**3GPP TSG-RAN WG2 #127bis *R2-240xxxx***

**Hefei, China, 14-18 October 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | **XXXX** | **rev** | **-** | **Current version:** | **18.3.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Misc RRC corrections for feMob | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_Mob\_enh2-Core | | | | |  | ***Date:*** | | | 2024-10-04 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | The CR addresses the following issues:  - In section 5.3.8.3 when the UE receives the field *measIdleValidityDuration* it should store this field rather than the one for reselection.  Further, the CR is to handle the following issues discovered from RAN2#127bis:  - UE release/clear all current common radio configurations including the PCell upon subsequent CPAC execution.  - The terminology “MN format” is not clear what it mean and should be clarified.  - In the Annex B2 is not clear whether the RRCReconfiguration can be sent unprotected if it includes the LTM-Config.  - The field description of securityCellSetId is added to the wrong IE.  - The current restriction for the s-measure says that is does not apply for the LTM measurements but this is wrong as the UE requires anyway L3 measurement to be configured in case it needs to perform L1 measurements for LTM. | | | | | | | | |
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| ***Summary of change:*** | | Section 5.3.5.13.8  - Clarified that first the UE release the common and dedicated configurations and then perform certain actions (e.g., keep some field and release others)  Section 5.3.8.3  - Clarified that when the UE receives the field *measIdleValidityDuration,* it should store it in a UE variable  Section 6.3.2  - Clarified that the field ul-powerControl refers to an element in the list configured using uplink-PowerControlToAddModList in the SpCellConfig of the ltm-CandidateConfig in the LTM-Candidate where the ltm-TCI-Info is configured.  - Move the fiels description of securityCellSetId to a different IE  - Removed the restriction on s-measure not applicable to LTM measurements  Section 11.2.2  - Clarified the terminology about “MN format”  Section Annex B  - Clarified that the RRCReconfiguration cannot be send unprotected if it includes the LTM-Config.  **Impact Analysis**  Impacted 5G architecture options: NR SA, NR-DC  Impacted functionality: LTM and CPAC  Inter-operability:  1. If the network is implemented according to the CR and the UE is not, there is no inter-operability issue.  2. If the UE is implemented according to the CR and the network is not, there is no inter-operability issue. | | | | | | | | |
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| ***Consequences if not approved:*** | | If the CR is not approved the following may happen for LTM and CPAC:  - UE release/clear all current common radio configurations including the PCell upon subsequent CPAC execution.  - The terminology “MN format” is not clear what it mean and should be clarified.  - In the Annex B2 is not clear whether the RRCReconfiguration can be sent unprotected if it includes the LTM-Config.  - The field description of securityCellSetId is added to the wrong IE.  - The current restriction for the s-measure says that is does not apply for the LTM measurements but this is wrong as the UE requires anyway L3 measurement to be configured in case it needs to perform L1 measurements for LTM | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.3.5.13.8, 5.3.8.3, 6.3.2, 11.2.2, B.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*START OF CHANGE*

##### 5.3.5.13.8 Subsequent CPAC execution

Upon the conditional reconfiguration execution for subsequent CPAC, the UE shall:

1> if the selected subsequent CPAC candidate configuration is stored in MCG *VarConditionalReconfig*:

2> for each SRB/DRB in current UE configuration:

- keep the associated RLC, PDCP and SDAP entities, their state variables, buffers and timers;

- release all fields related to the SRB/DRB configuration except for *srb-Identity*, *drb-Identity*, and *securityConfig*;

2> release/clear all current dedicated radio configuration except for the following:

- the MCG C-RNTI;

- the AS security configurations associated with the master key and the secondary key;

- the *logicalChannelIdentity* and *logicalChannelIdentityExt* of RLC bearers configured in RLC-BearerConfig and the associated RLC entities, their state variables, buffers, and timers;

- the bh-*LogicalChannelIdentity* of BH RLC channels configured in *BH-RLC-ChannelConfig* and the associated RLC entities, their state variables, buffers, and timers;

- the UE variables *VarConditionalReconfig* and *VarServingSecurityCellSetID*;

- the logged measurement configuration*.*

2> release/clear all current common radio configuration, except the *spCellConfigCommon* of the PCell;

2> apply the default MAC Cell Group configuration for MCG MAC and SCG MAC as specified in 9.2.2;

2> use the default values specified in 9.2.3 for timers T310, T311 and constants N310, N311, where T310, N310, and N311 are for both MCG and SCG, and T311 is only for the MCG;

2> apply the default L1 parameter values as specified in corresponding physical layer specifications for the MCG and SCG;

1> else:

2> for each SRB/DRB in current UE configuration:

- keep the associated PDCP and SDAP entities, their state variables, buffers and timers;

- release all fields related to the SRB/DRB configuration except for *srb-Identity*, *drb-Identity*, and *securityConfig*;

2> release/clear all current dedicated radio configuration associated with the SCG except for the following:

- the AS security configurations associated with the secondary key;

- the UE variables *VarConditionalReconfig*.

2> release/clear all current common radio configuration associated with the SCG;

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

2> use the default values specified in 9.2.3 for timer T310 and constants N310 and N311 for the SCG ;

2> apply the default L1 parameter values as specified in corresponding physical layer specifications for the SCG;

1> if the *securityCellSetId* is included in the entry in *VarConditionalReconfig* containing the *RRCReconfiguration* message:

2> if *servingSecurityCellSetId* is not included within *VarServingSecurityCellSetID*; or

2> if the value of the *securityCellSetId* is not equal to the value of *servingSecurityCellSetId* within *VarServingSecurityCellSetID*:

3> consider the first *sk-Counter* value in the *sk-CounterList* associated with the *securityCellSetId* within the *VarConditionalReconfig* as the selected *sk-Counter* value, and perform security key update procedure as specified in 5.3.5.7;

3> remove the selected *sk-Counter* value from the *sk-CounterList* associated with the *securityCellSetId* within the *VarConditionalReconfig*;

3> if the current *VarServingSecurityCellSetID* includes *servingSecurityCellSetId*:

4> replace the value of *servingSecurityCellSetId* within *VarServingSecurityCellSetID* with the value of *securityCellSetId* associated with the selected cell;

3> else:

4> store the *servingSecurityCellSetId* within *VarServingSecurityCellSetID* with the value of *securityCellSetId* associated with the selected cell;

1> if the selected subsequent CPAC candidate configuration is stored in the SCG *VarConditionalReconfig*:

2> for each *drb-Identity* value included in each *RadioBearerConfig* in the selected subsequent CPAC candidate configuration that is part of the current UE configuration, the UE shall perform the following actions after the end of this procedure:

3> if the bearer is an AM DRB:

4> trigger the PDCP entity of the bearer to perform PDCP data recovery as specified in TS 38.323 [5];

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

1> else:

2> for each *drb-Identity* value included in each *RadioBearerConfig* in the selected subsequent CPAC candidate configuration that is part of the current UE configuration, the UE shall perform the following actions after the end of this procedure:

3> if the *keyToUse* in the *RadioBearerConfig* is different from the *keyToUse* in the current UE configuration;or

3> if the bearer is associated with the secondary key (S-KgNB) as indicated by *keyToUse* in the current UE configuration and a new *sk-Counter* value has been selected due to the conditional reconfiguration execution for subsequent CPAC:

4> if the PDCP entity of this DRB is not configured with *cipheringDisabled*:

5> configure the PDCP entity with the ciphering algorithm and KUPenc key associated with the master key (KgNB) or the secondary key (S-KgNB), as indicated in *keyToUse*, i.e., the ciphering configuration shall be applied to all subsequent PDCP PDUs received and sent by the UE;

4> if the PDCP entity of this DRB is configured with *integrityProtection*:

5> configure the PDCP entity with the integrity protection algorithms according to *securityConfig* and apply the KUPint key associated with the master key (KgNB) or the secondary key (S-KgNB) as indicated in *keyToUse*;

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

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

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

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

4> if *drb-ContinueEHC-UL* is included in *pdcp-Config*:

5> indicate to lower layer that *drb-ContinueEHC-UL* is configured;

4> if *drb-ContinueUDC* is included in *pdcp-Config*:

5> indicate to lower layer that *drb-ContinueUDC* is configured;

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

4> trigger the PDCP entity of the bearer to perform PDCP re-establishment as specified in TS 38.323 [5];

3> else:

4> if there is an associated SCG RLC bearer in the selected subsequent CPAC candidate configuration that is part of the current UE configuration:

