**3GPP TSG-RAN WG2 Meeting #124R2-2313625**

**Chicago, Illinois, USA, 13-17 November 2023**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | **4063** | **rev** | **6** | **Current version:** | **17.6.0** |  |
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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:***  | Introduction of further measurement gap enhancements |
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| ***Source to WG:*** | MediaTek Inc., Huawei, HiSilicon |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_MG\_enh2-Core |  | ***Date:*** | 2023/11/13 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | This CR introduces new features for Rel-18 further measurement gap enhancements.According to RAN4 LS R2-2302431/R4-2303306, RAN4 agreed to support measurements without gap with interruption for NR SSB-based inter-frequency and intra-frequency. The CR adds corresponding capability reporting for this.The new capability is based on Rel-16 *NeedForGapsInfoNR* capability and it re-uses the same dynamic reporting mechanism as in Rel-16 *NeedForGapsInfoNR*.According to RAN4 LS R2-2307041/R4-2310158, RAN4 agreed to introduce effective measurement window configuration for LTE inter-RAT measurement. The effective measurement window is used to determine the location of scheduling and measurement restriction and it is configured with measurement window periodicity, time domain offset and window duration. |
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| ***Summary of change:*** | <1> Introduce new indication (*needForInterruptionInfoNR*) for the Rel-18 case where interruption is needed for NR SSB based measurement without gap. The Rel-18 indication can be included in in *RRCReconfigurationComplete* and *RRCResumeComplete* message.<2> The Rel-18 indication is in addition to the legacy *NeedForGapsInfoNR* information. The UE may report 3 different cases: * If gap is needed, the UE reports “gap” in Rel-16 field and empty field in corresponding R18 IE.
* If gap is NOT needed and there is no interruption, the UE reports “no-gap” in Rel-16 field and “no-gap-no-interruption” in Rel-18 field
* If gap is NOT needed but there is interruption, the UE reports “no-gap” in Rel-16 field and “no-gap-with-interruption” in Rel-18 field.

<3> The UE includes Rel-18 indication (*needForInterruptionInfoNR*) only if network requests it via a controlling flag (*needForInterruptionConfigNR*).<4> Introduce new terminology of effective measurement window and new configuration *MeasWindowConfig* for the effective measurement window. The effective measurement window is a per-UE configuration. |
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| ***Consequences if not approved:*** | New features for measurements gap enhancement are not supported |
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| ***Clauses affected:*** | 5.3.5.3, 5.3.13.4, 5.5.1, 5.5.2.1, 5.5.2.x(New), 6.2.2, 6.3.2, 11.2.1, 11.2.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.306 CR 0906TS 38.331 CR 4286 |
| ***affected:*** |  | **x** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **x** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | R2-2303614, R2-2304434, R2-2306283, R2-2306804, R2-2308768, R2-2310397, R2-2311895 |

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* 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 the MCG and the SCG *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;

2> if all the SIB(s) and/or posSIB(s) requested in *DedicatedSIBRequest* message have been acquired:

3> stop timer T350, if running;

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;

2> if all the SIB(s) and/or posSIB(s) requested in *DedicatedSIBRequest* message have been acquired:

3> stop timer T350, if running;

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 *needForGapNCSG-ConfigNR*:

2> if *needForGapNCSG-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 *needForGapNCSG-ConfigEUTRA*:

2> if *needForGapNCSG-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 *onDemandSIB-Request*:

2> if *onDemandSIB-Request* is set to *setup*:

3> consider itself to be configured to request SIB(s) or posSIB(s) in RRC\_CONNECTED in accordance with clause 5.2.2.3.5;

2> else:

3> consider itself not to be configured to request SIB(s) or posSIB(s) in RRC\_CONNECTED in accordance with clause 5.2.2.3.5;

3> stop timer T350, if running;

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-L2RelayUE-Config*:

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

1> if the *RRCReconfiguration* message includes the *sl-L2RemoteUE-Config*:

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> perform the *Paging* message reception procedure as specified in 5.3.2.3;

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 5.3.5.9a;

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

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

1> if the *RRCReconfiguration* message includes the *ue-TxTEG-RequestUL-TDOA-Config*:

2> if *ue-TxTEG-RequestUL-TDOA-Config* is set to *setup*:

3> perform the UE positioning assistance information procedure as specified in 5.7.14;

2> else:

3> release the configuration of UE positioning assistance information;

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 *masterCellGroup* containing the *reportUplinkTxDirectCurrentMoreCarrier*:

3> include in the *uplinkTxDirectCurrentMoreCarrierList* 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;

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

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

NOTE 0b: The UE does not expect that the *reportUplinkTxDirectCurrentTwoCarrier* or *reportUplinkTxDirectCurrentMoreCarrier* is received in both *masterCellGroup* and in *secondaryCellGroup*. Network only configures at most one of *reportUplinkTxDirectCurrent, reportUplinkTxDirectCurrentTwoCarrier* or *reportUplinkTxDirectCurrentMoreCarrier* in one RRC message*.*

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 and the *RRCReconfiguration* message does not include the *reconfigurationWithSync* in the *masterCellGroup*:

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> 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 and the logged measurements configuration is for NR:

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* orin at least one of the entries of *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; or

4> if the *RRCReconfiguration* message includes the *needForInterruptionConfigNR* and set it to *enabled*; or

4> if the *needForInterruptionConfigNR* is enabled and the *NeedForInterruptionInfoNR* 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:

7> 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;

6> else:

7> include an entry in *interFreq-needForGap* and set the corresponding gap requirement information for each supported NR band;

5> if the *needForInterruptionConfigNR* is enabled:

6> include the *needForInterruptionInfoNR* and set the contents as follows:

7> include *intraFreq-needForInterruption* with the same number of entries, and listed in the same order, as in *intraFreq-needForGap*;

7> for each entry in *intraFreq-needForInterruption*, include *interruptionIndication* and set the interruption requirement information if the corresponding entry in *intraFreq-needForGap* is set to *no-gap;*

7> include *interFreq-needForInterruption* with the same number of entries, and listed in the same order, as in *interFreq-needForGap*;

7> for each entry in *interFreq-needForInterruption*, include *interruptionIndication* and set the interruption requirement information if the corresponding entry in *interFreq-needForGap* is set to *no-gap*;

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 *needForGapNCSG-ConfigNR*; or

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

5> include the *NeedForGapNCSG-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:

7> for each supported NR band included in *requestedTargetBandFilterNCSG-NR*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

6> else:

7> 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 *needForGapNCSG-ConfigEUTRA*; or

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

5> include the *NeedForGapNCSG-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 message (*RRCConnectionReconfiguration* or *RRCConnectionResume*) containing the *RRCReconfiguration* message:

4> perform SCG activation as specified in 5.3.5.13a;

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

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

4> else if the SCG was deactivated before the reception of the E-UTRA RRC message containing the *RRCReconfiguration* message:

5> if *bfd-and-RLM* was not configured to *true* before the reception of the E-UTRA *RRCConnectionReconfiguration* or *RRCConnectionResume* message containing the *RRCReconfiguration* message or if lower layers indicate that a Random Access procedure is needed for SCG activation:

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

5> else the procedure ends;

4> else the procedure ends;

3> else:

4> perform SCG deactivation as specified in 5.3.5.13b;

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 the *scg-State* is not included in the *RRCConnectionReconfiguration*:

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

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

4> else the procedure ends;

3> else:

4> perform SCG deactivation as specified in 5.3.5.13b;

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> perform SCG activation as specified in 5.3.5.13a;

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

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

3> else if the SCG was deactivated before the reception of the NR RRC message containing the *RRCReconfiguration* message:

4> if *bfd-and-RLM* was not configured to *true* before the reception of the *RRCReconfiguration* or *RRCResume* message containing the *RRCReconfiguration* message; or

4> if lower layers indicate that a Random Access procedure is needed for SCG activation:

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

4> else the procedure ends;

3> else the procedure ends;

2> else

3> perform SCG deactivation as specified in 5.3.5.13b;

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 the *scg-State* is not included in the *RRCReconfiguration* message containing the *RRCReconfiguration* message:

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

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

5> else:

6> the procedure ends;

4> else:

5> perform SCG deactivation as specified in 5.3.5.13b;

5> the procedure ends;

3> else:

4> if the *RRCReconfiguration* does not include the *mrdc-SecondaryCellGroupConfig*:

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

6> perform SCG deactivation as specified in 5.3.5.13b;

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> if the UE is in NR-DC and;

2> if the *RRCReconfiguration* does not include the *mrdc-SecondaryCellGroupConfig*:

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

4> perform SCG deactivation as specified in 5.3.5.13b;

3> else:

4> perform SCG activation without SN message as specified in 5.3.5.13b1;

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

3> if *ta-Report* is configured with value *enabled* and the UE supports TA reporting:

4> indicate TA report initiation to lower layers;

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, DRBs, multicast MRB, and BH RLC channels for IAB-MT, and Uu Relay RLC channels for L2 U2N Relay UE, 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; or,

1> if *sl-PathSwitchConfig* was included in *reconfigurationWithSync* included in *spCellConfig* of an MCG, and when successfully sending *RRCReconfigurationComplete* message (i.e., PC5 RLC acknowledgement is received from target L2 U2N Relay UE):

2> stop timer T304 for that cell group if running;

2> if *sl-PathSwitchConfig* was included in *reconfigurationWithSync*:

3> stop timer T420;

3> release all radio resources, including release of the RLC entities and the MAC configuration at the source side;

3> reset MAC used in the source cell;

NOTE 2b: PDCP and SDAP configured by the source prior to the path switch that are reconfigured and re-used by target when delta signalling is used, are not released as part of this procedure.

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 the MCG and the SCG *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 MCG *measConfig*, if configured, and for each *measId* of the SCG *measConfig*, if configured, 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/discovery 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/discovery 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> if *reconfigurationWithSync* was included in *masterCellGroup*:

3> if configured with application layer measurements and if application layer measurement report container has been received from upper layers for which the successful transmission of the message or at least one segment of the message has not been confirmed by lower layers:

4> re-submit the *MeasurementReportAppLayer* message or all segments of the *MeasurementReportAppLayer* message to lower layers for transmission via SRB4;

2> if *reconfigurationWithSync* was included in *masterCellGroup* and the target cell provides *SIB21*:

3> if the UE initiated transmission of an *MBSInterestIndication*message during the last 1 second preceding reception of this *RRCReconfiguration* message; or

3> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution, and the UE has initiated transmission of an *MBSInterestIndication* message after having received this *RRCReconfiguration* message:

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

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.

<Skip>

5.3.13.4 Reception of the *RRCResume* by the UE

The UE shall:

1> stop timer T319, if running;

1> stop timer T319a, if running and consider SDT procedure is not ongoing;

1> stop timer T380, if running;

1> if T331 is running:

2> stop timer T331;

2> perform the actions as specified in 5.7.8.3;

1> if the *RRCResume* includes the *fullConfig*:

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

1> else:

2> if the *RRCResume* does not include the *restoreMCG-SCells*:

3> release the MCG SCell(s) from the UE Inactive AS context, if stored;

2> if the *RRCResume* does not include the *restoreSCG*:

3> release the MR-DC related configurations (i.e., as specified in 5.3.5.10) from the UE Inactive AS context, if stored;

2> restore the *masterCellGroup, mrdc-SecondaryCellGroup*, if stored, and *pdcp-Config* from the UE Inactive AS context;

2> configure lower layers to consider the restored MCG and SCG SCell(s) (if any) to be in deactivated state;

1> discard the UE Inactive AS context;

1> store the used *nextHopChainingCount* value associated to the current KgNB;

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

2> instruct the MAC entity to stop the *cg-SDT-TimeAlignmentTimer*, if it is running;

2> instruct the MAC entity to start the *timeAlignmentTimer* associated with the PTAG*,* if it is not running;

1> if *srs-PosRRC-InactiveConfig* is configured:

2> instruct the MAC entity to stop *inactivePosSRS-TimeAlignmentTimer*, if it is running;

1> release the *suspendConfig* except the *ran-NotificationAreaInfo*;

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

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

1> if the *RRCResume* includes the *mrdc-SecondaryCellGroup:*

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

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

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

3> 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*;

1> if the *RRCResume* includes the *radioBearerConfig*:

2> perform the radio bearer configuration according to 5.3.5.6;

1> if the *RRCResume* message includes the *sk-Counter*:

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

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

2> perform the radio bearer configuration according to 5.3.5.6;

1> if the *RRCResume* 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 *RRCResume* message includes the *needForGapNCSG-ConfigNR*:

2> if *needForGapNCSG-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 *RRCResume* message includes the *needForGapNCSG-ConfigEUTRA*:

2> if *needForGapNCSG-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 *RRCResume* message includes the *appLayerMeasConfig*:

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

1> if the *RRCResume* message includes the *sl-L2RemoteUE-Config* (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> if the *RRCResume* message includes the *sl-ConfigDedicatedNR*:

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

1> resume SRB2 (if suspended), SRB3 (if configured), SRB4 (if configured), all DRBs (that are suspended) and multicast MRBs;

NOTE 1: If the SCG is deactivated, resuming SRB3 and all DRBs does not imply that PDCP or RRC PDUs can be transmitted or received on SCG RLC bearers.

