**3GPP TSG-RAN WG2 Meeting #117-e *R2-220xxxx***

**Electronic, 21st Feb – 3rd Mar 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **2865** | **rev** | **2** | **Current version:** | **16.7.0** |  |
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| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | Introducing Enhancement of Data Collection for SON |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_ENDC\_SON\_MDT\_enh-Core |  | ***Date:*** | 01 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Introducing enhancements of data collection for SON in Rel-17. |
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| ***Summary of change:*** | SON changes as agreed in Rel-17 up to RAN2#116bis-e. |
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| ***Consequences if not approved:*** | Enhancement of data collection for SON are not supported in Rel-17. |
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| ***Clauses affected:*** | 5.3.3.4, 5.3.5.3, 5.3.5.8.3, 5.3.5.9, 5.3.7.2, 5.3.7.3, 5.3.7.5, 5.3.10.5, 5.3.13.2, 5.3.13.4, 5.7.3.5, 5.7.9.2, 5.7.10.3, 5.7.10.4, 5.7.10.5, 5.7.10.X (new), 6.2.2, 6.3.3, 6.3.4, 7.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

NEXT CHANGE

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

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

1> if the *RRCSetup* is received in response to an *RRCReestablishmentRequest*; or

1> if the *RRCSetup* is received in response to an *RRCResumeRequest* or *RRCResumeRequest1*:

2> discard any stored UE Inactive AS context and *suspendConfig*;

2> discard any current AS security context including the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key;

2> release radio resources for all established RBs except SRB0, including release of the RLC entities, of the associated PDCP entities and of SDAP;

2> release the RRC configuration except for the default L1 parameter values, default MAC Cell Group configuration and CCCH configuration;

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

2> stop timer T380, if running;

1> perform the cell group configuration procedure in accordance with the received *masterCellGroup* and as specified in 5.3.5.5;

1> perform the radio bearer configuration procedure in accordance with the received *radioBearerConfig* and as specified in 5.3.5.6;

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

1> stop timer T300, T301 or T319 if running;

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. stop timer T320, if running;

1> if the *RRCSetup* is received in response to an *RRCResumeRequest*, *RRCResumeRequest1* or *RRCSetupRequest*:

2> if T331 is running:

3> stop timer T331;

3> perform the actions as specified in 5.7.8.3;

2> enter RRC\_CONNECTED;

2> stop the cell re-selection procedure;

1> consider the current cell to be the PCell;

1> 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*:

2> if *reconnectCellId* in *VarRLF-Report* is not set, and if the received *RRCSetup* is in response to an *RRCSetupRequest*:

3> if *choCellId* in *VarRLF-Report* is set:

4> set *timeUntilReconnection* in *VarRLF-Report* to the time that elapsed since the radio link failure or handover failure experienced in the *failedPCellId* stored in *VarRLF-Report*;

3> else:

4> set *timeUntilReconnection* in *VarRLF-Report* to the time that elapsed since the last radio link failure or handover failure;

3> set *nrReconnectCellId* in *reconnectCellId* in *VarRLF-Report* to the global cell identity and the tracking area code of the PCell;

1> if the UE supports RLF report for inter-RAT MRO NR as defined in TS 36.306 [62], and if the UE has radio link failure or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]:

2> if *reconnectCellId* in *VarRLF-Report* of TS 36.331[10] is not set:

3> set *timeUntilReconnection* in *VarRLF-Report* of TS 36.331[10] to the time that elapsed since the last radio link failure or handover failure in LTE;

3> set *nrReconnectCellId* in *reconnectCellId* in *VarRLF-Report* of TS 36.331[10] to the global cell identity and the tracking area code of the PCell;

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

2> if upper layers provide a 5G-S-TMSI:

3> if the *RRCSetup* is received in response to an *RRCSetupRequest*:

4> set the *ng-5G-S-TMSI-Value* to *ng-5G-S-TMSI-Part2*;

3> else:

4> set the *ng-5G-S-TMSI-Value* to *ng-5G-S-TMSI*;

2> if upper layers selected an SNPN or a PLMN and in case of PLMN UE is either allowed or instructed to access the PLMN via a cell for which at least one CAG ID is broadcast:

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

2> else:

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

2> if upper layers provide the 'Registered AMF':

3> include and set the *registeredAMF* as follows:

4> if the PLMN identity of the 'Registered AMF' is different from the PLMN selected by the upper layers:

5> include the *plmnIdentity* in the *registeredAMF* and set it to the value of the PLMN identity in the 'Registered AMF' received from upper layers;

4> set the *amf-Identifier* to the value received from upper layers;

3> include and set the *guami-Type* to the value provided by the upper layers;

2> if upper layers provide one or more S-NSSAI (see TS 23.003 [21]):

3> include the *s-NSSAI-List* and set the content to the values provided by the upper layers;

2> set the *dedicatedNAS-Message* to include the information received from upper layers;

2> if connecting as an IAB-node:

3> include the *iab-NodeIndication*;

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

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

3> include the *idleMeasAvailable*;

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 *RRCSetupComplete* message;

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

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

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

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

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

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

2> if the *RRCSetup* is received in response to an *RRCResumeRequest*, *RRCResumeRequest1* or *RRCSetupRequest*:

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

4> include the *mobilityState* in the *RRCSetupComplete* 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;

1> submit the *RRCSetupComplete* message to lower layers for transmission, upon which the procedure ends.

NEXT CHANGE

#### 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 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 *VarConditionalReconfig*, if any;

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

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

2> for each DAPS bearer:

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

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

2> for each SRB:

3> release the PDCP entity for the source SpCell;

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

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

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

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

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

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

1> else:

2> if the RRCReconfiguration includes the fullConfig:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2> perform the radio bearer configuration according to 5.3.5.6;

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

2> perform the radio bearer configuration according to 5.3.5.6;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2> perform conditional reconfiguration as specified in 5.3.5.13;

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

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

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

2> else:

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

1> if the *RRCReconfiguration* message includes the *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-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> set the content of the *RRCReconfigurationComplete* message as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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.x, upon successfully completing the Random Access procedure triggered for the *reconfigurationWithSync* in *spCellConfig* of the MCG;

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

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

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

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

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

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

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

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

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

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:

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 *reconfigurationWithSync* was included in *spCellConfig* of an SCG:

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

3> else:

4> the procedure ends;

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

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

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

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

3> else:

4> the procedure ends;

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

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

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

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

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

2> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution for CPC:

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 *reconfigurationWithSync* was included in *spCellConfig* in *nr-SCG*:

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

2> else

3> the procedure ends;

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

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

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

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

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

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

4> else:

5> the procedure ends;

3> else:

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

2> else:

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

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

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

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

3> resume SRB2 and DRBs that are suspended;

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

2> stop timer T304 for that cell group;

2> stop timer T310 for source SpCell if running;

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

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

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

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

3> if T390 is running:

4> stop timer T390 for all access categories;

4> perform the actions as specified in 5.3.14.4.

3> if T350 is running:

4> stop timer T350;

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

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

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

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

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

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

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

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

4> for the associated *reportConfigId*:

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

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

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

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

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

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

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

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

4> start or restart the prohibit timer (if exists) associated with the concerned UE assistance information with the timer value set to the value in corresponding configuration;

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

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

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

2> the procedure ends.

NOTE 3: The UE is only required to acquire broadcasted *SIB1* if the UE can acquire it without disrupting unicast data reception, i.e. the broadcast and unicast 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.

NEXT CHANGE

##### 5.3.5.8.3 T304 expiry (Reconfiguration with sync Failure)

The UE shall:

1> if T304 of the MCG expires:

2> release dedicated preambles provided in *rach-ConfigDedicated* if configured;

2> release dedicated msgA PUSCH resources provided in *rach-ConfigDedicated* if configured;

2> if any DAPS bearer is configured, and radio link failure is not detected in the source PCell, according to subclause 5.3.10.3:

3> reset MAC for the target PCell and release the MAC configuration for the target PCell;

3> for each DAPS bearer:

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

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

3> for each SRB:

4> if the *masterKeyUpdate* was not received:

5> configure the PDCP entity for the source PCell with state variables continuation as specified in TS 38.323 [5];

4> release the PDCP entity for the target PCell;

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

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

4> re-establish the RLC entity for the source PCell;

3> release the physical channel configuration for the target PCell;

3> discard the keys used in target PCell (the KgNB key, the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key), if any;

3> resume suspended SRBs in the source PCell;

3> for each non-DAPS bearer:

4> revert back to the UE configuration used for the DRB in the source PCell, includes PDCP, RLC states variables, the security configuration and the data stored in transmission and reception buffers in PDCP and RLC entities ;

3> revert back to the UE measurement configuration used in the source PCell;

3> store the handover failure information in *VarRLF-Report* as described in the subclause 5.3.10.5;

3> initiate the failure information procedure as specified in subclause 5.7.5 to report DAPS handover failure.

2> else:

3> revert back to the UE configuration used in the source PCell;

3> if the associated T304 was not initiated upon cell selection performed while timer T311 was running, as defined in subclause 5.3.7.3:

4> store the handover failure information in *VarRLF-Report* as described in the subclause 5.3.10.5;

3> initiate the connection re-establishment procedure as specified in subclause 5.3.7.

NOTE 1: In the context above, "the UE configuration" includes state variables and parameters of each radio bearer.

1> else if T304 of a secondary cell group expires:

2> if MCG transmission is not suspended:

3> release dedicated preambles provided in *rach-ConfigDedicated,* if configured;

3> initiate the SCG failure information procedure as specified in subclause 5.7.3 to report SCG reconfiguration with sync failure, upon which the RRC reconfiguration procedure ends;

2> else:

3> if the UE is in NR-DC:

4> initiate the connection re-establishment procedure as specified in subclause 5.3.7;

3> else (the UE is in (NG) EN-DC):

4> initiate the connection re-establishment procedure as specified in TS 36.331 [10], subclause 5.3.7;

1> else if T304 expires when *RRCReconfiguration* is received via other RAT (HO to NR failure):

2> reset MAC;

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

NOTE 2: In this clause, the term 'handover failure' has been used to refer to 'reconfiguration with sync failure'.

NEXT CHANGE

#### 5.3.5.9 Other configuration

The UE shall:

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

2> else:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1> else:

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

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

2> consider itself to be configured to provide the successful handover information in accordance with 5.7.10.X;

1> else:

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

NEXT CHANGE

### 5.3.7 RRC connection re-establishment

<Text Omitted>

#### 5.3.7.2 Initiation

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

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

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

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

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

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

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

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

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

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

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

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

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

1> upon T316 expiry, in accordance with sub-clause 5.7.3b.5.

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

1> stop timer T312, if running;

1> stop timer T304, if running;

1> start timer T311;

1> stop timer T316, if running;

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

2> reset MAC;

2> release *spCellConfig*, if configured;

2> suspend all RBs, and BH RLC channels for IAB-MT, except SRB0;

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

2> if MR-DC is configured:

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

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

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

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

2> release *btNameList*, if configured;

2> release *wlanNameList*, if configured;

2> release *sensorNameList*, if configured;

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

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

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

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

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

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

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

2> release *referenceTimePreferenceReporting*, if configured;

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

2> release *obtainCommonLocation*, if configured;

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

1> if any DAPS bearer is configured:

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

2> for each DAPS bearer:

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

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

2> for each SRB:

3> release the PDCP entity for the source SpCell;

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

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

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

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

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

Upon selecting a suitable NR cell, the UE shall:

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

1> stop timer T311;

1> if T390 is running:

2> stop timer T390 for all access categories;

2> perform the actions as specified in 5.3.14.4;

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

1> if *attemptCondReconfig* is configured; and

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

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

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

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

1> else:

2> if UE is configured with *conditionalReconfiguration*:

3> reset MAC;

3> release *spCellConfig*, if configured;

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

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

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

3> if MR-DC is configured:

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

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

3> release *btNameList*, if configured;

3> release *wlanNameList*, if configured;

3> release *sensorNameList*, if configured;

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

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

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

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

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

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

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

3> release referenceTimePreferenceReporting, if configured;

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

3> release *obtainCommonLocation*, if configured;

3> suspend all RBs, except SRB0;

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

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

3> for the associated *reportConfigId*:

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

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

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

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

2> start timer T301;

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

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

2> apply the CCCH configuration as specified in 9.1.1.2;

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

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

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

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

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

<Text Omitted>

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

The UE shall:

1> stop timer T301;

1> consider the current cell to be the PCell;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1> the procedure ends.

NEXT CHANGE

### 5.3.10 Radio link failure related actions

#### 5.3.10.1 Detection of physical layer problems in RRC\_CONNECTED

The UE shall:

1> if any DAPS bearer is configured, upon receiving N310 consecutive "out-of-sync" indications for the source SpCell from lower layers and T304 is running:

2> start timer T310 for the source SpCell.

1> upon receiving N310 consecutive "out-of-sync" indications for the SpCell from lower layers while neither T300, T301, T304, T311, T316 nor T319 are running:

2> start timer T310 for the corresponding SpCell.

#### 5.3.10.2 Recovery of physical layer problems

Upon receiving N311 consecutive "in-sync" indications for the SpCell from lower layers while T310 is running, the UE shall:

1> stop timer T310 for the corresponding SpCell.

1> stop timer T312 for the corresponding SpCell, if running.

NOTE 1: In this case, the UE maintains the RRC connection without explicit signalling, i.e. the UE maintains the entire radio resource configuration.

NOTE 2: Periods in time where neither "in-sync" nor "out-of-sync" is reported by L1 do not affect the evaluation of the number of consecutive "in-sync" or "out-of-sync" indications.

#### 5.3.10.3 Detection of radio link failure

The UE shall:

1> if any DAPS bearer is configured and T304 is running:

2> upon T310 expiry in source SpCell; or

2> upon random access problem indication from source MCG MAC; or

2> upon indication from source MCG RLC that the maximum number of retransmissions has been reached; or

2> upon consistent uplink LBT failure indication from source MCG MAC:

3> consider radio link failure to be detected for the source MCG i.e. source RLF;

3> suspend the transmission and reception of all DRBs in the source MCG;

3> reset MAC for the source MCG;

3> release the source connection.

1> else:

2> during a DAPS handover: the following only applies for the target PCell;

2> upon T310 expiry in PCell; or

2> upon T312 expiry in PCell; or

2> upon random access problem indication from MCG MAC while neither T300, T301, T304, T311 nor T319 are running; or

2> upon indication from MCG RLC that the maximum number of retransmissions has been reached; or

2> if connected as an IAB-node, upon BH RLF indication received on BAP entity from the MCG; or

2> upon consistent uplink LBT failure indication from MCG MAC while T304 is not running:

3> if the indication is from MCG RLC and CA duplication is configured and activated for MCG, and for the corresponding logical channel *allowedServingCells* only includes SCell(s):

4> initiate the failure information procedure as specified in 5.7.5 to report RLC failure.

3> else:

4> consider radio link failure to be detected for the MCG, i.e. MCG RLF;

4> discard any segments of segmented RRC messages stored according to 5.7.6.3;

NOTE: Void.

4> if AS security has not been activated:

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

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

5> store the radio link failure information in the *VarRLF-Report* as described in subclause 5.3.10.5;

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

4> else:

5> store the radio link failure information in the *VarRLF-Report* as described in subclause 5.3.10.5;

5> if T316 is configured; and

5> if SCG transmission is not suspended; and

5> if neither PSCell change nor PSCell addition is ongoing (i.e. timer T304 for the NR PSCell is not running in case of NR-DC or timer T307 of the E-UTRA PSCell is not running as specified in TS 36.331 [10], clause 5.3.10.10, in NE-DC):

6> initiate the MCG failure information procedure as specified in 5.7.3b to report MCG radio link failure.

5> else:

6> initiate the connection re-establishment procedure as specified in 5.3.7.

The UE shall:

1> upon T310 expiry in PSCell; or

1> upon T312 expiry in PSCell; or

1> upon random access problem indication from SCG MAC; or

1> upon indication from SCG RLC that the maximum number of retransmissions has been reached; or

1> if connected as an IAB-node, upon BH RLF indication received on BAP entity from the SCG; or

1> upon consistent uplink LBT failure indication from SCG MAC:

2> if the indication is from SCG RLC and CA duplication is configured and activated for SCG, and for the corresponding logical channel *allowedServingCells* only includes SCell(s):

3> initiate the failure information procedure as specified in 5.7.5 to report RLC failure.

2> else:

3> consider radio link failure to be detected for the SCG, i.e. SCG RLF;

3> if MCG transmission is not suspended:

4> initiate the SCG failure information procedure as specified in 5.7.3 to report SCG radio link failure.

3> else:

4> if the UE is in NR-DC:

5> initiate the connection re-establishment procedure as specified in 5.3.7;

4> else (the UE is in (NG)EN-DC):

5> initiate the connection re-establishment procedure as specified in TS 36.331 [10], clause 5.3.7;

#### 5.3.10.4 RLF cause determination

The UE shall set the *rlf-Cause* in the *VarRLF-Report* as follows:

1> if the UE declares radio link failure due to T310 expiry:

2> set the *rlf-Cause* as *t310-Expiry*;

1> else if the UE declares radio link failure due to the random access problem indication from MCG MAC:

2> if the random access procedure was initiated for beam failure recovery:

3> set the *rlf-Cause* as *beamFailureRecoveryFailure*;

2> else:

3> set the *rlf-Cause* as *randomAccessProblem*;

1> else if the UE declares radio link failure due to the reaching of maximum number of retransmissions from the MCG RLC:

2> set the *rlf-Cause* as *rlc-MaxNumRetx*;

1> else if the UE declares radio link failure due to consistent uplink LBT failures:

2> set the *rlf-Cause* as *lbtFailure*;

1> else if the IAB-MT declares radio link failure due to the reception of a BH RLF indication on BAP entity:

2> set the *rlf-Cause* as *bh-rlfRecoveryFailure*.

1> else if the UE declares radio link failure due to T312 expiry:

2> set the *rlf-Cause* as *t312-Expiry*;

#### 5.3.10.5 RLF report content determination

The UE shall determine the content in the *VarRLF-Report* as follows:

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

1> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);

1> set the *measResultLastServCell* to include the cell level RSRP, RSRQ and the available SINR, of the source PCell (in case HO failure) or PCell (in case RLF) based on the available SSB and CSI-RS measurements collected up to the moment the UE detected failure;

1> if the SS/PBCH block-based measurement quantities are available:

2> set the *rsIndexResults* in *measResultLastServCell* to include all the available measurement quantities of the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE detected failure;

1> if the CSI-RS based measurement quantities are available:

2> set the *rsIndexResults* in *measResultLastServCell* to include all the available measurement quantities of the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE detected failure;

1> set the *ssbRLMConfigBitmap* and/or *csi-rsRLMConfigBitmap* in *measResultLastServCell* to include the radio link monitoring configuration of the source PCell(in case HO failure) or PCell (in case RLF), if available;

1> for each of the configured *measObjectNR* in which measurements are available:

2> if the SS/PBCH block-based measurement quantities are available:

3> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the cell with highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the cell with highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the cell with highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE detected failure;

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

2> if the CSI-RS based measurement quantities are available:

3> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the cell with highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the cell with highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the cell with highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE detected radio link failure;

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

2> for each neighbour cell, if any, included in *measResultListNR* in *measResultNeighCells*:

3> if the neighbour cell is one of the candidate cells for which the *reconfigurationWithSync* is included in the *masterCellGroup* in *VarConditionalReconfig* at the moment of the detected failure:

4> set *choConfig* in *MeasResult2NR* to the execution condition for each *measId* within *condTriggerConfig* associated to the neighbour cell within *VarConditionalReconfig*;

4> if at least one execution condition included in *choConfig* in *MeasResult2NR* was fulfilled at the moment of conditional reconfiguration execution, or radio link failure:

5> if the first entry of *choConfig* corresponds to a fullfilled execution condition at the moment of conditional reconfiguration execution, or radio link failure:

6> set c*ondFirstEventFullfilled* to *true*;

5> if the second entry of *choConfig*, if available, corresponds to a fullfilled execution condition at the moment of conditional reconfiguration execution, or radio link failure:

6> set *condSecondEventFullfilled* to *true*;

5> if the first entry of *choConfig* corresponds to a fulfilled execution condition at the moment of conditional reconfiguration execution, or radio link failure; and

5> if the second entry of *choConfig*, if available, corresponds to a fulfilled execution condition at the moment of conditional reconfiguration execution, or radio link failure:

6> set *firstTriggeredEvent* to the execution condition *condFirstEvent* corresponding to the first entry of *choConfig* or to the execution condition *condSecondEvent* corresponding to the second entry of *choConfig*, whichever execution condition was fulfilled first in time;

6> set *timeBetweenEvents* to the elapsed time between the point in time of fullfilling the condition in *choConfig* that was fulfilled first in time, and the point in time of fullfilling the condition in *choConfig* that was fulfilled second in time;

1> for each of the configured EUTRA frequencies in which measurements are available;

2> set the *measResultListEUTRA* in *measResultNeighCells* to include the best measured cells ordered such that the cell with highest RSRP is listed first if RSRP measurement results are available, otherwise the cell with highest RSRQ is listed first, and based on measurements collected up to the moment the UE detected failure;

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

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

1> set the *c-RNTI* to the C-RNTI used in the source PCell(in case HO failure) or PCell (in case RLF);

1> if the failure is detected due to reconfiguration with sync failure as described in 5.3.5.8.3, set the fields in *VarRLF-report* as follows:

2> set the *connectionFailureType* to *hof*;

2> if any DAPS bearer was configured while T304 was running:

3> set *dapsHOF* to *true*:

3> if radio link failure was detected in the source PCell, according to subclause 5.3.10.3:

4> set *timeConnSourceDAPSFailure* to the time between the initiation of the DAPS handover execution and the radio link failure detected in the source PCell while T304 was running;

4> set the *rlf-Cause* to the trigger for detecting the source radio link failure in accordance with clause 5.3.10.4;

2> set the *nrFailedPCellId* in *failedPCellId* to the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

2> include *nrPreviousCell* in *previousPCellId* and set it to the global cell identity and tracking area code of the PCell where the last *RRCReconfiguration* message including *reconfigurationWithSync* was received;

2> set the *timeConnFailure* to the elapsed time since reception of the last *RRCReconfiguration* message including the *reconfigurationWithSync*;

1> else if the failure is detected due to Mobility from NR failure as described in 5.4.3.5, set the fields in *VarRLF-report* as follows:

2> set the *connectionFailureType* to *hof*;

2> if last *MobilityFromNRCommand* concerned a failed inter-RAT handover from NR to E-UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO EUTRA (NR to EUTRA):

3> set the *eutraFailedPCellId* in *failedPCellId* to the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

2> include *nrPreviousCell* in *previousPCellId* and set it to the global cell identity and tracking area code of the PCell where the last *MobilityFromNRCommand* message was received;

2> if configuration of the conditional handover is available in *VarConditionalReconfig* at the moment of the handover failure:

3> set *timeSinceCHOReconfig* to the time elapsed between the execution of the last *RRCReconfiguration* message including *reconfigurationWithSync* for the target PCell of the failed conditional handover, and the reception in the source PCell of the last *conditionalReconfiguration* including the *condRRCReconfig* of the target PCell of the failed conditional handover;

3> set *choCandidateCellList* to include the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of each of the candidate target cells for conditional handover included in *condRRCReconfig* within *VarConditionalReconfig* at the time of the failed conditional handover, excluding the candidate target cells included in *measResulNeighCells*;

2> set the *timeConnFailure* to the elapsed time since the initialization of the handover associated to the last *MobilityFromNRCommand* message;

1> else if the failure is detected due to radio link failure as described in 5.3.10.3, set the fields in *VarRLF-report* as follows:

2> set the *connectionFailureType* to *rlf*;

2> set the *rlf-Cause* to the trigger for detecting radio link failure in accordance with clause 5.3.10.4;

2> set the *nrFailedPCellId* in *failedPCellId* to the global cell identity and the tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;

2> if an *RRCReconfiguration* message including the *reconfigurationWithSync* was received before the connection failure:

3> if the last *RRCReconfiguration* message including the *reconfigurationWithSync* concerned an intra NR handover:

4> include the *nrPreviousCell* in *previousPCellId* and set it to the global cell identity and the tracking area code of the PCell where the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was received;

4> if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a DAPS handover:

5> set *lastHOType* to *daps*;

4> else if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a conditional handover:

5> set *lastHOType* to *cho*;

4> set the *timeConnFailure* to the elapsed time since the execution of the last *RRCReconfiguration* message including the *reconfigurationWithSync*;

3> else if the last *RRCReconfiguration* message including the *reconfigurationWithSync* concerned a handover to NR from E-UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO EUTRA:

4> include the *eutraPreviousCell* in *previousPCellId* and set it to the global cell identity and the tracking area code of the E-UTRA PCell where the last *RRCReconfiguration* message including *reconfigurationWithSync* was received embedded in E-UTRA RRC message *MobilityFromEUTRACommand* message as specified in TS 36.331 [10] clause 5.4.3.3;

4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCReconfiguration* message including the *reconfigurationWithSync* embedded in E-UTRA RRC message *MobilityFromEUTRACommand* message as specified in TS 36.331 [10] clause 5.4.3.3;

3> if configuration of the conditional handover is available in *VarConditionalReconfig* at the moment of radio link failure:

3> set *choCandidateCellList* to include the global cell identity and tracking area code of all the candidate target cells for conditional handover included in *condRRCReconfig* within *VarConditionalReconfig* at the time of radio link failure, excluding the candidate target cells included in *measResulNeighCells*;

2> if configuration of the conditional handover is available in *VarConditionalReconfig* at the moment of declaring the radio link failure:

3> set *timeSinceCHOReconfig* to the time elapsed between the detection of the radio link failure, and the reception, in the source PCell, of the last *conditionalReconfiguration* including the *condRRCReconfig* message;

1> if *connectionFailureType* is *rlf* and the *rlf-Cause* is set to *randomAccessProblem* or *beamFailureRecoveryFailure*; or

1> if *connectionFailureType* is *hof* and if the failed handover is an intra-RAT handover:

2> set the *ra-InformationCommon* to include the random-access related information as described in subclause 5.7.10.5;

1> if available, set the *locationInfo* as in 5.3.3.7.