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

4> if the RLC entity of the associated RLC bearer(s) is re-established; or

4> if an associated RLC bearer is released in the selected subsequent CPAC candidate configuration:

5> if the bearer is an AM DRB:

6> trigger the PDCP entity of the bearer to perform PDCP data recovery as specified in TS 38.323 [5];

2> for each *srb-Identity* included in *RadioBearerConfig* that is part of the current UE configuration and if the radio bearer is SRB3 or SRB5, the UE shall perform the following actions after the end of this procedure:

3> if a new *sk-Counter* value has been selected due to the conditional reconfiguration execution for subsequent CPAC:

4> configure the PDCP entity to apply the integrity protection algorithm and KRRCint key associated with the secondary key (S-KgNB) as indicated in *keyToUse*, i.e. the integrity protection configuration 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;

4> configure the PDCP entity to apply the ciphering algorithm and KRRCenc key associated with the secondary key (S-KgNB) as indicated in *keyToUse*, i.e. the ciphering configuration 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;

4> trigger the PDCP entity of SRB to perform PDCP re-establishment as specified in TS 38.323 [5];

3> else:

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

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

1> if *scpac-ConfigComplete* is not included within the *VarConditionalReconfig* for the selected cell:

2> if the subsequent CPAC candidate cell configuration is stored in MCG *VarConditionalReconfig*:

3> consider *scpac-ReferenceConfiguration* in MCG *VarConditionalReconfig* to be the current UE configuration;

2> else:

3> consider *scpac-ReferenceConfiguration* in SCG *VarConditionalReconfig* to be the current SCG configuration;

NOTE 1: When the UE considers the reference configuration to be the current UE configuration, the UE should store fields and configurations that are part of the reference configuration but should not execute any actions or procedures triggered by the reception of an *RRCReconfiguration* message which are described in clause 5.3.5.3.

1> apply the stored *condRRCReconfig* of the selected cell(s) and perform the actions as specified in 5.3.5.3;

1> release the radio bearer(s) and the associated logical channel(s) that are part of the current UE configuration but not part of the subsequent CPAC candidate configuration for the selected cell, or the subsequent CPAC reference configuration (in case the subsequent CPAC candidate configuration does not include *scpac-ConfigComplete*).

NOTE 2: When *scpac-ConfigComplete* is not included for the selected cell, before a subsequent CPAC execution, a UE implementation may generate and store an RRC reconfiguration message by applying the received subsequent CPAC candidate configuration on top of the subsequent CPAC reference configuration, and the stored RRC reconfiguration message is applied for subsequent CPAC execution. The UE needs to ensure that the RRC reconfiguration applied at the time of subsequent CPAC execution is in accordance with the latest received *scpac-ReferenceConfiguration* and *condRRCReconfig* for the subsequent CPAC configuration.

*END OF CHANGE*

*START OF CHANGES*

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

The UE shall:

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

NOTE 0: When the *RRCRelease* message is received on a HARQ process with disabled HARQ feedback, and when STATUS reporting, as defined in TS 38.322 [4], has not been triggered for a logical channel associated with the SRB1, the lower layers can be considered to have indicated that the receipt of the *RRCRelease* message has been successfully acknowledged.

1> stop timer T380, if running;

1> stop timer T320, if running;

1> if timer T316 is running;

2> stop timer T316;

2> if the UE supports RLF-Report for fast MCG recovery procedure as specified in 38.306 [26]:

3> set the *elapsedTimeT316* in the *VarRLF-Report* to the value of the elapsed time of the timer T316;

3> set the *pSCellId* in the *VarRLF-Report* to the global cell identity of the PSCell, if available, otherwise to the physical cell identity and carrier frequency of the PSCell;

2> else:

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

1> stop timer T350, if running;

1> stop timer T346g, if running;

1> stop timer T348, if running;

1> if theAS security is not activated:

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

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

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

2> if *cnType* is included:

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

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

2> if *voiceFallbackIndication* is included:

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

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

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

2> if the *t320* is included:

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

1> else:

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

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

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

2> store the *deprioritisationReq* until T325 expiry;

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

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

2> if T331 is running:

3> stop timer T331;

3> perform the actions as specified in 5.7.8.3;

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

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

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

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

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

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

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

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

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

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

4> store the received *measReselectionCarrierListNR* in *VarMeasReselectionConfig*;

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

4> store the received *measReselectionValidityDuration* in *VarMeasReselectionConfig*;

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

4> store the received *measIdleValidityDuration* in *VarEnhMeasIdleConfig*;

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

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

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

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

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

4> consider the DRB to be configured for SDT;

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

4> consider the SRB2 to be configured for SDT;

3> for each RLC bearer (except those associated with broadcast MRBs and multicast MRBs) that is not suspended:

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

3> for SRB2 (if it is resumed) and for SRB1:

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

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

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

2> if *srs-PosRRC-Inactive* is configured:

3> apply the SRS for positioning configuration in RRC\_INACTIVE and instruct MAC to start the *inactivePosSRS-TimeAlignmentTimer*;

2> if *srs-PosRRC-InactiveValidityAreaNonPreConfig* is set to *setup*:

3> apply the SRS for positioning configuration in RRC\_INACTIVE and instruct MAC to start the *inactivePosSRS-ValidityAreaTAT*;

2> else if *srs-PosRRC-InactiveValidityAreaNonPreConfig* is set to *release*:

3> release *srs-PosRRC-InactiveValidityAreaNonPreConfig*, if available;

2> if *srs-PosRRC-InactiveValidityAreaPreConfigList* is set to *setup*:

3> store *srs-PosRRC-InactiveValidityAreaPreConfigList* and perform actions as specified in clause 5.7.20;

2> else if *srs-PosRRC-InactiveValidityAreaPreConfigList* is set to *release*:

3> remove all *srs-PosRRC-InactiveValidityAreaPreConfigList*, if available;

NOTE 1b: The Network should provide full configuration to UE for SRS for Positioning in RRC\_INACTIVE.

2> perform the LTM configuration release procedure for the MCG and the SCG as specified in clause 5.3.5.18.7;

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

2> remove the *servingSecurityCellSetId* within the *VarServingSecurityCellSetID*, if any;

2> for each *measId* of the MCG *measConfig* and for each *measId* of the SCG *measConfig*, if configured, 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> if the UE is NCR-MT and if *ncr-FwdConfig* is configured:

3> if the *ncr-FwdConfig* includes periodic forwarding resource configuration:

4> indicate to NCR-Fwd to continue forwarding only in accordance with the configured periodic forwarding resource set(s);

3> else:

4> indicate to NCR-Fwd to cease forwarding;

2> if the UE is acting as L2 U2N Remote UE and is not configured with MP:

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

4> indicate upper layers to trigger PC5 unicast link release;

3> else (i.e., maintain the PC5 RRC connection):

4> establish or re-establish (e.g. via release and add) SL RLC entity for SRB1;

2> else:

3> re-establish RLC entities for SRB1;

2> for each application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

3> inform upper layers about the release of the RAN visible application layer measurement configuration;

3> discard any RAN visible application layer measurement reports received from upper layers;

3> initiate the procedure in 5.5b.1.2;

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

3> stop the timer T319 if running;

3> in the stored UE Inactive AS context:

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

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

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

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

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

5> replace the physical cell identitywith the value of the *sl-PhysCellId* in *sl-ServingCellInfo* contained in the discovery message received from the connected L2 U2N Relay UE;

4> else:

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

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

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

3> stop the timer T319a if running and consider SDT procedure is not ongoing;

2> else:

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

- parameters within *ReconfigurationWithSync* of the PCell;

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

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

- *servingCellConfigCommonSIB*;

- *sl-L2RelayUE-Config*, if configured;

- *sl-L2RemoteUE-Config*, if configured;

- *aerial-Config*, if configured;

- c*ellDTX-DRX-Config*, if configured;

NOTE 1c: *suspendConfig* is not stored as part of UE Inactive AS Context, except for the fields explicitly specified.

3> store any previously or subsequently received application layer measurement report containers for which the successful transmission of the message or at least one segment of the message has not been confirmed by lower layers;

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

2> suspend all SRB(s) and DRB(s), except SRB0 and broadcast MRBs;

2> suspend all multicast MRB(s) associated with multicast session(s) not configured for reception in RRC\_INACTIVE;

2> indicate PDCP suspend to lower layers of all DRBs and multicast MRBs associated with multicast session(s) not configured for reception in RRC\_INACTIVE;

2> release Uu Relay RLC channel(s), if configured;

2> release PC5 Relay RLC channel(s), if configured;

2> release the SRAP entity, if configured;

NOTE 2a: A L2 U2N Relay UE may re-establish the SL-RLC0, SL-RLC1 and SRAP entity after release.