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

1> stop timer T320, if running;

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

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

1> resume measurements if suspended;

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 T302 is running:

2> stop timer T302;

2> perform the actions as specified in 5.3.14.4;

1> enter RRC\_CONNECTED;

1> indicate to upper layers that the suspended RRC connection has been resumed;

1> stop the cell re-selection procedure;

1> stop relay reselection procedure if any for L2 U2N Remote UE;

1> consider the current cell to be the PCell;

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

2> if the upper layer provides NAS PDU, set the *dedicatedNAS-Message* to include the information received from upper layers;

2> if upper layers provides a PLMN:

3> if the UE is either allowed or instructed to access the PLMN via a cell for which at least one CAG ID is broadcast:

4> set the *selectedPLMN-Identity* from the *npn-IdentityInfoList*;

3> else:

4> set the *selectedPLMN-Identity* to the PLMN selected by upper layers from the *plmn-IdentityInfoList*;

2> if the *masterCellGroup* contains 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 *masterCellGroup* contains the *reportUplinkTxDirectCurrentTwoCarrier*:

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

2> if the *masterCellGroup* contains the *reportUplinkTxDirectCurrentMoreCarrier*:

3> include in the *uplinkTxDirectCurrentMoreCarrierList* the list of uplink Tx DC locations for the configured uplink carrier aggregation in the MCG;

2> if the UE has idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*:

3> if the *idleModeMeasurementReq* is included in the *RRCResume* message:

4> set the *measResultIdleEUTRA* in the *RRCResumeComplete* message to the value of *measReportIdleEUTRA* in the *VarMeasIdleReport,* if available;

4> set the *measResultIdleNR* in the *RRCResumeComplete* message to the value of *measReportIdleNR* in the *VarMeasIdleReport*, if available;

4> discard the *VarMeasIdleReport* upon successful delivery of the *RRCResumeComplete* message is confirmed by lower layers;

3> else:

4> if the SIB1 contains *idleModeMeasurementsNR* and the UE has NR idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*; or

4> if the SIB1 contains *idleModeMeasurementsEUTRA* and the UE has E-UTRA idle/inactive measurement information available in *VarMeasIdleReport*:

5> include the *idleMeasAvailable*;

2> if the *RRCResume* message includes *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 *RRCResume* message includes *mrdc-SecondaryCellGroup* set to *nr-SCG*:

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

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

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

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

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

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

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

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

3> if T330 timer is running and the logged measurements configuration is for NR:

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

3> else:

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

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

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

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

2> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

3> include the *mobilityHistoryAvail* in the *RRCResumeComplete* message;

2> if *speedStateReselectionPars* is configured in the *SIB2*:

3> include the *mobilityState* in the *RRCResumeComplete* message and set it to the mobility state (as specified in TS 38.304 [20]) of the UE just prior to entering RRC\_CONNECTED state;

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

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

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

4> 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 *needForInterruptionConfigNR* is enabled:

4> include the *needForInterruptionInfoNR* and set the contents as follows:

5> include *intraFreq-needForInterruption* with the same number of entries, and listed in the same order, as in *intraFreq-needForGap*;

5> for each entry in *intraFreq-needForInterruption*, include *interruptionIndication* and set the interruption requirement information if the corresponding entry in *intraFreq-needForGap* is set to *no-gap;*

5> include *interFreq-needForInterruption* with the same number of entries, and listed in the same order, as in *interFreq-needForGap*;

5> for each entry in *interFreq-needForInterruption*, include *interruptionIndication* and set the interruption requirement information if the corresponding entry in *interFreq-needForGap* is set to *no-gap*;

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

3> include the *NeedForGapNCSG-InfoNR* and set the contents as follows:

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

4> if *requestedTargetBandFilterNCSG-NR* is configured:

5> for each supported NR band included in *requestedTargetBandFilterNCSG-NR*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

4> else:

5> include an entry for each supported NR band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

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

3> include the *NeedForGapNCSG-InfoEUTRA* and set the contents as follows:

4> if *requestedTargetBandFilterNCSG-EUTRA* is configured:

5> 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;

4> else:

5> include an entry for each supported E-UTRA band in *needForNCSG-EUTRA* and set the corresponding NCSG requirement information;

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

1> the procedure ends.

NOTE 2: Network only configures at most one of *reportUplinkTxDirectCurrent, reportUplinkTxDirectCurrentTwoCarrier* or *reportUplinkTxDirectCurrentMoreCarrier* in one RRC message*.*

<Skip unrelated parts>

5.5.1 Introduction

The network may configure an RRC\_CONNECTED UE to perform measurements. The network may configure the UE to report them in accordance with the measurement configuration or perform conditional reconfiguration evaluation in accordance with the conditional reconfiguration. The measurement configuration is provided by means of dedicated signalling i.e. using the *RRCReconfiguration* or *RRCResume.*

The network may configure the UE to perform the following types of measurements:

- NR measurements;

- Inter-RAT measurements of E-UTRA frequencies;

- Inter-RAT measurements of UTRA-FDD frequencies;

- NR sidelink measurements of L2 U2N Relay UEs.

The network may configure the UE to report the following measurement information based on SS/PBCH block(s):

- Measurement results per SS/PBCH block;

- Measurement results per cell based on SS/PBCH block(s);

- SS/PBCH block(s) indexes.

The network may configure the UE to report the following measurement information based on CSI-RS resources:

- Measurement results per CSI-RS resource;

- Measurement results per cell based on CSI-RS resource(s);

- CSI-RS resource measurement identifiers.

The network may configure the UE to perform the following types of measurements for NR sidelink and V2X sidelink:

- CBR measurements.

The network may configure the UE to report the following CLI measurement information based on SRS resources:

- Measurement results per SRS resource;

- SRS resource(s) indexes.

The network may configure the UE to report the following CLI measurement information based on CLI-RSSI resources:

- Measurement results per CLI-RSSI resource;

- CLI-RSSI resource(s) indexes.

The network may configure the UE to report the following Rx-Tx time difference measurement information based on CSI-RS for tracking or PRS:

- UE Rx-Tx time difference measurement result.

The measurement configuration includes the following parameters:

**1. Measurement objects:** A list of objects on which the UE shall perform the measurements.

- For intra-frequency and inter-frequency measurements a measurement object indicates the frequency/time location and subcarrier spacing of reference signals to be measured. Associated with this measurement object, the network may configure a list of cell specific offsets, a list of 'exclude-listed' cells and a list of 'allow-listed' cells. Exclude-listed cells are not applicable in event evaluation or measurement reporting. Allow-listed cells are the only ones applicable in event evaluation or measurement reporting.

- The *measObjectId* of the MO which corresponds to each serving cell is indicated by *servingCellMO* within the serving cell configuration.

- For inter-RAT E-UTRA measurements a measurement object is a single E-UTRA carrier frequency. Associated with this E-UTRA carrier frequency, the network can configure a list of cell specific offsets and a list of 'exclude-listed' cells. Exclude-listed cells are not applicable in event evaluation or measurement reporting.

- For inter-RAT UTRA-FDD measurements a measurement object is a set of cells on a single UTRA-FDD carrier frequency.

- For NR sidelink measurements of L2 U2N Relay UEs, a measurement object is a single NR sidelink frequency to be measured.

- For CBR measurement of NR sidelink communication, a measurement object is a set of transmission resource pool(s) on a single carrier frequency for NR sidelink communication.

- For CBR measurement of NR sidelink discovery, a measurement object is a set of discovery dedicated resource pool(s) or transmission resource pool(s) also used for NR sidelink discovery on a single carrier frequency for NR sidelink discovery.

- For CLI measurements a measurement object indicates the frequency/time location of SRS resources and/or CLI-RSSI resources, and subcarrier spacing of SRS resources to be measured.

**2. Reporting configurations:** A list of reporting configurations where there can be one or multiple reporting configurations per measurement object. Each measurement reporting configuration consists of the following:

- Reporting criterion: The criterion that triggers the UE to send a measurement report. This can either be periodical or a single event description.

- RS type: The RS that the UE uses for beam and cell measurement results (SS/PBCH block or CSI-RS).

- Reporting format: The quantities per cell and per beam that the UE includes in the measurement report (e.g. RSRP) and other associated information such as the maximum number of cells and the maximum number beams per cell to report.

In case of conditional reconfiguration, each configuration consists of the following:

- Execution criteria: The criteria the UE uses for conditional reconfiguration execution.

- RS type: The RS that the UE uses for obtaining beam and cell measurement results (SS/PBCH block-based or CSI-RS-based), used for evaluating conditional reconfiguration execution condition.

**3. Measurement identities:** For measurement reporting, a list of measurement identities where each measurement identity links one measurement object with one reporting configuration. By configuring multiple measurement identities, it is possible to link more than one measurement object to the same reporting configuration, as well as to link more than one reporting configuration to the same measurement object. The measurement identity is also included in the measurement report that triggered the reporting, serving as a reference to the network. For conditional reconfiguration triggering, one measurement identity links to exactly one conditional reconfiguration trigger configuration. And up to 2 measurement identities can be linked to one conditional reconfiguration execution condition.

**4. Quantity configurations:** The quantity configuration defines the measurement filtering configuration used for all event evaluation and related reporting, and for periodical reporting of that measurement. For NR measurements, the network may configure up to 2 quantity configurations with a reference in the NR measurement object to the configuration that is to be used. In each configuration, different filter coefficients can be configured for different measurement quantities, for different RS types, and for measurements per cell and per beam.

**5. Measurement gaps:** Periods that the UE may use to perform measurements.

**6. Effective measurement window:** Periods that the UE may use to perform inter RAT measurements.

A UE in RRC\_CONNECTED maintains a measurement object list, a reporting configuration list, and a measurement identities list according to signalling and procedures in this specification. The measurement object list possibly includes NR measurement object(s), CLI measurement object(s), inter-RAT objects, and L2 U2N Relay objects. Similarly, the reporting configuration list includes NR, inter-RAT, and L2 U2N Relay reporting configurations. Any measurement object can be linked to any reporting configuration of the same RAT type. Some reporting configurations may not be linked to a measurement object. Likewise, some measurement objects may not be linked to a reporting configuration.

The measurement procedures distinguish the following types of cells:

1. The NR serving cell(s) – these are the SpCell and one or more SCells.

2. Listed cells – these are cells listed within the measurement object(s).

3. Detected cells – these are cells that are not listed within the measurement object(s) but are detected by the UE on the SSB frequency(ies) and subcarrier spacing(s) indicated by the measurement object(s).

For NR measurement object(s), the UE measures and reports on the serving cell(s)/serving Relay UE (for L2 U2N Remote UE), listed cells and/or detected cells. For inter-RAT measurements object(s) of E-UTRA, the UE measures and reports on listed cells and detected cells and, for RSSI and channel occupancy measurements, the UE measures and reports on the configured resources on the indicated frequency. For inter-RAT measurements object(s) of UTRA-FDD, the UE measures and reports on listed cells. For CLI measurement object(s), the UE measures and reports on configured measurement resources (i.e. SRS resources and/or CLI-RSSI resources). For L2 U2N Relay object(s), the UE measures and reports on the serving NR cell(s), as well as the discovered L2 U2N Relay UEs.

Whenever the procedural specification, other than contained in clause 5.5.2, refers to a field it concerns a field included in the *VarMeasConfig* unless explicitly stated otherwise i.e. only the measurement configuration procedure covers the direct UE action related to the received *measConfig*.

In NR-DC, the UE may receive two independent *measConfig*:

- a *measConfig*, associated with MCG, that is included in the *RRCReconfiguration* message received via SRB1; and

- a *measConfig*, associated with SCG, that is included in the *RRCReconfiguration* message received via SRB3, or, alternatively, included within a *RRCReconfiguration* message embedded in a *RRCReconfiguration* message received via SRB1.

In this case, the UE maintains two independent *VarMeasConfig* and *VarMeasReportList*, one associated with each *measConfig*, and independently performs all the procedures in clause 5.5 for each *measConfig* and the associated *VarMeasConfig* and *VarMeasReportList*, unless explicitly stated otherwise.

