.e. DRX off periods) for the SFTD measurement in NR standalone. The network only includes *drx-SFTD-NeighMeas* field when *reprtSFTD-NeighMeas* is set to true. |
| ***reportSFTD-Meas***  Indicates whether UE is required to perform SFTD measurement between PCell and NR PSCell in NR-DC. |
| ***reportSFTD-NeighMeas***  Indicates whether UE is required to perform SFTD measurement between PCell and NR neighbour cells in NR standalone. The network does not include this field if *reportSFTD-Meas* is set to *true*. |
| ***reportRSRP***  Indicates whether UE is required to include RSRP result of NR PSCell or NR neighbour cells in SFTD measurement result, derived based on SSB. If it is set to true, the network should ensure that *ssb-ConfigMobility* is included in the measurement object for NR PSCell or NR neighbour cells. |

|  |
| --- |
| otherfield descriptions |
| ***MeasTriggerQuantity***  SINR is applicable only for CONNECTED mode events. |

#### – *ReportConfigNR-SL*

The IE *ReportConfigNR-SL* specifies criteria for triggering of a CBR measurement reporting event for NR sidelink communication. Measurement reporting events are based on CBR measurement results on the corresponding transmission resource pools. These events are labelled CN with N equal to 1 and 2.

Event C1: CBR of NR sidelink communication becomes better than absolute threshold;

Event C2: CBR of NR sidelink communication becomes worse than absolute threshold;

*ReportConfigNR-SL* information element

-- ASN1START

-- TAG-REPORTCONFIGNR-SL-START

ReportConfigNR-SL-r16 ::= SEQUENCE {

reportType-r16 CHOICE {

periodical-r16 PeriodicalReportConfigNR-SL-r16,

eventTriggered-r16 EventTriggerConfigNR-SL-r16

}

}

EventTriggerConfigNR-SL-r16::= SEQUENCE {

eventId-r16 CHOICE {

eventC1 SEQUENCE {

c1-Threshold-r16 SL-CBR-r16,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger

},

eventC2-r16 SEQUENCE {

c2-Threshold-r16 SL-CBR-r16,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger

},

...

},

reportInterval-r16 ReportInterval,

reportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantity-r16 MeasReportQuantity-r16,

...

}

PeriodicalReportConfigNR-SL-r16 ::= SEQUENCE {

reportInterval-r16 ReportInterval,

reportAmount-r16 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantity-r16 MeasReportQuantity-r16,

...

}

MeasReportQuantity-r16 ::= SEQUENCE {

cbr-r16 BOOLEAN,

...

}

-- TAG-REPORTCONFIGNR-SL-STOP

-- ASN1STOP

|  |
| --- |
| *ReportConfigNR-SL* field descriptions |
| ***reportType***  Type of the configured CBR measurement report for NR sidelink communication. |

|  |
| --- |
| *EventTriggerConfigNR-SL* field descriptions |
| ***cN-Threshold***  Threshold used for events C1 and C2 specified in clauses 5.5.4.11 and 5.5.4.12, respectively. |
| ***eventId***  Choice of NR event triggered reporting criteria. |
| ***reportAmoun***  Number of measurement reports applicable for *eventTriggered* as well as for *periodical* report types. |
| ***reportQuantity***  The sidelink measurement quantities to be included in the measurement report. In this release, this is set as the CBR measurement result. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |

|  |
| --- |
| *PeriodicalReportConfigNR-SL* field descriptions |
| ***reportAmount***  Number of measurement reports applicable for *eventTriggered* as well as for *periodical* report types. |
| ***reportQuantity***  The sidelink measurement quantities to be included in the measurement report. In this release, this is set as the CBR measurement result. |

#### – *ReportConfigToAddModList*

The IE *ReportConfigToAddModList* concerns a list of reporting configurations to add or modify.

ReportConfigToAddModList information element

-- ASN1START

-- TAG-REPORTCONFIGTOADDMODLIST-START

ReportConfigToAddModList ::= SEQUENCE (SIZE (1..maxReportConfigId)) OF ReportConfigToAddMod

ReportConfigToAddMod ::= SEQUENCE {

reportConfigId ReportConfigId,

reportConfig CHOICE {

reportConfigNR ReportConfigNR,

...,

reportConfigInterRAT ReportConfigInterRAT,

reportConfigNR-SL-r16 ReportConfigNR-SL-r16

}

}

-- TAG-REPORTCONFIGTOADDMODLIST-STOP

-- ASN1STOP

#### – *ReportInterval*

The IE *ReportInterval* indicates the interval between periodical reports. The *ReportInterval* is applicable if the UE performs periodical reporting (i.e. when *reportAmount* exceeds 1), for *triggerTypeevent* as well as for *triggerTypeperiodical*. Value *ms120* corresponds to 120 ms, value *ms240* corresponds to 240 ms and so on, while value *min1* corresponds to 1 min, *min6* corresponds to 6 min and so on.

*ReportInterval* information element

-- ASN1START

-- TAG-REPORTINTERVAL-START

ReportInterval ::= ENUMERATED {ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960,

min1,min6, min12, min30 }

-- TAG-REPORTINTERVAL-STOP

-- ASN1STOP

#### – *ReselectionThreshold*

The IE *ReselectionThreshold* is used to indicate an Rx level threshold for cell reselection. Actual value of threshold = field value \* 2 [dB].

*ReselectionThreshold* information element

-- ASN1START

-- TAG-RESELECTIONTHRESHOLD-START

ReselectionThreshold ::= INTEGER (0..31)

-- TAG-RESELECTIONTHRESHOLD-STOP

-- ASN1STOP

#### – *ReselectionThresholdQ*

The IE *ReselectionThresholdQ* is used to indicate a quality level threshold for cell reselection. Actual value of threshold = field value [dB].

*ReselectionThresholdQ* information element

-- ASN1START

-- TAG-RESELECTIONTHRESHOLDQ-START

ReselectionThresholdQ ::= INTEGER (0..31)

-- TAG-RESELECTIONTHRESHOLDQ-STOP

-- ASN1STOP

#### – *ResumeCause*

The IE *ResumeCause* is used to indicate the resume cause in *RRCResumeRequest* and *RRCResumeRequest1*.

*ResumeCause* information element

-- ASN1START

-- TAG-RESUMECAUSE-START

ResumeCause ::= ENUMERATED {emergency, highPriorityAccess, mt-Access, mo-Signalling,

mo-Data, mo-VoiceCall, mo-VideoCall, mo-SMS, rna-Update, mps-PriorityAccess,

mcs-PriorityAccess, spare1, spare2, spare3, spare4, spare5 }

-- TAG-RESUMECAUSE-STOP

-- ASN1STOP

#### – *RLC-BearerConfig*

The IE *RLC-BearerConfig* is used to configure an RLC entity, a corresponding logical channel in MAC and the linking to a PDCP entity (served radio bearer).

*RLC-BearerConfig* information element

-- ASN1START

-- TAG-RLC-BEARERCONFIG-START

RLC-BearerConfig ::= SEQUENCE {

logicalChannelIdentity LogicalChannelIdentity,

servedRadioBearer CHOICE {

srb-Identity SRB-Identity,

drb-Identity DRB-Identity

} OPTIONAL, -- Cond LCH-SetupOnly

reestablishRLC ENUMERATED {true} OPTIONAL, -- Need N

rlc-Config RLC-Config OPTIONAL, -- Cond LCH-Setup

mac-LogicalChannelConfig LogicalChannelConfig OPTIONAL, -- Cond LCH-Setup

...,

[[

rlc-Config-v1610 RLC-Config-v1610 OPTIONAL -- Need R

]],

[[

rlc-Config-v1700 RLC-Config-v1700 OPTIONAL, -- Need R

logicalChannelIdentityExt-r17 LogicalChannelIdentityExt-r17 OPTIONAL, -- Cond LCH-SetupModMRB

multicastRLC-BearerConfig-r17 MulticastRLC-BearerConfig-r17 OPTIONAL, -- Cond LCH-SetupOnlyMRB

servedRadioBearerSRB4-r17 SRB-Identity-v1700 OPTIONAL -- Need N

]]

}

MulticastRLC-BearerConfig-r17 ::= SEQUENCE {

servedMBS-RadioBearer-r17 MRB-Identity-r17,

isPTM-Entity-r17 ENUMERATED {true} OPTIONAL -- NEED S

}

LogicalChannelIdentityExt-r17 ::= INTEGER (320..65855)