2> if SL indirect path is configured:

3> release cell identity and relay UE ID configured in *sl-IndirectPathAddChange*;

3> indicate upper layers to trigger PC5 unicast link release of the SL indirect path;

2> if N3C indirect path is configured:

3> release *n3c-IndirectPathAddChange*;

3> consider the non-3GPP connection is not used;

2> if the UE is acting as a N3C relay UE:

3> release *n3c-IndirectPathConfigRelay*;

3> consider the non-3GPP connection is not used;

2> if the *t380* is included:

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

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

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

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

2> if T390 is running:

3> stop timer T390 for all access categories;

3> perform the actions as specified in 5.3.14.4;

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

2> if the UE is capable of L2 U2N Remote UE:

3> enter RRC\_INACTIVE, and perform either cell selection as specified in TS 38.304 [20], or relay selection as specified in clause 5.8.15.3, or both;

2> else:

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

2> if the *suspendConfig* includes *resumeIndication*:

3> perform the actions as if the UE received *Paging* message with the *ue-Identity* included in the *PagingRecord* matching the UE's stored *fullI-RNTI*, as specified in clause 5.3.2.3;

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

3> if the multicast PTM configuration is provided for at least one multicast session for which the UE is not indicated to stop monitoring the G-RNTI and the UE selects the same cell as the one on which the multicast session was received in RRC\_CONNECTED:

4> apply the multicast PTM configuration as specified in 5.10.3;

4> if multicast MCCH is present;

5> monitor the Multicast MCCH-RNTI as specified in 5.10.1.2;

1> else:

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

NOTE 3: Whether to release the PC5 unicast link is left to L2 U2N Remote UE's implementation.

NOTE 4: It is left to UE implementation whether to stop T430, if running, when going to RRC\_INACTIVE.

*END OF CHANGE*

*START OF CHANGE*

### 6.3.2 Radio resource control information elements

#### – *CandidateTCI-State*

The IE *CandidateTCI-State* defines a TCI states configuration which associate one or more reference signal with a corresponding quasi-colocation (QCL) type.

*CandidateTCI-State* information element

-- ASN1START

-- TAG-CANDIDATETCI-STATE-START

CandidateTCI-State-r18 ::= SEQUENCE {

tci-StateId-r18 TCI-StateId,

qcl-Type1-r18 LTM-QCL-Info-r18,

qcl-Type2-r18 LTM-QCL-Info-r18 OPTIONAL, -- Need R

pathlossReferenceRS-Id-r18 PathlossReferenceRS-Id-r17 OPTIONAL, -- Cond Joint

tag-Id-ptr-r18 ENUMERATED {n0,n1} OPTIONAL, -- Cond 2TA

ul-PowerControl-r18 Uplink-powerControlId-r17 OPTIONAL, -- Cond Joint2

...

}

LTM-QCL-Info-r18 ::= SEQUENCE {

referenceSignal-r18 CHOICE {

ssb-Index SSB-Index,

csi-RS-Index NZP-CSI-RS-ResourceId

},

qcl-Type-r18 ENUMERATED {typeA, typeB, typeC, typeD},

...

}

-- TAG-CANDIDATETCI-STATE-STOP

-- ASN1STOP

|  |
| --- |
| *CandidateTCI-State* field descriptions |
| ***pathlossReferenceRS-Id***  Indicates a *PathlossReferenceRS* of the candidate that includes this *CandidateTCI-State* and it refers to one of the *PathlossReferenceRS* configured within *LTM-TCI-Info*. In this version of the specification only SSB can be included as reference signal when *PathlossReferenceRS* is included within a *CandidateTCI-State* IE. |
| ***qcl-Type1, qcl-Type2***  QCL information for the TCI state. |
| ***tci-StateId***  The ID number of the TCI state. |
| ***ul-PowerControl***  Indicates the UL power control parameters for PUSCH, PUCCH, and SRS of the candidate that includes this *CandidateTCI-State*. The field is present only if *ul-powerControl* is not configured in any *BWP-Uplink-Dedicated* of the *SpCellConfig* in *ltm-CandidateConfig*. This field refers to an element in the list configured using *uplink-PowerControlToAddModList* in the *SpCellConfig* of the *ltm-CandidateConfig* in the *LTM-Candidate* where the *ltm-TCI-Info* is configured. |

|  |
| --- |
| *LTM-QCL-Info field descriptions* |
| ***referenceSignal***  The field *csi-RS-Index* refers to one of the *NZP-CSI-RS-Resource* configured within *LTM-TCI-Info*. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *2TA* | This field is mandatory present if *tag2* is present in the *SpCellConfig* in *ltm-CandidateConfig* and *unifiedTCI-StateType* in the *ltm-TCI-Info* within *LTM-Candidate* is set to *joint*. It is absent, Need R, otherwise. |
| *Joint* | This field is mandatory present, if *unifiedTCI-StateType* in the *ltm-TCI-Info* within *LTM-Candidate* *is* set to *joint*. It is absent, Need R, otherwise. |
| *Joint2* | This field is optionally present, Need R, if *unifiedTCI-StateType* in the *ltm-TCI-Info* within *LTM-Candidate is* set to *joint*. It is absent, otherwise. |

#### – *CandidateTCI-UL-State*

The IE *CandidateTCI-UL-State* defines an uplink TCI states configuration.

*CandidateTCI-UL-State* information element

-- ASN1START

-- TAG-CANDIDATETCI-UL-STATE-START

CandidateTCI-UL-State-r18 ::= SEQUENCE {

tci-UL-StateId-r18 TCI-UL-StateId-r17,

referenceSignal-r18 CHOICE {

ssb-Index SSB-Index,

csi-RS-Index NZP-CSI-RS-ResourceId

},

pathlossReferenceRS-Id-r18 PathlossReferenceRS-Id-r17 OPTIONAL, -- Need R

tag-Id-ptr-r18 ENUMERATED {n0,n1} OPTIONAL, -- Cond 2TA

ul-PowerControl-r18 Uplink-powerControlId-r17 OPTIONAL, -- Need R

...

}

-- TAG-CANDIDATETCI-UL-STATE-STOP

-- ASN1STOP

|  |
| --- |
| *CandidateTCI-UL-State* field descriptions |
| ***csi-RS-Index***  Indicates an *NZP-CSI-RS-Resource* of the LTM candidate that includes this *CandidateTCI-UL-State*. |
| ***pathlossReferenceRS-Id***  Indicates a *PathlossReferenceRS* of the LTM candidate that includes this *CandidateTCI-UL-State* and it refers to one of the *PathlossReferenceRS* configured within *LTM-TCI-Info*. In this version of the specification, only SSB can be included as reference signal when *PathlossReferenceRS* is included within a *CandidateTCI-UL-State* IE. |
| ***referenceSignal***  Reference signal with which spatial relation information is provided. The field *csi-RS-Index* refers to one of the *NZP-CSI-RS-Resource* configured within *LTM-TCI-Info*. |
| ***ssb-Index***  The index of a SSB/PBCH block as indicated in *ltm-SSB-Config* of the LTM candidate that includes this *CandidateTCI-UL-State*. |
| ***tci-UL-StateID***  The ID number of the uplink TCI state. |
| ***ul-PowerControl***  Indicates the UL power control parameters for PUSCH, PUCCH, and SRS of the candidate that includes this *CandidateTCI-UL-State*. The field is present only if ul-powerControl is not configured in any BWP-Uplink-Dedicated of the *SpCellConfig* in *ltm-CandidateConfig*. This field refers to an element in the list configured using *uplink-PowerControlToAddModList* in the *SpCellConfig* of the *ltm-CandidateConfig* in the *LTM-Candidate* where the *ltm-TCI-Info* is configured. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *2TA* | This field is mandatory present if *tag2* is present in the *SpCellConfig* in *ltm-CandidateConfig*. It is absent, Need R, otherwise. |

#### *– CondReconfigToAddModList*

The IE *CondReconfigToAddModList* concerns a list of conditional reconfigurations to add or modify, with for each entry the *condReconfigId* and the associated fields.