The configurations related to CBR measurements are only included in the *measConfig* associated with MCG.

The configurations related to Rx-Tx time difference measurement are only included in the *measConfig* associated with MCG.

5.5.2 Measurement configuration

5.5.2.1 General

The network applies the procedure as follows:

- to ensure that, whenever the UE has a *measConfig* associated with a CG, it includes a *measObject* for the SpCell and for each NR SCell of the CG to be measured;

- to configure at most one measurement identity across all CGs using a reporting configuration with the *reportType* set to *reportCGI;*

- to configure at most one measurement identity per the node hosting PDCP entity using a reporting configuration with the *ul-DelayValueConfig;*

- to configure at most one measurement identity per the node hosting PDCP entity using a reporting configuration with the *ul-ExcessDelayConfig;*

-to ensure that, in the *measConfig* associated with a CG:

- for all SSB based measurements there is at most one measurement object with the same *ssbFrequency*;

*-* an *smtc1* included in any measurement object with the same *ssbFrequency* has the same value and that an *smtc2* included in any measurement object with the same *ssbFrequency* has the same value and that an *smtc3list* included in any measurement object with the same *ssbFrequency* has the same value and that an *smtc4list* included in any measurement object with the same *ssbFrequency* has the same value;

- to ensure that all measurement objects configured in this specification and in TS 36.331 [10] with the same *ssbFrequency* have the same *ssbSubcarrierSpacing*;

- to ensure that, if a measurement object associated with the MCG has the same *ssbFrequency* as a measurement object associated with the SCG:

- for that *ssbFrequency*, the measurement window according to the *smtc1* configured by the MCG includes the measurement window according to the *smtc1* configured by the SCG, or vice-versa, with an accuracy of the maximum receive timing difference specified in TS 38.133 [14].

- if both measurement objects are used for RSSI measurements, bits in *measurementSlots* in both objects corresponding to the same slot are set to the same value. Also, the *endSymbol* is the same in both objects.

- to ensure that, if a measurement object has the same *ssbFrequency* as a measurement object configured in TS 36.331 [10]:

- for that *ssbFrequency*, the measurement window according to the *smtc* configured in TS 36.331 [10] includes the measurement window according to the *smtc1* configured in TS 38.331, or vice-versa, with an accuracy of the maximum receive timing difference specified in TS 38.133 [14].

- if both measurement objects are used for RSSI measurements, bits in *measurementSlots* in both objects corresponding to the same slot are set to the same value. Also, the *endSymbol* is the same in both objects.

- when the UE is in NE-DC, NR-DC, or NR standalone, to configure at most one measurement identity across all CGs using a reporting configuration with the *reportType* set to *reportSFTD*;

For CSI-RS resources, the network applies the procedure as follows:

- to ensure that all CSI-RS resources configured in each measurement object have the same center frequency, (*startPRB*+floor(*nrofPRBs*/2))

- to ensure that the total number of CSI-RS resources configured in each measurement object does not exceed the maximum number specified in TS 38.214 [19].

The UE shall:

1> if the received *measConfig* includes the *measObjectToRemoveList*:

2> perform the measurement object removal procedure as specified in 5.5.2.4;

1> if the received *measConfig* includes the *measObjectToAddModList*:

2> perform the measurement object addition/modification procedure as specified in 5.5.2.5;

1> if the received *measConfig* includes the *reportConfigToRemoveList*:

2> perform the reporting configuration removal procedure as specified in 5.5.2.6;

1> if the received *measConfig* includes the *reportConfigToAddModList*:

2> perform the reporting configuration addition/modification procedure as specified in 5.5.2.7;

1> if the received *measConfig* includes the *quantityConfig*:

2> perform the quantity configuration procedure as specified in 5.5.2.8;

1> if the received *measConfig* includes the *measIdToRemoveList*:

2> perform the measurement identity removal procedure as specified in 5.5.2.2;

1> if the received *measConfig* includes the *measIdToAddModList*:

2> perform the measurement identity addition/modification procedure as specified in 5.5.2.3;

1> if the received *measConfig* includes the *measGapConfig*:

2> perform the measurement gap configuration procedure as specified in 5.5.2.9;

1> if the received *measConfig* includes the *measGapSharingConfig*:

2> perform the measurement gap sharing configuration procedure as specified in 5.5.2.11;

1> if the received *measConfig* includes the *s-MeasureConfig*:

2> if *s-MeasureConfig* is set to *ssb-RSRP*, set parameter *ssb-RSRP* of *s-MeasureConfig* within *VarMeasConfig* to the threshold value of the RSRP indicated by the received value of *s-MeasureConfig* which is derived as specified in 6.3.2*;*

2> else, set parameter *csi-RSRP* of *s-MeasureConfig* within *VarMeasConfig* to the threshold value of the RSRP indicated by the received value of *s-MeasureConfig* which is derived as specified in 6.3.2.

1> if the received *measConfig* includes the *effectiveMeasWindowConfig*:

2> perform the effective measurement window configuration as specified in 5.5.2.x;

<Skip unrelated parts>

#### 5.5.2.9 Measurement gap configuration

The UE shall:

1> if *gapFR1* is set to *setup*:

2> if an FR1 measurement gap configuration configured by *gapFR1* is already setup, release the FR1 measurement gap configuration;

2> setup the FR1 measurement gap configuration indicated by the *gapFR1* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

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

subframe = *gapOffset* mod 10;

with *T* = MGRP/10 as defined in TS 38.133 [14];

2> apply the specified timing advance *mgta* to the gap occurrences calculated above (i.e. the UE starts the measurement *mgta* ms before the gap subframe occurrences);

1> else if *gapFR1* is set to *release*:

2> release the FR1 measurement gap configuration configured by *gapFR1*;

1> if *gapFR2* is set to *setup*:

2> if an FR2 measurement gap configuration configured by *gapFR2* is already setup, release the FR2 measurement gap configuration;

2> setup the FR2 measurement gap configuration indicated by the *gapFR2* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

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

subframe = *gapOffset* mod 10;

with *T* = MGRP/10 as defined in TS 38.133 [14];

2> apply the specified timing advance *mgta* to the gap occurrences calculated above (i.e. the UE starts the measurement *mgta* ms before the gap subframe occurrences);

1> else if *gapFR2* is set to *release*:

2> release the FR2 measurement gap configuration configured by *gapFR2*;

1> if *gapUE* is set to *setup*:

2> if a per UE measurement gap configuration configured by *gapUE* is already setup, release the per UE measurement gap configuration;

2> setup the per UE measurement gap configuration indicated by the *gapUE* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

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

subframe = *gapOffset* mod 10;

with *T* = MGRP/10 as defined in TS 38.133 [14];

2> apply the specified timing advance *mgta* to the gap occurrences calculated above (i.e. the UE starts the measurement *mgta* ms before the gap subframe occurrences);

1> else if *gapUE* is set to *release*:

2> release the per UE measurement gap configuration configured by *gapUE*.

1> for each *measGapId* included in the received *gapToReleaseList*:

2> release the measurement gap configuration associated with the *measGapId*;

1> for each *measPosPreConfigGapId* included in the received *posMeasGapPreConfigToReleaseList*:

2> release the measurement gap configuration associated with the *measPosPreConfigGapId*;

1> for each *GapConfig* received in *gapToAddModList*:

2> setup measurement gap configuration indicated by the *GapConfig* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

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

subframe = *gapOffset* mod 10;

with *T* = MGRP/10 as defined in TS 38.133 [14];

2> apply the specified timing advance *mgta* to the gap occurrences calculated above (i.e. the UE starts the measurement *mgta* ms before the gap subframe occurrences);

2> apply the measurement gap as per UE measurement gap, FR1 measurement gap, or FR2 measurement gap according to the *gapType* indicated by the *GapConfig*;

2> associate the measurement gap with the *measGapId* indicated by the *GapConfig*;

2> if *gapSharing* in the *GapConfig* is present:

3> setup the gap sharing configuration for the measurement gap in accordance with the received *gapSharing* as defined in TS 38.133 [14];

2> else:

3> release the gap sharing configuration (if configured) for the measurement gap;

1> for each *PosGapConfig* received in *PosMeasGapPreConfigToAddModList*:

2> if a measurement gap configuration associated with the *measPosPreConfigGapId* indicated by the *PosGapConfig* is already setup:

3> release the measurement gap configuration;

2> setup measurement gap configuration indicated by the *PosGapConfig* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

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

subframe = *gapOffset* mod 10;

with *T* = MGRP/10 as defined in TS 38.133 [14];

2> apply the specified timing advance *mgta* to the gap occurrences calculated above (i.e. the UE starts the measurement *mgta* ms before the gap subframe occurrences);

2> configure the measurement gap as indicated by *gapType*;

1> for each FR1, FR2, and per UE measurement gap that is setup:

2> if the measurement gap is configured by *GapConfig* and *preConfigInd-r17* in the corresponding *GapConfig* is present:

3> determine whether the measurement gap is activated or not according to TS 38.133 [14];

2> else if the measurement gap is configured by *PosGapConfig*:

3> consider the measurement gap to be deactivated;

2> else:

3> consider the measurement gap to be activated.

NOTE 1: For FR2 gap configuration with synchronous CA, for the UE in NE-DC or NR-DC, the SFN and subframe of the serving cell indicated by the *refServCellIndicator* is used in the gap calculation. Otherwise, the SFN and subframe of a serving cell on FR2 frequency is used in the gap calculation

NOTE 2: For FR1 gap or per UE gap configuration, for the UE in NE-DC or NR-DC, the SFN and subframe of the serving cell indicated by the *refServCellIndicator* in is used in the gap calculation. Otherwise, the SFN and subframe of the PCell is used in the gap calculation.

NOTE 3: For FR2 gap configuration with asynchronous CA, for the UE in NE-DC or NR-DC, the SFN and subframe of the serving cell indicated by the *refServCellIndicator* and *refFR2ServCellAsyncCA* is used in the gap calculation. Otherwise, the SFN and subframe of a serving cell on FR2 frequency indicated by the *refFR2ServCellAsyncCA* is used in the gap calculation

<Skip unrelated parts>

5.5.2.x Effective measurement window configuration

The UE shall:

1> if *effectiveMeasWindowConfig* is set to *setup*:

2> if an effective measurement window configuration is already setup:

3> release the effective measurement window configuration;

2> setup an effective measurement window configuration indicated by the *effectiveMeasWindowConfig* in accordance with the received *windowOffsetPeriodicity* (providing *periodicity* and *offset* for the following condition), i.e., the first subframe of each window occurs at an SFN and subframe meeting the following condition:

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

subframe = *offset* mod 10;

with *T* = *periodicity*/10;

1> else if *effectiveMeasWindowConfig* is set to *release*:

2> release the effective measurement window configuration;

NOTE X: The SFN and subframe of the PCell is used in the effective measurement window calculation.

6.2.2 Message definitions

<Skip unrelated parts>

– *RRCReconfiguration*

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

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

***RRCReconfiguration message***

-- ASN1START

-- TAG-RRCRECONFIGURATION-START

RRCReconfiguration ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcReconfiguration RRCReconfiguration-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCReconfiguration-IEs ::= SEQUENCE {

 radioBearerConfig RadioBearerConfig OPTIONAL, -- Need M

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

 measConfig MeasConfig OPTIONAL, -- Need M

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCReconfiguration-v1530-IEs OPTIONAL

}

RRCReconfiguration-v1530-IEs ::= SEQUENCE {

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

 fullConfig ENUMERATED {true} OPTIONAL, -- Cond FullConfig

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

 masterKeyUpdate MasterKeyUpdate OPTIONAL, -- Cond MasterKeyChange

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

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

 otherConfig OtherConfig OPTIONAL, -- Need M

 nonCriticalExtension RRCReconfiguration-v1540-IEs OPTIONAL

}

RRCReconfiguration-v1540-IEs ::= SEQUENCE {

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

 nonCriticalExtension RRCReconfiguration-v1560-IEs OPTIONAL

}

RRCReconfiguration-v1560-IEs ::= SEQUENCE {

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

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

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

 nonCriticalExtension RRCReconfiguration-v1610-IEs OPTIONAL

}

RRCReconfiguration-v1610-IEs ::= SEQUENCE {

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

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

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

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

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

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

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

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

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

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

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

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

 nonCriticalExtension RRCReconfiguration-v1700-IEs OPTIONAL

}

RRCReconfiguration-v1700-IEs ::= SEQUENCE {

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

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

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

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

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

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

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

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

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

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

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

 nonCriticalExtension RRCReconfiguration-v18xy-IEs OPTIONAL

}

RRCReconfiguration-v18xy-IEs ::= SEQUENCE {

 needForInterruptionConfigNR-r18 ENUMERATED { enabled, disabled } OPTIONAL, -- Need M

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

MRDC-SecondaryCellGroupConfig ::= SEQUENCE {

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

 mrdc-SecondaryCellGroup CHOICE {

 nr-SCG OCTET STRING (CONTAINING RRCReconfiguration),

 eutra-SCG OCTET STRING

 }

}

BAP-Config-r16 ::= SEQUENCE {

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

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

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

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

 ...