The UE may discard the radio link failure information or handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure/handover failure is detected.

NOTE 2: In this clause, the term 'handover failure' has been used to refer to 'reconfiguration with sync failure'.

### 5.3.13 RRC connection resume

<Text Omitted>

#### 5.3.13.2 Initiation

The UE initiates the procedure when upper layers or AS (when responding to RAN paging, upon triggering RNA updates while the UE is in RRC\_INACTIVE, or for NR sidelink communication/V2X sidelink communication as specified in sub-clause 5.3.13.1a) requests the resume of a suspended RRC connection.

The UE shall ensure having valid and up to date essential system information as specified in clause 5.2.2.2 before initiating this procedure.

Upon initiation of the procedure, the UE shall:

1> if the resumption of the RRC connection is triggered by response to NG-RAN paging:

2> select '0' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.14 using the selected Access Category and one or more Access Identities provided by upper layers;

3> if the access attempt is barred, the procedure ends;

1> else if the resumption of the RRC connection is triggered by upper layers:

2> if the upper layers provide an Access Category and one or more Access Identities:

3> perform the unified access control procedure as specified in 5.3.14 using the Access Category and Access Identities provided by upper layers;

4> if the access attempt is barred, the procedure ends;

2> if the resumption occurs after release with redirect with *mpsPriorityIndication*:

3> set the resumeCause to mps-PriorityAccess;

2> else:

3> set the *resumeCause* in accordance with the information received from upper layers;

1> else if the resumption of the RRC connection is triggered due to an RNA update as specified in 5.3.13.8:

2> if an emergency service is ongoing:

NOTE: How the RRC layer in the UE is aware of an ongoing emergency service is up to UE implementation.

3> select '2' as the Access Category;

3> set the *resumeCause* to *emergency*;

2> else:

3> select '8' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.14 using the selected Access Category and one or more Access Identities to be applied as specified in TS 24.501 [23];

3> if the access attempt is barred:

4> set the variable *pendingRNA-Update* to *true*;

4> the procedure ends;

1> if the UE is in NE-DC or NR-DC:

2> if the UE does not support maintaining SCG configuration upon connection resumption:

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

1> if the UE does not support maintaining the MCG SCell configurations upon connection resumption:

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

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

1> apply the default SRB1 configuration as specified in 9.2.1;

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

1> release *delayBudgetReportingConfig* from the UE Inactive AS context, if stored;

1> stop timer T342, if running;

1> release *overheatingAssistanceConfig* from the UE Inactive AS context, if stored;

1> stop timer T345, if running;

1> release *idc-AssistanceConfig* from the UE Inactive AS context, if stored;

1> release *drx-PreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346a, if running;

1> release *maxBW-PreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346b, if running;

1> release *maxCC-PreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346c, if running;

1> release *maxMIMO-LayerPreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346d, if running;

1> release *minSchedulingOffsetPreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346e, if running;

1> release *releasePreferenceConfig* from the UE Inactive AS context, if stored;

1> release *wlanNameList* from the UE Inactive AS context, if stored;

1> release *btNameList* from the UE Inactive AS context, if stored;

1> release *sensorNameList* from the UE Inactive AS context, if stored;

1> release *obtainCommonLocation* from the UE Inactive AS context, if stored;

1> stop timer T346f, if running;

1> release *referenceTimePreferenceReporting* from the UE Inactive AS context, if stored;

1> release *sl-AssistanceConfigNR* from the UE Inactive AS context, if stored;

1> apply the CCCH configuration as specified in 9.1.1.2;

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

1> start timer T319;

1> set the variable *pendingRNA-Update* to *false*;

1> release *successHO-Config* from the UE Inactive AS context, if stored;

1> initiate transmission of the *RRCResumeRequest* message or *RRCResumeRequest1* in accordance with 5.3.13.3.

<Text Omitted>

#### 5.3.13.4 Reception of the *RRCResume* by the UE

The UE shall:

1> stop timer T319;

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> 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> resume SRB2, SRB3 (if configured), and all DRBs;

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

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

2> else:

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

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;

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

1> the procedure ends.

NEXT CHANGE

<Text Omitted>

### 5.7.3.5 Actions related to transmission of *SCGFailureInformation* message

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

1> if the UE initiates transmission of the *SCGFailureInformation* message due to T310 expiry:

2> set the *failureType* as *t310-Expiry*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to T312 expiry:

2> set the *failureType* as *other* and set the *failureType-v1610* as *t312-Expiry*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide reconfiguration with sync failure information for an SCG:

2> set the *failureType* as *synchReconfigFailureSCG*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide random access problem indication from SCG MAC:

2> if the random access procedure was initiated for beam failure recovery:

3> set the *failureType* as *other* and set the *failureType-v1610* as *beamFailureRecoveryFailure*;

2> else:

3> set the *failureTyp*e as *randomAccessProblem*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide indication from SCG RLC that the maximum number of retransmissions has been reached:

2> set the *failureType* as *rlc-MaxNumRetx*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to SRB3 IP check failure:

2> set the *failureType* as *srb3-IntegrityFailure*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to Reconfiguration failure of NR RRC reconfiguration message:

2> set the *failureType* as *scg-reconfigFailure*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to consistent uplink LBT failures:

2> set the *failureType* as *other* and set the *failureType-v1610* as *scg-lbtFailure*;

1> else if connected as an IAB-node and the *SCGFailureInformation* is initiated due to the reception of a BH RLF indication on BAP entity from the SCG:

2> set the *failureType* as *other* and set *failureType-v1610* as *bh-RLF*;

1> include and set *MeasResultSCG*-Failure in accordance with 5.7.3.4;

1> for each *MeasObjectNR* configured by a *MeasConfig* associated with the MCG, and for which measurement results are available:

2> include an entry in *measResultFreqList*;

2> if there is a *measId* configured with the *MeasObjectNR* and a *reportConfig* which has *rsType* set to *ssb*:

3> set *ssbFrequency* in *measResultFreqList* to the value indicated by *ssbFrequency* as included in the *MeasObjectNR*;

2> if there is a *measId* configured with the *MeasObjectNR* and a *reportConfig* which has *rsType* set to *csi-rs*:

3> set *refFreqCSI-RS* in *measResultFreqList* to the value indicated by *refFreqCSI-RS* as included in the associated measurement object;

2> if a serving cell is associated with the *MeasObjectNR*:

3> set *measResultServingCell* in *measResultFreqList* to include the available quantities of the concerned cell and in accordance with the performance requirements in TS 38.133 [14];

2> set the *measResultNeighCellList* in *measResultFreqList* to include the best measured cells, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected the failure, and set its fields as follows;

3> ordering the cells with sorting as follows:

4> based on SS/PBCH block if SS/PBCH block measurement results are available and otherwise based on CSI-RS;

4> using RSRP if RSRP measurement results are available, otherwise using RSRQ if RSRQ measurement results are available, otherwise using SINR;

3> for each neighbour cell included:

4> include the optional fields that are available.

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

NOTE 2: Field *measResultSCG-Failure* is used to report available results for NR frequencies the UE is configured to measure by SCG RRC signalling.

1> if available, set the *locationInfo* as in 5.3.3.7.:

1> if the UE supports SCG failure for mobility robustness optimization:

2> if the failureType is set to synchReconfigFailureSCG; or

2> if the *failureType* is set to *randomAccessProblem* and the SCG failure was declared while T304 was running:

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

3> set the *failedPSCellId* to the physical cell identity and carrier frequency of the target PSCell of the failed PSCell change;

3> set the *previousPSCellId* to the physical cell identity and carrier frequency of the source PSCell where the last *RRCReconfiguration* message including *reconfigurationWithSync* for the SCG was received;

3> set the *timeSCGFailure* to the elapsed time since reception of the last *RRCReconfiguration* message including the *reconfigurationWithSync* for the SCG;

2> else:

3> set the *failedPSCellId* to the physical cell identity and carrier frequency of the PSCell in which the SCG failure was declared;

3> if the last *RRCReconfiguration* message including the *reconfigurationWithSync* for the SCG was received to enter the PSCell in which the SCG failure was declared:

4> set the *timeSCGFailure* to the elapsed time since reception of the last *RRCReconfiguration* message including the *reconfigurationWithSync* for the SCG;

4> set the *previousPSCellId* to the physical cell identity and carrier frequency of the PSCell where the last *RRCReconfiguration* message including *reconfigurationWithSync* for the SCG was received;

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

### 5.7.9 Mobility history information

#### 5.7.9.1 General

This procedure specifies how the mobility history information is stored by the UE, covering RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED.

#### 5.7.9.2 Initiation

If the UE supports storage of mobility history information, the UE shall:

1> Upon addition of a PSCell using an RRC message that does not include a PCell change and that is not received in response to *RRCSetupRequest* and that is not received in response to *RRCResumeRequest*:

2> include an entry in *visitedPSCellInfoList* in variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following:

3> set the field *timeSpent* of the entry according to following:

4> if this is the first PSCell entry for the current PCell since entering the current PCell in RRC\_CONNECTED:

5> include the entry as the time spent with no PSCell since entering the current PCell in RRC\_CONNECTED;

4> else:

5> include the time spent with no PSCell since last PSCell release or SCG failure since entering the current PCell in RRC\_CONNECTED;

1> Upon change, or release of a PSCell or upon declaring failure in a PSCell (SCG RLF or SCG HOF) while being connected to the current PCell:

2> include an entry in *visitedPSCellInfoList* of the variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following:

3> if the global cell identity of the previous PSCell is available:

4> include the global cell identity of that cell in the field *visitedCellId* of the entry;

3> else:

4> include the physical cell identity and carrier frequency of that cell in the field *visitedCellId* of the entry;

1. set the field *timeSpent* of the entry as the time spent in the previous PSCell while being connected to the current PCell;

1> Upon change of suitable cell, consisting of PCell in RRC\_CONNECTED (for NR or E-UTRA cell) or serving cell in RRC\_INACTIVE (for NR cell) or in RRC\_IDLE (for NR or E-UTRA cell), to another NR or E-UTRA cell, or when entering any cell selection' state from 'camped normally' state in NR or LTE or when entering 'any cell selection' state from a suitable cell in RRC\_CONNECTED state in NR or LTE:

2> include an entry in *visitedCellInfoList* of the variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following*:*

3> if the global cell identity of the previous PCell/serving cell is available:

4> include the global cell identity of that cell in the field *visitedCellId* of the entry;

3> else:

4> include the physical cell identity and carrier frequency of that cell in the field *visitedCellId* of the entry;

3> set the field *timeSpent* of the entry as the time spent in the previous PCell/serving cell;

3> if the UE continues to be connected to the same PSCell during the change of the PCell in RRC\_CONNECTED:

4> include *timeSpentPS-r17* of the previous PSCell;

include an entry in *visitedPSCellInfoList* of the variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following:

5> if the global cell identity of the PSCell is available:

6> include the global cell identity of that cell in the field *visitedCellId* of the entry;

5> else:

6> include the physical cell identity and carrier frequency of that cell in the field *visitedCellId* of the entry;

5> set the field *timeSpent* of the entry as the time spent in the PSCell, while being connected to previous PCell;

3> else if the UE changes PSCell, or attempts to change PSCell but fails, at the same time as the change of the PCell in RRC\_CONNECTED:

4> include an entry in *visitedPSCellInfoList* in variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following:

5> if the global cell identity of the previous PSCell is available:

6> include the global cell identity of that cell in the field *visitedCellId* of the entry;

5> else:

6> include the physical cell identity and carrier frequency of that cell in the field *visitedCellId* of the entry;

5> set the field *timeSpent* of the entry as the time spent in the PSCell, while being connected to previous PCell;

3> if the UE was not configured with a PSCell at the time of change of PCell in RRC\_CONNECTED:

4> include an entry in *visitedPSCellInfoList* after removing the oldest entry, if necessary, according to the following;

5> set the field *timeSpent* of the entry as the time without PSCell according to the following:

6> if the UE experienced a PSCell release or secondary cell radio link failure since entering the previous PCell in RRC\_CONNECTED:

7> include the time spent with no PSCell since last PSCell release or secondary cell radio link failure since entering the previous PCell in RRC\_CONNECTED;

3> if *visitedPSCellInfoList* exists in *VarMobilityHistoryReport*:

4> include *visitedPSCellInfoList* in the *visitedCellInfoList* of the variable *VarMobilityHistoryReport* associating it with the latest PCell entry;

4> remove *visitedPSCellInfoList* from the variable *VarMobilityHistoryReport*;

1> upon entering 'camped normally' state in NR (in RRC\_IDLE or RRC\_INACTIVE) or E-UTRA (in RRC\_IDLE) while previously in RRC\_CONNECTED state NR or LTE while not connected to a PSCell:

2> include an entry in *visitedPSCellInfoList* after removing the oldest entry, if necessary, according to the following;

3> set the field *timeSpent* of the entry as the time without PSCell according to the following:

4> if the UE experienced a PSCell release or secondary cell radio link failure since entering the current PCell in RRC\_CONNECTED:

5> include the time spent with no PSCell since last PSCell release or SCG radio link failure after entering the current PCell in RRC\_CONNECTED.

1> upon entering 'camped normally' state in NR (in RRC\_IDLE or RRC\_INACTIVE) or E-UTRA (in RRC\_IDLE) while previously in 'any cell selection' state or 'camped on any cell' state in NR or LTE:

2> include an entry in variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following:

3> set the field *timeSpent* of the entry as the time spent in 'any cell selection' state and/or 'camped on any cell' state in NR or LTE.

Nokia Proposal with simpler, Rel-17 specific structure/framework for consideration:

1> Upon connecting to a new suitable PCell in NR or LTE (RRC\_CONNECTED):

2> include an entry in variable *VarMobilityHistoryReport*, possibly after removing the oldest entry, if necessary, according to following*:*

3> if the global cell identity of the PCell is available:

4> include the global cell identity of that cell in the field *visitedPCellId-r17* of the entry;

3> else:

4> include the physical cell identity and carrier frequency of that cell in the field *visitedPCellId-r17* of the entry;

3> include a *visitedPCellId-r17* entry in variable *VarMobilityHistoryReport* per PCell entry after removing the oldest entry, if maximum is reached, according to following*:*

3> if UE operates in single connectivity mode with PCell:

4> include (an empty) *timeSpentPS-r17* in the field *visitedPSCellId-*r17;

3> else (being in DC):

4> if the global cell identity of the PSCell is available:

5> include the global cell identity of that cell in the field *visitedPSCellId-r17* of the entry;

4>else:

5>include the physical cell identity and carrier frequency of that cell in the field *visitedPSCellId-r17* of the entry;

3> Upon getting additionally connected to a PSCell:

1. include *timeSpentPS-r17* in the field *visitedPSCellId-*r17;

4> if the global cell identity of the PSCell is available:

5> include the global cell identity of that cell in the field *visitedPSCellId-r17* of the entry;

4>else:

5>include the physical cell identity and carrier frequency of that cell in the field *visitedPSCellId-r17* of the entry;

3> upon leaving the PSCell (changing to single connectivity):

4> set the field *timeSpentPS-r17* of the entry as the time spent in the PSCell;

4> include (an empty) *timeSpentPS-r17* in the field *visitedPSCellId-*r17;

2> upon leaving the PCell:

3>if there is no concurrently visited PSCell:

4> leave the field *timeSpentPS-r17* empty as time spent without PSCell until the visited PCell is left;

3>else:

4> last concurrently visited PSCell with setting the field *timeSpentPS-r17* with time spent in the PSCell until the concurrently visited PCell is left;

3>set the field *timeSpent-r17* of the entry as the time spent in the PCell;

NEXT CHANGE

### 5.7.10 UE Information

#### 5.7.10.3 Reception of the *UEInformationRequest* message

Upon receiving the *UEInformationRequest* message, the UE shall, only after successful security activation:

1> if the *idleModeMeasurementReq* is included in the *UEInformationRequest* and the UE has stored *VarMeasIdleReport* that contains measurement information concerning cells other than the PCell:

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

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

2> discard the *VarMeasIdleReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:

3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;

3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;

3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport;*

3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;

3> include the *logMeasInfoList* and set it to include one or more entries from the *VarLogMeasReport* starting from the entries logged first, and for each entry of the *logMeasInfoList* that is included, include all information stored in the corresponding *logMeasInfoList* entry in *VarLogMeasReport*;

3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

4> include the *logMeasAvailable*;

4> if *bt-LocationInfo* is included in *locationInfo* of one or more of the additional logged measurement entries in *VarLogMeasReport* that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

5> include the *logMeasAvailableBT*;

4> if *wlan-LocationInfo* is included in *locationInfo* of one or more of the additional logged measurement entries in *VarLogMeasReport* that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

5> include the *logMeasAvailableWLAN*;

1> if *ra-ReportReq* is set to *true* and the UE has random access related information available in *VarRA-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRA-Report*:

2> set the *ra-ReportList* in the *UEInformationResponse* message to the value of *ra-ReportList* in *VarRA-Report*;

2> discard the *ra-ReportList* from *VarRA-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if *rlf-ReportReq* is set to *true*:

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

3> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link failure or handover failure in NR;

3> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

3> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

2> else if the UE is capable of cross-RAT RLF reporting as defined in TS 38.306 [26] and has radio link failure information or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]:

3> set *timeSinceFailure* in *VarRLF-Report* of TS 36.331 [10] to the time that elapsed since the last radio link failure or handover failure in EUTRA;

3> set failedPCellId-EUTRA in the *rlf-Report* in the *UEInformationResponse* message to indicate the PCell in which RLF was detected or the source PCell of the failed handover in the *VarRLF-Report* of TS 36.331 [10];

3> set the *measResult-RLF-Report-EUTRA* in the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report* of TS 36.331 [10];

3> discard the *rlf-Report* from *VarRLF-Report* of TS 36.331 [10] upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure or connection resume failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure or connection resume failure in NR;

2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;

2> discard the *connEstFailReport* from *VarConnEstFailReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *mobilityHistoryReportReq* is set to *true*:

2> include the *mobilityHistoryReport* and set it to include *visitedCellInfoList* from *VarMobilityHistoryReport*;

2> include in the *mobilityHistoryReport* an entry for the current PCell, possibly after removing the oldest entry if required, and set its fields as follows:

3> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current PCell:

3> set field *timeSpent* to the time spent in the current PCell;

3> if *visitedPSCellInfoList* is present in *VarMobilityHistoryReport*:

4> for the newest entry of the PCell in the *mobiliyHistoryReport*, include *visitedPSCellInfoList* from *VarMobilityHistoryReport*;

4> if the UE is configured with a PSCell:

5> for the newest entry of the PCell in the *mobiliyHistoryReport*, include the current PSCell information in the *visitedPSCellInfoList,* possibly after removing the oldest entry, if required, and set its fields as follows:

6> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current PSCell:

6> set field *timeSpent* to the time spent in the current PSCell while being connected to the current PCell;

4> else:

5> for the newest entry of the PCell in the *mobiliyHistoryReport*, include a new entry in the *visitedPSCellInfoList,* possibly after removing the oldest entry, if required, and set its fields as follows:

6> set field *timeSpent* to the time spent without PSCell in the current PCell since last PSCell release or secondary cell radio link failure since connected to the current PCell in RRC\_CONNECTED;

3> else:

4> if the UE is configured with a PSCell:

5> for the newest entry of the PCell in the *mobiliyHistoryReport*, include the current PSCell information in the *visitedPSCellInfoList,* possibly after removing the oldest entry, if required, and set its fields as follows:

6> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current PSCell:

6> set field *timeSpent* to the time spent in the current PSCell while being connected to the current PCell;

4> else:

5> for the newest entry of the PCell in the *mobiliyHistoryReport*, include a new entry in the *visitedPSCellInfoList,* possibly after removing the oldest entry, if required, and set its fields as follows:

6> set field *timeSpent* to the time spent without PSCell in the current PCell since connected to the current PCell in RRC\_CONNECTED;

1> if the *successHO-ReportReq* is set to *true* and if the RPLMN is included in the *plmn-IdentityList* stored in *VarSuccessHO-Report*:

2> if the *successHO-Report* in the *VarSuccessHO-Report* concerns a DAPS handover:

3> set *upInterruptionTimeAtHO* in *VarSuccessHO-Report* to include the time elapsed between the time of arrival of the last PDCP PDU received from the source cell of the concerned handover and the time of arrival of the first non-duplicate PDCP PDU received from the target cell of the concerned handover, as measured at the time of arrival of the first non-duplicate PDCP PDU received from the target cell

2> set the *successHO-Report* in the *UEInformationResponse* message to the value of *successHO-Report* in the *VarSuccessHO-Report*, if available;

2> discard the *VarSuccessHO-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *logMeasReport* is included in the *UEInformationResponse*:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;

2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1.

#### 5.7.10.4 Actions upon successful completion of a random-access procedure or on successful or unsuccessful completion of a procedure for request of on-demand system information

Upon successfully performing random-access procedure initialized with 4-step or 2-step RA type, or upon failed or successfully completed on-demand system information acquisition procedure, the UE shall:

1> if the RPLMN or the PLMN selected by upper layers (see TS24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* in *SIB1* is not included in *plmn-IdentityList* stored in a non-empty *VarRA-Report*:

2> clear the information included in *VarRA-Report*;

1> if the number of *RA-Report* entries stored in the *ra-ReportList* in *VarRA-Report* is less than *maxRAReport*:

2> if the number of PLMN entries in *plmn-IdentityList* stored in *VarRA-Report* is less than *maxPLMN*; or

2> if the number of PLMN entries in *plmn-IdentityList* stored in *VarRA-Report* is equal to *maxPLMN* and the list of EPLMNs is subset of or equal to the *plmn-IdentityList* stored in *VarRA-Report*:

3> append the following contents associated to the successfully completed random-access procedure as a new entry in the *VarRA-Report*:

4> if the list of EPLMNs has been stored by the UE:

5> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN) without exceeding the limit of *maxPLMN*;

4> else:

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

4> set the *cellId* to the global cell identity and the tracking area code, if available, otherwise to the physical cell identity and carrier frequency of the cell in which the corresponding random-access preamble was transmitted;

4> if the corresponding random-access procedure was performed on an SCell of MCG:

5> set the sp*CellId* to the global cell identity of the PCell;

4> if the corresponding random-access procedure was performed on an SCell of SCG:

5> set the sp*CellId* to the global cell identity of the PSCell;

4> set the *raPurpose* to include the purpose of triggering the random-access procedure;

4> set the *ra-InformationCommon* as specified in subclause 5.7.10.5.

The UE may discard the random access report information, i.e. release the UE variable *VarRA-Report*, 48 hours after the last successful random access procedure related information is added to the *VarRA-Report*.

NOTE 1: The UE does not log the RA information in the RA report if the triggering event of the random access is consistent UL LBT on SpCell as specified in TS 38.321 [6].