-- TAG-RLC-BEARERCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *RLC-BearerConfig* field descriptions |
| ***isPTM-Entity***  If configured, indicates that the RLC entity is used for PTM reception. When the field is absent the RLC entity is used for PTP transmission/reception. |
| ***logicalChannelIdentity***  ID used commonly for the MAC logical channel and for the RLC bearer. Value 4 is not configured for DRBs if SRB4 is configured. |
| ***logicalChannelIdentityExt***  Extended logical channel ID used commonly for the MAC logical channel and for the RLC bearer for MBS multicast. If this field is configured, the UE shall ignore *logicalChannelIdentity*. |
| ***reestablishRLC***  Indicates that RLC should be re-established. Network sets this to *true* at least whenever the security key used for the radio bearer associated with this RLC entity changes. For SRB2, multicast MRBs and DRBs, unless full configuration is used, it is also set to *true* during the resumption of the RRC connection or the first reconfiguration after reestablishment. For SRB1, when resuming an RRC connection, or at the first reconfiguration after RRC connection reestablishment, the network does not set this field to *true.* |
| ***rlc-Config***  Determines the RLC mode (UM, AM) and provides corresponding parameters. RLC mode reconfiguration can only be performed by DRB/multicast MRB release/addition or full configuration. The network may configure *rlc-Config-v1610* only when *rlc-Config* (without suffix) is set to *am*. |
| ***servedMBS-RadioBearer***  Associates the RLC Bearer with a multicast MRB. The UE shall deliver DL RLC SDUs received via the RLC entity of this RLC bearer to the PDCP entity of the *servedMBS-RadioBearer*. |
| ***servedRadioBearer, servedRadioBearerSRB4***  Associates the RLC Bearer with an SRB or a DRB. The UE shall deliver DL RLC SDUs received via the RLC entity of this RLC bearer to the PDCP entity of the *servedRadioBearer*. Furthermore, the UE shall advertise and deliver uplink PDCP PDUs of the uplink PDCP entity of the *servedRadioBearer* to the uplink RLC entity of this RLC bearer unless the uplink scheduling restrictions (*moreThanOneRLC* in *PDCP-Config* and the restrictions in *LogicalChannelConfig*) forbid it to do so. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *LCH-Setup* | This field is mandatory present upon creation of a new logical channel for a DRB or a multicast MRB. This field is optionally present, Need S, upon creation of a new logical channel for an SRB. It is optionally present, Need M, otherwise. |
| *LCH-SetupModMRB* | This field is optionally present upon creation of a new logical channel for a multicast MRB. If this field is included upon creation of a new logical channel for a multicast MRB, it shall be present when modifying this logical channel. The field is absent for logical channels configured for an SRB and a DRB. |
| *LCH-SetupOnly* | This field is mandatory present upon creation of a new logical channel for a DRB or an SRB (*servedRadioBearer*). It is absent, Need M otherwise. |
| LCH-SetupOnlyMRB | This field is mandatory present upon creation of a new logical channel for a multicast MRB. It is absent, Need M otherwise. |

#### – *RLC-Config*

The IE *RLC-Config* is used to specify the RLC configuration of SRBs, multicast MRBs and DRBs.

*RLC-Config* information element

-- ASN1START

-- TAG-RLC-CONFIG-START

RLC-Config ::= CHOICE {

am SEQUENCE {

ul-AM-RLC UL-AM-RLC,

dl-AM-RLC DL-AM-RLC

},

um-Bi-Directional SEQUENCE {

ul-UM-RLC UL-UM-RLC,

dl-UM-RLC DL-UM-RLC

},

um-Uni-Directional-UL SEQUENCE {

ul-UM-RLC UL-UM-RLC

},

um-Uni-Directional-DL SEQUENCE {

dl-UM-RLC DL-UM-RLC

},

...

}

UL-AM-RLC ::= SEQUENCE {

sn-FieldLength SN-FieldLengthAM OPTIONAL, -- Cond Reestab

t-PollRetransmit T-PollRetransmit,

pollPDU PollPDU,

pollByte PollByte,

maxRetxThreshold ENUMERATED { t1, t2, t3, t4, t6, t8, t16, t32 }

}

DL-AM-RLC ::= SEQUENCE {

sn-FieldLength SN-FieldLengthAM OPTIONAL, -- Cond Reestab

t-Reassembly T-Reassembly,

t-StatusProhibit T-StatusProhibit

}

UL-UM-RLC ::= SEQUENCE {

sn-FieldLength SN-FieldLengthUM OPTIONAL -- Cond Reestab

}

DL-UM-RLC ::= SEQUENCE {

sn-FieldLength SN-FieldLengthUM OPTIONAL, -- Cond Reestab

t-Reassembly T-Reassembly

}

T-PollRetransmit ::= ENUMERATED {

ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms105,

ms110, ms115, ms120, ms125, ms130, ms135,

ms140, ms145, ms150, ms155, ms160, ms165,

ms170, ms175, ms180, ms185, ms190, ms195,

ms200, ms205, ms210, ms215, ms220, ms225,

ms230, ms235, ms240, ms245, ms250, ms300,

ms350, ms400, ms450, ms500, ms800, ms1000,

ms2000, ms4000, ms1-v1610, ms2-v1610, ms3-v1610,

ms4-v1610, spare1}

PollPDU ::= ENUMERATED {

p4, p8, p16, p32, p64, p128, p256, p512, p1024, p2048, p4096, p6144, p8192, p12288, p16384,p20480,

p24576, p28672, p32768, p40960, p49152, p57344, p65536, infinity, spare8, spare7, spare6, spare5, spare4,

spare3, spare2, spare1}

PollByte ::= ENUMERATED {

kB1, kB2, kB5, kB8, kB10, kB15, kB25, kB50, kB75,

kB100, kB125, kB250, kB375, kB500, kB750, kB1000,

kB1250, kB1500, kB2000, kB3000, kB4000, kB4500,

kB5000, kB5500, kB6000, kB6500, kB7000, kB7500,

mB8, mB9, mB10, mB11, mB12, mB13, mB14, mB15,

mB16, mB17, mB18, mB20, mB25, mB30, mB40, infinity,

spare20, spare19, spare18, spare17, spare16,

spare15, spare14, spare13, spare12, spare11,

spare10, spare9, spare8, spare7, spare6, spare5,

spare4, spare3, spare2, spare1}

T-Reassembly ::= ENUMERATED {

ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms110,

ms120, ms130, ms140, ms150, ms160, ms170,

ms180, ms190, ms200, spare1}

T-StatusProhibit ::= ENUMERATED {

ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

ms40, ms45, ms50, ms55, ms60, ms65, ms70,

ms75, ms80, ms85, ms90, ms95, ms100, ms105,

ms110, ms115, ms120, ms125, ms130, ms135,

ms140, ms145, ms150, ms155, ms160, ms165,

ms170, ms175, ms180, ms185, ms190, ms195,

ms200, ms205, ms210, ms215, ms220, ms225,

ms230, ms235, ms240, ms245, ms250, ms300,

ms350, ms400, ms450, ms500, ms800, ms1000,

ms1200, ms1600, ms2000, ms2400, spare2, spare1}

SN-FieldLengthUM ::= ENUMERATED {size6, size12}

SN-FieldLengthAM ::= ENUMERATED {size12, size18}

RLC-Config-v1610 ::= SEQUENCE {

dl-AM-RLC-v1610 DL-AM-RLC-v1610

}

RLC-Config-v1700 ::= SEQUENCE {

dl-UM-RLC-v1700 DL-UM-RLC-v1700

}

DL-AM-RLC-v1610 ::= SEQUENCE {

t-StatusProhibit-v1610 T-StatusProhibit-v1610 OPTIONAL, -- Need N

...,

[[

t-ReassemblyExt-r17 T-ReassemblyExt-r17 OPTIONAL -- Need N

]]

}

DL-UM-RLC-v1700 ::= SEQUENCE {

t-ReassemblyExt-r17 T-ReassemblyExt-r17 OPTIONAL, -- Need N

...