}

MasterKeyUpdate ::= SEQUENCE {

 keySetChangeIndicator BOOLEAN,

 nextHopChainingCount NextHopChainingCount,

 nas-Container OCTET STRING OPTIONAL, -- Cond securityNASC

 ...

}

OnDemandSIB-Request-r16 ::= SEQUENCE {

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

}

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

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

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

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

 ...

}

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

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

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

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

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

...

}

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

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

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

}

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

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

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

 oneShot-r17 NULL,

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

}

-- TAG-RRCRECONFIGURATION-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCReconfiguration-IEs* field descriptions** |
| ***appLayerMeasConfig***This field is used to configure application layer measurements. This field is absent when the UE is configured to operate with shared spectrum channel access or if *sl-L2RemoteUE-Config-r17* is configured or not released. |
| ***bap-Config***This field is used to configure the BAP entity for IAB nodes. |
| ***bap-Address***Indicates the BAP address of an IAB-node. The BAP address of an IAB-node cannot be changed once configured for the cell group to the BAP entity. |
| ***conditionalReconfiguration***Configuration of candidate target SpCell(s) and execution condition(s) for conditional handover, conditional PSCell addition or conditional PSCell change. The field is absent if any DAPS bearer is configured or if the *masterCellGroup* includes *ReconfigurationWithSync* or if the *sl-L2RemoteUE-Config* or *sl-L2RelayUE-Config* is configured. For conditional PSCell change, the field is absent if the *secondaryCellGroup* includes *ReconfigurationWithSync*. The *RRCReconfiguration* message contained in *DLInformationTransferMRDC* cannot contain the field *conditionalReconfiguration* for conditional PSCell change or for conditional PSCell addition. |
| ***daps-SourceRelease***Indicates to UE that the source cell part of DAPS operation is to be stopped and the source cell part of DAPS configuration is to be released. |
| ***dedicatedNAS-MessageList***This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list.  |
| ***dedicatedPagingDelivery***This field is used to transfer *Paging* message for the associated L2 U2N Remote UE to the L2 U2N Relay UE in RRC\_CONNECTED. |
| ***dedicatedPosSysInfoDelivery***This field is used to transfer *SIBPos* to the UE in RRC\_CONNECTED. |
| ***dedicatedSIB1-Delivery***This field is used to transfer *SIB1* to the UE (including L2 U2N Remote UE). The field has the same values as the corresponding configuration in *servingCellConfigCommon*. |
| ***dedicatedSystemInformationDelivery***This field is used to transfer *SIB6*, *SIB7*, *SIB8, SIB19, SIB20, SIB21* to the UE with an active BWP with no common search space configured or the L2 U2N Remote UE in RRC\_CONNECTED. For UEs in RRC\_CONNECTED (including L2 U2N Remote UE), this field is also used to transfer the SIBs requested on-demand. |
| ***defaultUL-BAP-RoutingID***This field is used for IAB-node to configure the default uplink Routing ID, which is used by IAB-node during IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment for *F1-C* and *non-F1* traffic. The *defaultUL-BAP-RoutingID* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes. This field is mandatory only for IAB-node bootstrapping. |
| ***defaultUL-BH-RLC-Channel***This field is used for IAB-nodes to configure the default uplink BH RLC channel*,* which is used by IAB-nodeduring IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment *for F1-C and non-F1 traffic*. The *defaultUL-BH-RLC-Channel* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes, and the new IP address is anchored at a different IAB-donor-DU. This field is mandatory for IAB-node bootstrapping. If the IAB-MT is operating in EN-DC, the default uplink BH RLC channel is referring to an RLC channel on the SCG; Otherwise, it is referring to an RLC channel either on the MCG or on the SCG depending on whether the MN or the SN configures this field. |
| ***flowControlFeedbackType***This field is only used for IAB-node that support hop-by-hop flow control to configure the type of flow control feedback. Value *perBH-RLC-Channel* indicates that the IAB-node shall provide flow control feedback per BH RLC channel, value *perRoutingID* indicates that the IAB-node shall provide flow control feedback per routing ID, and value *both* indicates that the IAB-node shall provide flow control feedback both per BH RLC channel and per routing ID. |
| ***fullConfig***Indicates that the full configuration option is applicable for the *RRCReconfiguration* message for intra-system intra-RAT HO. For inter-RAT HO from E-UTRA to NR, *fullConfig* indicates whether or not delta signalling of SDAP/PDCP from source RAT is applicable. This field is absent if any DAPS bearer is configured or when the *RRCReconfiguration* message is transmitted on SRB3, and in an *RRCReconfiguration* message for SCG contained in another *RRCReconfiguration* message (or *RRCConnectionReconfiguration* message, see TS 36.331 [10]) transmitted on SRB1. |
| ***iab-IP-Address***This field is used to provide the IP address information for IAB-node. |
| ***iab-IP-AddressIndex***This field is used to identify a configuration of an IP address. |
| ***iab-IP-AddressToAddModList***List of IP addresses allocated for IAB-node to be added and modified. |
| ***iab-IP-AddressToReleaseList***List of IP address allocated for IAB-node to be released. |
| ***iab-IP-Usage***This field is used to indicate the usage of the assigned IP address. If this field is not configured, the assigned IP address is used for all traffic. |
| ***iab-donor-DU-BAP-Address***This field is used to indicate the BAP address of the IAB-donor-DU where the IP address is anchored. |
| ***keySetChangeIndicator***Indicates whether UE shall derive a new KgNB. If *reconfigurationWithSync* is included, value *true* indicates that a KgNB key is derived from a KAMF key taken into use through the latest successful NAS SMC procedure, or N2 handover procedure with KAMF change, as described in TS 33.501 [11] for KgNB re-keying. Value *false* indicates that the new KgNB key is obtained from the current KgNB key or from the NH as described in TS 33.501 [11]. |
| ***masterCellGroup***Configuration of master cell group. |
| ***mrdc-ReleaseAndAdd***This field indicates that the current SCG configuration is released and a new SCG is added at the same time. |
| ***mrdc-SecondaryCellGroup***Includes an RRC message for SCG configuration in NR-DC or NE-DC.For NR-DC (nr-SCG), *mrdc-SecondaryCellGroup* contains the *RRCReconfiguration* message as generated (entirely) by SN gNB. In this version of the specification, the RRC message can only include fields *secondaryCellGroup, otherConfig, conditionalReconfiguration,* *measConfig,* *bap-Config* and *IAB-IP-AddressConfigurationList*.For NE-DC (eutra-SCG), *mrdc-SecondaryCellGroup* includes the E-UTRA *RRCConnectionReconfiguration* message as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA RRC message can only include the field *scg-Configuration*. |
| ***musim-GapConfig***Indicates the MUSIM gap configuration and controls setup/release of MUSIM gaps. In this version of the specification, the network does not configure MUSIM gap together with concurrent measurement gap or preconfigured measurement gap for positioning. |
| ***nas-Container***This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this field, although it affects activation of AS security after inter-system handover to NR. The content is defined in TS 24.501 [23]. |
| ***needForGapsConfigNR***Configuration for the UE to report measurement gap requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigEUTRA***Configuration for the UE to report measurement gap and NCSG requirement information of E‑UTRA target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigNR***Configuration for the UE to report measurement gap and NCSG requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForInterruptionConfigNR***Indicates whether the UE shall report interruption requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. The network sets this field to *enabled* only if the *needForGapsConfigNR* is configured. The network sets this field to *disabled* if the *needForGapsConfigNR* is released. |
| ***nextHopChainingCount***Parameter NCC: See TS 33.501 [11] |
| ***onDemandSIB-Request***If the field is present, the UE is allowed to request SIB(s) on-demand while in RRC\_CONNECTED according to clause 5.2.2.3.5. |
| ***onDemandSIB-RequestProhibitTimer***Prohibit timer for requesting SIB(s) on-demand while in RRC\_CONNECTED according to clause 5.2.2.3.5. Value in seconds. Value s0 means prohibit timer is set to 0 seconds, value s0dot5 means prohibit timer is set to 0.5 seconds, value s1 means prohibit timer is set to 1 second and so on. |
| ***otherConfig***Contains configuration related to other configurations. When configured for the SCG, only fields *drx-PreferenceConfig, maxBW-PreferenceConfig, maxBW-PreferenceConfigFR2-2, maxCC-PreferenceConfig, maxMIMO-LayerPreferenceConfig*, *maxMIMO-LayerPreferenceConfigFR2-2*, *minSchedulingOffsetPreferenceConfig, minSchedulingOffsetPreferenceConfigExt, rlm-RelaxationReportingConfig, bfd-RelaxationReportingConfig, btNameList, wlanNameList, sensorNameList* and *obtainCommonLocation* can be included. |
| ***radioBearerConfig***Configuration of Radio Bearers (DRBs, SRBs, multicast MRBs) including SDAP/PDCP. In (NG)EN-DC this field may only be present if the *RRCReconfiguration* is transmitted over SRB3. SRB4 should not be configured if *sl-L2RemoteUE-Config-r17* is configured or not released. |
| ***radioBearerConfig2***Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. This field can only be used if the UE supports NR-DC or NE-DC. |
| ***scg-State***Indicates that the SCG is in deactivated state.This field is not used- in an *RRCReconfiguration* message received:- within *mrdc-SecondaryCellGroup*, or- in an E-UTRA *RRCConnectionReconfiguration* message, or- in an E-UTRA *RRCConnectionResume* message or- in an *RRCReconfiguration* message received via SRB3, except if the *RRCReconfiguration* message is included in *DLInformationTransferMRDC*.The field is absent if CPA or CPC is configured for the UE, or if the *RRCReconfiguration* message is contained in *CondRRCReconfig*. |
| ***sl-L2RelayUE-Config***Contains L2 U2N relay operation related configurations used by a UE acting as or to be acting as a L2 U2N Relay UE. The field is absent if *conditionalReconfiguration* is configured for CHO. |
| ***sl-L2RemoteUE-Config***Contains L2 U2N relay operation related configurations used by a UE acting as or to be acting as a L2 U2N Remote UE. The field is absent if *conditionalReconfiguration* is configured for CHO, or if *appLayerMeasConfig* or SRB4 is configured/not released. |
| ***secondaryCellGroup***Configuration of secondary cell group ((NG)EN-DC or NR-DC). |
| ***sk-Counter***A counter used upon initial configuration of S-KgNB or S-KeNB, as well as upon refresh of S-KgNB or S-KeNB. This field is always included either upon initial configuration of an NR SCG or upon configuration of the first RB with *keyToUse* set to *secondary*, whichever happens first. This field is absent if there is neither any NR SCG nor any RB with *keyToUse* set to *secondary*. |
| ***sl-ConfigDedicatedNR***This field is used to provide the dedicated configurations for NR sidelink communication/discovery. |
| ***sl-ConfigDedicatedEUTRA-Info***This field includes the E-UTRA *RRCConnectionReconfiguration* as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA *RRCConnectionReconfiguration* can only includes sidelink related fields for V2X sidelink communication, i.e. *sl-V2X-ConfigDedicated*, *sl-V2X-SPS-Config*, *measConfig* and/or *otherConfig*. |
| ***sl-TimeOffsetEUTRA***This field indicates the possible time offset to (de)activation of V2X sidelink transmission after receiving DCI format 3\_1 used for scheduling V2X sidelink communication. Value *ms0dpt75* corresponds to 0.75ms, *ms1* corresponds to 1ms and so on. The network includes this field only when *sl-ConfigDedicatedEUTRA* is configured. |
| ***targetCellSMTC-SCG***The SSB periodicity/offset/duration configuration of target cell for NR PSCell addition and SN change. When UE receives this field, UE applies the configuration based on the timing reference of NR PCell for PSCell addition and PSCell change for the case of no reconfiguration with sync of MCG, and UE applies the configuration based on the timing reference of target NR PCell for the case of reconfiguration with sync of MCG. If both this field and the *smtc* in *secondaryCellGroup* -> *SpCellConfig* -> *reconfigurationWithSync* are absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |
| ***t316***Indicates the value for timer T316 as described in clause 7.1. Value *ms50* corresponds to 50 ms, value *ms100* corresponds to 100 ms and so on. This field can be configured only if the UE is configured with split SRB1 or SRB3. |
| ***ue-TxTEG-RequestUL-TDOA-Config***Configures the periodicity of UE reporting for the association between Tx TEG and SRS Positioning resources. When configured with *oneShot* UE reports the association only one time. When configured with *periodicReporting* UE reports the association periodically and the *periodicReporting* indicates the periodicity. Value *ms160* corresponds to 160ms, value *ms320* corresponds to 320ms and so on. |
| ***ul-GapFR2-Config***Indicates the FR2 UL gap configuration to UE. In EN-DC and NGEN-DC, the SN decides and configures the FR2 UL gap pattern. In NE-DC, the MN decides and configures the FR2 UL gap pattern. In NR-DC without FR2-FR2 band combination, the network entity which is configured with FR2 serving cell(s) decides and configures the FR2 UL gap pattern. |