*CondReconfigToAddModList* information element

-- ASN1START

-- TAG-CONDRECONFIGTOADDMODLIST-START

CondReconfigToAddModList-r16 ::= SEQUENCE (SIZE (1.. maxNrofCondCells-r16)) OF CondReconfigToAddMod-r16

CondReconfigToAddMod-r16 ::= SEQUENCE {

condReconfigId-r16 CondReconfigId-r16,

condExecutionCond-r16 SEQUENCE (SIZE (1..2)) OF MeasId OPTIONAL, -- Need M

condRRCReconfig-r16 OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL, -- Cond condReconfigAdd

...,

[[

condExecutionCondSCG-r17 OCTET STRING (CONTAINING CondReconfigExecCondSCG-r17) OPTIONAL -- Need M

]],

[[

condExecutionCondPSCell-r18 SEQUENCE (SIZE (1..2)) OF MeasId OPTIONAL, -- Cond condReconfigCHO-WithSCG

subsequentCondReconfig-r18 SubsequentCondReconfig-r18 OPTIONAL, -- Need M

securityCellSetId-r18 SecurityCellSetId-r18 OPTIONAL, -- Need M

scpac-ConfigComplete-r18 ENUMERATED {true} OPTIONAL -- Cond CPAC

]]

}

CondReconfigExecCondSCG-r17 ::= SEQUENCE (SIZE (1..2)) OF MeasId

SubsequentCondReconfig-r18 ::= SEQUENCE {

condExecutionCondToReleaseList-r18 CondExecutionCondToReleaseList-r18 OPTIONAL, -- Need N

condExecutionCondToAddModList-r18 CondExecutionCondToAddModList-r18 OPTIONAL, -- Need N

...

}

CondExecutionCondToAddModList-r18 ::= SEQUENCE (SIZE (1.. maxNrofCondCells-r16)) OF CondExecutionCondToAddMod-r18

CondExecutionCondToAddMod-r18 ::= SEQUENCE {

subsequentCondReconfigId-r18 CondReconfigId-r16,

subsequentCondExecutionCond-r18 SEQUENCE (SIZE (1..2)) OF MeasId OPTIONAL, -- Need M

subsequentCondExecutionCondSCG-r18 OCTET STRING (CONTAINING CondReconfigExecCondSCG-r17) OPTIONAL, -- Need M

...

}

CondExecutionCondToReleaseList-r18 ::= SEQUENCE (SIZE (1.. maxNrofCondCells-r16)) OF CondReconfigId-r16

-- TAG-CONDRECONFIGTOADDMODLIST-STOP

-- ASN1STOP

| *CondReconfigToAddMod* field descriptions |
| --- |
| ***condExecutionCond***  The execution condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for CHO, CPA, intra-SN CPC without MN involvement, MN initiated inter-SN CPC, MN initiated subsequent CPAC, or SN initiated intra-SN subsequent CPAC without MN involvement. When configuring 2 triggering events (Meas Ids) for a candidate cell, the network ensures that both refer to the same *measObject.* The network configures at most one from *condEventD1, condEventD2* or *condEventT1* for the same candidate cell. For CPA, MN-initiated inter-SN CPC, and for MN initiated subsequent CPAC, the network only indicates *MeasId*(s) associated with *condEventA4*. For intra-SN CPC and for SN initiated intra-SN subsequent CPAC without MN involvement, the network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |
| ***condExecutionCondPSCell***  The execution condition that needs to be fulfilled for the associated PSCell in order to trigger the execution of a conditional reconfiguration for CHO with candidate SCG(s). The Meas Ids refer to the *measConfig* associated with the MCG. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject*. The network only indicates *MeasId(s)* associated with condEventA4. |
| ***condExecutionCondSCG***  Contains execution condition that needs to be fulfilled in order to trigger the execution of a conditional reconfiguration for SN initiated inter-SN CPC, SN initiated inter-SN subsequent CPAC, or SN initiated intra-SN subsequent CPAC with MN involvement. The Meas Ids refer to the *measConfig* associated with the SCG. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject*. For each *condReconfigId*, the network always configures either *condExecutionCond* or *condExecutionCondSCG* (not both). The network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |
| ***condRRCReconfig***  The *RRCReconfiguration* message to be applied when the condition(s) are fulfilled. The *RRCReconfiguration* message contained in *condRRCReconfig* cannot contain the field *conditionalReconfiguration* or the field *daps-Config*. |
|  |
| ***subsequentCondReconfig***  Contains the execution conditions that need to be fulfilled in order to trigger the execution of a subsequent CPAC. If the field is configured, the configuration of candidate PSCells for subsequent CPAC is supported. The subsequent execution condition is used for conditional reconfiguration evaluation for other candidate cells when the *RRCReconfiguration* message contained in *condRRCReconfig* has been applied. |

|  |
| --- |
| *CondExecutionCondToAddMod* field descriptions |
| ***subsequentCondExecutionCond***  The execution condition that needs to be fulfilled in order to trigger the subsequent execution of a conditional reconfiguration for SN initiated intra-SN subsequent CPAC without MN involvement. When configuring 2 triggering events (Meas Ids) for a candidate cell, the network ensures that both refer to the same *measObject*. The network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |
| ***subsequentCondExecutionCondSCG***  Contains execution condition that needs to be fulfilled in order to trigger the subsequent execution of a conditional reconfiguration for SN initiated inter-SN subsequent CPAC, SN initiated intra-SN subsequent CPAC with MN involvement, or MN initiated subsequent CPAC. The Meas Ids refer to the *measConfig* associated with the SCG. When configuring 2 triggering events (Meas Ids) for a candidate cell, network ensures that both refer to the same *measObject*. The network only indicates *MeasId*(s) associated with *condEventA3* or *condEventA5*. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *condReconfigAdd* | The field is mandatory present when a *condReconfigId* is being added. Otherwise the field is optional, need M. |
| *condReconfigCHO-WithSCG* | This field is optional present, need M, if the *RRCReconfiguration* message contained in corresponding *condRRCReconfig* includes the *nr-SCG* and *condExecutionCond* is configured. Otherwise, it is absent. |
| *CPAC* | The field is optionally present, need M, when the conditional reconfiguration includes at least one candidate PSCell supporting subsequent CPAC. Otherwise, the field is absent, need R. |

#### *– ConditionalReconfiguration*

The IE *ConditionalReconfiguration* is used to add, modify and release the configuration of conditional reconfiguration.

*ConditionalReconfiguration* information element

-- ASN1START

-- TAG-CONDITIONALRECONFIGURATION-START

ConditionalReconfiguration-r16 ::= SEQUENCE {

attemptCondReconfig-r16 ENUMERATED {true} OPTIONAL, -- Cond CHO

condReconfigToRemoveList-r16 CondReconfigToRemoveList-r16 OPTIONAL, -- Need N

condReconfigToAddModList-r16 CondReconfigToAddModList-r16 OPTIONAL, -- Need N

...,

[[

scpac-ReferenceConfiguration-r18 SetupRelease {ReferenceConfiguration-r18} OPTIONAL, -- Need M

servingSecurityCellSetId-r18 SecurityCellSetId-r18 OPTIONAL, -- Need M

sk-CounterConfiguration-r18 SK-CounterConfiguration-r18 OPTIONAL -- Need M

]]

}

CondReconfigToRemoveList-r16 ::= SEQUENCE (SIZE (1.. maxNrofCondCells-r16)) OF CondReconfigId-r16

SK-CounterConfiguration-r18 ::= SEQUENCE {

sk-CounterConfigToReleaseList-r18 SEQUENCE (SIZE (1..maxSecurityCellSet-r18)) OF SecurityCellSetId-r18 OPTIONAL, -- Need N

sk-CounterConfigToAddModList-r18 SEQUENCE (SIZE (1..maxSecurityCellSet-r18)) OF SK-CounterConfig-r18 OPTIONAL -- Need N

}

SK-CounterConfig-r18 ::= SEQUENCE {

securityCellSetId-r18 SecurityCellSetId-r18,

sk-CounterList-r18 SEQUENCE (SIZE (1..maxSK-Counter-r18)) OF SK-Counter

}

SecurityCellSetId-r18 ::= INTEGER (1.. maxSecurityCellSet-r18)