#### 5.7.10.5 RA information determination for RA report and RLF report

The UE shall set the content in *ra-InformationCommon* as follows:

1> set the *absoluteFrequencyPointA* to indicate the absolute frequency of the reference resource block associated to the random-access resources used in the random-access procedure;

1> set the *locationAndBandwidth* and *subcarrierSpacing* associated to the UL BWP of the random-access resources used in the random-access procedure;

1> if contention based random-access resources are used in the random-access procedure:

2> set the *msgA-RO-FrequencyStart* and *msgA-RO-FDM* associated to the 2 step random-access resources if used in the random-access procedure;

2> if *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure is available:

3> set the *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure;

2> else:

3> set the *msgA-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *msgA-PRACH-ConfigurationIndex* used in the 2-step random-access procedure;

2> set the *msg1-FrequencyStart* associated to the 4 step random-access resources if used in the random-access procedure, and if its value is different from the value of *msgA-RO-FrequencyStart* if it is included in the *ra-InformationCommon*;

2> set the *msg1-FDM* associated to the 4 step random-access resources if used in the random-access procedure, and if its value is different from the value of *msgA-RO-FDMCFRA* if it is included in the *ra-InformationCommon;*

2> if *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure is available, and if its value is different from the value of *msgA-SubcarrierSpacing* if it is included in the *ra-InformationCommon*:

3> set the *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure;

2> else:

3> set the *msg1-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *prach-ConfigurationIndex* used in the 4-step random-access procedure, and if its value is different from the value of *msgA-SCS-From-prach-ConfigurationIndex* if it is included in the *ra-InformationCommon*;

1> if contention free random-access resources are used in the random-access procedure:

2> set the *msg1-FrequencyStartCFRA* and *msg1-FDMCFRA* associated to the 4 step random-access resources if used in the random-access procedure;

2> if *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure is available:

3> set the *msg1-SubcarrierSpacingCFRA* associated to the 4 step random-access resources used in the random-access procedure;

2> else:

3> set the *msg1-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *prach-ConfigurationIndex* used in the 4-step random-access procedure;

2> set the *msgA-RO-FrequencyStartCFRA* and *msgA-RO-FDMCFRA* associated to the 2 step contention free randomaccess resources if used in the random-access procedure;

2> set the *msgA-MCS*, the *nrofPRBs-PerMsgA-PO*, the *msgA-PUSCH-TimeDomainAllocation*, the *frequencyStartMsgA-PUSCH*, the *nrofMsgA-PO-FDM* associated to the 2 step random-access resources if used in the random-access procedure;

2> if *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure is available:

3> set the *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure;

2> else:

3> set the *msgA-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *msgA-PRACH-ConfigurationIndex* used in the 2-step random-access procedure;

1> if the random access procedure is initialized with *RA\_TYPE* set to *2-stepRA* as described in TS 38.321 [3]:

2> set the *dlPathlossRSRP* to the measeured RSRP of the DL pathloss reference obtained at the time of *RA\_Type* selection stage of the initialization of the RA procedure as captured in TS 38.321 [3];

2> if the configuration for the random access *msgA-TransMax* was configured in *RACH-ConfigDedicated* for this random access procedure:

3> set *msgA-TransMax* to the value of *msgA-TransMax* in *RACH-ConfigDedicated*;

2> else if *msgA-TransMax* was configured in *RACH-ConfigCommonTwoStepRA*:

3> set *msgA-TransMax* to the value of *msgA-TransMax* in *RACH-ConfigCommonTwoStepRA*;

2> set the *msgA-PUSCH-PayloadSize* to the size of the overall payload available in the UE buffer at the time of initiating the 2 step RA procedure;

1> if the purpose of the random access procedure is to request on-demand system information (i.e., if the *raPurpose* is set to *requestForOtherSI* or *msg3RequestForOtherSI*):

2> set the *intendedSIBs* to indicate the SIB(s) the UE wanted to receive as a result of the SI request;

2> set the *ssbsForSI-Acquisition* to indicate the SSB(s) used to receive the SI message;

2> if the on-demand system information acquisition was successful:

3> set the *onDemandSISuccess* to *true*;

2> else:

3> set the *onDemandSISuccess* to *false*;

1> set the parameters associated to individual random-access attempt in the chronological order of attempts in the *perRAInfoList* as follows:

2> if the random-access resource used is associated to a SS/PBCH block, set the associated random-access parameters for the successive random-access attempts associated to the same SS/PBCH block for one or more random-access attempts as follows:

3> set the *ssb-Index* to include the SS/PBCH block index associated to the used random-access resource;

3> set the *numberOfPreamblesSentOnSSB* to indicate the number of successive random-access attempts associated to the SS/PBCH block;

3> for each random-access attempt performed on the random-access resource, include the following parameters in the chronological order of the random-access attempt:

4> if the random-access attempt is performed on the contention based random-access resource and if *raPurpose* is not equal to '*requestForOtherSI*', include *contentionDetected* as follows:

5> if contention resolution was not successful as specified in TS 38.321 [6] for the transmitted preamble:

6> set the *contentionDetected* to *true*;

5> else:

6> set the *contentionDetected* to *false*;

4> if the random access attempt is a 2-step random access attempt:

5> if fallback from 2-step random access to 4-step random access occurred during the random access attempt:

6> set *fallbackToFourStepRA* to *true*;

5> else:

6> set *fallbackToFourStepRA* to *false*;

4> if the random-access attempt is performed on the contention based random-access resource; or

4> if the random-access attempt is performed on the contention free random-access resource and if the random-access procedure was initiated due to the PDCCH ordering:

5> if the random access attempt is a 4-step random access attempt and the SS/PBCH block RSRP of the SS/PBCH block corresponding to the random-access resource used in the random-access attempt is above *rsrp-ThresholdSSB*; or

5> if the random access attempt is a 2-step random access attempt and the SS/PBCH block RSRP of the SS/PBCH block corresponding to the random-access resource used in the random-access attempt is above *msgA-RSRP-ThresholdSSB*:

6> set the *dlRSRPAboveThreshold* to *true*;

5> else:

6> set the *dlRSRPAboveThreshold* to *false*;

2> else if the random-access resource used is associated to a CSI-RS, set the associated random-access parameters for the successive random-access attempts associated to the same CSI-RS for one or more random-access attempts as follows:

3> set the *csi-RS-Index* to include the CSI-RS index associated to the used random-access resource;

3> set the *numberOfPreamblesSentOnCSI-RS* to indicate the number of successive random-access attempts associated to the CSI-RS.

NOTE 1: Void.

#### 5.7.10.X Actions for the successful handover report determination

The UE shall:

1> if the ratio between the value of the elapsed time of the timer T304 and the configured value of the timer T304, included in the last applied *RRCReconfiguration* message including the *reconfigurationWithSync*, is greater than *thresholdPercentageT304* included in the *successHO-Config* received before executing the last reconfiguration with sync; or

1> if the ratio between the value of the elapsed time of the timer T310 and the configured value of the timer T310, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT310* included in the *successHO-Config* configured by the source PCell before executing the last reconfiguration with sync; or

1> if the T312 associated to the measurement identity of the target cell was running at the time of initiating the execution of the reconfiguration with sync procedure and if the ratio between the value of the elapsed time of the timer T312 and the configured value of the timer T312, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT312* included in the s*uccessHO-Config* configured by the source PCell before executing the last reconfiguration with sync; or

1> if *sourceDAPSFailureReporting* included in the *successHO-Config* before executing the last reconfiguration with sync is set to *true* and if the last executed handover was a DAPS handover and if an RLF occurred at the source PCell during the DAPS handover while T304 was running:

2> store the successful handover information in *VarSuccessHO-Report* and determine the content in *VarSuccessHO-Report* as follows:

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

3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e., includes the RPLMN);

3> set the *c-RNTI* to the C-RNTI assigned by the target PCell of the handover;

3> for the source PCell in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied:

4> set the *sourceCellID* in *sourceCellInfo* to the global cell identity and tracking area code of the source PCell;

4> set the *sourceCellMeas* in *sourceCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the source PCell based on the available SSB and CSI-RS measurements collected up to the moment the UE sends *RRCReconfigurationComplete* message*;*

4> set the *rsIndexResults* in *sourceCellMeas* to include all the available SSB and CSI-RS measurement quantities of the source PCell collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> if the last executed handover was a DAPS handover and if an RLF occurred at the source PCell during the DAPS handover while T304 was running:

5> set the *rlfInSource-DAPS* in *sourceCellInfo* to *true*;

3> for the target PCell indicated in the last applied *RRCReconfiguration* message including *reconfigurationWithSync*:

4> set the *targetCellID* in *targetCellInfo* to the global cell identity and tracking area code of the target PCell;

4> set the *targetCellMeas* in *targetCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the target PCell based on the available SSB and CSI-RS measurements collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> set the *rsIndexResults* in *targetCellMeas* to include all the available SSB and CSI-RS measurement quantities of the target PCell collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> if the last applied *RRCReconfiguration* message including *reconfigurationWithSync* was included in the stored *condRRCReconfig*:

5> set the *timeSinceCHOReconfig* to the time elapsed between the initiation of the execution of conditional reconfiguration for the target PCell and the reception of the last *conditionalReconfiguration* including the *condRRCReconfig* of the target PCell in the source PCell;

3> if the ratio between the value of the elapsed time of the timer T304 and the configured value of the T304 timer, included in the last applied *RRCReconfiguration* message including the *reconfigurationWithSync*, is greater than *thresholdPercentageT304* included in the *successHO-Config* received before executing the last reconfiguration with sync:

4> set *t304-cause* in *shr-Cause* to *true*;

4> set the *ra-InformationCommon* as specified in subclause 5.7.10.5;

3> if the ratio between the value of the elapsed time of the timer T310 and the configured value of the T310 timer, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT310* included in the *successHO-Config* configured by the source PCell before executing the last reconfiguration with sync:

4> set *t310-cause* in *shr-Cause* to *true*;

3> if the ratio between the value of the elapsed time of the timer T312 and the configured value of the T312 timer, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT312* included in the s*uccessHO-Config* configured by the source PCell before executing the last reconfiguration with sync:

4> set *t312-cause* in *shr-Cause* to *true*;

3> if *sourceDAPSFailureReporting* included in the *successHO-Config* configured by the source PCell before executing the last reconfiguration with sync is set to *true*, and if the last executed handover was a DAPS handover and if an RLF occurred at the source PCell during the DAPS handover while T304 was running:

4> set *sourceDAPSFailure* in *shr-Cause* to *true*;

3> for each of the *measObjectNR*, configured by the source PCell, in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied:

4> if measurements are available for the *measObjectNR*:

5> if the SS/PBCH block-based measurement quantities are available:

6> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell or target PCell, ordered such that the cell with highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the cell with highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the cell with highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message;

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

5> if the CSI-RS measurement quantities are available:

6> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell and target PCell, ordered such that the cell with highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the cell with highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the cell with highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message;

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

3> for each of the *measObjectEUTRA*, configured by the source PCell in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied:

4> if measurements are available for the *measObjectEUTRA*:

5> set the *measResultListEUTRA* in *measResultNeighCells* to include the best measured cells ordered such that the cell with highest RSRP is listed first if RSRP measurement results are available, otherwise the cell with highest RSRQ is listed first, based on measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message;

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

3> for each of the neighbour cells included in *measResultNeighCells*:

4> if the cell was a candidate target cell included in the *condRRCReconfig* within the *conditionalReconfiguration* configured by the source PCell, in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied:

5> set the *choCandidate* to *true* in *measResultNR*;

3> if available, set the *locationInfo* as in 5.3.3.7;

1> release *successHO-Config* configured by the source PCell before executing the last reconfiguration with sync.

The UE may discard the successful handover information, i.e., release the UE variable *VarSuccessHO-Report*, 48 hours after the last successful handover information is added to the *VarSuccessHO-Report*.NEXT CHANGE

### 6.2.2 Message definitions

<Text Omitted>

#### – *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-v17xy-IEs OPTIONAL

}

RRCReconfiguration-v17xy-IEs ::= SEQUENCE {

 otherConfig-v17xy OtherConfig-v17xy 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}

-- TAG-RRCRECONFIGURATION-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReconfiguration-IEs* field descriptions |
| ***bap-Config***This field is used to configure the BAP entity for IAB nodes. |
| ***bap-Address***Indicates the BAP address of an IAB-node. The BAP address of an IAB-node cannot be changed once configured to the BAP entity. |
| ***conditionalReconfiguration***Configuration of candidate target SpCell(s) and execution condition(s) for conditional handover or conditional PSCell change. For conditional PSCell change, this field may only be present in an *RRCReconfiguration* message for intra-SN PSCell change. The network does not configure a UE with both conditional PCell change and conditional PSCell change simultaneously. The field is absent if any DAPS bearer is configured or if the *masterCellGroup* includes *ReconfigurationWithSync*. 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. |
| ***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.  |
| ***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. The field has the same values as the corresponding configuration in *servingCellConfigCommon*. |
| ***dedicatedSystemInformationDelivery***This field is used to transfer *SIB6*, *SIB7*, *SIB8* to the UE with an active BWP with no common serach space configured. For UEs in RRC\_CONNECTED, this field is used to transfer the SIBs requested on-demand. |
| ***defaultUL-BAP-RoutingID***This field is used for IAB-node to configure the default uplink Routing ID, which is used by IAB-node during IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment for *F1-C* and *non-F1* traffic. The *defaultUL-BAP-RoutingID* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes. This field is mandatory only for IAB-node bootstrapping. |
| ***defaultUL-BH-RLC-Channel***This field is used for IAB-nodes to configure the default uplink BH RLC channel*,* which is used by IAB-nodeduring IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment *for F1-C and non-F1 traffic*. The *defaultUL-BH-RLC-Channel* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes, and the new IP address is anchored at a different IAB-donor-DU. This field is mandatory for IAB-node bootstrapping. If the IAB-MT is operating in EN-DC, the default uplink BH RLC channel is referring to an RLC channel on the SCG; Otherwise, it is referring to an RLC channel on the MCG. |
| ***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* 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 can only include the field *scg-Configuration*. |
| ***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. |
| ***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, maxCC-PreferenceConfig, maxMIMO-LayerPreferenceConfig*, *minSchedulingOffsetPreferenceConfig, btNameList, wlanNameList, sensorNameList* and *obtainCommonLocation* can be included. |
| ***radioBearerConfig***Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. In EN-DC this field may only be present if the *RRCReconfiguration* is transmitted over SRB3. |
| ***radioBearerConfig2***Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. This field can only be used if the UE supports NR-DC or NE-DC. |
| ***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. |
| ***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. |

|  |  |
| --- | --- |
| 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 |

<Text Omitted>

#### *– SCGFailureInformation*

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

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SCGFailureInformation* message

-- ASN1START

-- TAG-SCGFAILUREINFORMATION-START

SCGFailureInformation ::= SEQUENCE {

 criticalExtensions CHOICE {

 scgFailureInformation SCGFailureInformation-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

SCGFailureInformation-IEs ::= SEQUENCE {

 failureReportSCG FailureReportSCG OPTIONAL,

 nonCriticalExtension SCGFailureInformation-v1590-IEs OPTIONAL

}

SCGFailureInformation-v1590-IEs ::= SEQUENCE {

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportSCG ::= SEQUENCE {

 failureType ENUMERATED {

 t310-Expiry, randomAccessProblem,

 rlc-MaxNumRetx,

 synchReconfigFailureSCG, scg-ReconfigFailure,

 srb3-IntegrityFailure, other-r16, spare1},

 measResultFreqList MeasResultFreqList OPTIONAL,

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

 ...,

 [[

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

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

 t312-Expiry-r16, bh-RLF-r16, spare4, spare3, spare2, spare1} OPTIONAL

 ]],

 [[

 previousPSCellId-r17 SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR

 } OPTIONAL,

 failedPSCellId-r17 SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR

 } OPTIONAL,

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

 perRAInfoList-r17 PerRAInfoList-r16 OPTIONAL

 ]]

}

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

-- TAG-SCGFAILUREINFORMATION-STOP

-- ASN1STOP

| *SCGFailureInformation field descriptions* |
| --- |
| ***measResultFreqList***The field contains available results of measurements on NR frequencies the UE is configured to measure by *measConfig*. |
| ***measResultSCG-Failure***The field contains the *MeasResultSCG-Failure* IE which includes available results of measurements on NR frequencies the UE is configured to measure by the NR SCG *RRCReconfiguration* message.  |
| ***timeSCGFailure***This field is used to indicate the time elapsed since the last execution of *RRCReconfiguration* with *reconfigurationWithSync* for the SCG until the SCG failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |

<Text Omitted>

#### – *UEInformationRequest*

The *UEInformationRequest* message is used by the network to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*UEInformationRequest message*

-- ASN1START

-- TAG-UEINFORMATIONREQUEST-START

UEInformationRequest-r16 ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 ueInformationRequest-r16 UEInformationRequest-r16-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

UEInformationRequest-r16-IEs ::= SEQUENCE {

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

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

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

 ra-ReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

 rlf-ReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

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

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension UEInformationRequest-r17-IEs OPTIONAL

}

}

UEInformationRequest-r17-IEs ::= SEQUENCE {

 successHO-ReportReq-r17 ENUMERATED {true} OPTIONAL, -- Need N

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UEINFORMATIONREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationRequest-IEs* field descriptions |
| ***connEstFailReportReq***This field is used to indicate whether the UE shall report information about the connection failure. |
| ***idleModeMeasurementReq***This field indicates that the UE shall report the idle/inactive measurement information, if available, to the network in the *UEInformationResponse* message.  |
| ***logMeasReportReq***This field is used to indicate whether the UE shall report information about logged measurements. |
| ***mobilityHistoryReportReq***This field is used to indicate whether the UE shall report information about mobility history information. |
| ***ra-ReportReq***This field is used to indicate whether the UE shall report information about the random access procedure. |
| ***rlf-ReportReq***This field is used to indicate whether the UE shall report information about the radio link failure. |
| ***successHO-ReportReq***This field is used to indicate whether the UE shall report information about the successful handover report. |

#### – *UEInformationResponse*

The *UEInformationResponse* message is used by the UE to transfer information requested by the network.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*UEInformationResponse message*

-- ASN1START

-- TAG-UEINFORMATIONRESPONSE-START

UEInformationResponse-r16 ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 ueInformationResponse-r16 UEInformationResponse-r16-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

UEInformationResponse-r16-IEs ::= SEQUENCE {

 measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

 measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

 logMeasReport-r16 LogMeasReport-r16 OPTIONAL,

 connEstFailReport-r16 ConnEstFailReport-r16 OPTIONAL,

 ra-ReportList-r16 RA-ReportList-r16 OPTIONAL,

 rlf-Report-r16 RLF-Report-r16 OPTIONAL,

 mobilityHistoryReport-r16 MobilityHistoryReport-r16 OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension UEInformationResponse-r17-IEs OPTIONAL

}

UEInformationResponse-r17-IEs ::= SEQUENCE {

 successHO-Report-r17 SuccessHO-Report-r17 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

LogMeasReport-r16 ::= SEQUENCE {

 absoluteTimeStamp-r16 AbsoluteTimeInfo-r16,

 traceReference-r16 TraceReference-r16,

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

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

 logMeasInfoList-r16 LogMeasInfoList-r16,

 logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

 ...

}

LogMeasInfoList-r16 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r16)) OF LogMeasInfo-r16

LogMeasInfo-r16 ::= SEQUENCE {

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 relativeTimeStamp-r16 INTEGER (0..7200),

 servCellIdentity-r16 CGI-Info-Logging-r16 OPTIONAL,

 measResultServingCell-r16 MeasResultServingCell-r16 OPTIONAL,

 measResultNeighCells-r16 SEQUENCE {

 measResultNeighCellListNR MeasResultListLogging2NR-r16 OPTIONAL,

 measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

 },

 anyCellSelectionDetected-r16 ENUMERATED {true} OPTIONAL,

 ...

}

ConnEstFailReport-r16 ::= SEQUENCE {

 measResultFailedCell-r16 MeasResultFailedCell-r16,

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 measResultNeighCells-r16 SEQUENCE {

 measResultNeighCellListNR MeasResultList2NR-r16 OPTIONAL,

 measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

 },

 numberOfConnFail-r16 INTEGER (1..8),

 perRAInfoList-r16 PerRAInfoList-r16,

 timeSinceFailure-r16 TimeSinceFailure-r16,

 ...

}

MeasResultServingCell-r16 ::= SEQUENCE {

 resultsSSB-Cell MeasQuantityResults,

 resultsSSB SEQUENCE{

 best-ssb-Index SSB-Index,

 best-ssb-Results MeasQuantityResults,

 numberOfGoodSSB INTEGER (1..maxNrofSSBs-r16)

 } OPTIONAL

}

MeasResultFailedCell-r16 ::= SEQUENCE {

 cgi-Info CGI-Info-Logging-r16,

 measResult-r16 SEQUENCE {

 cellResults-r16 SEQUENCE{

 resultsSSB-Cell-r16 MeasQuantityResults

 },

 rsIndexResults-r16 SEQUENCE{

 resultsSSB-Indexes-r16 ResultsPerSSB-IndexList

 }

 }

}

RA-ReportList-r16 ::= SEQUENCE (SIZE (1..maxRAReport-r16)) OF RA-Report-r16

RA-Report-r16 ::= SEQUENCE {

 cellId-r16 CHOICE {

 cellGlobalId-r16 CGI-Info-Logging-r16,

 pci-arfcn-r16 SEQUENCE {

 physCellId-r16 PhysCellId,

 carrierFreq-r16 ARFCN-ValueNR

 }

 },

 ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

 raPurpose-r16 ENUMERATED {accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized,

 schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI,

 msg3RequestForOtherSI-r17, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1},

 ...,

 [[

 spCellID-r17 CGI-Info-Logging-r16 OPTIONAL

 ]]

}

RA-InformationCommon-r16 ::= SEQUENCE {

 absoluteFrequencyPointA-r16 ARFCN-ValueNR,

 locationAndBandwidth-r16 INTEGER (0..37949),

 subcarrierSpacing-r16 SubcarrierSpacing,

 msg1-FrequencyStart-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msg1-FrequencyStartCFRA-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msg1-SubcarrierSpacing-r16 SubcarrierSpacing OPTIONAL,

 msg1-SubcarrierSpacingCFRA-r16 SubcarrierSpacing OPTIONAL,

 msg1-FDM-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

 msg1-FDMCFRA-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

 perRAInfoList-r16 PerRAInfoList-r16,

 ...,

 [[

 perRAInfoList-v1660 PerRAInfoList-v1660 OPTIONAL

 ]],

 [[

 msg1-SCS-From-prach-ConfigurationIndex-r16 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL

 ]],

 [[

 msgA-RO-FrequencyStart-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msgA-RO-FrequencyStartCFRA-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msgA-SubcarrierSpacing-r17 SubcarrierSpacing OPTIONAL,

 msgA-RO-FDM-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

 msgA-RO-FDMCFRA-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

 msgA-SCS-From-prach-ConfigurationIndex-r17 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL,

 msgA-TransMax-r17 ENUMERATED {n1, n2, n4, n6, n8, n10, n20, n50, n100, n200} OPTIONAL,

 msgA-MCS INTEGER (0..15) OPTIONAL,

 nrofPRBs-PerMsgA-PO INTEGER (1..32) OPTIONAL,

 msgA-PUSCH-TimeDomainAllocation INTEGER (1..maxNrofUL-Allocations) OPTIONAL,

 frequencyStartMsgA-PUSCH INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 nrofMsgA-PO-FDM ENUMERATED {one, two, four, eight} OPTIONAL,

 dlPathlossRSRP-r17 RSRP-Range OPTIONAL,

 intendedSIBs-r17 SEQUENCE (SIZE (1..maxSIB)) OF SIB-Type-r17 OPTIONAL,

 ssbsForSI-Acquisition-r17 SEQUENCE (SIZE (1..maxNrofSSBs)) OF SSB-Index OPTIONAL,

 msgA-PUSCH-PayloadSize-r17 BIT STRING (SIZE (3)) OPTIONAL,

 onDemandSISuccess-r17 BOOLEAN OPTIONAL ]]

}

PerRAInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAInfo-r16

PerRAInfoList-v1660 ::= SEQUENCE (SIZE (1..200)) OF PerRACSI-RSInfo-v1660

PerRAInfo-r16 ::= CHOICE {

 perRASSBInfoList-r16 PerRASSBInfo-r16,

 perRACSI-RSInfoList-r16 PerRACSI-RSInfo-r16

}

PerRASSBInfo-r16 ::= SEQUENCE {

 ssb-Index-r16 SSB-Index,

 numberOfPreamblesSentOnSSB-r16 INTEGER (1..200),

 perRAAttemptInfoList-r16 PerRAAttemptInfoList-r16

}

PerRACSI-RSInfo-r16 ::= SEQUENCE {

 csi-RS-Index-r16 CSI-RS-Index,

 numberOfPreamblesSentOnCSI-RS-r16 INTEGER (1..200)

}

PerRACSI-RSInfo-v1660 ::= SEQUENCE {

 csi-RS-Index-v1660 INTEGER (1..96) OPTIONAL

}

PerRAAttemptInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAAttemptInfo-r16

PerRAAttemptInfo-r16 ::= SEQUENCE {

 contentionDetected-r16 BOOLEAN OPTIONAL,

 dlRSRPAboveThreshold-r16 BOOLEAN OPTIONAL,

 ... ,

 [[

 fallbackToFourStepRA-r17 BOOLEAN OPTIONAL

 ]]

}

SIB-Type-r17 ::= ENUMERATED {sibType2, sibType3, sibType4, sibType5, sibType9,

 sibType10-v1610, sibType11-v1610, sibType12-v1610, sibType13-v1610, sibType14-v1610,

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

RLF-Report-r16 ::= CHOICE {

 nr-RLF-Report-r16 SEQUENCE {

 measResultLastServCell-r16 MeasResultRLFNR-r16,

 measResultNeighCells-r16 SEQUENCE {

 measResultListNR-r16 MeasResultList2NR-r16 OPTIONAL,

 measResultListEUTRA-r16 MeasResultList2EUTRA-r16 OPTIONAL

 } OPTIONAL,

 c-RNTI-r16 RNTI-Value,

 previousPCellId-r16 CHOICE {

 nrPreviousCell-r16 CGI-Info-Logging-r16,

 eutraPreviousCell-r16 CGI-InfoEUTRALogging

 } OPTIONAL,

 failedPCellId-r16 CHOICE {

 nrFailedPCellId-r16 CHOICE {

 cellGlobalId-r16 CGI-Info-Logging-r16,

 pci-arfcn-r16 SEQUENCE {

 physCellId-r16 PhysCellId,

 carrierFreq-r16 ARFCN-ValueNR

 }

 },

 eutraFailedPCellId-r16 CHOICE {

 cellGlobalId-r16 CGI-InfoEUTRALogging,

 pci-arfcn-r16 SEQUENCE {

 physCellId-r16 EUTRA-PhysCellId,

 carrierFreq-r16 ARFCN-ValueEUTRA

 }

 }

 },

 reconnectCellId-r16 CHOICE {

 nrReconnectCellId-r16 CGI-Info-Logging-r16,

 eutraReconnectCellId-r16 CGI-InfoEUTRALogging

 } OPTIONAL,

 timeUntilReconnection-r16 TimeUntilReconnection-r16 OPTIONAL,

 reestablishmentCellId-r16 CGI-Info-Logging-r16 OPTIONAL,

 timeConnFailure-r16 INTEGER (0..1023) OPTIONAL,

 timeSinceFailure-r16 TimeSinceFailure-r16,

 connectionFailureType-r16 ENUMERATED {rlf, hof},

 rlf-Cause-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

 beamFailureRecoveryFailure, lbtFailure-r16,

 bh-rlfRecoveryFailure, t312-expiry-r17, spare1},

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 noSuitableCellFound-r16 ENUMERATED {true} OPTIONAL,

 ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

 ...,

 [[

 csi-rsRLMConfigBitmap-v1650 BIT STRING (SIZE (96)) OPTIONAL

 ]],

 [[

 dapsHOF-r17 ENUMERATED {true} OPTIONAL,

 lastHOType-r17 ENUMERATED {cho, daps, spare2, spare1} OPTIONAL,

 timeConnSourceDAPSFailure-r17 TimeConnSourceDAPSFailure-r17 OPTIONAL,

 timeSinceCHOReconfig-r17 TimeSinceCHOReconfig-r17 OPTIONAL,

 choCellId-r17 CHOICE {

 cellGlobalId-r17 CGI-Info-Logging-r16,

 pci-arfcn-r17 SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR

 }

 } OPTIONAL,

 choCandidateCellList-r17 ChoCandidateCellList-r17 OPTIONAL

 ]]

 },

 eutra-RLF-Report-r16 SEQUENCE {

 failedPCellId-EUTRA CGI-InfoEUTRALogging,

 measResult-RLF-Report-EUTRA-r16 OCTET STRING,

 ...