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

*– RRCReconfigurationComplete*

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

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

***RRCReconfigurationComplete message***

-- ASN1START

-- TAG-RRCRECONFIGURATIONCOMPLETE-START

RRCReconfigurationComplete ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcReconfigurationComplete RRCReconfigurationComplete-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCReconfigurationComplete-IEs ::= SEQUENCE {

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v1530-IEs OPTIONAL

}

RRCReconfigurationComplete-v1530-IEs ::= SEQUENCE {

 uplinkTxDirectCurrentList UplinkTxDirectCurrentList OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v1560-IEs OPTIONAL

}

RRCReconfigurationComplete-v1560-IEs ::= SEQUENCE {

 scg-Response CHOICE {

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

 eutra-SCG-Response OCTET STRING

 } OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v1610-IEs OPTIONAL

}

RRCReconfigurationComplete-v1610-IEs ::= SEQUENCE {

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

 needForGapsInfoNR-r16 NeedForGapsInfoNR-r16 OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v1640-IEs OPTIONAL

}

RRCReconfigurationComplete-v1640-IEs ::= SEQUENCE {

 uplinkTxDirectCurrentTwoCarrierList-r16 UplinkTxDirectCurrentTwoCarrierList-r16 OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v1700-IEs OPTIONAL

}

RRCReconfigurationComplete-v1700-IEs ::= SEQUENCE {

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

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

 selectedCondRRCReconfig-r17 CondReconfigId-r16 OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v1720-IEs OPTIONAL

}

RRCReconfigurationComplete-v1720-IEs ::= SEQUENCE {

 uplinkTxDirectCurrentMoreCarrierList-r17 UplinkTxDirectCurrentMoreCarrierList-r17 OPTIONAL,

 nonCriticalExtension RRCReconfigurationComplete-v18xy-IEs OPTIONAL

}

RRCReconfigurationComplete-v18xy-IEs ::= SEQUENCE {

 needForInterruptionInfoNR-r18 NeedForInterruptionInfoNR-r18 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRECONFIGURATIONCOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCReconfigurationComplete-IEs* field descriptions** |
| ***needForGapsInfoNR***This field is used to indicate the measurement gap requirement information of the UE for NR target bands. |
| ***needForGapNCSG-InfoEUTRA***This field is used to indicate the measurement gap and NCSG requirement information of the UE for E‑UTRA target bands. |
| ***needForGapNCSG-InfoNR***This field is used to indicate the measurement gap and NCSG requirement information of the UE for NR target bands. |
| ***needForInterruptionInfoNR***This field indicates whether interruption is needed while performing measurement on NR target bands without measurement gap. |
| ***scg-Response***In case of NR-DC (*nr-SCG-Response*), this field includes the *RRCReconfigurationComplete* message. In case of NE-DC (*eutra-SCG-Response*), this field includes the E-UTRA *RRCConnectionReconfigurationComplete* message as specified in TS 36.331 [10]*.* |
| ***selectedCondRRCReconfig***This field indicates the ID of the selected conditional reconfiguration the UE applied upon the execution of CPA or inter-SN CPC. |
| ***uplinkTxDirectCurrentList***The Tx Direct Current locations for the configured serving cells and BWPs if requested by the NW (see *reportUplinkTxDirectCurrent* in *CellGroupConfig*). |
| ***uplinkTxDirectCurrentMoreCarrierList***The Tx Direct Current locations for the configured intra-band CA requested by *reportUplinkTxDirectCurrentMoreCarrier-r17*. |
| ***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*). |

<Skip unrelated parts>

– *RRCResume*

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

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

***RRCResume* message**

-- ASN1START

-- TAG-RRCRESUME-START

RRCResume ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcResume RRCResume-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCResume-IEs ::= SEQUENCE {

 radioBearerConfig RadioBearerConfig OPTIONAL, -- Need M

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

 measConfig MeasConfig OPTIONAL, -- Need M

 fullConfig ENUMERATED {true} OPTIONAL, -- Need N

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCResume-v1560-IEs OPTIONAL

}

RRCResume-v1560-IEs ::= SEQUENCE {

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

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

 nonCriticalExtension RRCResume-v1610-IEs OPTIONAL

}

RRCResume-v1610-IEs ::= SEQUENCE {

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

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

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

 mrdc-SecondaryCellGroup-r16 CHOICE {

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

 eutra-SCG-r16 OCTET STRING

 } OPTIONAL, -- Cond RestoreSCG

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

 nonCriticalExtension RRCResume-v1700-IEs OPTIONAL

}

RRCResume-v1700-IEs ::= SEQUENCE {

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

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

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

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

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

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

 nonCriticalExtension RRCResume-v18xy-IEs OPTIONAL

}

RRCResume-v18xy-IEs ::= SEQUENCE {

 needForInterruptionConfigNR-r18 ENUMERATED { enabled, disabled } OPTIONAL, -- Need M

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRESUME-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCResume-IEs* field descriptions** |
| ***appLayerMeasConfig***This field is used to configure application layer measurements. This field is absent when the UE is configured to operate with shared spectrum channel access. |
| ***idleModeMeasurementReq***This field indicates that the UE shall report the idle/inactive measurements, if available, to the network in the *RRCResumeComplete* message |
| ***masterCellGroup***Configuration of the master cell group. |
| ***mrdc-SecondaryCellGroup***Includes an RRC message for SCG configuration in NR-DC or NE-DC.For NR-DC (*nr-SCG*), *mrdc-SecondaryCellGroup* contains the *RRCReconfiguration* message as generated (entirely) by SN gNB. In this version of the specification, the RRC message can only include fields *secondaryCellGroup* (with at least *reconfigurationWithSync*)*,* *otherConfig* and *measConfig*.For NE-DC (*eutra-SCG*), *mrdc-SecondaryCellGroup* includes the E-UTRA *RRCConnectionReconfiguration* message as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA RRC message only include the field *scg-Configuration* with at least *mobilityControlInfoSCG*. |
| ***needForGapsConfigNR***Configuration for the UE to report measurement gap requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigEUTRA***Configuration for the UE to report measurement gap and NCSG requirement information of E‑UTRA target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigNR***Configuration for the UE to report measurement gap and NCSG requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForInterruptionConfigNR***Indicates whether the UE shall report interruption requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. The network sets this field to *enabled* only if the *needForGapsConfigNR* is configured. The network sets this field to *disabled* if the *needForGapsConfigNR* is released. |
| ***radioBearerConfig***Configuration of Radio Bearers (DRBs, SRBs, multicast MRBs) including SDAP/PDCP. |
| ***radioBearerConfig2***Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. This field can only be used if the UE supports NR-DC or NE-DC. |
| ***restoreMCG-SCells***Indicates that the UE shall restore the MCG SCells from the UE Inactive AS Context, if stored. |
| ***restoreSCG***Indicates that the UE shall restore the SCG configurations from the UE Inactive AS Context, if stored. |
| ***scg-State***Indicates that the SCG is in deactivated state. |
| ***sk-Counter***A counter used to derive S-KgNB or S-KeNB based on the newly derived KgNB during RRC Resume. The field is only included when there is one or more RB with *keyToUse* set to *secondary* *or mrdc-SecondaryCellGroup* is included. |
| ***sl-ConfigDedicatedNR***This field is used to provide the dedicated configurations for NR sidelink communication/discovery used by L2 U2N Remote UE. |
| ***sl-L2RemoteUE-Config***Contains L2 U2N relay operation related configurations used by L2 U2N Remote UE. The field is absent if *appLayerMeasConfig* or SRB4 is configured/not released. |

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

– *RRCResumeComplete*

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

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

***RRCResumeComplete* message**

-- ASN1START

-- TAG-RRCRESUMECOMPLETE-START

RRCResumeComplete ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 rrcResumeComplete RRCResumeComplete-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

RRCResumeComplete-IEs ::= SEQUENCE {

 dedicatedNAS-Message DedicatedNAS-Message OPTIONAL,

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

 uplinkTxDirectCurrentList UplinkTxDirectCurrentList OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension RRCResumeComplete-v1610-IEs OPTIONAL

}

RRCResumeComplete-v1610-IEs ::= SEQUENCE {

 idleMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

 measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

 scg-Response-r16 CHOICE {

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

 eutra-SCG-Response OCTET STRING

 } OPTIONAL,

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

 mobilityHistoryAvail-r16 ENUMERATED {true} OPTIONAL,

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

 needForGapsInfoNR-r16 NeedForGapsInfoNR-r16 OPTIONAL,

 nonCriticalExtension RRCResumeComplete-v1640-IEs OPTIONAL

}

RRCResumeComplete-v1640-IEs ::= SEQUENCE {

 uplinkTxDirectCurrentTwoCarrierList-r16 UplinkTxDirectCurrentTwoCarrierList-r16 OPTIONAL,

 nonCriticalExtension RRCResumeComplete-v1700-IEs OPTIONAL

}

RRCResumeComplete-v1700-IEs ::= SEQUENCE {

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

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

 nonCriticalExtension RRCResumeComplete-v1720-IEs OPTIONAL

}

RRCResumeComplete-v1720-IEs ::= SEQUENCE {

 uplinkTxDirectCurrentMoreCarrierList-r17 UplinkTxDirectCurrentMoreCarrierList-r17 OPTIONAL,

 nonCriticalExtension RRCResumeComplete-v18xy-IEs OPTIONAL

}

RRCResumeComplete-v18xy-IEs ::= SEQUENCE {

 needForInterruptionInfoNR-r18 NeedForInterruptionInfoNR-r18 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCRESUMECOMPLETE-STOP

-- ASN1STOP

|  |
| --- |
| ***RRCResumeComplete-IEs* field descriptions** |
| ***idleMeasAvailable***Indication that the UE has idle/inactive measurement report available. |
| ***measResultIdleEUTRA***EUTRA measurement results performed during RRC\_INACTIVE. |
| ***measResultIdleNR***NR measurement results performed during RRC\_INACTIVE. |
| ***needForGapsInfoNR***This field is used to indicate the measurement gap requirement information of the UE for NR target bands. |
| ***needForGapNCSG-InfoEUTRA***This field is used to indicate the measurement gap and NCSG requirement information of the UE for E‑UTRA target bands |
| ***needForGapNCSG-InfoNR***This field is used to indicate the measurement gap and NCSG requirement information of the UE for NR target bands |
| ***needForInterruptionInfoNR***This field indicates whether interruption is needed while performing measurement on NR target bands without measurement gap. |
| ***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*). |
| ***uplinkTxDirectCurrentMoreCarrierList***The Tx Direct Current locations for the configured intra-band CA requested by *reportUplinkTxDirectCurrentMoreCarrier-r17*. |
| ***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*). |

<Skip unrelated parts>

### 6.3.2 Radio resource control information elements

<Skip unrelated parts>

– *MeasConfig*

The IE *MeasConfig* specifies measurements to be performed by the UE, and covers intra-frequency, inter-frequency and inter-RAT mobility as well as configuration of measurement gaps.