}

T-StatusProhibit-v1610 ::= ENUMERATED { ms1, ms2, ms3, ms4, spare4, spare3, spare2, spare1}

T-ReassemblyExt-r17 ::= ENUMERATED {ms210, ms220, ms340, ms350, ms550, ms1100, ms1650, ms2200}

-- TAG-RLC-CONFIG-STOP

-- ASN1STOP

| *RLC-Config* field descriptions |
| --- |
| ***maxRetxThreshold***  Parameter for RLC AM in TS 38.322 [4]. Value *t1* corresponds to 1 retransmission, value *t2* corresponds to 2 retransmissions and so on. |
| ***pollByte***  Parameter for RLC AM in TS 38.322 [4]. Value *kB25* corresponds to 25 kBytes, value *kB50* corresponds to 50 kBytes and so on. *infinity* corresponds to an infinite amount of kBytes. |
| ***pollPDU***  Parameter for RLC AM in TS 38.322 [4]. Value *p4* corresponds to 4 PDUs, value *p8* corresponds to 8 PDUs and so on. *infinity* corresponds to an infinite number of PDUs. |
| ***sn-FieldLength***  Indicates the RLC SN field size, see TS 38.322 [4], in bits. Value *size6* means 6 bits, value *size12* means 12 bits, value *size18* means 18 bits. The value of *sn-FieldLength* for a DRB/multicast MRB shall be changed only using reconfiguration with sync. The network configures only value *size12* in *SN-FieldLengthAM* for SRB. |
| ***t-PollRetransmit***  Timer for RLC AM in TS 38.322 [4], in milliseconds. Value *ms5* means 5 ms, value *ms10* means 10 ms and so on. |
| ***t-Reassembly***  Timer for reassembly in TS 38.322 [4], in milliseconds. Value *ms0* means 0 ms, value *ms5* means 5 ms and so on. |
| ***t-StatusProhibit***  Timer for status reporting in TS 38.322 [4], in milliseconds. Value *ms0* means 0 ms, value *ms5* means 5 ms and so on. If *t-StatusProhibit-v1610* is present, the UE shall ignore *t-StatusProhibit* (without suffix). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *Reestab* | The field is mandatory present at bearer setup. It is optionally present, need M, at RLC re-establishment. Otherwise it is absent. Need M. |

#### 

-------------------------------------------Skip Unchanged -------------------------------------------

#### – *TimeToTrigger*

The IE *TimeToTrigger* specifies the value range used for time to trigger parameter, which concerns the time during which specific criteria for the event needs to be met in order to trigger a measurement report. Value *ms0* corresponds to 0 ms and behaviour as specified in 7.1.2 applies, value *ms40* corresponds to 40 ms, and so on.

*TimeToTrigger* information element

-- ASN1START

-- TAG-TIMETOTRIGGER-START

TimeToTrigger ::= ENUMERATED {

ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256,

ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560,

ms5120}

-- TAG-TIMETOTRIGGER-STOP

-- ASN1STOP

#### *– UAC-BarringInfoSetIndex*

The IE *UAC-BarringInfoSetIndex* provides the index of the entry in *uac-BarringInfoSetList*. Value 1 corresponds to the first entry in *uac-BarringInfoSetList,* value 2 corresponds to the second entry in this list and so on. An index value referring to an entry not included in *uac-BarringInfoSetList* indicates no barring.

*UAC-BarringInfoSetIndex* information element

-- ASN1START

-- TAG-UAC-BARRINGINFOSETINDEX-START

UAC-BarringInfoSetIndex ::= INTEGER (1..maxBarringInfoSet)

-- TAG-UAC-BARRINGINFOSETINDEX-STOP

-- ASN1STOP

#### *– UAC-BarringInfoSetList*

The IE *UAC-BarringInfoSetList* provides a list of access control parameter sets. An access category can be configured with access parameters according to one of the sets.

*UAC-BarringInfoSetList* information element

-- ASN1START

-- TAG-UAC-BARRINGINFOSETLIST-START

UAC-BarringInfoSetList ::= SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet

UAC-BarringInfoSetList-v1700 ::= SEQUENCE (SIZE(1..maxBarringInfoSet)) OF UAC-BarringInfoSet-v1700

UAC-BarringInfoSet ::= SEQUENCE {

uac-BarringFactor ENUMERATED {p00, p05, p10, p15, p20, p25, p30, p40,

p50, p60, p70, p75, p80, p85, p90, p95},

uac-BarringTime ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512},

uac-BarringForAccessIdentity BIT STRING (SIZE(7))

}

UAC-BarringInfoSet-v1700 ::= SEQUENCE {

uac-BarringFactorForAI3-r17 ENUMERATED {p00, p05, p10, p15, p20, p25, p30, p40, p50, p60, p70, p75, p80, p85, p90, p95}

OPTIONAL -- Need S

}

-- TAG-UAC-BARRINGINFOSETLIST-STOP

-- ASN1STOP

|  |
| --- |
| *UAC-BarringInfoSetList* field descriptions |
| ***uac-BarringInfoSetList***  List of access control parameter sets. Each access category can be configured with access parameters corresponding to a particular set by *uac-barringInfoSetIndex*. Association of an access category with an index that has no corresponding entry in the *uac-BarringInfoSetList* is valid configuration and indicates no barring. |
| ***uac-BarringForAccessIdentity***  Indicates whether access attempt is allowed for each Access Identity. The leftmost bit, bit 0 in the bit string corresponds to Access Identity 1, bit 1 in the bit string corresponds to Access Identity 2, bit 2 in the bit string corresponds to Access Identity 11, bit 3 in the bit string corresponds to Access Identity 12, bit 4 in the bit string corresponds to Access Identity 13, bit 5 in the bit string corresponds to Access Identity 14, and bit 6 in the bit string corresponds to Access Identity 15. Value 0 means that access attempt is allowed for the corresponding access identity. |
| ***uac-BarringFactor***  Represents the probability that access attempt would be allowed during access barring check. |
| ***uac-BarringFactorForAI3***  Barring factor applicable for Access Identity 3. Represents the probability that access attempt would be allowed during access barring check. If absent, the UE considers the access attempt as allowed. |
| ***uac-BarringTime***  The average time in seconds before a new access attempt is to be performed after an access attempt was barred at access barring check for the same access category, see 5.3.14.5. |

#### *– UAC-BarringPerCatList*

The IE *UAC-BarringPerCatList* provides access control parameters for a list of access categories.

*UAC-BarringPerCatList* information element

-- ASN1START

-- TAG-UAC-BARRINGPERCATLIST-START

UAC-BarringPerCatList ::= SEQUENCE (SIZE (1..maxAccessCat-1)) OF UAC-BarringPerCat

UAC-BarringPerCat ::= SEQUENCE {

accessCategory INTEGER (1..maxAccessCat-1),

uac-barringInfoSetIndex UAC-BarringInfoSetIndex

}

-- TAG-UAC-BARRINGPERCATLIST-STOP

-- ASN1STOP

|  |
| --- |
| *UAC-BarringPerCatList* field descriptions |
| ***accessCategory***  The Access Category according to TS 22.261 [25]. |

#### *– UAC-BarringPerPLMN-List*

The IE *UAC-BarringPerPLMN-List* provides access category specific access control parameters, which are configured per PLMN/SNPN.

*UAC-BarringPerPLMN-List* information element

-- ASN1START

-- TAG-UAC-BARRINGPERPLMN-LIST-START

UAC-BarringPerPLMN-List ::= SEQUENCE (SIZE (1.. maxPLMN)) OF UAC-BarringPerPLMN

UAC-BarringPerPLMN ::= SEQUENCE {

plmn-IdentityIndex INTEGER (1..maxPLMN),

uac-ACBarringListType CHOICE{

uac-ImplicitACBarringList SEQUENCE (SIZE(maxAccessCat-1)) OF UAC-BarringInfoSetIndex,

uac-ExplicitACBarringList UAC-BarringPerCatList

} OPTIONAL -- Need S

}

-- TAG-UAC-BARRINGPERPLMN-LIST-STOP

-- ASN1STOP

|  |
| --- |
| *UAC-BarringPerPLMN-List* field descriptions |
| ***uac-ACBarringListType***  Access control parameters for each access category valid only for a specific PLMN or SNPN. UE behaviour upon absence of this field is specified in clause 5.3.14.2. |
| ***plmn-IdentityIndex***  Index of the PLMN or SNPN across the *plmn-IdentityInfoList* and *npn-IdentityInfoList* fields included in SIB1. |

#### – *UE-TimersAndConstants*

The IE UE-TimersAndConstants contains timers and constants used by the UE in RRC\_CONNECTED, RRC\_INACTIVE and RRC\_IDLE.