 }

}

SuccessHO-Report-r17 ::= SEQUENCE {

 sourceCellInfo-r17 SEQUENCE {

 sourcePCellId-r17 CGI-Info-Logging-r16 OPTIONAL,

 sourceCellMeas-r17 MeasResultSuccessHONR-r17 OPTIONAL,

 rlfInSource-DAPS-r17 ENUMERATED {true} OPTIONAL

 },

 targetCellInfo-r17 SEQUENCE {

 targetPCellId-r17 CGI-Info-Logging-r16 OPTIONAL,

 targetCellMeas-r17 MeasResultSuccessHONR-r17 OPTIONAL

 },

 measResultNeighCells-r17 SEQUENCE {

 measResultListNR-r17 MeasResultList2NR-r16 OPTIONAL,

 measResultListEUTRA-r17 MeasResultList2EUTRA-r16 OPTIONAL

 } OPTIONAL,

 locationInfo-r17 LocationInfo-r16 OPTIONAL,

 timeSinceCHOReconfig-r17 TimeSinceCHOReconfig-r17 OPTIONAL,

 shr-Cause-r17 SHR-Cause-r17 OPTIONAL,

 ra-InformationCommon-r17 RA-InformationCommon-r16 OPTIONAL,

 upInterruptionTimeAtHO-r17 UpInterruptionTimeAtHO-r17 OPTIONAL,

 c-RNTI-r17 RNTI-Value OPTIONAL,

 ...

}

MeasResultList2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2NR-r16

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

MeasResult2NR-r16 ::= SEQUENCE {

 ssbFrequency-r16 ARFCN-ValueNR OPTIONAL,

 refFreqCSI-RS-r16 ARFCN-ValueNR OPTIONAL,

 measResultList-r16 MeasResultListNR

}

MeasResultListLogging2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResultLogging2NR-r16

MeasResultLogging2NR-r16 ::= SEQUENCE {

 carrierFreq-r16 ARFCN-ValueNR,

 measResultListLoggingNR-r16 MeasResultListLoggingNR-r16

}

MeasResultListLoggingNR-r16 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultLoggingNR-r16

MeasResultLoggingNR-r16 ::= SEQUENCE {

 physCellId-r16 PhysCellId,

 resultsSSB-Cell-r16 MeasQuantityResults,

 numberOfGoodSSB-r16 INTEGER (1..maxNrofSSBs-r16) OPTIONAL

}

MeasResult2EUTRA-r16 ::= SEQUENCE {

 carrierFreq-r16 ARFCN-ValueEUTRA,

 measResultList-r16 MeasResultListEUTRA

}

MeasResultRLFNR-r16 ::= SEQUENCE {

 measResult-r16 SEQUENCE {

 cellResults-r16 SEQUENCE{

 resultsSSB-Cell-r16 MeasQuantityResults OPTIONAL,

 resultsCSI-RS-Cell-r16 MeasQuantityResults OPTIONAL

 },

 rsIndexResults-r16 SEQUENCE{

 resultsSSB-Indexes-r16 ResultsPerSSB-IndexList OPTIONAL,

 ssbRLMConfigBitmap-r16 BIT STRING (SIZE (64)) OPTIONAL,

 resultsCSI-RS-Indexes-r16 ResultsPerCSI-RS-IndexList OPTIONAL,

 csi-rsRLMConfigBitmap-r16 BIT STRING (SIZE (96)) OPTIONAL

 } OPTIONAL

 }

}

MeasResultSuccessHONR-r17::= SEQUENCE {

 measResult-r17 SEQUENCE {

 cellResults-r17 SEQUENCE{

 resultsSSB-Cell-r17 MeasQuantityResults OPTIONAL,

 resultsCSI-RS-Cell-r17 MeasQuantityResults OPTIONAL

 },

 rsIndexResults-r17 SEQUENCE{

 resultsSSB-Indexes-r17 ResultsPerSSB-IndexList OPTIONAL,

 resultsCSI-RS-Indexes-r17 ResultsPerCSI-RS-IndexList OPTIONAL

 }

 }

}

ChoCandidateCellList-r17 SEQUENCE(SIZE (1..maxNrofCondCells-r16) of ChoCandidate-r17

ChoCandidate-r17 ::= CHOICE {

 cellGlobalId CGI-Info-Logging-r16,

 pci-arfcn SEQUENCE {

 physCellId PhysCellId,

 carrierFreq ARFCN-ValueNR

 }

}

SHR-Cause-r17 ::= SEQUENCE {

 t304-cause ENUMERATED {true} OPTIONAL,

 t310-cause ENUMERATED {true} OPTIONAL,

 t312-cause ENUMERATED {true} OPTIONAL,

 sourceDAPSFailure ENUMERATED {true} OPTIONAL,

.......

}

TimeSinceFailure-r16 ::= INTEGER (0..172800)

MobilityHistoryReport-r16 ::= VisitedCellInfoList-r16

TimeUntilReconnection-r16 ::= INTEGER (0..172800)

TimeSinceCHOReconfig-r17 ::= INTEGER (0..1023)

TimeConnSourceDAPSFailure-r17 ::= INTEGER (0..1023)

UpInterruptionTimeAtHO-r17 ::= INTEGER (0..1023)

-- TAG-UEINFORMATIONRESPONSE-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationResponse-IEs* field descriptions |
| ***logMeasReport***This field is used to provide the measurement results stored by the UE associated to logged MDT.  |
| ***measResultIdleEUTRA***EUTRA measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***measResultIdleNR***NR measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***ra-ReportList***This field is used to provide the list of RA reports that is stored by the UE for the past upto *maxRAReport-r16* number of successful random access procedures. |
| ***rlf-Report***This field is used to indicate the RLF report related contents. |

|  |
| --- |
| *LogMeasReport* field descriptions |
| ***absoluteTimeStamp***Indicates the absolute time when the logged measurement configuration logging is provided, as indicated by NR within *absoluteTimeInfo*. |
| ***anyCellSelectionDetected***This field is used to indicate the detection of *any cell selection* state, as defined in TS 38.304 [20]. The UE sets this field when performing the logging of measurement results in RRC\_IDLE or RRC\_INACTIVE and there is no suitable cell or no acceptable cell. |
| ***measResultServingCell***This field refers to the log measurement results taken in the Serving cell. |
| ***numberOfGoodSSB***Indicates the number of good beams (beams that are above *absThreshSS-BlocksConsolidation,* if configured by the network) associated to the cells within the R value range (which is configured by network for cell reselection) of the highest ranked cell as part of the beam level measurements. If the UE has no SSB of a neighbour cell whose measurement quantity is above the *absThreshSS-BlocksConsolidation* or if the network has not configured the *absThreshSS-BlocksConsolidation*, then the UE does not include *numberOfGoodSSB* for the corresponding neighbour cell. If the UE has no SSB of the serving cell whose measurement quantity is above the *absThreshSS-BlocksConsolidation* or if the network has not configured the *absThreshSS-BlocksConsolidation*, then the UE shall set the *numberOfGoodSSB* for the serving cell to one. |
| ***relativeTimeStamp***Indicates the time of logging measurement results, measured relative to the *absoluteTimeStamp*. Value in seconds. |
| ***tce-Id***Parameter Trace Collection Entity Id: See TS 32.422 [52]. |
| ***traceRecordingSessionRef***Parameter Trace Recording Session Reference: See TS 32.422 [52]. |

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| --- |
| *ConnEstFailReport* field descriptions |
| ***measResultFailedCell***This field refers to the last measurement results taken in the cell, where connection establishment failure or connection resume failure happened. |
| ***measResultNeighCells***This field refers to the neighbour cell measurements when connection establishment failure or connection resume failure happened. |
| ***numberOfConnFail***This field is used to indicate the latest number of consecutive failed RRCSetup or RRCResume procedures in the same cell independent of RRC state transition. |
| ***timeSinceFailure***This field is used to indicate the time that elapsed since the connection (establishment or resume) failure. Value in seconds. The maximum value 172800 means 172800s or longer. |

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| *RA-InformationCommon* field descriptions |
| ***absoluteFrequencyPointA***This field indicates the absolute frequency position of the reference resource block (Common RB 0). |
| ***locationAndBandwidth***Frequency domain location and bandwidth of the bandwidth part associated to the random-access resources used by the UE. |
| ***perRAInfoList, perRAInfoList-v1660***This field provides detailed information about each of the random access attempts in the chronological order of the random access attempts. If perRAInfoList-v1660 is present, it shall contain the same number of entries, listed in the same order as in perRAInfoList-r16. |
| ***subcarrierSpacing***Subcarrier spacing used in the BWP associated to the random-access resources used by the UE. |

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| *RA-Report* field descriptions |
| ***cellID***This field indicates the CGI of the cell in which the associated random access procedure was performed. |
| ***contentionDetected***This field is used to indicate that contention was detected for the transmitted preamble in the given random access attempt or not. This field is not included when the UE performs random access attempt is using contention free random-access resources or when the *raPurpose* is set to *requestForOtherSI* or when the RA attempt is a 2-step RA attempt and fallback to 4-step RA did not occur (i.e. *fallbackToFourStepRA* is not included or is set to *false*). |
| ***csi-RS-Index, csi-RS-Index-v1660***This field is used to indicate the CSI-RS index corresponding to the random access attempt.If the random access procedure is for beam failure recovery, the field indicates the NZP-CSI-RS-ResourceId. For CSI-RS index larger than maxNrofCSI-RS-ResourcesRRM-1, the index value is the sum of csi-RS-Index (without suffix) and csi-RS-Index-v1660. |
| ***dlPathlossRSRP***Measeured RSRP of the DL pathloss reference obtained at the time of *RA\_Type* selection stage of the RA procedure as captured in TS 38.321 [3]. |
| ***dlRSRPAboveThreshold***In 4 step random access procedure, this field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold *rsrp-ThresholdSSB* in *beamFailureRecoveryConfig* in UL BWP configuration of UL BWP selected for random access procedure initiated for beam failure recovery; Otherwise, *rsrp-ThresholdSSB* in *rach-ConfigCommon* in UL BWP configuration of UL BWP selected for random access procedure.In 2 step random access procedure, this field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold *msgA-RSRP-ThresholdSSB* in *rach-ConfigCommonTwoStepRA* in UL BWP configuration of UL BWP selected for random access procedure. |
| ***fallbackToFourStepRA***This field indicates if a fallback indication in MsgB is received (according to TS 38.321 [3]) for the 2-step random access attempt. |
| ***intendedSIBs***This field indicates the SIB(s) the UE wanted to receive as a result of the on demand SI request (when the RA procedure is a used as a SI request) initiated by the UE. That is, it indicates the one(s) of the SIB(s) in the SI message(s) requested to be broadcast that the UE was interested in. |
| ***msg1-SCS-From-prach-ConfigurationIndex***This field is set by the UE with the corresponding SCS as derived from the *prach-ConfigurationIndex* in *RACH-ConfigGeneric* when the *msg1-SubcarrierSpacing* is absent; otherwise, this field is absent. |
| ***msgA-PUSCH-PayloadSize***This field indicates the size of the overall payload available in the UE buffer at the time of initiating the 2 step RA procedure. The value refers to the index of TS 38.321 [3], table 6.1.3.1-1, corresponding to the UE buffer size. |
| ***msgA-RO-FDM***This field indicates the number of msgA PRACH transmission occasions Frequency-Division Multiplexed in one time instance for the PRACH resources configured for 2-step CBRA.. |
| ***msgA-RO-FDMCFRA***This field indicates the number of msgA PRACH transmission occasions Frequency-Division Multiplexed in one time instance for the PRACH resources configured for 2-step CFRA. |
| ***msgA-RO-FrequencyStart***This field indicates the lowest resource block of the contention based random-access resources for 2-step CBRA attempts in the random-access procedure. The indication has the form of the offset of the lowest PRACH transmissions occasion with respect to PRB 0 in the frequency domain. |
| ***msgA-RO-FrequencyStartCFRA***This field indicates the lowest resource block of the contention free random-access resources for the 2-step CFRA attempts in the random-access procedure. The indication has the form of the offset of the lowest PRACH transmissions occasion with respect to PRB 0 in the frequency domain. |
| ***msgA-SCS-From-prach-ConfigurationIndex***This field is set by the UE with the corresponding SCS as derived from the *msgA-PRACH-ConfigurationIndex* in *RACH-ConfigGenericTwoStepRA* when the *msgA-SubcarrierSpacing* is absent; otherwise, this field is absent. |
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| ***numberOfPreamblesSentOnCSI-RS***This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding CSI-RS. |
| ***numberOfPreamblesSentOnSSB***This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding SS/PBCH block. |
| ***onDemandSISuccess***This field is set to *true* when the RA report entry is included because of either msg1 based on demand SI request or msg3 based on demand SI request and if the on-demand SI request is successful. This field is set to *false* when the RA report entry is included because of either msg1 based on demand SI request or msg3 based on demand SI request and if the on-demand SI request is not successful. Otherwise, the field is absent. |
| ***perRAAttemptInfoList***This field provides detailed information about a random access attempt. |
| ***perRACSI-RSInfoList***This field provides detailed information about the successive random access attempts associated to the same CSI-RS. |
| ***perRASSBInfoList***This field provides detailed information about the successive random access attempts associated to the same SS/PBCH block. |
| ***ra-InformationCommon***This field is used to provide information on random access attempts. This field is mandatory present. |
| ***raPurpose***This field is used to indicate the RA scenario for which the RA report entry is triggered. The RA accesses associated to Initial access from RRC\_IDLE, RRC re-establishment procedure, transition from RRC-INACTIVE. The indicator *beamFailureRecovery* is used in case of successful beam failure recovery related RA procedure in the SpCell [3]. The indicator *reconfigurationWithSync* is used if the UE executes a reconfiguration with sync. The indicator *ulUnSynchronized* is used if the random access procedure is initiated in a SpCell by DL or UL data arrival during RRC\_CONNECTED when the timeAlignmentTimer is not running in the PTAG or if the RA procedure is initiated in a serving cell by a PDCCH order [3]. The indicator *schedulingRequestFailure* is used in case of SR failures [3]. The indicator *noPUCCHResourceAvailable* is used when the UE has no valid SR PUCCH resources configured [3]. The indicator *requestForOtherSI* is used for MSG1 based on demand SI request. The indicator *msg3RequestForOtherSI* is used in case of MSG3 based SI request.  |
| ***spCellID***This field is used to indicate the CGI of the SpCell of the cell group associated to the SCell in which the associated random access procedure was performed. If the UE performs RA procedure on a SCell associated to the MCG, then this field is set to the CGI of the PCell and if the UE performs RA procedure on a SCell associated to the SCG, then this field is set to the CGI of the PSCell. Otherwise, the field is absent. |
| ***ssb-Index***This field is used to indicate the SS/PBCH index of the SS/PBCH block corresponding to the random access attempt. |
| ***ssbsForSI-Acquisition***This field indicates the SSB(s) (in the form of SSB index(es)) that the UE used to receive the requested SI message(s). The field is present if the purpose of the random access procedure was to request on-demand SI (i.e. if the *raPurpose* is set to *requestForOtherSI* or *msg3RequestForOtherSI*). Otherwise, the field is absent. |

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| *RLF-Report* field descriptions |
| ***choCellId***This field is used to indicate the candidate target cell for conditional handover included in *condRRCReconfig* that the UE selected for CHO recovery while T311 is running. |
| ***choCandidateCellList*** This field is used to indicate the list of candidate target cells for conditional handover included in *condRRCReconfig* at the time of connection failure. The field does not include the candidate target cells included in *measResulNeighCells*. |
| ***connectionFailureType***This field is used to indicate whether the connection failure is due to radio link failure or handover failure. |
| ***csi-rsRLMConfigBitmap,csi-rsRLMConfigBitmap-v1650***These fields are used to indicate the CSI-RS indexes configured in the RLM configurations for the active BWP when the UE declares RLF or HOF. The UE first fills in the *csi-rsRLMConfigBitmap-r16* to indicate the first 96 CSI-RS indexes and then *csi-rsRLMConfigBitmap-v1650* to indicate the latter 96 CSI-RS indexes. The first/leftmost bit in *csi-rsRLMConfigBitmap-r16* corresponds to CSI-RS index 0, the second bit corresponds to CSI-RS index 1. The first/leftmost bit in *csi-rsRLMConfigBitmap-v1650* corresponds to CSI-RS index 96, the second bit corresponds to CSI-RS index 97. These fields are included only if the *RadioLinkMonitoringConfig* for the respective BWP is configured. |
| ***c-RNTI***This field indicates the C-RNTI used in the PCell upon detecting radio link failure or the C-RNTI used in the source PCell upon handover failure. |
| ***dapsHOF***This field indicates whether the last handover failure (i.e., the failed handover associated to the *hof* indicated in the *connectionFailureType*) occurred upon a DAPS handover execution. |
| ***failedPCellId***This field is used to indicate the PCell in which RLF is detected or the target PCell of the failed handover. For intra-NR handover *nrFailedPCellId* is included and for the handover from NR to EUTRA *eutraFailedPCellId* is included. The UE sets the ARFCN according to the frequency band used for transmission/ reception when the failure occurred. |
| ***failedPCellId-EUTRA***This field is used to indicate the PCell in which RLF is detected or the source PCell of the failed handover in an E-UTRA RLF report. |
| ***lastHOType***This field is used to indicate the type of the last executed handover before the last detected connection failure. The field is set to *cho* if the last executed handover was initiated by a conditional reconfiguration execution. The field is set to *daps* if the last executed handover was a DAPS handover. |
| ***measResultListEUTRA***This field refers to the last measurement results taken in the neighboring EUTRA Cells, when the radio link failure or handover failure happened. |
| ***measResultListNR***This field refers to the last measurement results taken in the neighboring NR Cells, when the radio link failure or handover failure happened or successful handover happened. If configuration of the conditional handover is available in *VarConditionalReconfig* when the radio link failure happened, or if the the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a conditional handover when the handover failure or the successful handover happened, the UE uses *measResultListNR-r17*, otherwise it uses *measResultListNR-r16*. |
| ***measResultLastServCell***This field refers to the log measurement results taken in the PCell upon detecting radio link failure or the source PCell upon handover failure. |
| ***measResult-RLF-Report-EUTRA***Includes the E-UTRA *RLF-Report-r9* IE as specified in TS 36.331 [10]. |
| ***noSuitableCellFound***This field is set by the UE when the T311 expires. |
| ***previousPCellId***This field is used to indicate the source PCell of the last handover (source PCell when the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was received). For intra-NR handover *nrPreviousCell* is included and for the handover from EUTRA to NR *eutraPreviousCell* is included. |
| ***ra-InformationCommon***This field is optionally included when c*onnectionFailureType* is set to 'hof' or when *connectionFailureType* is set to 'rlf' and the *rlf-Cause* equals to 'randomAccessProblem' or 'beamRecoveryFailure'; otherwise this field is absent. |
| ***reconnectCellId***This field is used to indicate the cell in which the UE comes back to connected after connection failure and after failing to perform reestablishment. If the UE comes back to RRC CONNECTED in an NR cell then *nrReconnectCellID* is included and if the UE comes back to RRC CONNECTED in an LTE cell then *eutraReconnectCellID* is included |
| ***reestablishmentCellId***If the UE was not configured with *conditionalReconfiguration* at the time of re-establishment attempt, or if the cell selected for the re-establishment attempt is not a candidate target cell for conditional reconfiguration, this field is used to indicate the cell in which the re-establishment attempt was made after connection failure. |
| ***rlf-Cause***This field is used to indicate the cause of the last radio link failure that was detected. In case of handover failure information reporting (i.e., the *connectionFailureType* is set to '*hof*'), the UE is allowed to set this field to any value. |
| *rlfInSource-DAPS*This field indicates whether a radio link failure occurred at the source cell while T304 was running, prior to a DAPS handover failure. |
| ***ssbRLMConfigBitmap***This field is used to indicate the SS/PBCH block indexes configured in the RLM configurations for the active BWP when the UE declares RLF or HOF.The first/leftmost bit corresponds to SSB index 0, the second bit corresponds to SSB index 1. This field is included only if the *RadioLinkMonitoringConfig* for the respective BWP is configured. |
| ***timeConnFailure***This field is used to indicate the time elapsed since the last HO execution until connection failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeConnSourceDAPSFailure***This field is used to indicate the time that elapsed between the last DAPS handover execution and the radio link failure detected in the source cell while T304 is running. Value in milliseconds. The maximum value 1023 means 1023ms or longer. |
| ***timeSinceFailure***This field is used to indicate the time that elapsed since the connection (radio link or handover) failure. Value in seconds. The maximum value 172800 means 172800s or longer. In the case of failure(s) (either at source or at target or at both) associated to DAPS handover, this field indicates the time elapsed since the latest connection (radio link or handover) failure. |
| *timeSinceCHOReconfig*In case of handover failure, this field is used to indicate the time elapsed between the initiation of the last conditional reconfiguration execution towards the target cell and the reception of the latest conditional reconfiguration for this target cell. In case of radio link failure, this field is used to indicate the time elapsed between the radio link failure and the reception of the latest conditional reconfiguration while connected to the source PCell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeUntilReconnection***This field is used to indicate the time that elapsed between the connection (radio link or handover) failure and the next time the UE comes to RRC CONNECTED in an NR or EUTRA cell, after failing to perform reestablishment. Value in seconds. The maximum value 172800 means 172800s or longer. |

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| *SuccessHO-Report* field descriptions |
| ***c-RNTI***This field indicates the C-RNTI assigned by the target PCell of the handover for which the successful HO report was generated. |
| ***shr-Cause***This field is used to indicate the cause of the successful HO report. |
| *timeSinceCHOReconfig*This field is used to indicate the time elapsed between the initiation of the last conditional reconfiguration execution towards the target cell and the reception of the latest conditional reconfiguration for this target cell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***upInterruptionTimeAtHO*** This field is used to indicate the time elapsed between the time of arrival of the last PDCP PDU received from the source cell and the time of arrival of the first non-duplicate PDCP PDU received from the target cell, and it is measured at the time of arrival of the first non-duplicate PDCP PDU received from the target cell only in DAPS HO scenario. Value in milliseconds. The maximum value 1023 means 1023ms or longer. |

NEXT CHANGE

## 6.3 RRC information elements

### 6.3.2 Radio resource control information elements

<Text Omitted>

#### – *MeasResults*

The IE *MeasResults* covers measured results for intra-frequency, inter-frequency, inter-RAT mobility and measured results for NR sidelink communication.