-- TAG-CONDITIONALRECONFIGURATION-STOP

-- ASN1STOP

| *ConditionalReconfiguration* field descriptions |
| --- |
| ***attemptCondReconfig***  If present, the UE shall perform conditional reconfiguration if selected cell is a target candidate cell and it is the first cell selection after failure as described in clause 5.3.7.3. |
| ***condReconfigToAddModList***  List of the configuration of candidate SpCells to be added or modified for CHO, CPA or CPC. |
| ***condReconfigToRemoveList***  List of the configuration of candidate SpCells to be removed. |
| ***scpac-ReferenceConfiguration***  Includes the reference configuration for the candidate supporting subsequent CPAC. |
|  |
| ***servingSecurityCellSetId***  This field identifies the security cell set for serving PSCell. The network does not provide this field for the conditional reconfiguration(s) generated by the SN. |
| ***sk-counterConfiguration***  Includes a list of *sk-Counter* from which the UE should select the *sk-counter* used to derive S-KgNB for inter-SN subsequent CPAC. The network does not provide this field for the conditional reconfiguration(s) generated by the SN. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *CHO* | The field is optional present, Need R, if the UE is configured with at least a candidate SpCell for CHO. Otherwise the field is not present. |

#### – *MeasConfig*

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

*MeasConfig* information element

-- ASN1START

-- TAG-MEASCONFIG-START

MeasConfig ::= SEQUENCE {

measObjectToRemoveList MeasObjectToRemoveList OPTIONAL, -- Need N

measObjectToAddModList MeasObjectToAddModList OPTIONAL, -- Need N

reportConfigToRemoveList ReportConfigToRemoveList OPTIONAL, -- Need N

reportConfigToAddModList ReportConfigToAddModList OPTIONAL, -- Need N

measIdToRemoveList MeasIdToRemoveList OPTIONAL, -- Need N

measIdToAddModList MeasIdToAddModList OPTIONAL, -- Need N

s-MeasureConfig CHOICE {

ssb-RSRP RSRP-Range,

csi-RSRP RSRP-Range

} OPTIONAL, -- Need M

quantityConfig QuantityConfig OPTIONAL, -- Need M

measGapConfig MeasGapConfig OPTIONAL, -- Need M

measGapSharingConfig MeasGapSharingConfig OPTIONAL, -- Need M

...,

[[

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

]],

[[

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

]]

}

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

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

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

-- TAG-MEASCONFIG-STOP

-- ASN1STOP

| *MeasConfig* field descriptions |
| --- |
| ***effectiveMeasWindowConfig***  Used to setup and release effective measurement window in NR for E-UTRA measurements. |
| ***interFrequencyConfig-NoGap-r16***  If the field is set to true, UE is configured to perform SSB based inter-frequency measurement without measurement gaps when the inter-frequency SSB is completely contained in the active DL BWP of the UE, as specified in TS 38.133 [14], clause 9.3. Otherwise, the SSB based inter-frequency measurement is performed within measurement gaps. In NR-DC, the field can only be configured in the *measConfig* associated with MCG, and when configured, it applies to all the inter-frequency measurements configured by MN and SN. |
| ***measGapConfig***  Used to setup and release measurement gaps in NR. |
| ***measIdToAddModList***  List of measurement identities to add and/or modify. |
| ***measIdToRemoveList***  List of measurement identities to remove. |
| ***measObjectToAddModList***  List of measurement objects to add and/or modify. |
| ***measObjectToRemoveList***  List of measurement objects to remove. |
| ***reportConfigToAddModList***  List of measurement reporting configurations to add and/or modify. |
| ***reportConfigToRemoveList***  List of measurement reporting configurations to remove. |
| ***s-MeasureConfig***  Threshold for NR SpCell RSRP measurement controlling when the UE is required to perform measurements on non-serving cells. Choice of *ssb-RSRP* corresponds to cell RSRP based on SS/PBCH block and choice of *csi-RSRP* corresponds to cell RSRP of CSI-RS. This field is not configured to a UE configured with event(s) related to the L2 U2N Relay UE. |
| ***measGapSharingConfig***  Specifies the measurement gap sharing scheme and controls setup/ release of measurement gap sharing. |

*END OF CHANGE*

*START OF CHANGES*

### 11.2.2 Message definitions

#### – *CG-CandidateList*

This message is used to transfer the SCG radio configuration for one or more candidate cells for Conditional PSCell Addition (CPA), Conditional PSCell Change (CPC), inter-SN subsequent CPAC, or CHO with candidate SCG(s) as generated by the candidate target SgNB, or the serving SgNB in case of intra-SN subsequent CPAC configuration(s) which are delivered embedded within an RRC message generated by the MN.

Direction: Secondary gNB to master gNB or eNB.

*CG-CandidateList* message

-- ASN1START

-- TAG-CG-CANDIDATELIST-START

CG-CandidateList ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

cg-CandidateList-r17 CG-CandidateList-r17-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

CG-CandidateList-r17-IEs ::= SEQUENCE {

cg-CandidateToAddModList-r17 SEQUENCE (SIZE (1..maxNrofCondCells-r16)) OF CG-CandidateInfo-r17 OPTIONAL,

cg-CandidateToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofCondCells-r16)) OF CG-CandidateInfoId-r17 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

CG-CandidateInfo-r17 ::= SEQUENCE {

cg-CandidateInfoId-r17 CG-CandidateInfoId-r17,

candidateCG-Config-r17 OCTET STRING (CONTAINING CG-Config)

}

CG-CandidateInfoId-r17::= SEQUENCE {

ssbFrequency-r17 ARFCN-ValueNR,

physCellId-r17 PhysCellId

}

-- TAG-CG-CANDIDATELIST-STOP

-- ASN1STOP

|  |
| --- |
| *CG-CandidateList* field descriptions |
| ***cg-CandidateToAddModList***  Contains information regarding candidate target cells to be added or modified for Conditional PSCell Addition (CPA), Conditional PSCell Change (CPC), inter-SN subsequent CPAC, or CHO with candidate SCG(s) from the candidate target secondary node or from the serving secondary node for intra-SN subsequent CPAC in configuration(s) which are delivered embedded within an RRC message generated by the MN. |
| ***cg-CandidateToReleaseList***  Contains information regarding candidate target cells for CPA, CPC, inter-SN subsequent CPAC, or CHO with candidate SCG(s) to be removed from the candidate target secondary node or from the serving secondary node for intra-SN subsequent CPAC in configuration(s) which are delivered embedded within an RRC message generated by the MN. This list is not used in CPA, CPC, subsequent CPAC, or CHO with candidate SCG(s) preparation. |

|  |
| --- |
| *CG-CandidateInfo* field descriptions |
| ***cg-CandidateInfoId***  SSB frequency and Physical Cell Identity of the candidate target cell. |
| ***candidateCG-Config***  *CG-Config* message corresponding to the cell indicated by *cg-CandidateInfoId*. |

#### – *CG-Config*

This message is used to transfer the SCG radio configuration as generated by the SgNB or SeNB. It can also be used by a CU to request a DU to perform certain actions, e.g. to request the DU to perform a new lower layer configuration.

Direction: Secondary gNB or eNB to master gNB or eNB, alternatively CU to DU.

*CG-Config* message

-- ASN1START

-- TAG-CG-CONFIG-START

CG-Config ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

cg-Config CG-Config-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

CG-Config-IEs ::= SEQUENCE {

scg-CellGroupConfig OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

scg-RB-Config OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL,

configRestrictModReq ConfigRestrictModReqSCG OPTIONAL,

drx-InfoSCG DRX-Info OPTIONAL,

candidateCellInfoListSN OCTET STRING (CONTAINING MeasResultList2NR) OPTIONAL,

measConfigSN MeasConfigSN OPTIONAL,

selectedBandCombination BandCombinationInfoSN OPTIONAL,

fr-InfoListSCG FR-InfoList OPTIONAL,

candidateServingFreqListNR CandidateServingFreqListNR OPTIONAL,

nonCriticalExtension CG-Config-v1540-IEs OPTIONAL

}

CG-Config-v1540-IEs ::= SEQUENCE {

pSCellFrequency ARFCN-ValueNR OPTIONAL,

reportCGI-RequestNR SEQUENCE {

requestedCellInfo SEQUENCE {

ssbFrequency ARFCN-ValueNR,

cellForWhichToReportCGI PhysCellId

} OPTIONAL

} OPTIONAL,

ph-InfoSCG PH-TypeListSCG OPTIONAL,

nonCriticalExtension CG-Config-v1560-IEs OPTIONAL

}

CG-Config-v1560-IEs ::= SEQUENCE {

pSCellFrequencyEUTRA ARFCN-ValueEUTRA OPTIONAL,

scg-CellGroupConfigEUTRA OCTET STRING OPTIONAL,

candidateCellInfoListSN-EUTRA OCTET STRING OPTIONAL,

candidateServingFreqListEUTRA CandidateServingFreqListEUTRA OPTIONAL,

needForGaps ENUMERATED {true} OPTIONAL,

drx-ConfigSCG DRX-Config OPTIONAL,

reportCGI-RequestEUTRA SEQUENCE {

requestedCellInfoEUTRA SEQUENCE {

eutraFrequency ARFCN-ValueEUTRA,

cellForWhichToReportCGI-EUTRA EUTRA-PhysCellId

} OPTIONAL

} OPTIONAL,

nonCriticalExtension CG-Config-v1590-IEs OPTIONAL

}

CG-Config-v1590-IEs ::= SEQUENCE {

scellFrequenciesSN-NR SEQUENCE (SIZE (1.. maxNrofServingCells-1)) OF ARFCN-ValueNR OPTIONAL,