*UE-TimersAndConstants* information element

-- ASN1START

-- TAG-UE-TIMERSANDCONSTANTS-START

UE-TimersAndConstants ::= SEQUENCE {

t300 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000},

t301 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000},

t310 ENUMERATED {ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},

n310 ENUMERATED {n1, n2, n3, n4, n6, n8, n10, n20},

t311 ENUMERATED {ms1000, ms3000, ms5000, ms10000, ms15000, ms20000, ms30000},

n311 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10},

t319 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000},

...

}

-- TAG-UE-TIMERSANDCONSTANTS-STOP

-- ASN1STOP

#### – *UE-TimersAndConstants-RemoteUE*

The IE UE-TimersAndConstants-RemoteUE contains timers and constants used by the L2 U2N Remote UE in RRC\_CONNECTED, RRC\_INACTIVE and RRC\_IDLE.

*UE-TimersAndConstants-RemoteUE* information element

-- ASN1START

-- TAG-UE-TIMERSANDCONSTANTS-REMOTEUE-START

UE-TimersAndConstants-RemoteUE-r17 ::= SEQUENCE {

t300-RemoteUE-r17 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need S

t301-RemoteUE-r17 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need S

t319-RemoteUE-r17 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need S

...

}

-- TAG-UE-TIMERSANDCONSTANTS-REMOTEUE-STOP

-- ASN1STOP

|  |
| --- |
| *UE-TimersAndConstants* field descriptions |
| ***t300-RemoteUE***  Indicates the timer value of T300 used by L2 U2N Remote UE. If the field is absent, the timer value indicated in t300 applies to L2 U2N Remote UE. |
| ***t301-RemoteUE***  Indicates the timer value of T301 used by L2 U2N Remote UE. If the field is absent, the timer value indicated in t301 applies to L2 U2N Remote UE. |
| ***t319-RemoteUE***  Indicates the timer value of T319 used by L2 U2N Remote UE. If the field is absent, the timer value indicated in t319 applies to L2 U2N Remote UE. |

#### – *UL-DelayValueConfig*

The IE *UL-DelayValueConfig* IE specifies the configuration of the UL PDCP Packet Delay value per DRB measurement specified in TS 38.314 [53].

*UL-DelayValueConfig* information element

-- ASN1START

-- TAG-ULDELAYVALUECONFIG-START

UL-DelayValueConfig-r16 ::= SEQUENCE {

delay-DRBlist SEQUENCE (SIZE(1..maxDRB)) OF DRB-Identity

}

-- TAG-ULDELAYVALUECONFIG-STOP

-- ASN1STOP

| *UL-DelayValueConfig* field descriptions |
| --- |
| ***Delay-DRBlist***  Indicates the DRB IDs used by UE to provide results of UL PDCP Packet Delay value per DRB measurement as specified in TS 38.314 [53]. |

#### – *UL-ExcessDelayConfig*

The IE *UL-ExcessDelayConfig* IE specifies the configuration of the UL PDCP Excess Packet Delay per DRB measurement specified in TS 38.314 [53].

*UL-ExcessDelayConfig* information element

-- ASN1START

-- TAG-ULEXCESSDELAYCONFIG-START

UL-ExcessDelayConfig-r17 ::= SEQUENCE {

excessDelay-DRBlist-r17 SEQUENCE (SIZE(1..maxDRB)) OF ExcessDelay-DRB-IdentityInfo-r17

}

ExcessDelay-DRB-IdentityInfo-r17 ::= SEQUENCE {

drb-IdentityList SEQUENCE (SIZE (1..maxDRB)) OF DRB-Identity,

delayThreshold ENUMERATED {ms0dot25, ms0dot5, ms1, ms2, ms4, ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70,

ms80, ms90, ms100, ms150, ms300, ms500}

}

-- TAG-ULEXCESSDELAYCONFIG-STOP

-- ASN1STOP

| *UL-ExcessDelayConfig* field descriptions |
| --- |
| ***drb-IdentityList***  Indicates the DRB IDs used by UE to provide results of UL PDCP Excess Packet Delay per DRB measurement as specified in TS 38.314 [53]. |
| ***delayThreshold***  Indicates the delay threshold for the DRB IDs indicated in DRB-IdentityList. Value ms0dot25 corresponds to 0.25ms, ms0dot5 corresponds to 0.5ms, ms1 corresponds to 1ms and so on. |

#### – *UL-GapFR2-Config*

The IE *UL-GapFR2-Config* specifies the FR2 uplink gap configuration.

*UL-GapFR2-Config* information element

-- ASN1START

-- TAG-UL-GAPFR2-CONFIG-START

UL-GapFR2-Config-r17 ::= SEQUENCE {

gapOffset-r17 INTEGER (0..159),

ugl-r17 ENUMERATED {ms0dot125, ms0dot25, ms0dot5, ms1},

ugrp-r17 ENUMERATED {ms5, ms20, ms40, ms160},

refFR2ServCellAsyncCA-r17 ServCellIndex OPTIONAL -- Cond AsyncCA

}

-- TAG-UL-GAPFR2-CONFIG-STOP

-- ASN1STOP

| *UL-GapFR2-Config* field descriptions |
| --- |
| ***gapOffset***  Value *gapOffset* is the gap offset of the FR2 UL gap pattern with UGRP indicated in the field *ugrp*. The value range is from 0 to *ugrp*-1. |
| ***refFR2ServCellAsyncCA***  Indicates the FR2 serving cell identifier whose SFN and subframe is used for FR2 UL gap calculation for this gap pattern with asynchronous CA involving FR2 carrier(s). |
| ***ugl***  Value ugl is the gap length in ms of the FR2 UL gap. The FR2 UL gap length is according to in Table 9.1.7 in TS 38.133 [14]. Value *ms0dot125* corresponds to 0.125 ms, *ms0dot25* corresponds to 0.25 ms and so on. |
| ***ugrp***  Value ugrp is the gap repetition period in (ms) of the FR2 UL gap. The FR2 UL gap repetition period is according to Table 9.1.7 in TS 38.133 [14]. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *AsyncCA* | This field is mandatory present when configuring FR2 UL gap pattern to UE in:  - (NG)EN-DC, NR SA, NE-DC or NR-DC without FR2-FR2 band combination, with asynchronous CA involving FR2 carriers. |

#### – *UplinkCancellation*

The IE *UplinkCancellation* is used to configure the UE to monitor PDCCH for the CI-RNTI.

*UplinkCancellation* information element

-- ASN1START

-- TAG-UPLINKCANCELLATION-START

UplinkCancellation-r16 ::= SEQUENCE {

ci-RNTI-r16 RNTI-Value,

dci-PayloadSizeForCI-r16 INTEGER (0..maxCI-DCI-PayloadSize-r16),

ci-ConfigurationPerServingCell-r16 SEQUENCE (SIZE (1..maxNrofServingCells)) OF CI-ConfigurationPerServingCell-r16,

...

}

CI-ConfigurationPerServingCell-r16 ::= SEQUENCE {

servingCellId ServCellIndex,

positionInDCI-r16 INTEGER (0..maxCI-DCI-PayloadSize-1-r16),

positionInDCI-ForSUL-r16 INTEGER (0..maxCI-DCI-PayloadSize-1-r16) OPTIONAL, -- Cond SUL-Only

ci-PayloadSize-r16 ENUMERATED {n1, n2, n4, n5, n7, n8, n10, n14, n16, n20, n28, n32, n35, n42, n56, n112},

timeFrequencyRegion-r16 SEQUENCE {

timeDurationForCI-r16 ENUMERATED {n2, n4, n7, n14} OPTIONAL, -- Cond SymbolPeriodicity

timeGranularityForCI-r16 ENUMERATED {n1, n2, n4, n7, n14, n28},

frequencyRegionForCI-r16 INTEGER (0..37949),

deltaOffset-r16 INTEGER (0..2),

...