*MeasResults* information element

-- ASN1START

-- TAG-MEASRESULTS-START

MeasResults ::= SEQUENCE {

 measId MeasId,

 measResultServingMOList MeasResultServMOList,

 measResultNeighCells CHOICE {

 measResultListNR MeasResultListNR,

 ...,

 measResultListEUTRA MeasResultListEUTRA,

 measResultListUTRA-FDD-r16 MeasResultListUTRA-FDD-r16

 } OPTIONAL,

 ...,

 [[

 measResultServFreqListEUTRA-SCG MeasResultServFreqListEUTRA-SCG OPTIONAL,

 measResultServFreqListNR-SCG MeasResultServFreqListNR-SCG OPTIONAL,

 measResultSFTD-EUTRA MeasResultSFTD-EUTRA OPTIONAL,

 measResultSFTD-NR MeasResultCellSFTD-NR OPTIONAL

 ]],

 [[

 measResultCellListSFTD-NR MeasResultCellListSFTD-NR OPTIONAL

 ]],

 [[

 measResultForRSSI-r16 MeasResultForRSSI-r16 OPTIONAL,

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 ul-PDCP-DelayValueResultList-r16 UL-PDCP-DelayValueResultList-r16 OPTIONAL,

 measResultsSL-r16 MeasResultsSL-r16 OPTIONAL,

 measResultCLI-r16 MeasResultCLI-r16 OPTIONAL

 ]]

}

MeasResultServMOList ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF MeasResultServMO

MeasResultServMO ::= SEQUENCE {

 servCellId ServCellIndex,

 measResultServingCell MeasResultNR,

 measResultBestNeighCell MeasResultNR OPTIONAL,

 ...

}

MeasResultListNR ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultNR

MeasResultNR ::= SEQUENCE {

 physCellId PhysCellId OPTIONAL,

 measResult SEQUENCE {

 cellResults SEQUENCE{

 resultsSSB-Cell MeasQuantityResults OPTIONAL,

 resultsCSI-RS-Cell MeasQuantityResults OPTIONAL

 },

 rsIndexResults SEQUENCE{

 resultsSSB-Indexes ResultsPerSSB-IndexList OPTIONAL,

 resultsCSI-RS-Indexes ResultsPerCSI-RS-IndexList OPTIONAL

 } OPTIONAL

 },

 ...,

 [[

 cgi-Info CGI-InfoNR OPTIONAL

 ]],

 [[

 choCandidate-r17 ENUMERATED {true} OPTIONAL,

 choConfig-r17 SEQUENCE (SIZE (1..2)) OF CondTriggerConfig-r16 OPTIONAL,

 triggeredEvent-r17 SEQUENCE {

 condFirstEventFullfilled ENUMERATED {true} OPTIONAL,

 condSecondEventFullfilled ENUMERATED {true} OPTIONAL,

 timeBetweenEvents-r17 TimeBetweenEvent-r17 OPTIONAL,

 firstTriggeredEvent ENUMERATED {condFirstEvent, condSecondEvent} OPTIONAL

 } OPTIONAL,

 ]]

}

MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA

MeasResultEUTRA ::= SEQUENCE {

 eutra-PhysCellId PhysCellId,

 measResult MeasQuantityResultsEUTRA,

 cgi-Info CGI-InfoEUTRA OPTIONAL,

 ...

}

MultiBandInfoListEUTRA ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicatorEUTRA

MeasQuantityResults ::= SEQUENCE {

 rsrp RSRP-Range OPTIONAL,

 rsrq RSRQ-Range OPTIONAL,

 sinr SINR-Range OPTIONAL

}

MeasQuantityResultsEUTRA ::= SEQUENCE {

 rsrp RSRP-RangeEUTRA OPTIONAL,

 rsrq RSRQ-RangeEUTRA OPTIONAL,

 sinr SINR-RangeEUTRA OPTIONAL

}

ResultsPerSSB-IndexList::= SEQUENCE (SIZE (1..maxNrofIndexesToReport2)) OF ResultsPerSSB-Index

ResultsPerSSB-Index ::= SEQUENCE {

 ssb-Index SSB-Index,

 ssb-Results MeasQuantityResults OPTIONAL

}

ResultsPerCSI-RS-IndexList::= SEQUENCE (SIZE (1..maxNrofIndexesToReport2)) OF ResultsPerCSI-RS-Index

ResultsPerCSI-RS-Index ::= SEQUENCE {

 csi-RS-Index CSI-RS-Index,

 csi-RS-Results MeasQuantityResults OPTIONAL

}

MeasResultServFreqListEUTRA-SCG ::= SEQUENCE (SIZE (1..maxNrofServingCellsEUTRA)) OF MeasResult2EUTRA

MeasResultServFreqListNR-SCG ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF MeasResult2NR

MeasResultListUTRA-FDD-r16 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA-FDD-r16

MeasResultUTRA-FDD-r16 ::= SEQUENCE {

 physCellId-r16 PhysCellIdUTRA-FDD-r16,

 measResult-r16 SEQUENCE {

 utra-FDD-RSCP-r16 INTEGER (-5..91) OPTIONAL,

 utra-FDD-EcN0-r16 INTEGER (0..49) OPTIONAL

 }

}

MeasResultForRSSI-r16 ::= SEQUENCE {

 rssi-Result-r16 RSSI-Range-r16,

 channelOccupancy-r16 INTEGER (0..100)

}

MeasResultCLI-r16 ::= SEQUENCE {

 measResultListSRS-RSRP-r16 MeasResultListSRS-RSRP-r16 OPTIONAL,

 measResultListCLI-RSSI-r16 MeasResultListCLI-RSSI-r16 OPTIONAL

}

MeasResultListSRS-RSRP-r16 ::= SEQUENCE (SIZE (1.. maxCLI-Report-r16)) OF MeasResultSRS-RSRP-r16

MeasResultSRS-RSRP-r16 ::= SEQUENCE {

 srs-ResourceId-r16 SRS-ResourceId,

 srs-RSRP-Result-r16 SRS-RSRP-Range-r16

}

MeasResultListCLI-RSSI-r16 ::= SEQUENCE (SIZE (1.. maxCLI-Report-r16)) OF MeasResultCLI-RSSI-r16

MeasResultCLI-RSSI-r16 ::= SEQUENCE {

 rssi-ResourceId-r16 RSSI-ResourceId-r16,

 cli-RSSI-Result-r16 CLI-RSSI-Range-r16

}

UL-PDCP-DelayValueResultList-r16 ::= SEQUENCE (SIZE (1..maxDRB)) OF UL-PDCP-DelayValueResult-r16

UL-PDCP-DelayValueResult-r16 ::= SEQUENCE {

 drb-Id-r16 DRB-Identity,

 averageDelay-r16 INTEGER (0..10000),

 ...

}

TimeBetweenEvent-r17 ::= INTEGER (0..1023)

-- TAG-MEASRESULTS-STOP

-- ASN1STOP

|  |
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| *MeasResultEUTRA* field descriptions |
| ***eutra-PhysCellId***Identifies the physical cell identity of the E-UTRA cell for which the reporting is being performed. The UE reports a value in the range 0..503, other values are reserved. |

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| *MeasResultNR* field descriptions |
| ***averageDelay***Indicates average delay for the packets during the reporting period, as specified in TS 38.314 [53]. Value 0 corresponds to 0 millisecond, value 1 corresponds to 0.1 millisecond, value 2 corresponds to 0.2 millisecond, and so on. |
| ***cellResults***Cell level measurement results. |
| ***choCandidate***This field indicates whether the associated cell is a candidate target cell for conditional handover. This field may be included only in the reports associated to *UEInformationResponse* message, e.g., *SuccessHO-Report*. |
| ***choConfig***If the associated cell is a candidate target cell for conditional handover, this field indicates the conditional handover execution condition for each *measId* within *condTriggerConfig* associated to the cell. This field may be included only in the reports associated to *UEInformationResponse* message, e.g., *rlf-Report*. |
| ***condFirstEventFullfilled***This field indicates whether the first entry of *choConfig* corresponds to a fullfilled execution condition at the moment of conditional reconfiguration execution, or radio link failure. This field may be included only in the reports associated to *UEInformationResponse* message, e.g., *rlf-Report*. |
| ***condSecondEventFullfilled***This field indicates whether the second entry of *choConfig* corresponds to a fullfilled execution condition at the moment of conditional reconfiguration execution, or radio link failure. This field may be included only in the reports associated to *UEInformationResponse* message, e.g., *rlf-Report*. |
| ***drb-Id***Indicates DRB value for which uplink PDCP delay ratio or value is provided, according to TS 38.314 [53]. |
| ***firstTriggeredEvent***This field is set to *condFirstEvent* if the execution condition associated to the first entry of *choConfig* was fulfilled first in time. This field is set to *condSecondEvent* if the execution condition associated to the second entry of *choConfig* was fulfilled first in time. This field may be included only in the reports associated to *UEInformationResponse* message, e.g., *rlf-Report*. |
| ***locationInfo***Positioning related information and measurements. |
| ***physCellId***The physical cell identity of the NR cell for which the reporting is being performed. |
| ***resultsSSB-Cell***Cell level measurement results based on SS/PBCH related measurements. |
| ***resultsSSB-Indexes***Beam level measurement results based on SS/PBCH related measurements. |
| ***resultsCSI-RS-Cell***Cell level measurement results based on CSI-RS related measurements. |
| ***resultsCSI-RS-Indexes***Beam level measurement results based on CSI-RS related measurements. |
| ***rsIndexResults***Beam level measurement results. |
| ***timeBetweenEvents***Indicates the time elapsed between fulfilling the conditional execution conditions included in *choConfig*. Value in milliseconds. The maximum value 1023 means 1023ms or longer. This field may be included only in the reports associated to *UEInformationResponse* message, e.g., *rlf-Report*. |

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| *MeasResultUTRA-FDD* field descriptions |
| ***physCellId***The physical cell identity of the UTRA-FDD cell for which the reporting is being performed. |
| ***utra-FDD-EcN0***According to CPICH\_Ec/No in TS 25.133 [46] for FDD. |
| ***utra-FDD-RSCP***According to CPICH\_RSCP in TS 25.133 [46] for FDD. |

| *MeasResults* field descriptions |
| --- |
| ***measId***Identifies the measurement identity for which the reporting is being performed. |
| ***measQuantityResults***The value sinr is not included when it is used for *LogMeasReport-r16*. |
| ***measResultCellListSFTD-NR***SFTD measurement results between the PCell and the NR neighbour cell(s) in NR standalone. |
| ***measResultCLI***CLI measurement results. |
| ***measResultEUTRA***Measured results of an E-UTRA cell. |
| ***measResultForRSSI***Includes measured RSSI result in dBm (see TS 38.215 [9]) and *channelOccupancy* which is the percentage of samples when the RSSI was above the configured *channelOccupancyThreshold* for the associated *reportConfig*. |
| ***measResultListEUTRA***List of measured results for the maximum number of reported best cells for an E-UTRA measurement identity. |
| ***measResultListNR***List of measured results for the maximum number of reported best cells for an NR measurement identity. |
| ***measResultListUTRA-FDD***List of measured results for the maximum number of reported best cells for a UTRA-FDD measurement identity. |
| ***measResultNR***Measured results of an NR cell. |
| ***measResultServFreqListEUTRA-SCG***Measured results of the E-UTRA SCG serving frequencies: the measurement result of PSCell and each SCell, if any, and of the best neighbouring cell on each E-UTRA SCG serving frequency. |
| ***measResultServFreqListNR-SCG***Measured results of the NR SCG serving frequencies: the measurement result of PSCell and each SCell, if any, and of the best neighbouring cell on each NR SCG serving frequency. |
| ***measResultServingMOList***Measured results of measured cells with reference signals indicated in the serving cell measurement objects including measurement results of SpCell, configured SCell(s) and best neighbouring cell within measured cells with reference signals indicated in on each serving cell measurement object. If the sending of the *MeasurementReport* message is triggered by a measurement configured by the field *sl-ConfigDedicatedForNR* received within an E-UTRA *RRCConnectionReconfiguration* message (i.e. CBR measurements), this field is not applicable and its contents is ignored by the network. |
| ***measResultSFTD-EUTRA***SFTD measurement results between the PCell and the E-UTRA PScell in NE-DC. |
| ***measResultSFTD-NR***SFTD measurement results between the PCell and the NR PScell in NR-DC. |
| ***measResultsSL***CBR measurements results for NR sidelink communication. |
| ***measResultUTRA-FDD***Measured result of a UTRA-FDD cell. |

NEXT CHANGE

### 6.3.3 UE capability information elements

<Text Omitted>

#### – *SON-Parameters*

The IE *SON-Parameters* contains SON related parameters.

*SON-Parameters* information element

-- ASN1START

-- TAG-SON-PARAMETERS-START

SON-Parameters-r16 ::= SEQUENCE {

 rach-Report-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-SON-PARAMETERS-STOP

-- ASN1STOP

NEXT CHANGE

### 6.3.4 Other information elements

<Text Omitted>

#### – *OtherConfig*

The IE *OtherConfig* contains configuration related to miscellaneous other configurations.

*OtherConfig* information element

-- ASN1START

-- TAG-OTHERCONFIG-START

OtherConfig ::= SEQUENCE {

 delayBudgetReportingConfig CHOICE{

 release NULL,

 setup SEQUENCE{

 delayBudgetReportingProhibitTimer ENUMERATED {s0, s0dot4, s0dot8, s1dot6, s3, s6, s12, s30}

 }

 } OPTIONAL -- Need M

}

OtherConfig-v1540 ::= SEQUENCE {

 overheatingAssistanceConfig SetupRelease {OverheatingAssistanceConfig} OPTIONAL, -- Need M

 ...

}

CandidateServingFreqListNR-r16 ::= SEQUENCE (SIZE (1..maxFreqIDC-r16)) OF ARFCN-ValueNR

OtherConfig-v1610 ::= SEQUENCE {

 idc-AssistanceConfig-r16 SetupRelease {IDC-AssistanceConfig-r16} OPTIONAL, -- Need M

 drx-PreferenceConfig-r16 SetupRelease {DRX-PreferenceConfig-r16} OPTIONAL, -- Need M

 maxBW-PreferenceConfig-r16 SetupRelease {MaxBW-PreferenceConfig-r16} OPTIONAL, -- Need M

 maxCC-PreferenceConfig-r16 SetupRelease {MaxCC-PreferenceConfig-r16} OPTIONAL, -- Need M

 maxMIMO-LayerPreferenceConfig-r16 SetupRelease {MaxMIMO-LayerPreferenceConfig-r16} OPTIONAL, -- Need M

 minSchedulingOffsetPreferenceConfig-r16 SetupRelease {MinSchedulingOffsetPreferenceConfig-r16} OPTIONAL, -- Need M

 releasePreferenceConfig-r16 SetupRelease {ReleasePreferenceConfig-r16} OPTIONAL, -- Need M

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

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

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

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

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

 sl-AssistanceConfigNR-r16 ENUMERATED{true} OPTIONAL -- Need R

}

OtherConfig-v17xy ::= SEQUENCE {

 successHO-Config-r17 SetupRelease {SuccessHO-Config-r17} OPTIONAL -- Need M

}

SuccessHO-Config-r17 SEQUENCE {

 thresholdPercentageT304 ENUMERATED {p40, p60, p80, spare5, spare4, spare3, spare2, spare1} OPTIONAL, --Need M

 thresholdPercentageT310 ENUMERATED {p40, p60, p80, spare5, spare4, spare3, spare2, spare1} OPTIONAL, --Need M

 thresholdPercentageT312 ENUMERATED {p20, p40, p60, p80, spare4, spare3, spare2, spare1} OPTIONAL, --Need M

 sourceDAPSFailureReporting ENUMERATED{true} OPTIONAL, --Need M

 ...

}

OverheatingAssistanceConfig ::= SEQUENCE {

 overheatingIndicationProhibitTimer ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, s30,

 s60, s90, s120, s300, s600, spare3, spare2, spare1}

}

IDC-AssistanceConfig-r16 ::= SEQUENCE {

 candidateServingFreqListNR-r16 CandidateServingFreqListNR-r16 OPTIONAL, -- Need R

 ...

}

DRX-PreferenceConfig-r16 ::= SEQUENCE {

 drx-PreferenceProhibitTimer-r16 ENUMERATED {

 s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

 s8, s9, s10, s20, s30, spare2, spare1}

}

MaxBW-PreferenceConfig-r16 ::= SEQUENCE {

 maxBW-PreferenceProhibitTimer-r16 ENUMERATED {

 s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

 s8, s9, s10, s20, s30, spare2, spare1}

}

MaxCC-PreferenceConfig-r16 ::= SEQUENCE {

 maxCC-PreferenceProhibitTimer-r16 ENUMERATED {

 s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

 s8, s9, s10, s20, s30, spare2, spare1}

}

MaxMIMO-LayerPreferenceConfig-r16 ::= SEQUENCE {

 maxMIMO-LayerPreferenceProhibitTimer-r16 ENUMERATED {

 s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

 s8, s9, s10, s20, s30, spare2, spare1}

}

MinSchedulingOffsetPreferenceConfig-r16 ::= SEQUENCE {

 minSchedulingOffsetPreferenceProhibitTimer-r16 ENUMERATED {

 s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

 s8, s9, s10, s20, s30, spare2, spare1}

}

ReleasePreferenceConfig-r16 ::= SEQUENCE {

 releasePreferenceProhibitTimer-r16 ENUMERATED {

 s0, s0dot5, s1, s2, s3, s4, s5, s6, s7,

 s8, s9, s10, s20, s30, infinity, spare1},

 connectedReporting ENUMERATED {true} OPTIONAL -- Need R

}

-- TAG-OTHERCONFIG-STOP

-- ASN1STOP

| *OtherConfig* field descriptions |
| --- |
| ***candidateServingFreqListNR***Indicates for each candidate NR serving cells, the center frequency around which UE is requested to report IDC issues. |
| ***connectedReporting***Indicates that the UE can report a preference to remain in RRC\_CONNECTED state following a report to leave RRC\_CONNECTED state. If absent, the UE cannot report a preference to stay in RRC\_CONNECTED state. |
| ***delayBudgetReportingProhibitTimer***Prohibit timer for delay budget reporting. Value in seconds. Value *s0* means prohibit timer is set to 0 seconds, value *s0dot4* means prohibit timer is set to 0.4 seconds, and so on. |
| ***drx-PreferenceConfig***Configuration for the UE to report assistance information to inform the gNB about the UE's DRX preferences for power saving. |
| ***drx-PreferenceProhibitTimer***Prohibit timer for DRX preferences assistance information reporting. 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. |
| ***idc-AssistanceConfig***Configuration for the UE to report assistance information to inform the gNB about UE detected IDC problem. |
| ***maxBW-PreferenceConfig***Configuration for the UE to report assistance information to inform the gNB about the UE's preferred bandwidth for power saving. |
| ***maxBW-PreferenceProhibitTimer***Prohibit timer for preferred bandwidth assistance information reporting. 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. |
| ***maxCC-PreferenceConfig***Configuration for the UE to report assistance information to inform the gNB about the UE's preferred number of carriers for power saving. |
| ***maxCC-PreferenceProhibitTimer***Prohibit timer for preferred number of carriers assistance information reporting. 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. |
| ***maxMIMO-LayerPreferenceConfig***Configuration for the UE to report assistance information to inform the gNB about the UE's preferred number of MIMO layers for power saving. |
| ***maxMIMO-LayerPreferenceProhibitTimer***Prohibit timer for preferred number of number of MIMO layers assistance information reporting. 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. |
| ***minSchedulingOffsetPreferenceConfig***Configuration for the UE to report assistance information to inform the gNB about the UE's preferred *minimumSchedulingOffset* value for cross-slot scheduling for power saving. |
| ***minSchedulingOffsetPreferenceProhibitTimer***Prohibit timer for preferred *minimumSchedulingOffset* assistance information reporting. 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. |
| ***obtainCommonLocation***Requests the UE to attempt to have detailed location information available using GNSS. NR configures the field if *includeCommonLocationInfo* is configured for one or more measurements. |
| ***overheatingAssistanceConfig***Configuration for the UE to report assistance information to inform the gNB about UE detected internal overheating. |
| ***overheatingIndicationProhibitTimer***Prohibit timer for overheating assistance information reporting. 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. |
| ***referenceTimePreferenceReporting***If present, the field indicates the UE is configured to provide reference time assistance information. |
| ***releasePreferenceConfig***Configuration for the UE to report assistance information to inform the gNB about the UE's preference to leave RRC\_CONNECTED state. |
| ***releasePreferenceProhibitTimer***Prohibit timer for release preference assistance information reporting. 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. Value *infinity* means that once a UE has reported a release preference, the UE cannot report a release preference again during the RRC connection. |
| ***sensorNameList***Configuration for the UE to report measurements from specific sensors. |
| ***sl-AssistanceConfigNR***Indicate whether UE is configured to provide configured grant assistance information for NR sidelink communication. |
| ***sourceDAPSFailureReporting***This field indicates whether the UE shall generate the SHR upon successfully completing the DAPS handover to the target cell and if a radio link failure was experienced in the source PCell while executing the DAPS handover. This field is set in the *otherConfig* configured by the source cell of the DAPS handover. |
| ***successHO-Config***Configuration for the UE to report the successful handover information to the network. |
| ***thresholdPercentageT304***This field indicates the threshold for the ratio in percentage between the elapsed T304 timer and the configured value of the T304 timer. Value *p40* corresponds to 40%, value *p60* corresponds to 60% and so on. This field is set in the *otherConfig* configured by the target cell of the handover. |
| ***thresholdPercentageT310***This field indicates the threshold for the ratio in percentage between the elapsed T310 timer and the configured value of the T310 timer. Value *p40* corresponds to 40%, value *p60* corresponds to 60% and so on. This field is set in the *otherConfig* configured by the source cell of the handover. |
| ***thresholdPercentageT312***This field indicates the threshold for the ratio in percentage between the elapsed T312 timer and the configured value(s) of the T312 timer. Value *p20* corresponds to 20%, value *p40* corresponds to 40% and so on. This field is set in the *otherConfig* configured by the source cell of the handover. |

<Text Omitted>

#### – *UE-MeasurementsAvailable*

The IE *UE-MeasurementsAvailable* is used to indicate all relevant available indicators for UE measurements.

*UE-MeasurementsAvailable* information element

-- ASN1START

-- TAG-UE-MeasurementsAvailable-START

UE-MeasurementsAvailable-r16 ::= SEQUENCE {

 logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

 connEstFailInfoAvailable-r16 ENUMERATED {true} OPTIONAL,

 rlf-InfoAvailable-r16 ENUMERATED {true} OPTIONAL,

 ...,

 [[

 successHO-InfoAvailable-r17 ENUMERATED {true} OPTIONAL

 ]]

}

-- TAG-UE-MeasurementsAvailable-STOP

-- ASN1STOP

<Text Omitted>

#### – *VisitedCellInfoList*

The IE *VisitedCellInfoList* includes the mobility history information of maximum of 16 most recently visited primary cells or time spent in any cell selection state and/or camped on any cell state in NR or E-UTRA and, in case of Dual Connectivity, the mobility history information of maxPSCellHistory most recently visited primary secondary cell group cells per visited primary cell. The most recently visited cell is stored first in the list. The list includes cells visited in RRC\_IDLE, RRC\_INACTIVE and RRC\_CONNECTED states for NR and RRC\_IDLE and RRC\_CONNECTED for E-UTRA.

*VisitedCellInfoList* information element

-- ASN1START

-- TAG-VISITEDCELLINFOLIST-START

VisitedCellInfoList-r16 ::= SEQUENCE (SIZE (1..maxCellHistory-r16)) OF VisitedCellInfo-r16

VisitedCellInfo-r16 ::= SEQUENCE {

 visitedCellId-r16 CHOICE {

 nr-CellId-r16 CHOICE {

 cgi-Info CGI-Info-Logging-r16,

 pci-arfcn-r16 SEQUENCE {

 physCellId-r16 PhysCellId,

 carrierFreq-r16 ARFCN-ValueNR

 }

 },

 eutra-CellId-r16 CHOICE {

 cellGlobalId-r16 CGI-InfoEUTRA,

 pci-arfcn-r16 SEQUENCE {

 physCellId-r16 EUTRA-PhysCellId,

 carrierFreq-r16 ARFCN-ValueEUTRA

 }

 }

 } OPTIONAL,

 timeSpent-r16 INTEGER (0..4095),

 ...,

 [[

 visitedPSCellInfoList-r17 VisitedPSCellInfoList-r17 OPTIONAL

 ]]

}

visitedPSCellInfoList-r17 ::= SEQUENCE (SIZE (1..maxPSCellHistory-r17)) OF VisitedPSCellInfo-r17

VisitedPSCellInfo-r17 ::= SEQUENCE {

 visitedCellId-r17 CHOICE {

 nr-CellId-r17 CHOICE {

 cgi-Info-r17 CGI-Info-Logging-r16,

 pci-arfcn-r17 SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR

 }

 },

 eutra-CellId-r17 CHOICE {

 cellGlobalId-r17 CGI-InfoEUTRA,

 pci-arfcn-r17 SEQUENCE {

 physCellId-r17 EUTRA-PhysCellId,

 carrierFreq-r17 ARFCN-ValueEUTRA

 }

 }

 } OPTIONAL,

 timeSpent-r17 INTEGER (0..4095),

 ...