scellFrequenciesSN-EUTRA SEQUENCE (SIZE (1.. maxNrofServingCells-1)) OF ARFCN-ValueEUTRA OPTIONAL,

nonCriticalExtension CG-Config-v1610-IEs OPTIONAL

}

CG-Config-v1610-IEs ::= SEQUENCE {

drx-InfoSCG2 DRX-Info2 OPTIONAL,

nonCriticalExtension CG-Config-v1620-IEs OPTIONAL

}

CG-Config-v1620-IEs ::= SEQUENCE {

ueAssistanceInformationSCG-r16 OCTET STRING (CONTAINING UEAssistanceInformation) OPTIONAL,

nonCriticalExtension CG-Config-v1630-IEs OPTIONAL

}

CG-Config-v1630-IEs ::= SEQUENCE {

selectedToffset-r16 T-Offset-r16 OPTIONAL,

nonCriticalExtension CG-Config-v1640-IEs OPTIONAL

}

CG-Config-v1640-IEs ::= SEQUENCE {

servCellInfoListSCG-NR-r16 ServCellInfoListSCG-NR-r16 OPTIONAL,

servCellInfoListSCG-EUTRA-r16 ServCellInfoListSCG-EUTRA-r16 OPTIONAL,

nonCriticalExtension CG-Config-v1700-IEs OPTIONAL

}

CG-Config-v1700-IEs ::= SEQUENCE {

candidateCellInfoListCPC-r17 CandidateCellInfoListCPC-r17 OPTIONAL,

twoPHRModeSCG-r17 ENUMERATED {enabled} OPTIONAL,

nonCriticalExtension CG-Config-v1730-IEs OPTIONAL

}

CG-Config-v1730-IEs ::= SEQUENCE {

fr1-Carriers-SCG-r17 INTEGER (1..32) OPTIONAL,

fr2-Carriers-SCG-r17 INTEGER (1..32) OPTIONAL,

nonCriticalExtension CG-Config-v1800-IEs OPTIONAL

}

CG-Config-v1800-IEs ::= SEQUENCE {

candidateServingFreqRangeListNR-r18 CandidateServingFreqRangeListNR-r18 OPTIONAL,

candidateServingFreqListNR-r16 CandidateServingFreqListNR-r16 OPTIONAL,

idc-TDM-AssistanceConfig-r18 ENUMERATED {enabled} OPTIONAL,

candidateCellInfoListSubsequentCPC-r18 CandidateCellInfoListCPC-r17 OPTIONAL,

scpac-ReferenceConfigurationSCG-r18 ReferenceConfiguration-r18 OPTIONAL,

subsequentCPAC-Information-r18 CandidateCellInfoListCPC-r17 OPTIONAL,

successPSCell-Config-r18 SuccessPSCell-Config-r18 OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

ServCellInfoListSCG-NR-r16 ::= SEQUENCE (SIZE (1.. maxNrofServingCells)) OF ServCellInfoXCG-NR-r16

ServCellInfoXCG-NR-r16 ::= SEQUENCE {

dl-FreqInfo-NR-r16 FrequencyConfig-NR-r16 OPTIONAL,

ul-FreqInfo-NR-r16 FrequencyConfig-NR-r16 OPTIONAL, -- Cond FDD

...

}

FrequencyConfig-NR-r16 ::= SEQUENCE {

freqBandIndicatorNR-r16 FreqBandIndicatorNR,

carrierCenterFreq-NR-r16 ARFCN-ValueNR,

carrierBandwidth-NR-r16 INTEGER (1..maxNrofPhysicalResourceBlocks),

subcarrierSpacing-NR-r16 SubcarrierSpacing

}

ServCellInfoListSCG-EUTRA-r16 ::= SEQUENCE (SIZE (1.. maxNrofServingCellsEUTRA)) OF ServCellInfoXCG-EUTRA-r16

ServCellInfoXCG-EUTRA-r16 ::= SEQUENCE {

dl-CarrierFreq-EUTRA-r16 ARFCN-ValueEUTRA OPTIONAL,

ul-CarrierFreq-EUTRA-r16 ARFCN-ValueEUTRA OPTIONAL, -- Cond FDD

transmissionBandwidth-EUTRA-r16 TransmissionBandwidth-EUTRA-r16 OPTIONAL,

...

}

TransmissionBandwidth-EUTRA-r16 ::= ENUMERATED {rb6, rb15, rb25, rb50, rb75, rb100}

PH-TypeListSCG ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF PH-InfoSCG

PH-InfoSCG ::= SEQUENCE {

servCellIndex ServCellIndex,

ph-Uplink PH-UplinkCarrierSCG,

ph-SupplementaryUplink PH-UplinkCarrierSCG OPTIONAL,

...,

[[

twoSRS-PUSCH-Repetition-r17 ENUMERATED{enabled} OPTIONAL

]],

[[

twoSRS-MultipanelScheme-r18 ENUMERATED{enabled} OPTIONAL

]]

}

PH-UplinkCarrierSCG ::= SEQUENCE{

ph-Type1or3 ENUMERATED {type1, type3},

...

}

MeasConfigSN ::= SEQUENCE {

measuredFrequenciesSN SEQUENCE (SIZE (1..maxMeasFreqsSN)) OF NR-FreqInfo OPTIONAL,

...

}

NR-FreqInfo ::= SEQUENCE {

measuredFrequency ARFCN-ValueNR OPTIONAL,

...

}

ConfigRestrictModReqSCG ::= SEQUENCE {

requestedBC-MRDC BandCombinationInfoSN OPTIONAL,

requestedP-MaxFR1 P-Max OPTIONAL,

...,

[[

requestedPDCCH-BlindDetectionSCG INTEGER (1..15) OPTIONAL,

requestedP-MaxEUTRA P-Max OPTIONAL

]],

[[

requestedP-MaxFR2-r16 P-Max OPTIONAL,

requestedMaxInterFreqMeasIdSCG-r16 INTEGER(1..maxMeasIdentitiesMN) OPTIONAL,

requestedMaxIntraFreqMeasIdSCG-r16 INTEGER(1..maxMeasIdentitiesMN) OPTIONAL,

requestedToffset-r16 T-Offset-r16 OPTIONAL

]],

[[

reservedResourceConfigNRDC-r17 ResourceConfigNRDC-r17 OPTIONAL

]],

[[

aggregatedBandwidthSN-r17 AggregatedBandwidthSN-r17 OPTIONAL

]],

[[

requestedMaxLTM-CandidateIdSCG-r18 INTEGER(0..maxNrofLTM-Configs-r18) OPTIONAL

]],

[[

requestedL1-MeasConfigNRDC-r18 L1-MeasConfigNRDC-r18 OPTIONAL

]]

}

BandCombinationIndex ::= INTEGER (1..maxBandComb)

BandCombinationInfoSN ::= SEQUENCE {

bandCombinationIndex BandCombinationIndex,

requestedFeatureSets FeatureSetEntryIndex

}

FR-InfoList ::= SEQUENCE (SIZE (1..maxNrofServingCells-1)) OF FR-Info

FR-Info ::= SEQUENCE {

servCellIndex ServCellIndex,

fr-Type ENUMERATED {fr1, fr2}

}

CandidateServingFreqListNR ::= SEQUENCE (SIZE (1.. maxFreqIDC-MRDC)) OF ARFCN-ValueNR

CandidateServingFreqListEUTRA ::= SEQUENCE (SIZE (1.. maxFreqIDC-MRDC)) OF ARFCN-ValueEUTRA

T-Offset-r16 ::= ENUMERATED {ms0dot5, ms0dot75, ms1, ms1dot5, ms2, ms2dot5, ms3, spare1}

CandidateCellInfoListCPC-r17 ::= SEQUENCE (SIZE (1..maxFreq)) OF CandidateCellInfo-r17