},

uplinkCancellationPriority-v1610 ENUMERATED {enabled} OPTIONAL -- Need S

}

-- TAG-UPLINKCANCELLATION-STOP

-- ASN1STOP

|  |
| --- |
| *UplinkCancellation* field descriptions |
| ***ci-ConfigurationPerServingCell***  Indicates (per serving cell) the position of the *ci-PaylaodSize* bit CI values inside the DCI payload (see TS 38.213 [13], clause 11.2A). |
| ***ci-RNTI***  RNTI used for indication cancellation in UL (see TS 38.212 [17] clause 7.3.1 and TS 38.213 [13], clause 11.2A). |
| ***dci-PayloadSizeForCI***  Total length of the DCI payload scrambled with CI-RNTI (see TS 38.213 [13], clause 11.2A). |

|  |
| --- |
| *CI-ConfigurationPerServingCell* field descriptions |
| ***ci-PayloadSize***  Configures the field size for each UL cancelation indicator of this serving cell (servingCellId) (see TS 38.213 [13], clause 11.2A). |
| ***deltaOffset***  Configures the additional offset from the end of a PDCCH reception where the UE detects the DCI format 2\_4 and the first symbol of the T\_"CI" symbols, in the unit of OFDM symbols (see TS 38.213 [13], clause 11.2A). |
| ***frequencyRegionForCI***  Configures the reference frequency region where a detected UL CI is applicable (see TS 38.213 [13], clause 11.2A). It is defined in the same way as *locationAndBandwidth*. |
| ***positionInDCI***  Starting position (in number of bit) of the *ci-PayloadSize* bit CI value applicable for this serving cell (servingCellId) within the DCI payload (see TS 38.213 [13], clause 11.2A). |
| ***positionInDCI-ForSUL***  Starting position (in number of bit) of the *ci-PayloadSize* bit CI value applicable for SUL of this serving cell (servingCellId) within the DCI payload (see TS 38.213 [13], clause 11.2A). |
| ***timeDurationForCI***  Configures the duration of the reference time region in symbols where a detected UL CI is applicable of this serving cell (servingCellId) (see TS 38.213 [13], clause 11.2A). If the field is absent, i.e., the configured UL CI monitoring periodicity indicated by *monitoringSlotPeriodicityAndOffset* for DCI format 2\_4 is larger than 1 slot or 1 slot with only one monitoring occasion, the UE applies the value of the configured UL CI monitoring periodicity, |
| ***timeFrequencyRegion***  Configures the reference time and frequency region where a detected UL CI is applicable of this serving cell (servingCellId) (see TS 38.213 [13], clause 11.2A). |
| ***timeGranularityForCI***  Configures the number of partitions within the time region of this serving cell (servingCellId) (see TS 38.213 [13], clause 11.2A). |
| ***uplinkCancellationPriority***  Configures uplink cancellation behavior if both UL CI and intra-UE priority indicator are configured for a given UE. If the field is present, then UL CI is only applicable to the UL transmissions indicated/configured as low priority level. If the field is absent, UL CI is applicable to UL transmission irrespective of its priority level (see TS 38.213 [13], clause 11.2A). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SUL-Only* | The field is optionally present, Need R, if *supplementaryUplink* is configured in *ServingCellConfig*. It is absent otherwise. |
| *SymbolPeriodicity* | This field is mandatory present if the configured UL CI monitoring periodicity indicated by *monitoringSlotPeriodicityAndOffset* for DCI format 2\_4 is 1 slot with more than one monitoring occasion, otherwise absent. |

#### *– UplinkConfigCommon*

The IE *UplinkConfigCommon* provides common uplink parameters of a cell.

*UplinkConfigCommon* information element

-- ASN1START

-- TAG-UPLINKCONFIGCOMMON-START

UplinkConfigCommon ::= SEQUENCE {

frequencyInfoUL FrequencyInfoUL OPTIONAL, -- Cond InterFreqHOAndServCellAdd

initialUplinkBWP BWP-UplinkCommon OPTIONAL, -- Cond ServCellAdd

dummy TimeAlignmentTimer

}

UplinkConfigCommon-v1700 ::= SEQUENCE {

initialUplinkBWP-RedCap-r17 BWP-UplinkCommon OPTIONAL -- Need R

}

-- TAG-UPLINKCONFIGCOMMON-STOP

-- ASN1STOP

|  |
| --- |
| *UplinkConfigCommon* field descriptions |
| ***frequencyInfoUL***  Absolute uplink frequency configuration and subcarrier specific virtual carriers. |
| ***initialUplinkBWP***  The initial uplink BWP configuration for a serving cell (see TS 38.213 [13], clause 12). |
| ***initialUplinkBWP-RedCap***  If present, RedCap UEs use this UL BWP instead of *initialUplinkBWP*.  If absent, RedCap UEs use *initialUplinkBWP* 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. |

#### – *UplinkConfigCommonSIB*

The IE *UplinkConfigCommonSIB* provides common uplink parameters of a cell.

*UplinkConfigCommonSIB* information element

-- ASN1START

-- TAG-UPLINKCONFIGCOMMONSIB-START

UplinkConfigCommonSIB ::= SEQUENCE {

frequencyInfoUL FrequencyInfoUL-SIB,

initialUplinkBWP BWP-UplinkCommon,

timeAlignmentTimerCommon TimeAlignmentTimer

}

UplinkConfigCommonSIB-v1700 ::= SEQUENCE {

initialUplinkBWP-RedCap-r17 BWP-UplinkCommon OPTIONAL -- Need R

}

-- TAG-UPLINKCONFIGCOMMONSIB-STOP

-- ASN1STOP

|  |
| --- |
| *UplinkConfigCommonSIB* field descriptions |
| ***frequencyInfoUL***  Absolute uplink frequency configuration and subcarrier specific virtual carriers. |
| ***InitialUplinkBWP***  The initial uplink BWP configuration for a PCell (see TS 38.213 [13], clause 12). |
| ***initialUplinkBWP-RedCap***  If present, RedCap UEs use this UL BWP instead of *initialUplinkBWP*.  If absent, RedCap UEs use *initialUplinkBWP* provided that it does not exceed the RedCap UE maximum bandwidth (see also clause 5.2.2.4.2). |

#### – *Uplink-PowerControl*

The IE *Uplink-PowerControl* is used to configure UE specific power control parameter for PUSCH, PUCCH and SRS.

*Uplink-PowerControl* information element

-- ASN1START

-- TAG-UPLINK-POWERCONTROL-START

Uplink-powerControl-r17 ::= SEQUENCE {

ul-powercontrolId-r17 Uplink-powerControlId-r17 OPTIONAL, -- Need R

p0AlphaSetforPUSCH-r17 P0AlphaSet-r17 OPTIONAL, -- Need R

p0AlphaSetforPUCCH-r17 P0AlphaSet-r17 OPTIONAL, -- Need R

p0AlphaSetforSRS-r17 P0AlphaSet-r17 OPTIONAL -- Need R

}

P0AlphaSet-r17 ::= SEQUENCE {

p0-r17 INTEGER (-16..15) OPTIONAL, -- Need R

alpha-r17 Alpha OPTIONAL, -- Need R

closedLoopIndex-r17 ENUMERATED { i0, i1 }

}

Uplink-powerControlId-r17 ::= INTEGER(1.. maxULTCI-r17)

-- editor's note: how to handle any legacy power control parameters, where to state those are not configred/applied?

-- TAG-UPLINK-POWERCONTROL-STOP

-- ASN1STOP

|  |
| --- |
| *Uplink-PowerControl* field descriptions |
| ***UL-powerControl***  Configures power control parameters for PUSCH, PUCCH and SRS. |

#### – *Uu-Relay-RLC-ChannelConfig*

The IE *Uu-Relay-RLC-ChannelConfig* is used to configure an RLC entity, a corresponding logical channel in MAC for Uu Relay RLC channel between L2 U2N Relay UE and network.

*Uu-Relay-RLC-ChannelConfig* information element

-- ASN1START

-- TAG-UURELAYRLCCHANNELCONFIG-START

Uu-Relay-RLC-ChannelConfig-r17::= SEQUENCE {

uu-LogicalChannelIdentity-r17 LogicalChannelIdentity OPTIONAL, -- Cond LCH-SetupOnly

uu-Relay-RLC-ChannelID-r17 Uu-Relay-RLC-ChannelID-r17,

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

rlc-Config-r17 RLC-Config OPTIONAL, -- Cond LCH-Setup

mac-LogicalChannelConfig-r17 LogicalChannelConfig OPTIONAL, -- Cond LCH-Setup

...