}

-- TAG-VISITEDCELLINFOLIST-STOP

-- ASN1STOP

| *VisitedCellInfoList* field descriptions |
| --- |
| ***timeSpent***This field indicates the duration of stay in the cell or in any cell selection state and/or camped on any cell state in NR or E-UTRA approximated to the closest second. If the duration of stay exceeds 4095s, the UE shall set it to 4095s. |
| ***visitedCellId***This field indicates the visited cell id including NR and E-UTRA cells. |

NEXT CHANGE

## 6.4 RRC multiplicity and type constraint values

### Multiplicity and type constraint definitions

-- ASN1START

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-START

maxAI-DCI-PayloadSize-r16 INTEGER ::= 128 --Maximum size of the DCI payload scrambled with ai-RNTI

maxAI-DCI-PayloadSize-1-r16 INTEGER ::= 127 --Maximum size of the DCI payload scrambled with ai-RNTI minus 1

maxBandComb INTEGER ::= 65536 -- Maximum number of DL band combinations

maxBandsUTRA-FDD-r16 INTEGER ::= 64 -- Maximum number of bands listed in UTRA-FDD UE caps

maxBH-RLC-ChannelID-r16 INTEGER ::= 65536 -- Maximum value of BH RLC Channel ID

maxBT-IdReport-r16 INTEGER ::= 32 -- Maximum number of Bluetooth IDs to report

maxBT-Name-r16 INTEGER ::= 4 -- Maximum number of Bluetooth name

maxCAG-Cell-r16 INTEGER ::= 16 -- Maximum number of NR CAG cell ranges in SIB3, SIB4

maxTwoPUCCH-Grp-ConfigList-r16 INTEGER ::= 32 -- Maximum number of supported configuration(s) of {primary PUCCH group

 -- config, secondary PUCCH group config}

maxCBR-Config-r16 INTEGER ::= 8 -- Maximum number of CBR range configurations for sidelink communication

 -- congestion control

maxCBR-Config-1-r16 INTEGER ::= 7 -- Maximum number of CBR range configurations for sidelink communication

 -- congestion control minus 1

maxCBR-Level-r16 INTEGER ::= 16 -- Maximum number of CBR levels

maxCBR-Level-1-r16 INTEGER ::= 15 -- Maximum number of CBR levels minus 1

maxCellBlack INTEGER ::= 16 -- Maximum number of NR blacklisted cell ranges in SIB3, SIB4

maxCellGroupings-r16 INTEGER ::= 32 -- Maximum number of cell groupings for NR-DC

maxCellHistory-r16 INTEGER ::= 16 -- Maximum number of visited PCells reported

maxPSCellHistory-r17 INTEGER ::= 16 -- Maximum number of visited PSCells reported

maxCellInter INTEGER ::= 16 -- Maximum number of inter-Freq cells listed in SIB4

maxCellIntra INTEGER ::= 16 -- Maximum number of intra-Freq cells listed in SIB3

maxCellMeasEUTRA INTEGER ::= 32 -- Maximum number of cells in E-UTRAN

maxCellMeasIdle-r16 INTEGER ::= 8 -- Maximum number of cells per carrier for idle/inactive measurements

maxCellMeasUTRA-FDD-r16 INTEGER ::= 32 -- Maximum number of cells in FDD UTRAN

maxCellWhite INTEGER ::= 16 -- Maximum number of NR whitelisted cell ranges in SIB3, SIB4

maxEARFCN INTEGER ::= 262143 -- Maximum value of E-UTRA carrier frequency

maxEUTRA-CellBlack INTEGER ::= 16 -- Maximum number of E-UTRA blacklisted physical cell identity ranges

 -- in SIB5

maxEUTRA-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxLogMeasReport-r16 INTEGER ::= 520 -- Maximum number of entries for logged measurements

maxMultiBands INTEGER ::= 8 -- Maximum number of additional frequency bands that a cell belongs to

maxNARFCN INTEGER ::= 3279165 -- Maximum value of NR carrier frequency

maxNR-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxFreqIdle-r16 INTEGER ::= 8 -- Maximum number of carrier frequencies for idle/inactive measurements

maxNrofServingCells INTEGER ::= 32 -- Max number of serving cells (SpCells + SCells)

maxNrofServingCells-1 INTEGER ::= 31 -- Max number of serving cells (SpCells + SCells) minus 1

maxNrofAggregatedCellsPerCellGroup INTEGER ::= 16

maxNrofAggregatedCellsPerCellGroupMinus4-r16 INTEGER ::= 12

maxNrofDUCells-r16 INTEGER ::= 512 -- Max number of cells configured on the collocated IAB-DU

maxNrofAvailabilityCombinationsPerSet-r16 INTEGER ::= 512 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5

maxNrofAvailabilityCombinationsPerSet-1-r16 INTEGER ::= 511 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5 minus 1

maxNrofSCells INTEGER ::= 31 -- Max number of secondary serving cells per cell group

maxNrofCellMeas INTEGER ::= 32 -- Maximum number of entries in each of the cell lists in a measurement object

maxNrofCG-SL-r16 INTEGER ::= 8 -- Max number of sidelink configured grant

maxNrofCG-SL-1-r16 INTEGER ::= 7 -- Max number of sidelink configured grant minus 1

maxNrofSS-BlocksToAverage INTEGER ::= 16 -- Max number for the (max) number of SS blocks to average to determine cell measurement

maxNrofCondCells-r16 INTEGER ::= 8 -- Max number of conditional candidate SpCells

maxNrofCSI-RS-ResourcesToAverage INTEGER ::= 16 -- Max number for the (max) number of CSI-RS to average to determine cell measurement

maxNrofDL-Allocations INTEGER ::= 16 -- Maximum number of PDSCH time domain resource allocations

maxNrofSR-ConfigPerCellGroup INTEGER ::= 8 -- Maximum number of SR configurations per cell group

maxLCG-ID INTEGER ::= 7 -- Maximum value of LCG ID

maxLC-ID INTEGER ::= 32 -- Maximum value of Logical Channel ID

maxLC-ID-Iab-r16 INTEGER ::= 65855 -- Maximum value of BH Logical Channel ID extension

maxLTE-CRS-Patterns-r16 INTEGER ::= 3 -- Maximum number of additional LTE CRS rate matching patterns

maxNrofTAGs INTEGER ::= 4 -- Maximum number of Timing Advance Groups

maxNrofTAGs-1 INTEGER ::= 3 -- Maximum number of Timing Advance Groups minus 1

maxNrofBWPs INTEGER ::= 4 -- Maximum number of BWPs per serving cell

maxNrofCombIDC INTEGER ::= 128 -- Maximum number of reported MR-DC combinations for IDC

maxNrofSymbols-1 INTEGER ::= 13 -- Maximum index identifying a symbol within a slot (14 symbols, indexed from 0..13)

maxNrofSlots INTEGER ::= 320 -- Maximum number of slots in a 10 ms period

maxNrofSlots-1 INTEGER ::= 319 -- Maximum number of slots in a 10 ms period minus 1

maxNrofPhysicalResourceBlocks INTEGER ::= 275 -- Maximum number of PRBs

maxNrofPhysicalResourceBlocks-1 INTEGER ::= 274 -- Maximum number of PRBs minus 1

maxNrofPhysicalResourceBlocksPlus1 INTEGER ::= 276 -- Maximum number of PRBs plus 1

maxNrofControlResourceSets INTEGER ::= 12 -- Max number of CoReSets configurable on a serving cell

maxNrofControlResourceSets-1 INTEGER ::= 11 -- Max number of CoReSets configurable on a serving cell minus 1

maxNrofControlResourceSets-1-r16 INTEGER ::= 15 -- Max number of CoReSets configurable on a serving cell extended in minus 1

maxNrofCoresetPools-r16 INTEGER ::= 2 -- Maximum number of CORESET pools

maxCoReSetDuration INTEGER ::= 3 -- Max number of OFDM symbols in a control resource set

maxNrofSearchSpaces-1 INTEGER ::= 39 -- Max number of Search Spaces minus 1

maxSFI-DCI-PayloadSize INTEGER ::= 128 -- Max number payload of a DCI scrambled with SFI-RNTI

maxSFI-DCI-PayloadSize-1 INTEGER ::= 127 -- Max number payload of a DCI scrambled with SFI-RNTI minus 1

maxIAB-IP-Address-r16 INTEGER ::= 32 -- Max number of assigned IP addresses

maxINT-DCI-PayloadSize INTEGER ::= 126 -- Max number payload of a DCI scrambled with INT-RNTI

maxINT-DCI-PayloadSize-1 INTEGER ::= 125 -- Max number payload of a DCI scrambled with INT-RNTI minus 1

maxNrofRateMatchPatterns INTEGER ::= 4 -- Max number of rate matching patterns that may be configured

maxNrofRateMatchPatterns-1 INTEGER ::= 3 -- Max number of rate matching patterns that may be configured minus 1

maxNrofRateMatchPatternsPerGroup INTEGER ::= 8 -- Max number of rate matching patterns that may be configured in one group

maxNrofCSI-ReportConfigurations INTEGER ::= 48 -- Maximum number of report configurations

maxNrofCSI-ReportConfigurations-1 INTEGER ::= 47 -- Maximum number of report configurations minus 1

maxNrofCSI-ResourceConfigurations INTEGER ::= 112 -- Maximum number of resource configurations

maxNrofCSI-ResourceConfigurations-1 INTEGER ::= 111 -- Maximum number of resource configurations minus 1

maxNrofAP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrOfCSI-AperiodicTriggers INTEGER ::= 128 -- Maximum number of triggers for aperiodic CSI reporting

maxNrofReportConfigPerAperiodicTrigger INTEGER ::= 16 -- Maximum number of report configurations per trigger state for aperiodic reporting

maxNrofNZP-CSI-RS-Resources INTEGER ::= 192 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources

maxNrofNZP-CSI-RS-Resources-1 INTEGER ::= 191 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources minus 1

maxNrofNZP-CSI-RS-ResourcesPerSet INTEGER ::= 64 -- Maximum number of NZP CSI-RS resources per resource set

maxNrofNZP-CSI-RS-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-RS resource sets per cell

maxNrofNZP-CSI-RS-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-RS resource sets per cell minus 1

maxNrofNZP-CSI-RS-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of resource sets per resource configuration

maxNrofNZP-CSI-RS-ResourcesPerConfig INTEGER ::= 128 -- Maximum number of resources per resource configuration

maxNrofZP-CSI-RS-Resources INTEGER ::= 32 -- Maximum number of Zero-Power (ZP) CSI-RS resources

maxNrofZP-CSI-RS-Resources-1 INTEGER ::= 31 -- Maximum number of Zero-Power (ZP) CSI-RS resources minus 1

maxNrofZP-CSI-RS-ResourceSets-1 INTEGER ::= 15

maxNrofZP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrofZP-CSI-RS-ResourceSets INTEGER ::= 16

maxNrofCSI-IM-Resources INTEGER ::= 32 -- Maximum number of CSI-IM resources

maxNrofCSI-IM-Resources-1 INTEGER ::= 31 -- Maximum number of CSI-IM resources minus 1

maxNrofCSI-IM-ResourcesPerSet INTEGER ::= 8 -- Maximum number of CSI-IM resources per set

maxNrofCSI-IM-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-IM resource sets per cell

maxNrofCSI-IM-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-IM resource sets per cell minus 1

maxNrofCSI-IM-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of CSI IM resource sets per resource configuration

maxNrofCSI-SSB-ResourcePerSet INTEGER ::= 64 -- Maximum number of SSB resources in a resource set

maxNrofCSI-SSB-ResourceSets INTEGER ::= 64 -- Maximum number of CSI SSB resource sets per cell

maxNrofCSI-SSB-ResourceSets-1 INTEGER ::= 63 -- Maximum number of CSI SSB resource sets per cell minus 1

maxNrofCSI-SSB-ResourceSetsPerConfig INTEGER ::= 1 -- Maximum number of CSI SSB resource sets per resource configuration

maxNrofFailureDetectionResources INTEGER ::= 10 -- Maximum number of failure detection resources

maxNrofFailureDetectionResources-1 INTEGER ::= 9 -- Maximum number of failure detection resources minus 1

maxNrofFreqSL-r16 INTEGER ::= 8 -- Maximum number of carrier frequency for NR sidelink communication

maxNrofSL-BWPs-r16 INTEGER ::= 4 -- Maximum number of BWP for NR sidelink communication

maxFreqSL-EUTRA-r16 INTEGER ::= 8 -- Maximum number of EUTRA anchor carrier frequency for NR sidelink communication

maxNrofSL-MeasId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement identity (RSRP) per destination

maxNrofSL-ObjectId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement objects (RSRP) per destination

maxNrofSL-ReportConfigId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement reporting configuration(RSRP) per destination

maxNrofSL-PoolToMeasureNR-r16 INTEGER ::= 8 -- Maximum number of resource pool for NR sidelink measurement to measure for

 -- each measurement object (for CBR)

maxFreqSL-NR-r16 INTEGER ::= 8 -- Maximum number of NR anchor carrier frequency for NR sidelink communication

maxNrofSL-QFIs-r16 INTEGER ::= 2048 -- Maximum number of QoS flow for NR sidelink communication per UE

maxNrofSL-QFIsPerDest-r16 INTEGER ::= 64 -- Maximum number of QoS flow per destination for NR sidelink communication

maxNrofObjectId INTEGER ::= 64 -- Maximum number of measurement objects

maxNrofPageRec INTEGER ::= 32 -- Maximum number of page records

maxNrofPCI-Ranges INTEGER ::= 8 -- Maximum number of PCI ranges

maxPLMN INTEGER ::= 12 -- Maximum number of PLMNs broadcast and reported by UE at establishment

maxNrofCSI-RS-ResourcesRRM INTEGER ::= 96 -- Maximum number of CSI-RS resources per cell for an RRM measurement object

maxNrofCSI-RS-ResourcesRRM-1 INTEGER ::= 95 -- Maximum number of CSI-RS resources per cell for an RRM measurement object minus 1

maxNrofMeasId INTEGER ::= 64 -- Maximum number of configured measurements

maxNrofQuantityConfig INTEGER ::= 2 -- Maximum number of quantity configurations

maxNrofCSI-RS-CellsRRM INTEGER ::= 96 -- Maximum number of cells with CSI-RS resources for an RRM measurement object

maxNrofSL-Dest-r16 INTEGER ::= 32 -- Maximum number of destination for NR sidelink communication

maxNrofSL-Dest-1-r16 INTEGER ::= 31 -- Highest index of destination for NR sidelink communication

maxNrofSLRB-r16 INTEGER ::= 512 -- Maximum number of radio bearer for NR sidelink communication per UE

maxSL-LCID-r16 INTEGER ::= 512 -- Maximum number of RLC bearer for NR sidelink communication per UE

maxSL-SyncConfig-r16 INTEGER ::= 16 -- Maximum number of sidelink Sync configurations

maxNrofRXPool-r16 INTEGER ::= 16 -- Maximum number of Rx resource pool for NR sidelink communication

maxNrofTXPool-r16 INTEGER ::= 8 -- Maximum number of Tx resource pool for NR sidelink communication

maxNrofPoolID-r16 INTEGER ::= 16 -- Maximum index of resource pool for NR sidelink communication

maxNrofSRS-PathlossReferenceRS-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for SRS power control.

maxNrofSRS-PathlossReferenceRS-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for SRS power control minus 1.

maxNrofSRS-ResourceSets INTEGER ::= 16 -- Maximum number of SRS resource sets in a BWP.

maxNrofSRS-ResourceSets-1 INTEGER ::= 15 -- Maximum number of SRS resource sets in a BWP minus 1.

maxNrofSRS-PosResourceSets-r16 INTEGER ::= 16 -- Maximum number of SRS Positioning resource sets in a BWP.

maxNrofSRS-PosResourceSets-1-r16 INTEGER ::= 15 -- Maximum number of SRS Positioning resource sets in a BWP minus 1.

maxNrofSRS-Resources INTEGER ::= 64 -- Maximum number of SRS resources.

maxNrofSRS-Resources-1 INTEGER ::= 63 -- Maximum number of SRS resources minus 1.

maxNrofSRS-PosResources-r16 INTEGER ::= 64 -- Maximum number of SRS Positioning resources.

maxNrofSRS-PosResources-1-r16 INTEGER ::= 63 -- Maximum number of SRS Positioning resources in an SRS Positioning

 -- resource set minus 1.

maxNrofSRS-ResourcesPerSet INTEGER ::= 16 -- Maximum number of SRS resources in an SRS resource set

maxNrofSRS-TriggerStates-1 INTEGER ::= 3 -- Maximum number of SRS trigger states minus 1, i.e., the largest code point.

maxNrofSRS-TriggerStates-2 INTEGER ::= 2 -- Maximum number of SRS trigger states minus 2.

maxRAT-CapabilityContainers INTEGER ::= 8 -- Maximum number of interworking RAT containers (incl NR and MRDC)

maxSimultaneousBands INTEGER ::= 32 -- Maximum number of simultaneously aggregated bands

maxULTxSwitchingBandPairs INTEGER ::= 32 -- Maximum number of band pairs supporting dynamic UL Tx switching in a band combination

maxNrofSlotFormatCombinationsPerSet INTEGER ::= 512 -- Maximum number of Slot Format Combinations in a SF-Set.

maxNrofSlotFormatCombinationsPerSet-1 INTEGER ::= 511 -- Maximum number of Slot Format Combinations in a SF-Set minus 1.

maxNrofTrafficPattern-r16 INTEGER ::= 8 -- Maximum number of Traffic Pattern for NR sidelink communication.

maxNrofPUCCH-Resources INTEGER ::= 128

maxNrofPUCCH-Resources-1 INTEGER ::= 127

maxNrofPUCCH-ResourceSets INTEGER ::= 4 -- Maximum number of PUCCH Resource Sets

maxNrofPUCCH-ResourceSets-1 INTEGER ::= 3 -- Maximum number of PUCCH Resource Sets minus 1.

maxNrofPUCCH-ResourcesPerSet INTEGER ::= 32 -- Maximum number of PUCCH Resources per PUCCH-ResourceSet

maxNrofPUCCH-P0-PerSet INTEGER ::= 8 -- Maximum number of P0-pucch present in a p0-pucch set

maxNrofPUCCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUCCH power control.

maxNrofPUCCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUCCH power control minus 1.

maxNrofPUCCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUCCH power control extended.

maxNrofPUCCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUCCH power control

 -- minus 1 extended.

maxNrofPUCCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between the extended maximum and the non-extended maximum

maxNrofPUCCH-ResourceGroups-r16 INTEGER ::= 4 -- Maximum number of PUCCH resources groups.

maxNrofPUCCH-ResourcesPerGroup-r16 INTEGER ::= 128 -- Maximum number of PUCCH resources in a PUCCH group.

maxNrofMultiplePUSCHs-r16 INTEGER ::= 8 -- Maximum number of multiple PUSCHs in PUSCH TDRA list

maxNrofP0-PUSCH-AlphaSets INTEGER ::= 30 -- Maximum number of P0-pusch-alpha-sets (see TS 38.213 [13], clause 7.1)

maxNrofP0-PUSCH-AlphaSets-1 INTEGER ::= 29 -- Maximum number of P0-pusch-alpha-sets minus 1 (see TS 38.213 [13], clause 7.1)

maxNrofPUSCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUSCH power control.

maxNrofPUSCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUSCH power control minus 1.

maxNrofPUSCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUSCH power control extended

maxNrofPUSCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUSCH power control

 -- extended minus 1

maxNrofPUSCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between maxNrofPUSCH-PathlossReferenceRSs-r16 and

 -- maxNrofPUSCH-PathlossReferenceRSs

maxNrofNAICS-Entries INTEGER ::= 8 -- Maximum number of supported NAICS capability set

maxBands INTEGER ::= 1024 -- Maximum number of supported bands in UE capability.

maxBandsMRDC INTEGER ::= 1280

maxBandsEUTRA INTEGER ::= 256

maxCellReport INTEGER ::= 8

maxDRB INTEGER ::= 29 -- Maximum number of DRBs (that can be added in DRB-ToAddModList).

maxFreq INTEGER ::= 8 -- Max number of frequencies.

maxFreqLayers INTEGER ::= 4 -- Max number of frequency layers.

maxFreqIDC-r16 INTEGER ::= 128 -- Max number of frequencies for IDC indication.

maxCombIDC-r16 INTEGER ::= 128 -- Max number of reported UL CA for IDC indication.

maxFreqIDC-MRDC INTEGER ::= 32 -- Maximum number of candidate NR frequencies for MR-DC IDC indication

maxNrofCandidateBeams INTEGER ::= 16 -- Max number of PRACH-ResourceDedicatedBFR in BFR config.

maxNrofCandidateBeams-r16 INTEGER ::= 64 -- Max number of candidate beam resources in BFR config.

maxNrofCandidateBeamsExt-r16 INTEGER ::= 48 -- Max number of PRACH-ResourceDedicatedBFR in the CandidateBeamRSListExt

maxNrofPCIsPerSMTC INTEGER ::= 64 -- Maximum number of PCIs per SMTC.

maxNrofQFIs INTEGER ::= 64

maxNrofResourceAvailabilityPerCombination-r16 INTEGER ::= 256

maxNrOfSemiPersistentPUSCH-Triggers INTEGER ::= 64 -- Maximum number of triggers for semi persistent reporting on PUSCH

maxNrofSR-Resources INTEGER ::= 8 -- Maximum number of SR resources per BWP in a cell.

maxNrofSlotFormatsPerCombination INTEGER ::= 256

maxNrofSpatialRelationInfos INTEGER ::= 8

maxNrofSpatialRelationInfos-plus-1 INTEGER ::= 9

maxNrofSpatialRelationInfos-r16 INTEGER ::= 64

maxNrofSpatialRelationInfosDiff-r16 INTEGER ::= 56 -- Difference between maxNrofSpatialRelationInfos-r16 and maxNrofSpatialRelationInfos

maxNrofIndexesToReport INTEGER ::= 32

maxNrofIndexesToReport2 INTEGER ::= 64

maxNrofSSBs-r16 INTEGER ::= 64 -- Maximum number of SSB resources in a resource set.

maxNrofSSBs-1 INTEGER ::= 63 -- Maximum number of SSB resources in a resource set minus 1.

maxNrofS-NSSAI INTEGER ::= 8 -- Maximum number of S-NSSAI.

maxNrofTCI-StatesPDCCH INTEGER ::= 64

maxNrofTCI-States INTEGER ::= 128 -- Maximum number of TCI states.

maxNrofTCI-States-1 INTEGER ::= 127 -- Maximum number of TCI states minus 1.

maxNrofUL-Allocations INTEGER ::= 16 -- Maximum number of PUSCH time domain resource allocations.

maxQFI INTEGER ::= 63

maxRA-CSIRS-Resources INTEGER ::= 96

maxRA-OccasionsPerCSIRS INTEGER ::= 64 -- Maximum number of RA occasions for one CSI-RS

maxRA-Occasions-1 INTEGER ::= 511 -- Maximum number of RA occasions in the system

maxRA-SSB-Resources INTEGER ::= 64

maxSCSs INTEGER ::= 5

maxSecondaryCellGroups INTEGER ::= 3

maxNrofServingCellsEUTRA INTEGER ::= 32

maxMBSFN-Allocations INTEGER ::= 8

maxNrofMultiBands INTEGER ::= 8

maxCellSFTD INTEGER ::= 3 -- Maximum number of cells for SFTD reporting

maxReportConfigId INTEGER ::= 64

maxNrofCodebooks INTEGER ::= 16 -- Maximum number of codebooks supported by the UE

maxNrofCSI-RS-ResourcesExt-r16 INTEGER ::= 16 -- Maximum number of codebook resources supported by the UE for eType2/Codebook combo

maxNrofCSI-RS-Resources INTEGER ::= 7 -- Maximum number of codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-r16 INTEGER ::= 512 -- Maximum number of alternative codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-1-r16 INTEGER ::= 511 -- Maximum number of alternative codebook resources supported by the UE minus 1

maxNrofSRI-PUSCH-Mappings INTEGER ::= 16

maxNrofSRI-PUSCH-Mappings-1 INTEGER ::= 15

maxSIB INTEGER::= 32 -- Maximum number of SIBs

maxSI-Message INTEGER::= 32 -- Maximum number of SI messages

maxPO-perPF INTEGER ::= 4 -- Maximum number of paging occasion per paging frame

maxAccessCat-1 INTEGER ::= 63 -- Maximum number of Access Categories minus 1

maxBarringInfoSet INTEGER ::= 8 -- Maximum number of access control parameter sets

maxCellEUTRA INTEGER ::= 8 -- Maximum number of E-UTRA cells in SIB list

maxEUTRA-Carrier INTEGER ::= 8 -- Maximum number of E-UTRA carriers in SIB list

maxPLMNIdentities INTEGER ::= 8 -- Maximum number of PLMN identities in RAN area configurations

maxDownlinkFeatureSets INTEGER ::= 1024 -- (for NR DL) Total number of FeatureSets (size of the pool)

maxUplinkFeatureSets INTEGER ::= 1024 -- (for NR UL) Total number of FeatureSets (size of the pool)

maxEUTRA-DL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxEUTRA-UL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxFeatureSetsPerBand INTEGER ::= 128 -- (for NR) The number of feature sets associated with one band.