***MeasConfig* information element**

-- ASN1START

-- TAG-MEASCONFIG-START

MeasConfig ::= SEQUENCE {

 measObjectToRemoveList MeasObjectToRemoveList OPTIONAL, -- Need N

 measObjectToAddModList MeasObjectToAddModList OPTIONAL, -- Need N

 reportConfigToRemoveList ReportConfigToRemoveList OPTIONAL, -- Need N

 reportConfigToAddModList ReportConfigToAddModList OPTIONAL, -- Need N

 measIdToRemoveList MeasIdToRemoveList OPTIONAL, -- Need N

 measIdToAddModList MeasIdToAddModList OPTIONAL, -- Need N

 s-MeasureConfig CHOICE {

 ssb-RSRP RSRP-Range,

 csi-RSRP RSRP-Range

 } OPTIONAL, -- Need M

 quantityConfig QuantityConfig OPTIONAL, -- Need M

 measGapConfig MeasGapConfig OPTIONAL, -- Need M

 measGapSharingConfig MeasGapSharingConfig OPTIONAL, -- Need M

 ...,

 [[

 interFrequencyConfig-NoGap-r16 ENUMERATED {true} OPTIONAL -- Need R

 ]],

 [[

 effectiveMeasWindowConfig-r18 SetupRelease {MeasWindowConfig-r18} OPTIONAL -- Need M

 ]]

}

MeasObjectToRemoveList ::= SEQUENCE (SIZE (1..maxNrofObjectId)) OF MeasObjectId

MeasIdToRemoveList ::= SEQUENCE (SIZE (1..maxNrofMeasId)) OF MeasId

ReportConfigToRemoveList ::= SEQUENCE (SIZE (1..maxReportConfigId)) OF ReportConfigId

-- TAG-MEASCONFIG-STOP

-- ASN1STOP

| ***MeasConfig* field descriptions** |
| --- |
| ***effectiveMeasWindowConfig***Used to setup and release effective measurement window in NR for E-UTRA measurements. |
| ***interFrequencyConfig-NoGap-r16***If the field is set to true, UE is configured to perform SSB based inter-frequency measurement without measurement gaps when the inter-frequency SSB is completely contained in the active DL BWP of the UE, as specified in TS 38.133 [14], clause 9.3. Otherwise, the SSB based inter-frequency measurement is performed within measurement gaps. In NR-DC, the field can only be configured in the *measConfig* associated with MCG, and when configured, it applies to all the inter-frequency measurements configured by MN and SN. |
| ***measGapConfig***Used to setup and release measurement gaps in NR. |
| ***measIdToAddModList***List of measurement identities to add and/or modify. |
| ***measIdToRemoveList***List of measurement identities to remove. |
| ***measObjectToAddModList***List of measurement objects to add and/or modify. |
| ***measObjectToRemoveList***List of measurement objects to remove. |
| ***reportConfigToAddModList***List of measurement reporting configurations to add and/or modify. |
| ***reportConfigToRemoveList***List of measurement reporting configurations to remove. |
| ***s-MeasureConfig***Threshold for NR SpCell RSRP measurement controlling when the UE is required to perform measurements on non-serving cells. Choice of *ssb-RSRP* corresponds to cell RSRP based on SS/PBCH block and choice of *csi-RSRP* corresponds to cell RSRP of CSI-RS.  |
| ***measGapSharingConfig***Specifies the measurement gap sharing scheme and controls setup/ release of measurement gap sharing. |

#### – *MeasGapConfig*

The IE *MeasGapConfig* specifies the measurement gap configuration and controls setup/release of measurement gaps.

*MeasGapConfig* information element

-- ASN1START

-- TAG-MEASGAPCONFIG-START

MeasGapConfig ::= SEQUENCE {

 gapFR2 SetupRelease { GapConfig } OPTIONAL, -- Need M

 ...,

 [[

 gapFR1 SetupRelease { GapConfig } OPTIONAL, -- Need M

 gapUE SetupRelease { GapConfig } OPTIONAL -- Need M

 ]],

 [[

 gapToAddModList-r17 SEQUENCE (SIZE (1..maxNrofGapId-r17)) OF GapConfig-r17 OPTIONAL, -- Need N

 gapToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofGapId-r17)) OF MeasGapId-r17 OPTIONAL, -- Need N

 posMeasGapPreConfigToAddModList-r17 PosMeasGapPreConfigToAddModList-r17 OPTIONAL, -- Need N

 posMeasGapPreConfigToReleaseList-r17 PosMeasGapPreConfigToReleaseList-r17 OPTIONAL -- Need N

 ]]

}

GapConfig ::= SEQUENCE {

 gapOffset INTEGER (0..159),

 mgl ENUMERATED {ms1dot5, ms3, ms3dot5, ms4, ms5dot5, ms6},

 mgrp ENUMERATED {ms20, ms40, ms80, ms160},

 mgta ENUMERATED {ms0, ms0dot25, ms0dot5},

 ...,

 [[

 refServCellIndicator ENUMERATED {pCell, pSCell, mcg-FR2} OPTIONAL -- Cond NEDCorNRDC

 ]],

 [[

 refFR2ServCellAsyncCA-r16 ServCellIndex OPTIONAL, -- Cond AsyncCA

 mgl-r16 ENUMERATED {ms10, ms20} OPTIONAL -- Cond PRS

 ]]

}

GapConfig-r17 ::= SEQUENCE {

 measGapId-r17 MeasGapId-r17,

 gapType-r17 ENUMERATED {perUE, perFR1, perFR2},

 gapOffset-r17 INTEGER (0..159),

 mgl-r17 ENUMERATED {ms1, ms1dot5, ms2, ms3, ms3dot5, ms4, ms5, ms5dot5, ms6, ms10, ms20},

 mgrp-r17 ENUMERATED {ms20, ms40, ms80, ms160},

 mgta-r17 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot75},

 refServCellIndicator-r17 ENUMERATED {pCell, pSCell, mcg-FR2} OPTIONAL, -- Cond NEDCorNRDC

 refFR2-ServCellAsyncCA-r17 ServCellIndex OPTIONAL, -- Cond AsyncCA

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

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

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

 gapSharing-r17 MeasGapSharingScheme OPTIONAL, -- Need R

 gapPriority-r17 GapPriority-r17 OPTIONAL, -- Need R

 ...

}

PosMeasGapPreConfigToAddModList-r17 ::= SEQUENCE (SIZE (1..maxNrofPreConfigPosGapId-r17)) OF PosGapConfig-r17

PosMeasGapPreConfigToReleaseList-r17 ::= SEQUENCE (SIZE (1..maxNrofPreConfigPosGapId-r17)) OF MeasPosPreConfigGapId-r17

PosGapConfig-r17 ::= SEQUENCE {

 measPosPreConfigGapId-r17 MeasPosPreConfigGapId-r17,

 gapOffset-r17 INTEGER (0..159),

 mgl-r17 ENUMERATED {ms1dot5, ms3, ms3dot5, ms4, ms5dot5, ms6, ms10, ms20},

 mgrp-r17 ENUMERATED {ms20, ms40, ms80, ms160},

 mgta-r17 ENUMERATED {ms0, ms0dot25, ms0dot5},

 gapType-r17 ENUMERATED {perUE, perFR1, perFR2},

 ...

}

MeasPosPreConfigGapId-r17 ::= INTEGER (1..maxNrofPreConfigPosGapId-r17)

-- TAG-MEASGAPCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *MeasGapConfig* field descriptions |
| ***gapAssociationPRS***Indicates that PRS measurement is associated with this measurement gap. The network only includes this field for one per-UE gap or for one per-FR gap. If concurrent gap (i.e. one of the gap combination as defined in Table 9.1.8-1 in TS 38.133 [14]) is configured and no gap is configured with this field, the PRS measurement is associated with the gap configured via *GapConfig* (without suffix), if available. If both per-UE gap and per-FR gap are configured via *GapConfig* and/or *GapConfig-r17*, the PRS measurement is always associated with the per-UE gap. |
| ***gapFR1***Indicates measurement gap configuration that applies to FR1 only. In (NG)EN-DC, *gapFR1* cannot be set up by NR RRC (i.e. only LTE RRC can configure FR1 measurement gap). In NE-DC, *gapFR1* can only be set up by NR RRC (i.e. LTE RRC cannot configure FR1 gap). In NR-DC, *gapFR1* can only be set up in the *measConfig* associated with MCG. *gapFR1* can not be configured together with *gapUE*. The applicability of the FR1 measurement gap is according to Table 9.1.2-2 and Table 9.1.2-3 in TS 38.133 [14]. |
| ***gapFR2***Indicates measurement gap configuration applies to FR2 only. In (NG)EN-DC or NE-DC, *gapFR2* can only be set up by NR RRC (i.e. LTE RRC cannot configure FR2 gap). In NR-DC, *gapFR2* can only be set up in the *measConfig* associated with MCG. *gapFR2* cannot be configured together with *gapUE*. The applicability of the FR2 measurement gap is according to Table 9.1.2-2 and Table 9.1.2-3 in TS 38.133 [14]. |
| ***gapOffset***Value *gapOffset* is the gap offset of the gap pattern with MGRP indicated in the field *mgrp*. The value range is from 0 to *mgrp*-1. If *ncsgInd-r17* is present, this offset value refers to the starting point of VIL1 (the visible interruption length before the ML). |
| ***gapPriority***Indicates the priority of this measurement gap (see TS 38.133 [14], clause 9.1.8.3). Value *1* indicates highest priority, value 2 indicates second level priority, and so on. |
| ***gapSharing***Indicates the measurement gap sharing scheme that applies to this *GapConfig*. For applicability of the different gap sharing schemes, see TS 38.133 [14]. Value *scheme00* corresponds to scheme "00", value *scheme01* corresponds to scheme "01", and so on. |
| ***gapToAddModList***A list of of measurement gap configuration to be added or modified. If more than one measurement gap is configured (i.e. concurrent measurement gap as specified in TS 38.133[14], clause 9.1.8), the maximum number of configured measurement gap is limited by the gap combinations defined in Table 9.1.8-1 in TS 38.133 [14]. The network configures at most one NCSG or pre-configured measurement gap for a given gap type. In this version of the specification, the network configures this field only in NR standalone. This field is used only for a UE that supports pre-configured measurement gap, concurrent measurement gap, or NCSG. In this version of the specification, the network does not configure concurrent measurement gap together with MUSIM gap or preconfigured measurement gap for positioning. |
| ***gapToReleaseList***A list of measurement gap configuration to be released. |
| ***gapType***Indicates the type of this measurement gap. Value *perUE* indicates that it is a per UE measurement gap, value *perFR1* indicates that it is an FR1 measurement gap, and value *perFR2* indicates that it is an FR2 measurement gap. |
| ***gapUE***Indicates measurement gap configuration that applies to all frequencies (FR1 and FR2). In (NG)EN-DC, *gapUE* cannot be set up by NR RRC (i.e. only LTE RRC can configure per UE measurement gap). In NE-DC, *gapUE* can only be set up by NR RRC (i.e. LTE RRC cannot configure per UE gap). In NR-DC, *gapUE* can only be set up in the *measConfig* associated with MCG. If *gapUE* is configured, then neither *gapFR1* nor *gapFR2* can be configured. The applicability of the per UE measurement gap is according to Table 9.1.2-2 and Table 9.1.2-3 in TS 38.133 [14]. |
| ***measGapId***The ID of this measurement gap configuration. |
| ***mgl***Value *mgl* is the measurement gap length in ms of the measurement gap. If *ncsgInd-r17* is not present, the measurement gap length is according to in Table 9.1.2-1 in TS 38.133 [14]. If *ncsgInd-r17* is present, this field indicates the measurement length (ML) in NCSG pattern and is configured according to Table 9.1.9.3-1 in TS 38.133 [14]. Value *ms1dot5* corresponds to 1.5 ms, *ms3* corresponds to 3 ms and so on. If *mgl-r16* is present, UE shall ignore the *mgl* (without suffix). Value *ms1*, *ms2*, and *ms5* can only be configured if *ncsgInd* is present. |
| ***mgrp***If *ncsgInd-r17* is not present, the *mgrp* field indicates the measurement gap repetition period in (ms) of the measurement gap according to Table 9.1.2-1 in TS 38.133 [14]. If *ncsgInd-r17* is present, the *mgrp* field indicates the Visible Interruption Repetition Period (VIRP) of NCSG pattern and is configured according to Table 9.1.9.3-1 in TS 38.133 [14]. |
| ***mgta***Value *mgta* is the measurement gap timing advance in ms. The applicability of the measurement gap timing advance is according to clause 9.1.2 of TS 38.133 [14], or according to clause 9.1.9 of TS 38.133 [14] if *ncsgInd* is present. Value *ms0* corresponds to 0 ms, *ms0dot25* corresponds to 0.25 ms, *ms0dot5* corresponds to 0.5 ms and *ms0dot75* corresponds to 0.75 ms. For FR2, the network only configures 0 ms and 0.25 ms if *ncsgInd* is not present. If *ncsgInd* is present, the network only configures 0ms for per-UE NCSG and FR1 NCSG and only configures 0ms or 0.75ms for FR2 NCSG. Value *ms0dot75* can only be configured if *ncsgInd* is present. |
| ***ncsgInd***Indicates that the measurement gap is a NCSG as specified in 38.133 [14]. |
| ***posMeasGapPreConfigToAddModList***List of preconfigured measurement gap for positioning to add and/or modify. All the gaps configured are associated with the measurement of PRS for RSTD, UE-RxTx Time Difference, PRS-RSRP and PRS-RSRPP as defined in TS 38.215 [9]. In this version of the specification, the network does not configure preconfigured measurement gap for positioning together with concurrent measurement gap or MUSIM gap. |
| ***posMeasGapPreConfigToReleaseList***List of preconfigured measurement gap for positioning to release. |
| ***preConfigInd***Indicates whether the measurement gap is a pre-configured measurement gap. |
| ***refFR2ServCellAsyncCA***Indicates the FR2 serving cell identifier whose SFN and subframe is used for FR2 gap calculation for this gap pattern with asynchronous CA involving FR2 carrier(s). |
| ***refServCellIndicator***Indicates the serving cell whose SFN and subframe are used for gap calculation for this gap pattern. Value pCell corresponds to the PCell, pSCell corresponds to the PSCell, and mcg-FR2 corresponds to a serving cell on FR2 frequency in MCG. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *AsyncCA* | This field is mandatory present when configuring and reconfiguring FR2 gap pattern to UE in:- (NG)EN-DC or NR SA with asynchronous CA involving FR2 carrier(s);- NE-DC or NR-DC with asynchronous CA involving FR2 carrier(s), if the field *refServCellIndicator* is set to *mcg-FR2*.Otherwise, it is absent, Need R. |
| *NEDCorNRDC* | This field is mandatory present when configuring and reconfiguring gap pattern to UE in NE-DC or NR-DC. Otherwise, it is absent, Need R. |
| *PRS* | This field is optionally present, Need R, when configuring gap pattern to UE for measurements of DL-PRS configured via LPP (TS 37.355 [49]). Otherwise, it is absent. |