}

-- TAG-UURELAYRLCCHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *Uu-Relay-RLC-ChannelConfig* field descriptions |
| ***uu-LogicalChannelIdentity***  Indicates the logical channel id for Uu Relay RLC channel of the L2 U2N Relay UE. |
| ***uu-Relay-RLC-ChannelID***  Indicates the Uu Relay RLC channel in the link between L2 U2N Relay UE and network. |
| ***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 Uu Relay 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 Uu Relay RLC channel. It is absent, Need M otherwise. |

#### – *Uu-Relay-RLC-ChannelID*

The IE *Uu-Relay-RLC-ChannelID* is used to identify a Uu Relay RLC channel in the link between L2 U2N Relay UE and network.

*Uu-Relay-RLC-ChannelID* information element

-- ASN1START

-- TAG-UURELAYRLCCHANNELID-START

Uu-Relay-RLC-ChannelID-r17 ::= BIT STRING (SIZE (16))

-- TAG-UURELAYRLCCHANNELID-STOP

-- ASN1STOP

#### – *UplinkTxDirectCurrentList*

The IE *UplinkTxDirectCurrentList* indicates the Tx Direct Current locations per serving cell for each configured UL BWP in the serving cell, based on the BWP numerology and the associated carrier bandwidth.

*UplinkTxDirectCurrentList* information element

-- ASN1START

-- TAG-UPLINKTXDIRECTCURRENTLIST-START

UplinkTxDirectCurrentList ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF UplinkTxDirectCurrentCell

UplinkTxDirectCurrentCell ::= SEQUENCE {

servCellIndex ServCellIndex,

uplinkDirectCurrentBWP SEQUENCE (SIZE (1..maxNrofBWPs)) OF UplinkTxDirectCurrentBWP,

...,

[[

uplinkDirectCurrentBWP-SUL SEQUENCE (SIZE (1..maxNrofBWPs)) OF UplinkTxDirectCurrentBWP OPTIONAL

]]

}

UplinkTxDirectCurrentBWP ::= SEQUENCE {

bwp-Id BWP-Id,

shift7dot5kHz BOOLEAN,

txDirectCurrentLocation INTEGER (0..3301)

}

-- TAG-UPLINKTXDIRECTCURRENTLIST-STOP

-- ASN1STOP

|  |
| --- |
| *UplinkTxDirectCurrentBWP* field descriptions |
| ***bwp-Id***  The BWP-Id of the corresponding uplink BWP. |
| ***shift7dot5kHz***  Indicates whether there is 7.5 kHz shift or not. 7.5 kHz shift is applied if the field is set to *true*. Otherwise 7.5 kHz shift is not applied. |
| ***txDirectCurrentLocation***  The uplink Tx 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 uplink 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. |

|  |
| --- |
| *UplinkTxDirectCurrentCell* field descriptions |
| ***servCellIndex***  The serving cell ID of the serving cell corresponding to the *uplinkDirectCurrentBWP*. |
| ***uplinkDirectCurrentBWP***  The Tx Direct Current locations for all the uplink BWPs configured at the corresponding serving cell. |
| ***uplinkDirectCurrentBWP-SUL***  The Tx Direct Current locations for all the supplementary uplink BWPs configured at the corresponding serving cell. |

#### – *UplinkTxDirectCurrentTwoCarrierList*

The IE *UplinkTxDirectCurrentTwoCarrierList* indicates the Tx Direct Current locations when uplink intra-band CA with two carriers is configured, based on the configured carriers and BWP numerology and the associated carrier bandwidth of the carriers. The UE does not report the uplink Direct Current location information for SUL carrier(s).

*UplinkTxDirectCurrentTwoCarrierList* information element

-- ASN1START

-- TAG-UPLINKTXDIRECTCURRENTTWOCARRIERLIST-START

UplinkTxDirectCurrentTwoCarrierList-r16 ::= SEQUENCE (SIZE (1..maxNrofTxDC-TwoCarrier-r16)) OF UplinkTxDirectCurrentTwoCarrier-r16

UplinkTxDirectCurrentTwoCarrier-r16 ::= SEQUENCE {

carrierOneInfo-r16 UplinkTxDirectCurrentCarrierInfo-r16,

carrierTwoInfo-r16 UplinkTxDirectCurrentCarrierInfo-r16,

singlePA-TxDirectCurrent-r16 UplinkTxDirectCurrentTwoCarrierInfo-r16,

secondPA-TxDirectCurrent-r16 UplinkTxDirectCurrentTwoCarrierInfo-r16 OPTIONAL

}

UplinkTxDirectCurrentCarrierInfo-r16 ::= SEQUENCE {

servCellIndex-r16 ServCellIndex,

servCellInfo-r16 CHOICE {

bwp-Id-r16 BWP-Id,

deactivatedCarrier-r16 ENUMERATED {deactivated}

}

}

UplinkTxDirectCurrentTwoCarrierInfo-r16 ::= SEQUENCE {

referenceCarrierIndex-r16 ServCellIndex,

shift7dot5kHz-r16 BOOLEAN,

txDirectCurrentLocation-r16 INTEGER (0..3301)

}

-- TAG-UPLINKTXDIRECTCURRENTTWOCARRIERLIST-STOP

-- ASN1STOP

|  |
| --- |
| *UplinkTxDirectCurrentTwoCarrierInfo* field descriptions |
| ***referenceCarrierIndex***  The serving cell ID of the carrier which is to be used as the reference for interpreting the Tx Direction Current location as reported using *txDirectCurrentLocation-r16*. The numerology of the uplink BWP ID reported with *bwp-Id-r16* for this serving cell is the numerology used for interpreting the reported subcarrier location. |
| ***shift7dot5kHz***  Indicates whether there is 7.5 kHz shift or not. 7.5 kHz shift is applied if the field is set to *true*. Otherwise 7.5 kHz shift is not applied. |
| ***txDirectCurrentLocation***  The uplink Tx Direct Current location for the two carrier uplink CA with the serving cells reported using *carrierOneInfo-r16* and *carrierTwoInfo-r16*. Values in the range of this field between 0 and 3299 indicate the subcarrier index of the uplink Tx Direct Current location with the subcarrier taken from the serving cell with ID *referenceCarrierIndex* and the numerology of the corresponding uplink BWP reported for this serving cell. Value 3300 indicates "Outside the carrier" and value 3301 indicates "Undetermined position within the carrier". |

|  |
| --- |
| *UplinkTxDirectCurrentCarrierInfo* field descriptions |
| ***bwp-Id***  The BWP ID of the serving cell which is part of the two carrier uplink carrier aggregation. The UE shall not report this field if the serving cell is reported as deactivated using *deactivatedCarrier-r16.* |
| ***deactivatedCarrier***  For the reported uplink Tx Direct Current location(s) corresponding to *singlePA-TxDirectCurrent-r16*, indicates whether the carrier is deactivated or not for this serving cell. If the carrier refers to the PCell, the UE shall not set this field to *deactivated*. |
| ***servCellIndex***  The serving cell ID of the serving cell which is part of the two carrier uplink carrier aggregation. |

|  |
| --- |
| *UplinkTxDirectCurrentTwoCarrier* field descriptions |
| ***carrierOneInfo***  The serving cell ID and BWP ID of the first carrier of the uplink carrier aggregation for which the uplink Tx Direct Current location(s) are being reported. |
| ***carrierTwoInfo***  The serving cell ID and BWP ID of the second carrier of the uplink carrier aggregation for which the uplink Tx Direct Current location(s) are being reported. |
| ***singlePA-TxDirectCurrent***  The uplink Tx Direct Current location for the UE which support single PA for this uplink carrier aggregation. For the UEs which support dual PA for this uplink carrier aggregation, this field is for reporting the uplink Tx Direct Current location of the first PA. |
| ***secondPA-TxDirectCurrent***  The uplink Tx Direct Current location used by the UE with the second PA for the UEs which support dual PA for this uplink carrier aggregation. This field shall be absent for the *UplinkTxDirectCurrentTwoCarrier* entity where *deactivatedCarrier* of *carrierOneInfo* or *carrierTwoInfo* is set to *deactivated*. |

#### – *ZP-CSI-RS-Resource*

The IE *ZP-CSI-RS-Resource* is used to configure a Zero-Power (ZP) CSI-RS resource (see TS 38.214 [19], clause 5.1.4.2). Reconfiguration of a *ZP-CSI-RS-Resource* between periodic or semi-persistent and aperiodic is not supported.