CandidateCellInfo-r17 ::= SEQUENCE {

ssbFrequency-r17 ARFCN-ValueNR,

candidateList-r17 SEQUENCE (SIZE (1..maxNrofCondCells-r16)) OF CandidateCell-r17

}

CandidateCell-r17 ::= SEQUENCE {

physCellId-r17 PhysCellId,

condExecutionCondSCG-r17 OCTET STRING (CONTAINING CondReconfigExecCondSCG-r17) OPTIONAL

}

AggregatedBandwidthSN-r17 ::= SEQUENCE {

aggBW-FDD-DL-r17 SupportedAggBandwidth-r17 OPTIONAL,

aggBW-FDD-UL-r17 SupportedAggBandwidth-r17 OPTIONAL,

aggBW-TDD-DL-r17 SupportedAggBandwidth-r17 OPTIONAL,

aggBW-TDD-UL-r17 SupportedAggBandwidth-r17 OPTIONAL,

aggBW-TotalDL-r17 SupportedAggBandwidth-r17 OPTIONAL,

aggBW-TotalUL-r17 SupportedAggBandwidth-r17 OPTIONAL

}

-- TAG-CG-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *CG-Config* field descriptions |
| ***aggregatedBandwidthSN***  Used to indicate or request the maximum aggregated bandwidth at the SN side if the *supportedAggBW-FR1* was reported for the *selectedBandCombination* or *requestedBC-MRDC*, respectively*.* This field is only used in NR-DC.  - *aggBW-FDD-DL/UL-r17* indicates the aggregated bandwidth across FDD DL/UL CCs in SCG;  - *aggBW-TDD-DL/UL-r17* indicates the aggregated bandwidth across TDD DL/UL CCs in SCG;  - *aggBW-TotalDL/UL-r17* indicates the aggregated bandwidth across all DL/UL CCs in SCG. |
| ***candidateCellInfoListCPC***  Contains information regarding candidate target cells for Conditional PSCell Change (CPC) or inter-SN subsequent CPAC that the source secondary gNB suggests the target secondary gNB to consider configuring for CPC or subsequent CPAC, and/or that the source secondary gNB prepares for intra-SN subsequent CPAC configuration(s) which are delivered embedded within an RRC message generated by the MN. This field is only used in SN initiated CPC and SN initiated subsequent CPAC. |
| ***candidateCellInfoListSN***  Contains information regarding cells that the source secondary node suggests the target secondary gNB to consider configuring. |
| ***candidateCellInfoListSN-EUTRA***  Includes the *MeasResultList3EUTRA* as specified in TS 36.331 [10]. Contains information regarding cells that the source secondary node suggests the target secondary eNB to consider configuring. This field is only used in NE-DC. |
| ***candidateCellInfoListSubsequentCPC***  Contains information regarding candidate target cells for subsequent CPAC that candidate secondary gNB (or the serving secondary gNB in case of intra-SN subsequent CPAC configuration(s) which are delivered embedded within an RRC message generated by the MN) suggests the master gNB to consider configuring for subsequent CPAC. This field is only used in MN initiated and SN initiated subsequent CPAC. This field is only included in a *CG-Config* message which is contained within a *CG-CandidateList* message. |
| ***candidateServingFreqListNR, candidateServingFreqListEUTRA***  Indicates frequencies of candidate serving cells for In-Device Co-existence Indication (see TS 36.331 [10]). |
| ***candidateServingFreqListNR-r16***  indicates the candidate frequencies configured by SN for IDC. This field is only used in NR-DC. |
| ***candidateServingFreqRangeListNR***  indicates the candidate frequency ranges configured by SN for IDC. This field is only used in NR-DC. |
| ***configRestrictModReq***  Used by SN to request changes to SCG configuration restrictions previously set by MN to ensure UE capabilities are respected and to indicate the configured/reserved SCG resources. E.g. can be used to request configuring an NR band combination whose use MN has previously forbidden. SN only includes this field in SN-initiated procedures, unless this field is used to indicate configured/reserved SCG resources (corresponding to *reservedResourceConfigNRDC* and/or *aggregatedBandwidthSN*) only. |
| ***drx-ConfigSCG***  This field contains the complete DRX configuration of the SCG. This field is only used in NR-DC. |
| ***drx-InfoSCG***  This field contains the DRX long and short cycle configuration of the SCG. This field is used in (NG)EN-DC and NE-DC. |
| ***drx-InfoSCG2***  This field contains the drx-onDurationTimer configuration of the SCG. This field is only used in (NG)EN-DC. |
| ***fr-InfoListSCG***  Contains information of FR information of serving cells that include PScell and SCells configured in SCG. |
| ***fr1-Carriers-SCG, fr2-Carriers-SCG***  Indicates the number of FR1 or FR2 serving cells configured in SCG. |
| ***idc-TDM-AssistanceConfig***  Indicates if the IDC TDM reporting is enabled for the UE by SN. This field is only used in NR-DC. |
| ***measuredFrequenciesSN***  Used by SN to indicate a list of frequencies measured by the UE. |
| ***needForGaps***  In NE-DC, indicates whether the SN requests gNB to configure measurements gaps. |
| ***ph-InfoSCG***  Power headroom information in SCG that is needed in the reception of PHR MAC CE of MCG |
| ***ph-SupplementaryUplink***  Power headroom information for supplementary uplink. In the case of (NG)EN-DC and NR-DC, this field is only present when two UL carriers are configured for a serving cell and one UL carrier reports type1 PH while the other reports type 3 PH. |
| ***ph-Type1or3***  Type of power headroom for a certain serving cell in SCG (PSCell and activated SCells). Value *type1* refers to type 1 power headroom, value *type3* refers to type 3 power headroom. (See TS 38.321 [3]). |
| ***ph-Uplink***  Power headroom information for uplink. |
| ***pSCellFrequency, pSCellFrequencyEUTRA***  Indicates the frequency of PSCell in NR (i.e., *pSCellFrequency*) or E-UTRA (i.e., *pSCellFrequencyEUTRA*). In this version of the specification, *pSCellFrequency* is not used in NE-DC whereas *pSCellFrequencyEUTRA* is only used in NE-DC. *pSCellFrequency* indicates the *absoluteFrequencySSB*. |
| ***reportCGI-RequestNR, reportCGI-RequestEUTRA***  Used by SN to indicate to MN about configuring *reportCGI* procedure. The request may optionally contain information about the cell for which SN intends to configure *reportCGI* procedure. In this version of the specification, the *reportCGI-RequestNR* is used in (NG)EN-DC and NR-DC whereas *reportCGI-RequestEUTRA* is used only for NE-DC. |
| ***requestedBC-MRDC***  Used to request configuring a band combination and corresponding feature sets which are forbidden to use by MN (i.e. outside of the *allowedBC-ListMRDC*) to allow re-negotiation of the UE capabilities for SCG configuration. |
| ***requestedL1-MeasConfigNRDC***  Used to request the maximum number of allowed resources for L1 measurements to be configured for LTM at the SCG. This field is only used in NR-DC. |
| ***requestedMaxInterFreqMeasIdSCG***  Used to request the maximum number of allowed measurement identities to configure for inter-frequency measurement. This field is only used in NR-DC. |
| ***requestedMaxIntraFreqMeasIdSCG***  Used to request the maximum number of allowed measurement identities to configure for intra-frequency measurement on each serving frequency. |
| ***requestedMaxLTM-CandidateIdSCG***  Used to request the maximum number of allowed LTM candidate configurations to configure. This field is only used in NR-DC. |
| ***requestedPDCCH-BlindDetectionSCG***  Requested value of the reference number of cells for PDCCH blind detection allowed to be configured for the SCG. |
| ***requestedP-MaxEUTRA***  Requested value for the maximum power for the serving cells the UE can use in E-UTRA SCG. This field is only used in NE-DC. |
| ***requestedP-MaxFR1***  Requested value for the maximum power for the serving cells on frequency range 1 (FR1) in this secondary cell group (see TS 38.104 [12]) the UE can use in NR SCG. |
| ***requestedP-MaxFR2***  Requested value for the maximum power for the serving cells on frequency range 2 (FR2) in this secondary cell group the UE can use in NR SCG. This field is only used in NR-DC. |
| ***requestedToffset***  Requests the new value for the time offset restriction used by the SN for scheduling SCG transmissions (i.e. see TS 38.213 [13]). This field is used in NR-DC only when the fields *nrdc-PC-mode-FR1-r16* or *nrdc-PC-mode-FR2-r16* are set to dynamic. Value ms0dot5 corresponds to 0.5 ms, value ms0dot75 corresponds to 0.75 ms, value ms1 corresponds to 1ms and so on. |
| ***reservedResourceConfigNRDC***  Used to request or indicate the maximum number of resources reserved for the SCG. This field is only used in NR-DC. |