maxPerCC-FeatureSets INTEGER ::= 1024 -- (for NR) Total number of CC-specific FeatureSets (size of the pool)

maxFeatureSetCombinations INTEGER ::= 1024 -- (for MR-DC/NR)Total number of Feature set combinations (size of the pool)

maxInterRAT-RSTD-Freq INTEGER ::= 3

maxHRNN-Len-r16 INTEGER ::= 48 -- Maximum length of HRNNs

maxNPN-r16 INTEGER ::= 12 -- Maximum number of NPNs broadcast and reported by UE at establishment

maxNrOfMinSchedulingOffsetValues-r16 INTEGER ::= 2 -- Maximum number of min. scheduling offset (K0/K2) configurations

maxK0-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K0)

maxK2-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K2)

maxDCI-2-6-Size-r16 INTEGER ::= 140 -- Maximum size of DCI format 2-6

maxDCI-2-6-Size-1-r16 INTEGER ::= 139 -- Maximum DCI format 2-6 size minus 1

maxNrofUL-Allocations-r16 INTEGER ::= 64 -- Maximum number of PUSCH time domain resource allocations

maxNrofP0-PUSCH-Set-r16 INTEGER ::= 2 -- Maximum number of P0 PUSCH set(s)

maxOnDemandSIB-r16 INTEGER ::= 8 -- Maximum number of SIB(s) that can be requested on-demand

maxOnDemandPosSIB-r16 INTEGER ::= 32 -- Maximum number of posSIB(s) that can be requested on-demand

maxCI-DCI-PayloadSize-r16 INTEGER ::= 126 -- Maximum number of the DCI size for CI

maxCI-DCI-PayloadSize-1-r16 INTEGER ::= 125 -- Maximum number of the DCI size for CI minus 1

maxWLAN-Id-Report-r16 INTEGER ::= 32 -- Maximum number of WLAN IDs to report

maxWLAN-Name-r16 INTEGER ::= 4 -- Maximum number of WLAN name

maxRAReport-r16 INTEGER ::= 8 -- Maximum number of RA procedures information to be included in the RA report

maxTxConfig-r16 INTEGER ::= 64 -- Maximum number of sidelink transmission parameters configurations

maxTxConfig-1-r16 INTEGER ::= 63 -- Maximum number of sidelink transmission parameters configurations minus 1

maxPSSCH-TxConfig-r16 INTEGER ::= 16 -- Maximum number of PSSCH TX configurations

maxNrofCLI-RSSI-Resources-r16 INTEGER ::= 64 -- Maximum number of CLI-RSSI resources for UE

maxNrofCLI-RSSI-Resources-1-r16 INTEGER ::= 63 -- Maximum number of CLI-RSSI resources for UE minus 1

maxNrofCLI-SRS-Resources-r16 INTEGER ::= 32 -- Maximum number of SRS resources for CLI measurement for UE

maxCLI-Report-r16 INTEGER ::= 8

maxNrofConfiguredGrantConfig-r16 INTEGER ::= 12 -- Maximum number of configured grant configurations per BWP

maxNrofConfiguredGrantConfig-1-r16 INTEGER ::= 11 -- Maximum number of configured grant configurations per BWP minus 1

maxNrofCG-Type2DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for type 2 configured grants per BWP

maxNrofConfiguredGrantConfigMAC-1-r16 INTEGER ::= 31 -- Maximum number of configured grant configurations per MAC entity minus 1

maxNrofSPS-Config-r16 INTEGER ::= 8 -- Maximum number of SPS configurations per BWP

maxNrofSPS-Config-1-r16 INTEGER ::= 7 -- Maximum number of SPS configurations per BWP minus 1

maxNrofSPS-DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for SPS per BWP

maxNrofDormancyGroups INTEGER ::= 5 --

maxNrofPUCCH-ResourceGroups-1-r16 INTEGER ::= 3 --

maxNrofServingCellsTCI-r16 INTEGER ::= 32 -- Maximum number of serving cells in simultaneousTCI-UpdateList

maxNrofTxDC-TwoCarrier-r16 INTEGER ::= 64 -- Maximum number of UL Tx DC locations reported by the UE for 2CC uplink CA

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-STOP

-- ASN1STOP

# 7 Variables and constants

## 7.4 UE variables

<Text Omitted>

#### – *VarMobilityHistoryReport*

The UE variable *VarMobilityHistoryReport* includes the mobility history information.

*VarMobilityHistoryReport* UE variable

-- ASN1START

-- TAG-VARMOBILITYHISTORYREPORT-START

VarMobilityHistoryReport-r16 ::= VisitedCellInfoList-r16

VarMobilityHistoryReport-r17 ::= SEQUENCE {

 visitedCellInfoList-r16 VisitedCellInfoList-r16,

 visitedPSCellInfoList-r17 VisitedPSCellInfoList-r17 OPTIONAL

}

-- TAG-VARMOBILITYHISTORYREPORT-STOP

-- ASN1STOP

<Text Omitted>

#### – *VarSuccessHO-Report*

The UE variable *VarSuccessHO-Report* includes the successful handover information.

*VarSccessHO-Report* variable

-- ASN1START

-- TAG-VARSUCCESSHO-Report-START

VarSuccessHO-Report-r17-IEs ::= SEQUENCE {

 successHO-Report-r17 SuccessHO-Report-r17,

 plmn-IdentityList-r17 PLMN-IdentityList2-r16

}

-- TAG-VARSUCCESSHO-Report-STOP

-- ASN1STOP

END OF CHANGES

# Annex – RAN2 agreements

Below are the RAN2 agreements up to RAN2#116-e:

* SHR: Highlighted in yellow the agreements captured in this version of this running CR.
* 2-step RA and on-demand SI: Highlighted in green the agreements captured in this version of this running CR.
* Other topics: Highlighted in turquoise the agreements captured in this version of this running CR.
* DAPS: Highlighted in pink the agreements captured in this version of this running CR.
* CHO: Highlighted in red the agreements captured in this version of this running CR

# 1 RAN2#111

## 1.1 SON

**=> RAN2 to consider the SON aspects of CHO and SON aspects of 2-step RA as part of the WI.**

**=> RAN2 to consider the SON aspects of DAPS HO as part of the WI.**

=> The following scenarios are considered:

1) Successful CHO and HO (i.e. no failure happens). FFS consideration in RAN2/3

2) Unsuccessful CHO due to late CHO execution.

3) Unsuccessful CHO after CHO execution.

4) Successful or Unsuccessful CHO after unsuccessful CHO or handover failure.

Note: other scenarios are not ruled out…

=> RAN2 should study what CHO failure information can be stored in RLF report.

=> RAN 2 to discuss the method for distinguishing between different handover types in RLF report. FFS the details, e.g., explicitly way or not.

=> RAN2 to agree studying the RLF report and/or FailureInformation message contents in the DAPS failure scenarios.

=> New logged content for 2-step RA is introduced in:

1. RA report
2. RLF report
3. CEF report

=> Study the necessity of introducing new method for more precise identification of the DL coverage quality during the UL coverage outage.

## 1.2 MDT

=> The coexistence issue between IDC and MDT feature is identified and the legacy mechanism defined in LTE spec is the baseline. FFS on potential enhancements.

=> Study the support of logged and Immediate MDT in MR-DC scenario. For M5/M6/M7, it is proposed to apply them for EN-DC/MR-DC cases with different bear types. FFS on details.

# 2 RAN2#112

## 2.1 SON

## 2.1.2 CHO

Agreements:

The following time information is as part of the UE RLF report:

 Time between the first CHO execution and the corresponding CHO command received at UE at least in the CHO failure case.

FFS: The following time information is as part of the UE report:

c. The time elapsed since receiving the CHO configuration until the immediate HO reception or execution.

d. Timeline relationship between two consecutive RLF reports for cases of successful or unsuccessful CHO after unsuccessful CHO or handover failure

e. Time between the UE receiving the CHO command and RLF

f. UE reports the time elapsed since CHO execution until connection failure

g. In case of multiple failures case, UE includes the time elapsed since CHO execution until connection failure (TimeConnFailure) and time elapsed since the last radio link or handover failure (TimeSinceFailure) in each RLF-Report

h. The time between CHO execution and successful reestablishment to a third cell after CHO failure towards the candidate target cell selected at CHO execution

i. The time elapsed since CHO configuration until the immediate HO reception or execution

Agreements:

 The following cells’ related cell and beam measurements are included in the RLF report associated to CHO failure:

 a. Source cell of the CHO. FFS the detail on cell ID. Try our best to reuse the existing information.

 b. The target cell towards which the CHO was executed, if CHO related condition was satisfied. FFS the detail on cell ID. Try our best to reuse the existing information.

c. The cell in which the re-establishment is performed after the CHO failure or source RLF. Try our best to reuse the existing information. FFS on the related measurements.

FFS: Candidate target cells as configured in the CHO configuration.

Agreements:

 RLF-report shall contain information to differentiate an ordinary HO failure from the CHO failure and CHO recovery failure. FFS: implicit indication vs explicit indication.

Focused scenarios:

In case of successive CHO related failures, the UE stores and reports both RLF related information in the RLF report. The successive failure referred above, includes at least the following scenarios.

 a. A UE that has CHO configuration declares RLF in the source cell. The UE selects for connection re-establishment a configured candidate CHO target cell. The UE fails to re-establish to the selected CHO candidate cell.

 b. A UE that has CHO configuration executes the CHO towards the target cell upon fulfilling the configured condition and experiences a HO failure. The UE selects for connection re-establishment a configured candidate CHO target cell. The UE fails to re-establish to the selected CHO candidate cell.

 c. A UE that has CHO configuration executes the normal HO towards the target cell and experiences a HO failure. The UE selects for connection re-establishment a configured candidate CHO target cell. The UE fails to re-establish to the selected CHO candidate cell using CHO procedure.

Note: other scenarios still can be discussed.

 FFS: Further clarification on the successful reestablishment.

=> Regarding the CHO-related timers, Option D, E, F will not be included in the RLF report and other options will continue discussion through email mail after this meeting.

## 2.1.2 DAPS

Agreements:

 In case of successive failures associated to DAPS, the UE stores and reports both failure related information(FFS the details of the information). The successive failure referred above, includes the following scenarios:

 UE declares RLF on the source cell while performing the DAPS towards the target cell and declares HOF towards the target cell.

FFS: For the case of failed DAPS handover to the target cell but successful fallback to source, no further information is needed in the legacy FailureInformation message.

Agreements:

 At least the following cells’ related cell and beam measurements are included in the UE report associated to DAPS failure (try to reuse existing information):

 a. Source cell of the DAPS

 b. Target cell of the DAPS

## 2.1.3 2-Step RA

Agreements:

Confirm that the information included in Rel-16 RA report which also applied to 2-step RA at least contains:

 Cell ID of the cell in which the RA is performed

 RA purpose

 Frequency information of the BWP where RA is performed

 Frequency information of RA resources

 Number of preambles sent on an SSB

 Beam index

 Contention detection per RA attempt

 Beam quality indication. FFS on the details.

Agreements:

At least following RACH frequency related information should be included in RACH report for optimization of 2-step RACH:

l msgA-FrequencyStart-r17

l msgA-FrequencyStartCFRA-r17

l msgA-SubcarrierSpacing-r17

l msgA-SubcarrierSpacingCFRA-r17

l msgA-FDM-r17

l msgA-FDMCFRA-r17

## 2.1.4 Other WID-related topics

=> RAN2 to investigate RACH optimization enhancements other than 2-step RACH-specific enhancements.

=> RAN2 to investigate successful handover report.

=> RAN2 to investigate Mobility history information enhancements.

=> RAN2 to investigate UL/DL coverage imbalanced.

## 2.2 MDT

Agreements:

1 NR MDT support IDC mechanism, including:

 - upon detection of IDC, the UE suppress logging and tag MDT report with InDeviceCoexDetected flag.

 - UE resumes the measurement logging when the IDC problem is resolved

=> RAN2 to investigate logging early measurements.

=> RAN2 to investigate MDT and On-demand SI.

=> Other topics are still open to be pursued.

# 3 RAN2#113

## 3.1 SON

### 3.1.1 CHO

Agreements:

1 Include in the RLF report the “Time elapsed since CHO execution until connection failure”. How to convey this information is FFS. (email discussion 886, Qualcomm)

2 Reuse the following legacy timers in the RLF report also for CHO: timeUntilReconnection, timeSinceFailure.

3 In the RLF report for CHO, the UE includes of the latest radio measurement results. FFS: to indicate whether or not it is candidate target cell. (email discussion 887, Ericsson)

Signalling model for RLF report:

FFS: Separate IEs/fields within the existing RLF-report are used to represent the second HOF. Also consider the second HO is successful case together. What measurements also need to be considered.

Agreements:

 UE reports "Time elapsed since CHO execution until connection failure" implicitly or explicitly, i.e. UE either explicitly provides the aforementioned timing information or provides sufficient information for the network to compute it.

=> Continue the discussion ”UE shall include the latest radio measurement results of the candidate target cells in the RLF-report.” through email. (Ericsson)

=> Before agreeing on including an indication indicating whether a neighbor cell, included as part of neighbor cell measurement result, is associated to a CHO candidate target cell or not, RAN2 waits RAN3 to confirm whether the source cell can keep the UE context, at least up to the point the RLF-report is received by the source cell. Draft LS to RAN3 for this.(#899, Ericsson)

### 3.1.2 DAPS

Following DAPS HO scenarios are considered:

a. Failed DAPS handover to the target cell but successfully fallback to source

b. UE declares RLF on the source cell before successfully DAPS handover towards target cell

### 3.1.3 2-Step RA

Agreements

2-step RA related SON:

1 The reporting granularity of whether the DL beam quality, associated to the used 2 step RA resource, is above or below the msgA-RSRP-ThresholdSSB is per-RA-attempt.

2 The RA report includes an indication that enables the network to know that the fallback from 2 step RA to 4 step RA was performed by the UE. FFS: Implicit vs explicit indication.

3 Choose ‘per RA procedure’ for the granularity of RA type (2 step RA vs 4 step RA) indication. FFS: Implicit vs explicit indication.

FFS: The RA report includes as indication of whether the DL beam quality, associated to the used 2 step RA resource, is above or below the msgA-RSRP-Threshold. (email discussion 888, ZTE)

Agreement:

 UE includes the measured RSRP of DL pathloss reference obtained just before performing RACH procedure in 2step RA report. FFS how to reduce the report overhead.

=> No need to include indication to indicate whether DL beam quality of associated 2 step RA resource is above or below the msgA-RSRP-Threshold in 2step RA report if P2 is agreed.

### 3.1.4 Success HO Report

Agreements:

Contents of the HO success report:

The source cell and target cell related identifiers and measurements are to be included in the successful HO report.

## 3.2 MDT

=> Introduce UE based solutions in Rel17 to fulfil the requirement that management based logged MDT should not overwrite signalling based logged MDT. FFS the details.

Agreements:

1 Support counting the number of received random access preamble per cell/per SSB separately for 2step RA and 4step RA type.

2 L2 measurements for IAB will NOT be introduced in Rel-17 SON/MDT WI.

3 RAN2 will NOT enhance the current delay measurement mechanism.

4 In case split bearer data goes through Xn/X2 interface, the delay over Xn/X2 interface should be taken into account in M6 for split bearers.

 5 D3 is re-used to reflect the DL delay on F1-U/X2/Xn, D2.3 is re-used to reflect the UL delay on F1-U/X2/Xn, LS to RAN3 for further confirmation.

6 The delay over Xn/X2/F1-U interface should be taken into account in M6 for MN terminated SCG bearers and SN terminated MCG bearers.

7 For QoS monitoring related delay reporting to CN, the minimum value between two legs is defined as the total delay measurement M6 over MCG/SCG for split bearers WITH PDCP duplication.

8 For QoS monitoring related delay reporting to CN, the delay estimation coordination (forwarding) between MN and SN is needed for split bearers.

9 For QoS monitoring related delay reporting to CN, the delay estimation coordination (forwarding) between MN and SN is needed for MN terminated SCG bearers and SN terminated MCG bearers.

FFS in email discussion (822, vivo) For QoS monitoring related delay reporting to CN, RAN2 to choose one of the following options for the total delay measurement M6 over MCG/SCG for split bearers WITHOUT PDCP duplication.

l Option a: the maximum value between two legs;

l Option b: weighte average (consider the number of packets) over MN and SN;

l Option c: simply by average the values of M6 from MN and M6 from SN;

l Option d: raw data (separate delay in MN and SN);

l Option e: no differentiation

Agreement:

 The network can use a flag in logged MDT configuration to indicate if an early measurement/idle mode configuration has relevance for logged measurement purposes. Upon such an indication, UE can log measurements on non-cellReselection (carrier frequencies not part of SIB4 or SIB5). AreaConfig and/or InterFreqTargetInfo can be used for filtering of SIB4 and non-SIB4 frequencies. Whether a flag is needed should be FFS.

Agreements:

1 One specific raPurpose is introduced for MSG3 based on demand SI request.

All the following proposals can be discussed through post meeting email discussion.

FFS: UE reports its requested notBroadcasting SI message. It is FFS to only report the SIBs UE actually intends to request.

Proposal 2: It is FFS to consider following scenarios:

3. Cell reselection occurs during the RACH for SI request.

4. The required SI is already broadcast periodically by network

5. Detecting geographic areas that are (unintentionally) covered by a non-desired SIA

6. Connected on-demand SI request cases

Proposal 4: It is FFS for UE to report Time elapsed since the SI request initiation or the UE modem realizes the need for on demand SI until the successful SI acquisition or the acquisition failure.

Proposal 6: It is FFS whether only Msg3-based SI request related information is reported.

Proposal 7: It is FFS whether to extend current RA-report to include the on demand SI information.

Agreement:

 For QoS monitoring related delay reporting to CN, ‘weighted average (consider the number of packets) over MN and SN’ is used to calculate the total delay measurement M6 over MCG/SCG for split bearers WITHOUT PDCP duplication.

# 4 RAN2#113-bis

#### 8.13.2.1 Handover related SON aspects

### 4.1.1 CHO

=> RAN2 to focus on the following CHO scenarios at least:

a. Scenario 1 (too late HO): 1a, 1b, 1c, 1d

b. Scenario 2 (too early HO): 2a, 2b

c. Scenario 3 (HO to wrong cell): 3a, 3b, 3c, 3e, 3f

FFS the need to merge certain scenarios, e.g. 1b/1c, 2a/2b

Agreements:

1 Include in the RLF-report for CHO the following:

a. Configured CHO execution condition(s) (A3 and/or A5 event configuration, TTT values)

b. Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell(s) in which CHO execution was triggered.

c. Latest radio measurement results of the candidate target cells

Inclusion of a) and c) are subject to the RAN3 reply to the RAN2 LS R2-2102149.

Try to reuse existing mechanism as much as possible.

2 Include in the RLF report for CHO the following information:

a. Indication of whether a measured neighbour cell included in the existing measResultNeighCells was a CHO candidate cell or not.

b. List of candidate cells IDs.

Inclusion of a) and b) are subject to the RAN3 reply to the RAN2 LS R2-2102149

3 The following information in the RLF report for CHO are needed:

b. CHOCellId, to indicate the selected CHO cell after the first connection failure and before the reestablishment

c. CellID to indicate the cell in which the UE attempted the second reestablishment after failure of the first reestablishment following an HOF/RLF.

How to provide these information is FFS.

### 4.1.2 DAPS

=> RAN2 to focus on the following DAPS scenarios:

a. Scenario 1 (too late DAPS): 1a, 1b

b. Scenario 2 (too early DAPS): 2a, 2b/2c

c. Scenario 3 (DAPS to wrong cell): 3a, 3b/3c

FFS whether to merge scenarios 2b/2c and 3b/3c.

Agreements:

1 Include in the RLF report for DAPS HO, the following measurements (reuse the legacy mechanism and IEs):

 a. Measurements of neighbour cells when HOF or RLF occurs

2 RAN2 to agree the intention of the following timers:

a. Time elapsed since DAPS HO execution until RLF occurs in source cell before fallback

b. Time elapsed since DAPS HO execution until RLF occurs in source cell after fallback

c. The elapsed time between the execution of DAPS and RLF in target cell

FFS if for the above timers the existing timers can be reused.

3 Include in the RLF report for DAPS HO the following information:

a. RLF-cause of the RLF occurred in the source cell while performing a DAPS HO

b. Explicit indicator for DAPS handover failure

### 4.1.3 HO success Report

4 At least the following triggering conditions are applied for generating an HO Success Report in the case that the HO succeeds:

a. The UE logs the HO success report if, while doing HO, T310 value exceeds a threshold

b. The UE logs the HO success report if, while doing HO, T312 value exceeds a threshold

c. The UE logs the HO success report if, while doing HO, T304 exceeds a threshold

d. In case of DAPS, if the UE gets an RLF in the source while doing DAPS.

Agreements:

1 RAN2 to focus on the following scenarios for HO Success Report:

a. Scenario 1 (ordinary HO): 1a, 1b

b. Scenario 2 (CHO): 2a, 2b

c. Scenario 3 (DAPS): 3a

2 RAN2 for further discuss whether the following scenarios should be considered under the RLF report or under the HO success report:

a. Scenario 2c

b. Scenario 3b

3 The following radio related measurements are as part of the successful HO report:

a. Latest radio measurement results of the candidate target cells in the case of conditional HO. FFS best cell(s) should be included in.

b. Flag to indicate RLF issues in source cell during DAPS HO

4 The following time-related measurements are as part of the successful HO report:

a. Time elapsed between the CHO execution towards the target cell and the corresponding latest CHO configuration received for the selected target cell

5 Location information is included as part of the successful HO report.

Proposal 4 RAN2 to further discuss the need of the following parameters as part of the successful HO report:

a. Latest radio link quality of neighbour cells before HO command was received for all HO types.

b. Configured CHO execution condition(s), e.g. A3 and/or A5 event configuration, of the candidate target cells. The inclusion of this parameter depends on the RAN3 reply to the RAN2 LS R2-2102149.

c. The radio quality of source cell when ConditionalReconfiguration is received before conditional handover execution condition is satisfied

d. Latest radio link quality of source cell before HO command was received in the case of DAPS.

Proposal 6 RAN2 to further discuss the need of the following time-related measurements as part of the successful HO report:

a. Elapsed time for T310 timer for normal HO

b. Elapsed time for T310 timer for Conditional HO

### 4.1.4 2-step RA

Agreements:

1 The RA report includes an explicit indication per RA attempt that enables the network to know that the fallback from 2-step RA to 4-step RA was performed by the UE.

2 RAN2 already agreed “UE includes the measured RSRP of DL pathloss reference obtained just ‎before performing RACH ‎procedure in 2step RA report. FFS how to reduce the report ‎overhead.‎”

=> RAN2 to discuss and ‎reply LS to R2-2008731, focusing on agreements and no further observations. ‎

### 4.1.5 Others

FFS: Proposal 11: UE reports the SN RACH report to the MN, and then MN sends the SN RACH report to the SN.

Agreements:

Mobility history information enhancements

1 If PSCell MHI is introduced, at least include PSCell ID (may include CGI or frequency+PCI) and the time UE stayed in each PSCell into PSCell MHI.

‎

UL/DL coverage imbalance

Proposal 13A: FFS how to identify and solve the problem about UL/DL coverage imbalance.

Enhancement for SN Change failure

Proposal 15A: FFS on enhancements for SN change failure, and request from R3 LS R2-2102639 is baseline for further discussions.

## 4.2 MDT

#### 8.13.3.1 Immediate MDT enhancements

Agreements:

1 For MN terminated SCG bearer and SN terminated MCG bearer, the terminated node, e.g., MN in case of MN terminated SCG bearer,configures the configuration to UE.

=> RAN2 understanding is that for the accuracy of the result, the M6 result can be indicated with data marker (duplication indicator).

=> All the immediate MDT configurations and reporting in EN-DC scenario (i.e. section 5.4.1.3 Immediate MDT for MR-DC in TS 37.320) are also applicable for (NG)EN-DC, NE-DC and NR-DC.

#### 8.13.3.2 Logged MDT enhancements

Agreements:

1 UE reports the SIBs that UE actually intends to request.

2 Both Msg1-based and Msg3-based SI request related information are supported.

3 Option 3 (R2-2104434) is used for logged MDT in EN-DC, i.e., do not introduce SN configuration for logged MDT (neither for camping nor for non-camping/ EMR specific frequencies).

4 UE provides assistance by which network can avoid overwriting of an MDT configuration.

5 Introduce the logged MDT type (i.e. the management based MDT or the signalling based MDT) in the logged MDT configuration.

Proposal 4: It is FFS whether to extend current RA-report to include the on demand SI related information.

Proposal 6: It is FFS whether there is a need to avoid logged MDT configuration in the following cases from network perspective:

1) Logged MDT is configured, but no results are available e.g. so far nothing stored, or all previously stored results retrieved

2) Logged MDT configuration is released, but UE still has un-retrieved results that would be discarded upon accepting a new configuration

# 5 RAN2#114-e

## 5.1 SON

Agreements:

1 To represent Timer C, i.e. the “Time elapsed between the first CHO execution and the corresponding latest CHO configuration received for the selected target cell” introduce a new timer, e.g. timeSinceCHOReconfig.

2 To represent the measurement results of the candidate target cells:

Reuse the measResultNeighCells in the RLF-Report, and include an indication (depending RAN3 conclusion) on whether a measured neighbour cell was configured as a CHO candidate or not.