*ZP-CSI-RS-Resource* information element

-- ASN1START

-- TAG-ZP-CSI-RS-RESOURCE-START

ZP-CSI-RS-Resource ::= SEQUENCE {

zp-CSI-RS-ResourceId ZP-CSI-RS-ResourceId,

resourceMapping CSI-RS-ResourceMapping,

periodicityAndOffset CSI-ResourcePeriodicityAndOffset OPTIONAL, --Cond PeriodicOrSemiPersistent

...

}

ZP-CSI-RS-ResourceId ::= INTEGER (0..maxNrofZP-CSI-RS-Resources-1)

-- TAG-ZP-CSI-RS-RESOURCE-STOP

-- ASN1STOP

|  |
| --- |
| *ZP-CSI-RS-Resource* field descriptions |
| ***periodicityAndOffset***  Periodicity and slot offset for periodic/semi-persistent ZP-CSI-RS (see TS 38.214 [19], clause 5.1.4.2). Network always configures the UE with a value for this field for periodic and semi-persistent ZP-CSI-RS resource (as indicated in PDSCH-Config). |
| ***resourceMapping***  OFDM symbol and subcarrier occupancy of the ZP-CSI-RS resource within a slot. |
| ***zp-CSI-RS-ResourceId***  ZP CSI-RS resource configuration ID (see TS 38.214 [19], clause 5.1.4.2). |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *PeriodicOrSemiPersistent* | The field is optionally present, Need M, for periodic and semi-persistent ZP-CSI-RS-Resources (as indicated in PDSCH-Config). The field is absent otherwise. |

#### – *ZP-CSI-RS-ResourceSet*

The IE *ZP-CSI-RS-ResourceSet* refers to a set of *ZP-CSI-RS-Resources* using their *ZP-CSI-RS-ResourceId*s.

*ZP-CSI-RS-ResourceSet* information element

-- ASN1START

-- TAG-ZP-CSI-RS-RESOURCESET-START

ZP-CSI-RS-ResourceSet ::= SEQUENCE {

zp-CSI-RS-ResourceSetId ZP-CSI-RS-ResourceSetId,

zp-CSI-RS-ResourceIdList SEQUENCE (SIZE(1..maxNrofZP-CSI-RS-ResourcesPerSet)) OF ZP-CSI-RS-ResourceId,

...

}

-- TAG-ZP-CSI-RS-RESOURCESET-STOP

-- ASN1STOP

|  |
| --- |
| *ZP-CSI-RS-ResourceSet* field descriptions |
| ***zp-CSI-RS-ResourceIdList***  The list of *ZP-CSI-RS-ResourceId* identifying the *ZP-CSI-RS-Resource* elements belonging to this set. |

#### – *ZP-CSI-RS-ResourceSetId*

The IE *ZP-CSI-RS-ResourceSetId* identifies a *ZP-CSI-RS-ResourceSet*.

*ZP-CSI-RS-ResourceSetId* information element

-- ASN1START

-- TAG-ZP-CSI-RS-RESOURCESETID-START

ZP-CSI-RS-ResourceSetId ::= INTEGER (0..maxNrofZP-CSI-RS-ResourceSets-1)

-- TAG-ZP-CSI-RS-RESOURCESETID-STOP

-- ASN1STOP

-------------------------------------------Skip Unchanged -------------------------------------------

### 6.3.4 Other information elements

-------------------------------------------Skip Unchanged -------------------------------------------