<Skip unrelated parts>

– *MeasTriggerQuantityEUTRA*

The IE *MeasTriggerQuantityEUTRA* is used to configure the trigger quantity and reporting range for E-UTRA measurements. The RSRP, RSRQ and SINR ranges correspond to *RSRP-Range*, *RSRQ-Range* and *RS-SINR-Range* in TS 36.331 [10], respectively.

***MeasTriggerQuantityEUTRA* information element**

-- ASN1START

-- TAG-MEASTRIGGERQUANTITYEUTRA-START

MeasTriggerQuantityEUTRA::= CHOICE {

 rsrp RSRP-RangeEUTRA,

 rsrq RSRQ-RangeEUTRA,

 sinr SINR-RangeEUTRA

}

RSRP-RangeEUTRA ::= INTEGER (0..97)

RSRQ-RangeEUTRA ::= INTEGER (0..34)

SINR-RangeEUTRA ::= INTEGER (0..127)

-- TAG-MEASTRIGGERQUANTITYEUTRA-STOP

-- ASN1STOP

– *MeasWindowConfig*

The IE *MeasWindowConfig* specifies the effective measurement window configuration for inter-RAT E-UTRA measurement.

***MeasWindowConfig* information element**

-- ASN1START

-- TAG-MEASWINDOWCONFIG-START

MeasWindowConfig-r18 ::= SEQUENCE {

 windowOffsetPeriodicity CHOICE {

 periodicityMs40 INTEGER (0..39),

 periodicityMs80 INTEGER (0..79),

 ...

 }

 windowDuration ENUMERATED {ms2, ms5, ms5dot5, spare1},

 ...

}

-- TAG-MEASWINDOWCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***MeasWindowConfig* field descriptions** |
| ***windowOffsetPeriodicity***Indicates the periodicity and offset of effective measurement window. The choice determines the periodicity (periodicityMs40 for 40ms and periodicityMs80 for 80 ms). The field value indicates the offset in ms. |
| ***windowDuration***Value *windowDuration* is the measurement window length in ms of effective measurement window. Value *ms2* corresponds to 2 ms, value *ms5* corresponds to 5 ms, and Value *ms5dot5* corresponds to 5.5 ms. |

– *MobilityStateParameters*

The IE *MobilityStateParameters* contains parameters to determine UE mobility state.

***MobilityStateParameters* information element**

-- ASN1START

-- TAG-MOBILITYSTATEPARAMETERS-START

MobilityStateParameters ::= SEQUENCE{

 t-Evaluation ENUMERATED {

 s30, s60, s120, s180, s240, spare3, spare2, spare1},

 t-HystNormal ENUMERATED {

 s30, s60, s120, s180, s240, spare3, spare2, spare1},

 n-CellChangeMedium INTEGER (1..16),

 n-CellChangeHigh INTEGER (1..16)

}

-- TAG-MOBILITYSTATEPARAMETERS-STOP

-- ASN1STOP

| ***MobilityStateParameters* field descriptions** |
| --- |
| ***n-CellChangeHigh***The number of cell changes to enter high mobility state. Corresponds to NCR\_H in TS 38.304 [20]. |
| ***n-CellChangeMedium***The number of cell changes to enter medium mobility state. Corresponds to NCR\_M in TS 38.304 [20]. |
| ***t-Evaluation***The duration for evaluating criteria to enter mobility states. Corresponds to TCRmax in TS 38.304 [20]. Value in seconds, *s30* corresponds to 30 s and so on. |
| ***t-HystNormal***The additional duration for evaluating criteria to enter normal mobility state. Corresponds to TCRmaxHyst in TS 38.304 [20]. Value in seconds, value *s30* corresponds to 30 seconds and so on. |

<Skip unrelated parts>

– *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 (except the BWP(s) configured with *servingCellMO* associated with NCD-SSB) do not contain the frequency domain resources of the SSB associated to the initial DL BWP (CD-SSB). Value *no-gap* indicates a measurement gap is not needed to measure the SSB associated to the initial DL BWP (CD-SSB) for all configured BWPs (except the BWP(s) configured with *servingCellMO* associated with NCD-SSB), 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.  |

– *NeedForGapNCSG-ConfigEUTRA*

The IE *NeedForGapNCSG-ConfigEUTRA* contains configuration related to the reporting of measurement gap and NCSG requirement information.

***NeedForGapNCSG-ConfigEUTRA* information element**

-- ASN1START

-- TAG-NeedForGapNCSG-ConfigEUTRA-START

NeedForGapNCSG-ConfigEUTRA-r17 ::= SEQUENCE {

 requestedTargetBandFilterNCSG-EUTRA-r17 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF FreqBandIndicatorEUTRA OPTIONAL -- Need R

}

-- TAG-NeedForGapNCSG-ConfigEUTRA-STOP

-- ASN1STOP

|  |
| --- |
| ***NeedForGapNCSG-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. |

– *NeedForGapNCSG-ConfigNR*

The IE *NeedForGapNCSG-ConfigNR* contains configuration related to the reporting of measurement gap and NCSG requirement information.

***NeedForGapNCSG-ConfigNR* information element**

-- ASN1START

-- TAG-NEEDFORGAPNCSG-CONFIGNR-START

NeedForGapNCSG-ConfigNR-r17 ::= SEQUENCE {

 requestedTargetBandFilterNCSG-NR-r17 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL -- Need R

}

-- TAG-NEEDFORGAPNCSG-CONFIGNR-STOP

-- ASN1STOP

|  |
| --- |
| ***NeedForGapNCSG-ConfigNR field descriptions*** |
| ***requestedTargetBandFilterNCSG-NR***Indicates the target NR bands that the UE is requested to report the measurement gap and NCSG requirement information. |

– *NeedForGapNCSG-InfoEUTRA*

The IE *NeedForGapNCSG-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.

***NeedForGapNCSG-InfoEUTRA* information element**

-- ASN1START

-- TAG-NEEDFORGAPNCSG-INFOEUTRA-START

NeedForGapNCSG-InfoEUTRA-r17 ::= SEQUENCE {

 needForNCSG-EUTRA-r17 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF NeedForNCSG-EUTRA-r17

}

NeedForNCSG-EUTRA-r17 ::= SEQUENCE {

 bandEUTRA-r17 FreqBandIndicatorEUTRA,

 gapIndication-r17 ENUMERATED {gap, ncsg, nogap-noncsg}

}

-- TAG-NEEDFORGAPNCSG-INFOEUTRA-STOP

-- ASN1STOP

|  |
| --- |
| ***NeedForGapNCSG-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. |

– *NeedForGapNCSG-InfoNR*

The IE *NeedForGapNCSG-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.

***NeedForGapNCSG-InfoNR* information element**

-- ASN1START

-- TAG-NEEDFORGAPNCSG-INFONR-START

NeedForGapNCSG-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-NEEDFORGAPNCSG-INFONR-STOP

-- ASN1STOP

|  |
| --- |
| ***NeedForGapNCSG-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 (except the BWP(s) configured with *servingCellMO* associated with NCD-SSB) do not contain the frequency domain resources of the SSB associated to the initial DL BWP (CD-SSB). 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 (CD-SSB) for all configured BWPs (except the BWP(s) configured with *servingCellMO* associated with NCD-SSB), 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.  |

– *NeedForInterruptionInfoNR*

The IE *NeedForInterruptionInfoNR* indicates whether interruption is needed for the UE to perform SSB based measurements on an NR target band without measurement gap while NR-DC or NE-DC is not configured.

***NeedForInterruptionInfoNR* information element**

-- ASN1START

-- TAG-NeedForInterruptionInfoNR-START

NeedForInterruptionInfoNR-r18 ::= SEQUENCE {

 intraFreq-needForInterruption-r18 NeedForInterruptionIntraFreqList-r18,

 interFreq-needForInterruption-r18 NeedForInterruptionBandListNR-r18

}

NeedForInterruptionIntraFreqList-r18 ::= SEQUENCE (SIZE (1.. maxNrofServingCells)) OF NeedForInterruptionNR-r18

NeedForInterruptionBandListNR-r18 ::= SEQUENCE (SIZE (1..maxBands)) OF NeedForInterruptionNR-r18

NeedForInterruptionNR-r18 ::= SEQUENCE {

 interruptionIndication-r18 ENUMERATED {no-gap-with-interruption, no-gap-no-interruption} OPTIONAL

}

-- TAG-NeedForInterruptionInfoNR-STOP

-- ASN1STOP

|  |
| --- |
| ***NeedForInterruptionInfoNR* field descriptions** |
| ***intraFreq-needForInterruption***Indicates the interruption requirement information for NR intra-frequency measurement. Each entry in the list is associated to the entry in list *intraFreq-needForGap-r16* with the same index. This field shall be set to *no-gap-no-interruption* for the corresponding band(s) where *bwpOperationMeasWithoutInterrupt-r18* is supported by the UE. |
| ***interFreq-needForInterruption***Indicates the interruption requirement information for NR inter-frequency measurement. Each entry in the list is associated to the entry in list *interFreq-needForGap-r16* with the same index. |

|  |
| --- |
| ***NeedForInterruptionNR field descriptions*** |
| ***interruptionIndication***Indicates whether interruption is needed for the UE to perform SSB based measurements without measurement gap. Value *no-gap-with-interruption* indicates that interruption is needed. Value *no-gap-no-interruption* indicates interruption is not needed.  |

<Skip unrelated parts>

11.2.1 General

This clause specifies RRC messages that are sent either across the X2-, Xn- or the NG-interface, either to or from the gNB, i.e. a single 'logical channel' is used for all RRC messages transferred across network nodes. The information could originate from or be destined for another RAT.