=> RAN2 to progress the following method to derive Timer D, i.e. the time elapsed between CHO execution until the first HOF/RLF: The TimeConnFailure is re-used with possible updates to indicate that it is started at CHO execution. Introduce a new timer is not excluded.

Agreements:

5 For CHO, the reestablishmentCellID in the RLF-Report is used to represent the CellID in which the UE attempted the second reestablishment after failure of the CHO recovery failure following an HOF/RLF.

6 For CHO, the reestablishmentCellID is also used to represent in the RLF-report the cellID of the cell in which the UE attempted the (first) reestablishment if such cell is a non-CHO candidate cell.

8 RAN2 to include in the RLF report the following parameters for CHO failure cases:

a. failedPCellId is reused to indicate the cell where the first connection failure is detected in case of CHO

b. previousPCellId to include the source cell identity if the first failure is a HOF or CHOF

c. C-RNTI

d. rlf-cause if the first failure is RLF

e. noSuitableCellFound

10 For scenarios that two connection failures happened, the connection failure corresponds to the first failure. Separate IEs will be used for the two failures

7 For CHO, it is confirmed that a new CHOCellID is introduced in the RLF-Report to represent the CHO candidate cell selected after the first connection failure and before the reestablishment.

Agreements:

24 For DAPS, the timeSinceFailure represents “the time elapsed since the last connection failure” (irrespective of whether that is in source or target).

26 For DAPS, the failedPCell and reestablishmentCellID in the RLF-report are reused as in legacy.

28 For DAPS, scenarios 2b/2c and 3b/3c are merged.

Agreements:

31 The UE does not log SHR if no triggering conditions are configured.

32 The UE generates Successful HO report upon exceeding thresholds on T310, T312 and T304 exceed also for CHO case (in addition to regular HO)

34 The UE indicates in the SHR which triggering conditions for generating the SHR were fulfilled, e.g. flag for T310, T304, T312 indications.

35 Include in the SHR, the latest radio link quality of neighbour cells before HO execution for all HO types.

36 For location config/reports for SHR, location info for RLF report can be reused.

38 UE logs successful HO report in case prior configuration is received for successful HO report (interested trigger and corresponding configuration), otherwise UE doesn’t store successful HO report.

39 The varSuccHOReport is introduced to store the parameters for successful HO report.

40 The UE includes the availability of successful HO report to NW in each completed message send in RRC procedure, i.e., RRCReconfigurationComplete, RRCReestablishmentComplete, RRCSetupComplete, RRCResumeComplete message if it has available successful HO report to be reported.

41 UEInformationRequest/UEInformationResponse message is used for successful HO report request and report.

42 The UE only stores the latest SHR entry.

43 The SHR scenario 3b, i.e. “Successful HO completion, but RLF in source during DAPS HO” is part of the SHR.

44 The SHR scenario 2c, i.e. “Successful CHO recovery while initial failure” is part of the RLF-Report.

Open issues

All the following bullets should be discussed in the post meeting email discussions accordingly:

22 RAN2 to keep discussing the need to include in the RLF report the “The elapsed time between first failure in source (or target) and second failure in target (or source) while performing the DAPS HO”.

25 For DAPS, RAN2 to further discuss the need of the following information in the RLF-Report:

a. DAPS handover type indication in RLF-report in case that DAPS HO is successfully performed but subsequent RLF occurs in target

b. failure order indicator, e.g., consecutivetwofailuresoder, to indicate whether the failure between the UE and the source cell occurs before the one between the UE and the target cell

c. Indicator to determine whether the HoF happened before or after the RLF at the source

d. The state of source link after successful RACH should be included in the RLF-Report.

30 RAN2 to further discuss configuration aspects of T310/T312/T304 thresholds for SHR triggering conditions.

37 FFS whether to include in SHR the ra-InformationCommon of RA report.

13 FFS:Use separate IEs within the existing RLF-report to represent the second failure, and the first failure can be represented by reusing as much as possible existing IEs.

19 FFS: For DAPS, the timeConnFailure in the RLF-report represents “The elapsed time between the execution of DAPS and HOF or RLF in target cell”.

20 FFS: For DAPS, “The time elapsed since DAPS HO execution until RLF occurs in source cell before fallback”, is represented by a new timer in the RLF-Report, e.g. timeConnSourceFailure.

21 FFS: For DAPS, “The time elapsed since DAPS HO execution until RLF occurs in source cell after fallback”, is represented by the legacy timeConnFailure and by a “DAPS fallback” indication.

1 For CHO, agreement on the definition of Timer C is not revisited for the moment.

2 For CHO, RAN2 does not see the need of new timers to be included in the RLF-Report at the moment.

3 For CHO, RAN2 does not see the need of new radio-related measurements to be included in the RLF-Report at the moment.

4 The agreement about including in the RLF-Report “Fulfilled CHO execution condition(s), i.e. whether A3 and/or A5 event was fullfilled, for the cell(s) in which CHO execution was triggered” is not revisited at the moment.

9 The need of an explicit CHO indication as HO type in the RLF-Report should be further evaluated, e.g. during stage-3 discussion.

11 RAN2 does not see the need to introduce a single flag in the RLF-Report indicating whether all CHO conditions were met.

12 For CHO, RAN2 does not see the need at the moment to introduce an attemptCondReconfig IE in the RLF report

14 For CHO, no need to merge scenarios 1b/1c.

15 For CHO, no need to merge scenarios 2a/2b.

16 For CHO, there is no need at the moment to deprioritize case 3c and 3f.

17 For CHO, there is no need at the moment to move CHO scenario 2b from “To early CHO” to “CHO to wrong cell”.

18 There is no need to further differentiate in the description of MRO scenarios between CHO recovery and re-establishment procedure.

23 For DAPS, there is no need to include in the RLF report a new time, e.g., timeFailureDAPSHO, to indicate the time elapsed since the first connection failure until the successful RACH with the target DAPS HO cell.

27 The existing FailureInformation message associated to DAPS failure is not enhanced for SON purposes.

29 For DAPS, there is no need to further discuss the following:

a. Move scenario 1b into the too early DAPS HO

b. Introduce new scenario 3d and merge scenarios 3a and 3d

33 No further SHR triggering conditions is considered at the moment.

### 5.1.1 2-step RA

Agreements:

1 If a RA procedure switching from 2-step RA to 4-step RA occurs, one RA report entry is used to convey RA information for 2-step RA and 4-step RA attempts.

2 To introduce 2-step RACH related information in RACH report:

 enhance the legacy field ra-InformationCommon to include 2-step RA related information. FFS the detailed information.

## 5.2 MDT

Agreements:

1 For the content for on demand SI:

 Include information to differentiate between Msg1-based or Msg3-based on-demand SI request. How to convey the information is FFS.

 UE records intended SIBs for failed on-Demand SI request. FFS the successful case.

Agreements:

1 In order to avoid overwriting of signalling-based logged MDT, UE-assisted and network-based solution, which relying on network implementation through UE providing assistance, is introduced.

Two alternatives:

- UE-based solution, which is UE rejects network configuration

- UE-assisted and network-based solution, which relying on network implementation through UE providing assistance

|  |  |  |
| --- | --- | --- |
| **Options** | **Source** | **Detailed proposals** |
| 1 | [2], vivo | Proposal 1: Upon reception of the assistance information (indicating the logged MDT type), NW shall be able to avoid the logged MDT being overwritten in the following scenario: the previously configured logged MDT is signalling-based, while the latest logged MDT configuration is management-based. |
| 2 | [7], LG Electronics UK | Proposal 2. If MDT configuration is released and the UE has un-retrieved logging information, the UE sends *UEAssistanceInformation* to inform the type of logging information (i.e. management-based, signaling-based) to the network. |
| 3 | [8], Ericsson | Proposal 6: UE needs to store the flag information until logged MDT report are collected by the network or till 48 hours after T330 expiry.Proposal 7: A UE configured with signalling-based MDT sends an explicit reject message to RAN if it receives a management-based MDT configuration.Proposal 8: Status of T330 timer can be included in the loggedMDTReject message to assist the network in avoiding overwriting. |
| 4 | [10], Samsung | Proposal A.1, A.2, A.3 |
| 5 | [11], Huawei, HiSilicon | The UE reports the logged MDT type to the network only when:u Signalling based Logged MDT is configured, but no results are available e.g. so far nothing stored, or all previously stored results retrievedu Signalling based Logged MDT configuration is stopped (i.e. the expiry of T330), but UE still has un-retrieved results that would be discarded upon accepting a new configuration |

From summary rapporteur’s point of view, option 1/2/4/5 are to reply on network to solve the issue (e.g. by network implementation), and option 3 suggests that UE rejects network configuration. Among all proposals, how the UE should set the assistance information is also heavily discussed.

# 6 RAN2#115-e

## 6.1 CHO

Agreements in 113bis are confirmed as:

1 Include in the RLF-report for CHO the following:

a. Configured CHO execution condition(s) (A3 and/or A5 event configuration, TTT values)

c. Latest radio measurement results of the candidate target cells

Try to reuse existing mechanism as much as possible.

Agreement a. can be revisited if RAN3 has further progress on it.

Agreements:

1 The following signalling model for the RLF-Report of CHO:

 Use separate IEs within the existing RLF-report to represent the second failure, and the first failure can be represented by reusing as much as possible existing IEs

The following type of CHO-related parameters are included in the RLF-Report for CHO for the moment:

 Time between fullfilment of triggering conditions

 the first satisfied event or condition

Agreements:

1 To apply the agreements related to the NR CHO RLF-Report to the LTE CHO RLF-Report. However, RAN2 should keep focusing on NR progress first.

## 6.2 DAPS

Agreements:

1 In case the RLF occurs in source cell after fallback, the timeConnSourceFailure is used to represent the time elapsed between the DAPS HO execution and the RLF in the source.

2 For the case of HOF while performing DAPS HO followed by a fallback to the source cell, following signalling is applied: The detailed handover failure related information are included in the RLF-Report and this RLF report can be fetched like any other RLF report.

The legacy timeConnFailure can be reused to represent in the RLF report the scenario of DAPS HOF or RLF in target cell (after DAPS HO).

3 For the case of RLF in source cell while performing DAPS HO (i.e. before fallback), the follow time information is included in the RLF-Report:

a. timeConnSourceFailure: The time elapsed since DAPS HO execution until RLF occurs in source cell while performing DAPS HO before the fallback

4 The RLF report is used to log the failure related measurement in these scenarios:

 a. Failure at the source (RLF) while performing access to DAPS target cell and failing to access the target (HOF)

 b. Failure at the target cell (HOF) and failing to perform fallback (RLF at source)

## 6.3 SHR

Agreements:

1: Define separate thresholds for T310/T312/T304, and the percentage values are 40%, 60%, 80%. The percentage is to indicate the ratio of the threshold value (unit: ms) over the signalled T310/T312/T304 value (unit: ms).

1a: For threshold for T312, the percentage value also includes 20%.

2: For the thresholds of T310/T312 in the source cell, the source cell configures the values. FFS source cell or target cell can configure the threshold for T304.

3: Introduce a UE capability indication for SHR.

4: The UE may discard the SHR, i.e. release the UE variable VarSuccHO-Report, 48 hours after the SHR is stored.

Agreement:

1 UP measurements for Successful Handover Report will be introduced as RAN3 required. FFS the details.

## 6.4 2-step RACH

Agreement

1 Measured RSRP of DL pathloss reference obtained just before performing RACH procedure to be logged in 2-step RACH report is of per RACH procedure granularity.

## 6.5 Others

Agreements:

***RA Report to the SN:***

1 UE reports the SN RACH report to the MN, and then MN sends the SN RACH report to SN.

***SN Related MHI Information:***

2 RAN2 to confirm that the PSCell transition is part of MHI.

3 PSCell MHI is reported only to PCell.

4 UEInformationResponse message is used to convey the PSCell MHI to the MN.

5 Take Option 1 ‎(PSCell MHI nested within the PCell MHI) as baseline.

***Report and Content of SCG Failure Information:***

6 RAN2 confirms that the 5 information requested by RAN3 LS ‎ R3-211332 ‎ are needed, and how to report them to the network could be further discussed.

**FFS:**

**Proposal 10 Reuse existing SCG failure messages to transfer the SCG failure information for PSCell ‎failure analysis requested by RAN3.‎**

**Proposal 11 If reuse existing SCG failure messages, add new fields for the first 3 information (i.e., ‎CGI of the Source PSCell, CGI of the Failed PSCell, and timeSCGFailure) requested in RAN3 LS R3-211332.**

**Proposal 12 If reuse existing SCG failure messages, reuse existing field of failureType for the 4th information (i.e., ‎connectionFailureType‎) requested in RAN3 LS R3-211332 ‎.**

**Proposal 15 Check with RAN3 first about whether EN-DC and NG-EN-DC scenarios are in the consideration of RAN3 LS R3-211332 for the SCG failure recording for the purpose of PSCell failure analysis.**

=> Draft LS to inform RAN3 our progress on the agreements (reply to LS R2-2008723 and R2-2102639) (CATT).

## 6.6 MDT

Agreements:

1 The UE includes the beam identifiers used to acquire the SI message(s) in the on-demand SI procedure related report. FFS: How to capture this information

2 Extend RA report for both successful and failure on-demand SI request. FFS: Whether successful one-demand SI request related scenario is included or not is postponed to RAN2#116 meeting.

3 Signaling based logged MDT override protection is applicable in the following scenarios:

1) Signaling based Logged MDT is configured, but no results are available e.g. so far nothing stored, or all previously stored results retrieved

2) Signaling based Logged MDT configuration is stopped (i.e. the expiry of T330), but UE still has un-retrieved results that would be discarded upon accepting a new configuration

4 Include an indicator to indicate the signaling based logged MDT configuration availability in RRCSetupComplete / RRCConnectionSetupComplete and RRCResumeComplete / RRCConnectionResumeComplete.

 FFS: Implicit (flag indicating T330 is running or not) vs explicit indication

5 UE includes an indication regarding whether the T330 timer is running or not in RRCSetupComplete / RRCConnectionSetupComplete and RRCResumeComplete / RRCConnectionResumeComplete.

# 7 RAN2#116-e

## 7.1 HO-related

Agreements:

1 The following method to support for Time D among the following: The “Time D” is represented via the timeConnFailure, which is supposed to start at CHO execution and stop when the HOF/RLF occurs.

Agreements:

1 Include an indicator in the RLF report indicating whether the last executed HO before the RLF in the target cell was a DAPS HO.

2 The value of the T304 threshold to be provided in the SHR configuration is configured by the target cell.

3 An explicit indicator is added in the RLF report indicating whether the last executed HO before the RLF in the target cell was a CHO HO

=> RAN2 to further discuss whether and how to handle the scenario of SHR and RLF-Report being generated for the same HO.

=> SHR does not include information on whether the UE is handed-over to another cell early after the successful HO.

=> The following triggering conditions for SHR are not pursued in rel-17:

a. T310/T312 in target cell is started after a short time of successful HO

b. The number of preamble attempt in target cell is greater than one threshold

c. If the UP interruption time is above a certain threshold

d. Configured CFRA RACH resource not used and the UE is forced to use the CBRA for HO

## 7.2 2-step RACH related

Agreements:

1 Including the field msgA-Transmax in RA-InformationCommon IE to indicate RA type switching point in the 2-step RA report.

2 Preamble group optimization for RACH report is not introduced in Rel-17.

3 Introduce MSGA PUSCH resource related information in 2-step RA report and the details within the following information: the payload size transmitted in MSGA for a 2-step RACH attempt. FFS the detail and how to reduce overhead.

## 7.3 Other topics

Agreements:

1: The UE needs to include RA information in case that failureType is set to randomAccessProblem or beamFailureRecoveryFailure-r16.

2: RA-InformationCommon-r16 is used as a baseline to indicate random-access related information set by the PSCell.

3: The parameter connectionFailureType could reuse the current failureType in SCG failure message. FFS on enhancements.

4 The condition “failureType is set to synchReconfigFailureSCG” for including RA information.

 => FFS: Introduce one bit flag to indicate whether T304 is running or not in SCG failure message.

## 7.4 Immediate MDT

Agreements:

1 For non-duplication and duplication case, a single D1 is calculated.

2 The following method is used for configuring D1 in case of split bearer: only one node can configures D1 to UE, and UE reports D1 to corresponding node where configuration is received;

3 At least for OAM observability, MN and SN can calculate M5 measurement in the DU respectively when split bearer is used.

4 The same as LTE, reporting of immediate MDT results won’t be impact by IDC.

5 No enhancement is needed in RAN2 signalling to support IDC tagging in immediate MDT results**.**

6 MN and SN can calculate M7 measurement in the DU respectively when split bearer is used.

7 From RAN2’s perspective, indication of duplication status is beneficial to be included for M5/M7 measurement in split bearer

=> Enhancement on M5 measurement is not pursued in this release.

=> Enhancement on M7 measurement is not pursued in this release.

## 7.5 Logged MDT

=> Frequency-specific and RAT-specific coverage hole indication in logged MDT are not pursued in Rel-17.

Agreements:

1 Extended LoggedMeasurementConfiguration with AreaConfig and/or InterFreqTargetInfo, implies the Logged MDT reports are provided according to legacy MDT performance measurements.

2 LoggedMeasurementConfiguration is extended with a flag to indicate if an early measurement/idle mode configuration has relevance for logged measurement purposes.

3 Multiple CEF reports is introduced to solve the problem about UL/DL coverage imbalance. FFS whether UE capability is applied. FFS how to limit the overhead during running CR.

Votes for support

“DL signal state during UL outage” (4)

“multiple CEF reports” (5)

Agreements:

1 Alpha in PRB Usage for MIMO is changed to float value 1.00~100.00

2 Introduce a new PRB usage matrix with Alpha autonomously adjusted based on statistical data of MIMO layer, the variable value can be called β.

## 7.6 L2 measurements

=> Introduce packet “reliability” measurement for D1, i.e. reuse the LTE metric.

Agreements

1 The new delay measurement can be called excess packet delay for NR.

2 FFS: the definition of the measurement of excess packet delay for NR is:

- it represents the ratio of packets in UL per DRB exceeding the configured delay threshold among the UL PDCP SDUs received. The delay for each packet is calculated from packet arrival at PDCP upper SAP until the UL grant to transmit the packet is available, which has included the delay the UE gets resources granted (from sending SR/RACH to get the first grant)

3 The network can collect the measurement excess packet delay for NR from the UE.

4 LTE excess packet delay reporting can be used as a baseline, and details can be further discussed.

# 8 RAN2#116bis-e

Agreements

1 In case the UE experiences an RLF in a cell after being configured with CHO configuration in that cell (i.e., RLF in source while having CHO config), the UE shall log in the RLF-Report, the already agreed timeSinceCHOReconfig which represents in this case the time elapsed between the RLF in that cell and the latest received CHO configuration while connected to that cell.

2 The following granularities are adopted for the timers timeConnSourceDAPSFailure, timeSinceCHOReconfig, timeBetweenEvents:

a. timeConnSourceDAPSFailure: milliseconds

b. timeSinceCHOReconfig: hundreds of ms

c. timeBetweenEvents: milliseconds

3 Related to how to set the timeSinceFailure: keep the specification as-is (time since last failure).

4 For the inclusion of RA-InformationCommon in the SHR: RA-InformationCommon is included in SHR when T304 is above the threshold.

Observation 1 It is not possible for the network to identify that the SHR and RLF report are generated for the same HO.

5 The UP interruption time at HO is evaluated at PDCP layer without considering duplicates.

6 The UE is responsible for performing the user plane interruption time measurements at the HO i.e., inline with the agreement from RAN2#115 meeting.

Agreements

1 For the 2-step RA, the UE reports the payload size without considering the padding.

2 For the 2-step RA, the UE reports the payload size per RA procedure.

3 The UE includes intendedSIBs, ssbsForSI-Acquisition in the RA report also for a successfully completed on-demand SI procedure.

4 The UE includes the PCell ID in the RA-Report, if the RA procedure is performed in an SCell of the MCG.

5 The UE includes the PSCell ID in the RA-Report, if the RA procedure is performed in an SCell of the SCG.

# 9 RAN2#117-e

Agreements:

1 The time elapsed between the DAPS HO initialization and the RLF in the source cell after fallback is represented by the timeConnFailure (no changes needed to the current running CR).

2 The modeling of the UE actions in the case of consecutive failures in the current running CR is considered as baseline. Further clarifications (if any) may be addressed during the running CR review.

3 The timeUntilReconnection in the RLF report for the consecutive CHO failure cases represents the time from first failure to the time of reconnection.

4 To include the ‘t312-expiry’ as a new rlf-cause in the RLF-Report.

5 The UE shall generate the SHR due to RLF in the source cell during a DAPS HO, only if it is configured to do so in the SHR configuration (i.e. in the successHO-Config).

6 To include PLMN checking before sending the availability indicator for the SHR (as in RLF Report).

7 RAN2 to confirm that the UE includes the RA resource related parameters (frequency start, FDM, and SubcarrierSpacing of the msgA RA resource) under following scenarios:

a. RA procedure involves only 2 step RA (i.e. no switching to 4-step RA)

b. When 2 step RA to 4 step RA switching occurs, only those parameters that are different in 4 step RA resources compared to the 2 step RA resources are included.

8 TS 36.331 modifications are not introduced to handle the scenario of LTE MN fetching the list of NR RA reports in Rel-17.

9 TS 38.331 modifications are not introduced to handle the scenario of NR MN fetching the LTE RA report in Rel-17.

10 RAN2 confirms (UE behaviour from Rel-15/Rel-16) that the UE sets the failureType to randomAccessProblem in the SCGFailureInformationNR, when the UE experiences random access problem indication from the SCG MAC whileT304 is running for the SCG. Otherwise, if the UE initiates transmission of the SCGFailureInformationNR message to provide reconfiguration with sync failure information for an SCG (T304 expiry), the UE sets the failureType to synchReconfigFailureSCG.

11 The total number of PSCell (across all PCells) related information that should be stored by the UE in the MHI in 16.

12 When the UE reaches the maximum number of PSCell, if it gets a new PSCell, the UE removes the oldest stored PSCell entry and stores the newly configured PSCell entry.

13 The UE includes the time spent with no PSCell in the MHI, when connected to a certain PCell.

14 Keep the CHO candidate cell list and the CHO configuration only in the RLF-Report (not in the SHR), as in the current running CR. This agreement can be revisit depending on RAN3 progress.

15 UP interruption measurements should be considered: Only at DAPS HO.

16 The SHR configuration is provided in the otherConfig which can be provided by the source cell before the HO, and/or by the target cell as part of the HO command (as in the current running CR).

17 Clarify in the field descriptions of the successHO-Config IE which node (source/target) configures the specific triggering condition:

a. T312/T310 thresholds are configured by the source (confirm agreement from RAN2#115)

b. T304 threshold is configured by the target (confirm agreement from RAN2#116)

c. Source cell(s) configure(s) the DAPS source RLF condition.

Agreement:

 Inclusion of one or more of the following PUSCH resource parameters only when the UE uses random access resources provided in dedicated signalling, or only when configured with CFRA:

 a. msgA-MCS (4 bits)

 b. nrofPRBs-PerMsgA-PO (5 bits)

 c. msgA-PUSCH-TimeDomainAllocation (4 bits)

 d. frequencyStartMsgA-PUSCH (9 bits)

 e. nrofMsgA-PO-FDM (2 bits)

**3: UE reports that whether the on-demand SI acquiring was successful or not.**

Agreements:

1 The RA related Information associated to the SCG failure are included in the SCGFailureInformation.

the SCG failure due to random access problem indication in the SCG MAC

2 The UE only includes the perRAInfoList rather than the full RA-Information in the SCGFailureInformation message.

3 A single T312 threshold common to all measurement identities is configured in the SHR configuration

4 The SHR shall be generated only if the T312 associated to the measurement identity of the target cell is running.

5 RAN2 does not see the need to include the following:

a. Indicator in the RLF-Report (SHR) indicating that there is an SHR (RLF-Report) associated to the same HO

b. Timestamps in the SHR and RLF-Report to link them in time. FFS how to represent this timestamp (e.g. absolute or relative timestamp)

7 Amend the running CR such that the SHR will not be generated when the UE succeeds with the CHO recovery, in line with the agreement from RAN2#114-e .

Agreements:

1 For the 2-step RA, the payload reported by the UE in the RA-Report is the overall payload available in the UE buffer at the time of initiating the 2 step RA procedure.

2 A 3-bit bitstring in RA report is adopted, where the value of the 3-bit bitstring refers to one of the indexes of the 5-bit BSR table in TS 38.321 (similar to the definition of the messageSize field within SL-TrafficPatternInfo)

3 The RA Information associated to a SCG failure are included in the SCGFailureInformation for the following scenarios

a. when failureType is set to randomAccessProblem while T304 is running

c. when failureType is set to synchReconfigFailureSCG

4 RAN2 to include the following information in the SCGFailureInformation in case of SCG failure

a. previousPSCellID (i.e. PCI)

b. failedPSCellID (i.e. PCI)

c. timeSCGFailure

5 There is no need for the UE to include a 1 bit flag in the SCGFailureInformation to indicate that the T304 was running when the UE declared

6 The C-RNTI of the target cell is included in the SHR .