# 7 Variables and constants

## 7.1 Timers

### 7.1.1 Timers (Informative)

| Timer | Start | Stop | At expiry |
| --- | --- | --- | --- |
| T300 | Upon transmission of *RRCSetupRequest.* | Upon reception of *RRCSetup* or *RRCReject* message, cell re-selection, the (re)selected L2 U2N Relay UE becomes unsuitable, and upon abortion of connection establishment by upper layers. | Perform the actions as specified in 5.3.3.7. |
| T301 | Upon transmission of *RRCReestabilshmentRequest* | Upon reception of *RRCReestablishment* or *RRCSetup* message as well as when the selected cell becomes unsuitable or the (re)selected L2 U2N Relay UE becomes unsuitable. | Go to RRC\_IDLE |
| T302 | Upon reception of *RRCReject* while performing RRC connection establishment or resume, upon reception of *RRCRelease* with *waitTime*. | Upon entering RRC\_CONNECTED or RRC\_IDLE, upon cell re-selection, upon cell change due to relay (re)selection, and upon reception of *RRCReject* message. | Inform upper layers about barring alleviation as specified in 5.3.14.4 |
| T304 | Upon reception of *RRCReconfiguration* message including *reconfigurationWithSync* for the MCG, or upon reception of *RRCReconfiguration* message including *reconfigurationWithSync* for the SCG not indicated as deactivated in the NR or E-UTRA message containing the *RRCReconfiguration* message or upon conditional reconfiguration execution i.e. when applying a stored *RRCReconfiguration* message including *reconfigurationWithSync*. | Upon successful completion of random access on the corresponding SpCell  For T304 of SCG, upon SCG release | For T304 of MCG, in case of the handover from NR or intra-NR handover, initiate the RRC re-establishment procedure; In case of handover to NR, perform the actions defined in the specifications applicable for the source RAT. If any DAPS bearer is configured and if there is no RLF in source PCell, initiate the failure information procedure.  For T304 of SCG, inform network about the reconfiguration with sync failure by initiating the SCG failure information procedure as specified in 5.7.3. |
| T310 | Upon detecting physical layer problems for the SpCell i.e. upon receiving N310 consecutive out-of-sync indications from lower layers. | Upon receiving N311 consecutive in-sync indications from lower layers for the SpCell, upon receiving RRCReconfiguration with *reconfigurationWithSync* for that cell group, upon reception of *MobilityFromNRCommand*, upon the reconfiguration of *rlf-TimersAndConstant,* upon initiating the connection re-establishment procedure, upon conditional reconfiguration execution i.e. when applying a stored RRCReconfiguration message including *reconfigurationWithSync* for that cell group, and upon initiating the MCG failure information procedure.  Upon SCG release, if the T310 is kept in SCG. | If the T310 is kept in MCG: If AS security is not activated: go to RRC\_IDLE else: initiate the MCG failure information procedure as specified in 5.7.3b or the connection re-establishment procedure as specified in 5.3.7 or the procedure as specified in 5.3.10.3 if any DAPS bearer is configured.  If the T310 is kept in SCG, Inform E-UTRAN/NR about the SCG radio link failure by initiating the SCG failure information procedure as specified in 5.7.3. |
| T311 | Upon initiating the RRC connection re-establishment procedure | Upon selection of a suitable NR cell, or upon selection of a suitable L2 U2N Relay UE, or a cell using another RAT. | Enter RRC\_IDLE |
| T312 | If T312 is configured in MCG: Upon triggering a measurement report for a measurement identity for which T312 has been configured and *useT312* has been set to true, while T310 in PCell is running.  If T312 is configured in SCG and *useT312* has been set to true: Upon triggering a measurement report for a measurement identity for which T312 has been configured, while T310 in PSCell is running. | Upon receiving N311 consecutive in-sync indications from lower layers for the SpCell, receiving *RRCReconfiguration* with *reconfigurationWithSync* for that cell group, upon reception of *MobilityFromNRCommand*, upon initiating the connection re-establishment procedure, upon the reconfiguration of *rlf-TimersAndConstant*, upon initiating the MCG failure information procedure, upon conditional reconfiguration execution i.e. when applying a stored RRCReconfiguration message including *reconfigurationWithSync* for that cell group, and upon the expiry of T310 in corresponding SpCell.  Upon SCG release, if the T312 is kept in SCG | If the T312 is kept in MCG initiate the MCG failure information procedure as specified in 5.7.3b or the connection re-establishment procedure.  If the T312 is kept in SCG, Inform E-UTRAN/NR about the SCG radio link failure by initiating the SCG failure information procedure.as specified in 5.7.3. |
| T316 | Upon transmission of the *MCGFailureInformation* message | Upon receiving *RRCRelease*, *RRCReconfiguration* with *reconfigurationwithSync* for the PCell, *MobilityFromNRCommand,* or upon initiating the re-establishment procedure | Perform the actions as specified in 5.7.3b.5. |
| T319 | Upon transmission of *RRCResumeRequest* or *RRCResumeRequest1 when the resume procedure is not initiated for SDT.* | Upon reception of *RRCResume,* *RRCSetup, RRCRelease, RRCRelease* with *suspendConfig* or *RRCReject* message, upon cell re-selection and upon relay (re)selection. | Perform the actions as specified in 5.3.13.5. |
| T319a | Upon transmission of *RRCResumeRequest* or *RRCResumeRequest1* when the resume procedure is initiated for SDT. | Upon reception of *RRCResume,* *RRCSetup, RRCRelease,* *RRCReject* message or upon failure to resume RRC connection for SDT as specified in 5.3.13.5. | Perform the actions as specified in 5.3.13.5. |
| T320 | Upon reception of *t320* or upon cell (re)selection to NR from another RAT with validity time configured for dedicated priorities (in which case the remaining validity time is applied). | Upon entering RRC\_CONNECTED, upon reception of *RRCRelease*, when PLMN selection or SNPN selection is performed on request by NAS, when the UE enters RRC\_IDLE from RRC\_INACTIVE, or upon cell (re)selection to another RAT (in which case the timer is carried on to the other RAT). | Discard the cell reselection priority information provided by dedicated signalling. |
| T321 | Upon receiving *measConfig* including a *reportConfig* with the purpose set to *reportCGI* | Upon acquiring the information needed to set all fields of *cgi-info*, upon receiving *measConfig* that includes removal of the *reportConfig* with the *purpose* set to *reportCGI* and upon detecting that a cell is not broadcasting SIB1. | Initiate the measurement reporting procedure, stop performing the related measurements. |
| T322 | Upon receiving *measConfig* including *reportConfigNR* with the purpose set to *reportSFTD* and *drx-SFTD-NeighMeas* is set to *true*. | Upon acquiring the SFTD measurement results, upon receiving *measConfig* that includes removal of the *reportConfig* with the *purpose* set to *reportSFTD*. | Initiate the measurement reporting procedure, stop performing the related measurements*.* |
| T325 | Upon reception of *RRCRelease* message with *deprioritisationTimer*. |  | Stop deprioritisation of all frequencies or NR signalled by *RRCRelease.* |
| T330 | Upon receiving *LoggedMeasurementConfiguration* message | Upon log volume exceeding the suitable UE memory, upon initiating the release of *LoggedMeasurementConfiguration* procedure | Perform the actions specified in 5.5a.1.4 |
| T331 | Upon receiving *RRCRelease* message with *measIdleDuration* | Upon receiving *RRCSetup, RRCResume*, *RRCRelease* with idle/inactive measurement configuration, upon cell selection/reselection to a cell that does not belong to the *validityArea* (if configured)*,* or upon cell re-selection to another RAT*.* | Perform the actions as specified in 5.7.8.3. |
| T342 | Upon transmitting *UEAssistanceInformation* message with *DelayBudgetReport*. | Upon releasing *delayBudgetReportingConfig* during the connection re-establishment/resume procedures, and upon receiving *delayBudgetReportingConfig* set to *release.* | No action. |
| T345 | Upon transmitting *UEAssistanceInformation* message with *overheatingAssistance* | Upon releasing *overheatingAssistance* during the connection re-establishment procedure, upon initiating the connection resumption procedure, and upon receiving *overheatingAssistanceConfig* set to *release.* | No action. |
| T346a (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *drx-Preference*. | Upon releasing *drx-PreferenceConfig* during the connection re-establishment/resume procedures, upon receiving *drx-PreferenceConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T346b (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *maxBW-Preference*. | Upon releasing *maxBW-PreferenceConfig* during the connection re-establishment/resume procedures, upon receiving *maxBW-PreferenceConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T346c (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *maxCC-Preference*. | Upon releasing *maxCC-PreferenceConfig* during the connection re-establishment/resume procedures, upon receiving *maxCC-PreferenceConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T346d (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *maxMIMO-LayerPreference*. | Upon releasing *maxMIMO-LayerPreferenceConfig* during the connection re-establishment/resume procedures, upon receiving *maxMIMO-LayerPreferenceConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T346e (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *minSchedulingOffsetPreference*. | Upon releasing *minSchedulingOffsetPreferenceConfig* during the connection re-establishment/resume procedures, upon receiving *minSchedulingOffsetPreferenceConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T346f | Upon transmitting *UEAssistanceInformation* message with *releasePreference*. | Upon releasing *releasePreferenceConfig* during the connection re-establishment/resume procedures, or upon receiving *releasePreferenceConfig* set to *release.* | No action. |
| T346g | Upon transmitting *UEAssistanceInformation* message with *musim-PreferredRRC-State*. | Upon receiving *RRCRelease*, or upon receiving *musim-LeaveAssistanceConfig* set to *release*. | Perform the actions as specified in 5.3.8.6. |
| T346h | Upon transmitting *UEAssistanceInformation* message with *musim-GapPreferenceList* Information. | Upon releasing *musim-GapAssistanceConfig* during the connection re-establishment/resume procedures, or upon receiving *musim-GapAssistanceConfig* set to *release*. | No action. |
| T346i | Upon transmitting *UEAssistanceInformation* message with *scg-DeactivationPreference* | Upon RRC connection re-establishment/resume or upon receiving *scg-DeactivationPreferenceConfig* set to *release*. | No action. |
| T346j (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *rlm-RelaxationReportingConfig*. | Upon releasing *rlm-RelaxationReportingConfig* during the connection re-establishment/resume procedures, upon receiving *rlm-RelaxationReportingConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T346k (The UE maintains one instance of this timer per cell group) | Upon transmitting *UEAssistanceInformation* message with *bfd-RelaxationReportingConfig*. | Upon releasing *bfd-RelaxationReportingConfig* during the connection re-establishment/resume procedures, upon receiving *bfd-RelaxationReportingConfig* set to *release*, or upon performing MR-DC release*.* | No action. |
| T350 | Upon transmitting *DedicatedSIBRequest* message with *requestedSIB-List* and/or *requestedPosSIB-List*. | Upon acquiring the requested SIB(s) or posSIB(s), upon releasing *onDemandSIB-Request* during the connection re-establishment procedures, upon receiving *onDemandSIB-Request* set to release, upon reception of *RRCRelease* or upon successful change of PCell while in RRC\_CONNECTED. | No action |
| T380 | Upon reception of t380 in *RRCRelease.* | Upon reception of *RRCResume*, *RRCSetup* or *RRCRelease*. | Perform the actions as specified in 5.3.13. |
| T390 | When access attempt is barred at access barring check for an Access Category. The UE maintains one instance of this timer per Access Category. | Upon cell (re)selection, upon cell change due to relay (re)selection, upon entering RRC\_CONNECTED, upon reception of *RRCReconfiguration* including *reconfigurationWithSync*, upon change of PCell while in RRC\_CONNECTED, upon reception of *MobilityFromNRCommand*, or upon reception of *RRCRelease*. | Perform the actions as specified in 5.3.14.4. |
| T400 | Upon transmission of RRCReconfigurationSidelink | Upon reception of RRCReconfigurationFailureSidelink or RRCReconfigurationCompleteSidelink | Perform the Sidelink radio link failure related actions as specified in 5.8.9.3. |
| T420 | Upon reception of the *RRC reconfiguration* message indicating direct-to-indirect path switch | Upon successfully sending *RRCReconfigurationComplete* message (i.e., PC5 RLC acknowledge is received from target L2 U2N Relay UE) | Perform the RRC re-establishment procedure as specified in 5.3.7. |

### 7.1.2 Timer handling

When the UE applies zero value for a timer, the timer shall be started and immediately expire unless explicitly stated otherwise.

## 7.2 Counters

| Counter | Reset | Incremented | When reaching max value |
| --- | --- | --- | --- |
| N310 | Upon reception of "in-sync" indication from lower layers;  upon receiving *RRCReconfiguration* with *reconfigurationWithSync* for that cell group;  upon initiating the connection re-establishment procedure. | Upon reception of "out-of-sync" from lower layer while the timer T310 is stopped. | Start timer T310 |
| N311 | Upon reception of "out-of-sync" indication from lower layers;  upon receiving *RRCReconfiguration* with *reconfigurationWithSync* for that cell group;  upon initiating the connection re-establishment procedure. | Upon reception of the "in-sync" from lower layer while the timer T310 is running. | Stop the timer T310. |

------------------------------------------Change End----------------------------------------