-- ASN1START

-- TAG-NR-INTER-NODE-DEFINITIONS-START

NR-InterNodeDefinitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 ARFCN-ValueNR,

 ARFCN-ValueEUTRA,

 CellIdentity,

 CGI-InfoEUTRA,

 CGI-InfoNR,

 CondReconfigExecCondSCG-r17,

 CSI-RS-Index,

 CSI-RS-CellMobility,

 DRX-Config,

 EUTRA-PhysCellId,

 FeatureSetDownlinkPerCC-Id,

 FeatureSetUplinkPerCC-Id,

 FreqBandIndicatorNR,

 GapConfig,

 maxBandComb,

 maxBands,

 maxBandsEUTRA,

 maxCellSFTD,

 maxFeatureSetsPerBand,

 maxFreq,

 maxFreqIDC-MRDC,

 maxNrofCombIDC,

 maxNrofCondCells-r16,

 maxNrofCondCells-1-r17,

 maxNrofPhysicalResourceBlocks,

 maxNrofSCells,

 maxNrofServingCells,

 maxNrofServingCells-1,

 maxNrofServingCellsEUTRA,

 maxNrofIndexesToReport,

 maxSimultaneousBands,

 MBSInterestIndication-r17,

 MeasQuantityResults,

 MeasResultCellListSFTD-EUTRA,

 MeasResultCellListSFTD-NR,

 MeasResultList2NR,

 MeasResultSCG-Failure,

 MeasResultServFreqListEUTRA-SCG,

 NeedForGapsInfoNR-r16,

 NeedForGapNCSG-InfoNR-r17,

 NeedForGapNCSG-InfoEUTRA-r17,

 NeedForInterruptionInfoNR-r18,

 OverheatingAssistance,

 OverheatingAssistance-r17,

 P-Max,

 PhysCellId,

 RadioBearerConfig,

 RAN-NotificationAreaInfo,

 RRCReconfiguration,

 ServCellIndex,

 SetupRelease,

 SSB-Index,

 SSB-MTC,

 SSB-ToMeasure,

 SS-RSSI-Measurement,

 ShortMAC-I,

 SubcarrierSpacing,

 UEAssistanceInformation,

 UE-CapabilityRAT-ContainerList,

 maxNrofCLI-RSSI-Resources-r16,

 maxNrofCLI-SRS-Resources-r16,

 RSSI-ResourceId-r16,

 SDT-Config-r17,

 SidelinkUEInformationNR-r16,

 SRS-ResourceId,

 UE-RadioPagingInfo-r17

FROM NR-RRC-Definitions;

-- TAG-NR-INTER-NODE-DEFINITIONS-STOP

-- ASN1STOP

### 11.2.2 Message definitions

<Skip unrelated parts>

– *HandoverPreparationInformation*

This message is used to transfer the NR RRC information used by the target gNB during handover preparation or UE context retrieval, e.g. in case of resume or re-establishment, including UE capability information. This message is also used for transferring the information between the CU and DU.

Direction: source gNB/source RAN to target gNB or CU to DU.

***HandoverPreparationInformation* message**

-- ASN1START

-- TAG-HANDOVER-PREPARATION-INFORMATION-START

HandoverPreparationInformation ::= SEQUENCE {

 criticalExtensions CHOICE {

 c1 CHOICE{

 handoverPreparationInformation HandoverPreparationInformation-IEs,

 spare3 NULL, spare2 NULL, spare1 NULL

 },

 criticalExtensionsFuture SEQUENCE {}

 }

}

HandoverPreparationInformation-IEs ::= SEQUENCE {

 ue-CapabilityRAT-List UE-CapabilityRAT-ContainerList,

 sourceConfig AS-Config OPTIONAL, -- Cond HO

 rrm-Config RRM-Config OPTIONAL,

 as-Context AS-Context OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

AS-Config ::= SEQUENCE {

 rrcReconfiguration OCTET STRING (CONTAINING RRCReconfiguration),

 ...,

 [[

 sourceRB-SN-Config OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL,

 sourceSCG-NR-Config OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

 sourceSCG-EUTRA-Config OCTET STRING OPTIONAL

 ]],

 [[

 sourceSCG-Configured ENUMERATED {true} OPTIONAL

 ]],

 [[

 sdt-Config-r17 SDT-Config-r17 OPTIONAL

 ]]

}

AS-Context ::= SEQUENCE {

 reestablishmentInfo ReestablishmentInfo OPTIONAL,

 configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

 ...,

 [[ ran-NotificationAreaInfo RAN-NotificationAreaInfo OPTIONAL

 ]],

 [[ ueAssistanceInformation OCTET STRING (CONTAINING UEAssistanceInformation) OPTIONAL -- Cond HO2

 ]],

 [[

 selectedBandCombinationSN BandCombinationInfoSN OPTIONAL

 ]],

 [[

 configRestrictInfoDAPS-r16 ConfigRestrictInfoDAPS-r16 OPTIONAL,

 sidelinkUEInformationNR-r16 OCTET STRING OPTIONAL,

 sidelinkUEInformationEUTRA-r16 OCTET STRING OPTIONAL,

 ueAssistanceInformationEUTRA-r16 OCTET STRING OPTIONAL,

 ueAssistanceInformationSCG-r16 OCTET STRING (CONTAINING UEAssistanceInformation) OPTIONAL, -- Cond HO2

 needForGapsInfoNR-r16 NeedForGapsInfoNR-r16 OPTIONAL

 ]],

 [[

 configRestrictInfoDAPS-v1640 ConfigRestrictInfoDAPS-v1640 OPTIONAL

 ]],

 [[

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

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

 mbsInterestIndication-r17 OCTET STRING (CONTAINING MBSInterestIndication-r17) OPTIONAL

 ]],

 [[

 needForInterruptionInfoNR-r18 NeedForInterruptionInfoNR-r18 OPTIONAL

 ]]

}

ConfigRestrictInfoDAPS-r16 ::= SEQUENCE {

 powerCoordination-r16 SEQUENCE {

 p-DAPS-Source-r16 P-Max,

 p-DAPS-Target-r16 P-Max,

 uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

 } OPTIONAL

}

ConfigRestrictInfoDAPS-v1640 ::= SEQUENCE {

 sourceFeatureSetPerDownlinkCC-r16 FeatureSetDownlinkPerCC-Id,

 sourceFeatureSetPerUplinkCC-r16 FeatureSetUplinkPerCC-Id

}

ReestablishmentInfo ::= SEQUENCE {

 sourcePhysCellId PhysCellId,

 targetCellShortMAC-I ShortMAC-I,

 additionalReestabInfoList ReestabNCellInfoList OPTIONAL

}

ReestabNCellInfoList ::= SEQUENCE ( SIZE (1..maxCellPrep) ) OF ReestabNCellInfo

ReestabNCellInfo::= SEQUENCE{

 cellIdentity CellIdentity,

 key-gNodeB-Star BIT STRING (SIZE (256)),

 shortMAC-I ShortMAC-I

}

RRM-Config ::= SEQUENCE {

 ue-InactiveTime ENUMERATED {

 s1, s2, s3, s5, s7, s10, s15, s20,

 s25, s30, s40, s50, min1, min1s20, min1s40,

 min2, min2s30, min3, min3s30, min4, min5, min6,

 min7, min8, min9, min10, min12, min14, min17, min20,

 min24, min28, min33, min38, min44, min50, hr1,

 hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,

 hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,

 day2hr12, day3, day4, day5, day7, day10, day14, day19,

 day24, day30, dayMoreThan30} OPTIONAL,

 candidateCellInfoList MeasResultList2NR OPTIONAL,

 ...,

 [[

 candidateCellInfoListSN-EUTRA MeasResultServFreqListEUTRA-SCG OPTIONAL

 ]]

}

-- TAG-HANDOVER-PREPARATION-INFORMATION-STOP

-- ASN1STOP

|  |
| --- |
| ***HandoverPreparationInformation* field descriptions** |
| ***as-Context***Local RAN context required by the target gNB or DU. |
| ***rrm-Config***Local RAN context used mainly for RRM purposes. |
| ***sourceConfig***The radio resource configuration as used in the source cell. |
| ***ue-CapabilityRAT-List***The UE radio access related capabilities concerning RATs supported by the UE. A gNB that retrieves MRDC related capability containers ensures that the set of included MRDC containers is consistent w.r.t. the feature set related information. |
| ***ue-InactiveTime***Duration while UE has not received or transmitted any user data. Thus the timer is still running in case e.g., UE measures the neighbour cells for the HO purpose. Value *s1* corresponds to 1 second, *s2* corresponds to 2 seconds and so on. Value *min1* corresponds to 1 minute, value *min1s20* corresponds to 1 minute and 20 seconds, value *min1s40* corresponds to 1 minute and 40 seconds and so on. Value *hr1* corresponds to 1 hour, *hr1min30* corresponds to 1 hour and 30 minutes and so on. |

|  |
| --- |
| ***AS-Config* field descriptions** |
| ***rrcReconfiguration***Contains the *RRCReconfiguration* configuration as generated entirely by the MN. If the *TMGI-r17* is included in the *MRB-ToAddMod-r17* in the *RadioBearerConfig*, the *plmn-Index* is replaced by the PLMN ID, if needed. |
| ***sdt-Config***Contains the IE *SDT-Config* as generated entirely by the last serving gNB. This field is only used during the SDT procedure with UE context relocation as defined in TS 38.300 [2], clause 18.2. |
| ***sourceRB-SN-Config***Contains the IE *RadioBearerConfig* as generated entirely by the SN. This field is only used when the UE is configured with SN terminated RB(s). |
| ***sourceSCG-Configured***Value *true* indicates that the UE is configured with NR or EUTRA SCG in source configuration. The field is only used in NR-DC and NE-DC and is included only if the fields *sourceSCG-NR-Config* and *sourceSCG-EUTRA-Config* are absent. |
| ***sourceSCG-EUTRA-Config***Contains the current dedicated SCG configuration in *RRCConnectionReconfiguration* message as specified in TS 36.331 [10] and generated entirely by the SN. In this version of the specification, the E-UTRA *RRCConnectionReconfiguration* message can only include the field *scg-Configuration* . This field is only used in NE-DC. |
| ***sourceSCG-NR-Config***Contains the current dedicated SCG configuration in *RRCReconfiguration* message as generated entirely by the SN. In this version of the specification, the *RRCReconfiguration* message can only include fields *secondaryCellGroup* and *measConfig*. This field is only used in NR-DC. |

|  |
| --- |
| ***AS-Context* field descriptions** |
| ***configRestrictInfoDAPS***Includes fields for which source cell explicitly indicates the restriction to be observed by target cell during DAPS handover. |
| ***mbsInterestIndication***Includes the information last reported by the UE in the NR *MBSInterestIndication* message, where the *plmn-Index* (if included by the UE in *tmgi*) is replaced by the PLMN ID, if needed. A TMGI for which the *plmn-Index* points to a non-serving SNPN is removed from the NR *MBSInterestIndication* message. |
| ***needForGapsInfoNR***Includes measurement gap requirement information of the UE for NR target bands. |
| ***selectedBandCombinationSN***Indicates the band combination selected by SN in (NG)EN-DC, NE-DC, and NR-DC. |
| ***sidelinkUEInformationEUTRA***This field includes *SidelinkUEInformation* IE as specified in TS 36.331 [10]. |
| ***sidelinkUEInformationNR***This field includes *SidelinkUEInformationNR* IE. |
| ***ueAssistanceInformation***Includes for each UE assistance feature the information last reported by the UE, if any. |
| ***ueAssistanceInformationSCG***Includes for each UE assistance feature associated with the SCG, the information last reported by the UE in the NR *UEAssistanceInformation* message for the SCG, if any. |

|  |
| --- |
| ***ConfigRestrictInfoDAPS* field descriptions** |
| ***sourceFeatureSetPerUplinkCC/sourceFeatureSetPerDownlinkCC***Indicates an index referring to the position of the *FeatureSetUplinkPerCC*/*FeatureSetDownlinkPerCC* selected by source in the *featureSetsUplinkPerCC*/*featureSetsDownlinkPerCC*. |

|  |
| --- |
| ***RRM-Config* field descriptions** |
| ***candidateCellInfoList***A list of the best cells on each frequency for which measurement information was available |
| ***candidateCellInfoListSN-EUTRA***A list of EUTRA cells including serving cells and best neighbour cells on each serving frequency, for which measurement results were available. This field is only used in NE-DC.  |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *HO* | The field is mandatory present in case of handover within NR or UE context retrieval, e.g. in case of resume or re-establishment. The field is optionally present in case of handover from E-UTRA/5GC. Otherwise the field is absent. |
| *HO2* | The field is optionally present in case of handover within NR; otherwise the field is absent. |

NOTE 1: The following table indicates per source RAT whether RAT capabilities are included or not.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source RAT** | **NR capabilities** | **E-UTRA capabilities** | **MR-DC capabilities** | **UTRA capabilities** |
| NR | May be included if UE Radio Capability ID as specified in 23.502 [43] is used for the UE. Included otherwise. | May be included | May be included | May be included, ignored by gNB if received |
| E-UTRAN | May be included if UE Radio Capability ID as specified in 23.502 [43] is used for the UE. Included otherwise. | May be included | May be included | May be included, ignored by gNB if received |

NOTE 2: The following table indicates, in case of inter-RAT handover from E-UTRA, which additional IEs are included or not:

|  |  |  |  |
| --- | --- | --- | --- |
| **Source system** | **sourceConfig** | **rrm-Config** | **as-Context** |
| E-UTRA/EPC | Not included | May be included | Not included |
| E-UTRA/5GC | May be included, but only *radioBearerConfig* is included in the *RRCReconfiguration*. | May be included | Not included |