| ***scellFrequenciesSN-EUTRA, scellFrequenciesSN-NR***  Indicates the frequency of all SCells with SSB configured in SCG. The field *scellFrequenciesSN-EUTRA* is used in NE-DC; the field *scellFrequenciesSN-NR* is used in (NG)EN-DC and NR-DC. In (NG)EN-DC, the field is optionally provided to the MN. *scellFrequenciesSN-NR* indicates *absoluteFrequencySSB*. |
| ***scg-CellGroupConfig***  Contains the *RRCReconfiguration* message (containing only *secondaryCellGroup* and/or *measConfig* and/or *otherConfig* and/or *appLayerMeasConfig* and/or *conditionalReconfiguration*, *ltm-Config*, and/or *bap-Config* and/or *iab-IP-AddressConfigurationList*):  - to be sent to the UE, used upon SCG establishment or modification (only when the SCG is not released by the SN), as generated (entirely) by the (target) SgNB. In this case, the SN sets the *RRCReconfiguration* message in accordance with clause 6 e.g. regarding the "Need" or "Cond" statements.  or  - including the current SCG configuration of the UE, when provided in response to a query from MN, or in SN triggered SN change in order to enable delta signaling by the target SN, or in SN triggered modification procedure in order to coordinate CHO or MN-initiated CPC with SCG reconfigurations (see TS 38.423 [35]). In this case, the SN sets the *RRCReconfiguration* message in accordance with clause 11.2.3.  The field is absent if neither SCG (re)configuration nor SCG configuration query nor SN triggered modification procedure in order to coordinate CHO or MN-initiated CPC with SCG reconfigurations (see TS 38.423 [35]) nor SN triggered SN change is performed, e.g. at inter-node capability/configuration coordination which does not result in SCG (re)configuration towards the UE. The field is also absent upon an SCG release triggered by the SN. This field is not applicable in NE-DC. |
| ***scg-CellGroupConfigEUTRA***  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*:  - to be sent to the UE, used to (re-)configure the SCG configuration upon SCG establishment or modification (only when the SCG is not released by the SN), as generated (entirely) by the (target) SeNB. In this case, the SN sets the *scg-Configuration* within the EUTRA *RRCConnectionReconfiguration* message in accordance with clause 6 in TS 36.331 [10] e.g. regarding the "Need" or "Cond" statements.  or  - including the current SCG configuration of the UE, when provided in response to a query from MN, or in SN triggered SN change in order to enable delta signalling by the target SN.  The field is absent if neither SCG (re)configuration nor SCG configuration query nor SN triggered SN change is performed, e.g. at inter-node capability/configuration coordination which does not result in SCG (re)configuration towards the UE. The field is also absent upon an SCG release triggered by the SN. This field is only used in NE-DC. |
| ***scg-RB-Config***  Contains the IE *RadioBearerConfig*:  - to be sent to the UE, used to (re-)configure the SCG RB configuration upon SCG establishment or modification, as generated (entirely) by the (target) SgNB or SeNB. In this case, the SN sets the *RadioBearerConfig* in accordance with clause 6, e.g. regarding the "Need" or "Cond" statements.  or  - including the current SCG RB configuration of the UE, when provided in response to a query from MN or in SN triggered SN change or in SN triggered SN release or bearer type change between SN terminated bearer to MN terminated bearer in order to enable delta signaling by the MN or target SN. In this case, the SN sets the *RadioBearerConfig* in accordance with clause 11.2.3.  The field is absent if neither SCG (re)configuration nor SCG configuration query nor SN triggered SN change nor SN triggered SN release is performed, e.g. at inter-node capability/configuration coordination which does not result in SCG RB (re)configuration. |
| ***scpac-ReferenceConfigurationSCG***  Includes the reference configuration associated with the SCG for the candidate supporting subsequent CPAC. |
| ***selectedBandCombination***  Indicates the band combination selected by SN in (NG)EN-DC, NE-DC, and NR-DC. The SN should inform the MN with this field whenever the band combination and/or feature set it selected for the SCG changes (i.e. even if the new selection concerns a band combination and/or feature set that is allowed by the *allowedBC-ListMRDC*) |
| ***selectedToffset***  Indicates the value used by the SN for scheduling SCG transmissions (i.e. see TS 38.213 [13]). This field is used in NR-DC only when the fields *nrdc-PC-mode-FR1-r16* or *nrdc-PC-mode-FR2-r16* are set to dynamic. The SN can only indicate a value that is less than or equal to *maxToffset* received from MN. This field is used in NR-DC only when MN has included the field *maxToffset* in *CG-ConfigInfo*. Value *ms0dot5* corresponds to 0.5 ms, value *ms0dot75* corresponds to 0.75 ms, value *ms1* corresponds to 1ms and so on. |
| ***servCellInfoListSCG-EUTRA***  Indicates the carrier frequency and the transmission bandwidth of the serving cell(s) in the SCG in intra-band NE-DC. The field is needed when MN and SN operate serving cells in the same band for either contiguous or non-contiguous intra-band band combination or LTE NR inter-band band combinations where the frequency range of the E-UTRA band is a subset of the frequency range of the NR band (as specified in Table 5.5B.4.1-1 of TS 38.101-3 [34]) in NE-DC. |
| ***servCellInfoListSCG-NR***  Indicates the frequency band indicator, carrier center frequency, UE specific channel bandwidth and SCS of the serving cell(s) in the SCG in intra-band (NG)EN-DC. The field is needed when MN and SN operate serving cells in the same band for either contiguous or non-contiguous intra-band band combination or LTE NR inter-band band combinations where the frequency range of the E-UTRA band is a subset of the frequency range of the NR band (as specified in Table 5.5B.4.1-1 of TS 38.101-3 [34]) in (NG)EN-DC. |
| ***subsequentCPAC-Information***  Contains information about handling of stored subsequent CPAC configurations for the UE that the target secondary gNB suggests the master gNB to consider configuring for normal PSCell addition or change. It includes information about updates of execution conditions for the subsequent CPAC configurations that are to be kept at the PSCell addition/change. |
| ***successPSCell-Config***  Include the successful PSCell change or addition report configuration in case of SN initiated PSCell change or CPC. The *thresholdPercentageT304-SCG* is not configured in this message. |
| ***twoPHRModeSCG***  Indicates if the power headroom for SCG shall be reported as two PHRs (each PHR associated with a SRS resource set) is enabled or not. |
| ***twoSRS-MultipanelScheme***  Indicates whether the indicated serving cell is configured with multiple panel simultaneous uplink transmission schemes of multipanelSchemeSDM or multipanelSchemeSFN corresponding to two SRS resource sets configured in either *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage 'codebook' or 'noncodebook'. |
| ***twoSRS-PUSCH-Repetition***  Indicates whether the indicated serving cell is configured for PUSCH repetition corresponding to two SRS resource sets configured in either *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage 'codebook' or 'noncodebook'. |
| ***transmissionBandwidth-EUTRA***  Indicates the transmission bandwidth on an E-UTRA carrier frequency as defined by the parameter Transmission Bandwidth Configuration "NRB" TS 36.104 [33]. The values rb6, rb15, rb25, rb50, rb75, rb100 indicate 6, 15, 25, 50, 75 and 100 resource blocks respectively. |
| ***ueAssistanceInformationSCG***  Includes for each UE assistance feature associated with the SCG, the information last reported by the UE in the NR *UEAssistanceInformation* message for the SCG, if any. |

|  |
| --- |
| *BandCombinationInfoSN* field descriptions |
| ***bandCombinationIndex***  In case of NR-DC, this field indicates the position of a band combination in the *supportedBandCombinationList*. In case of NE-DC, this field indicates the position of a band combination in the *supportedBandCombinationList* and/or *supportedBandCombinationListNEDC-Only*. In case of (NG)EN-DC, this field indicates the position of a band combination in the *supportedBandCombinationList* and/or *supportedBandCombinationList-UplinkTxSwitch*. Band combination entries in *supportedBandCombinationList* are referred by an index which corresponds to the position of a band combination in the *supportedBandCombinationList*. Band combination entries in *supportedBandCombinationListNEDC-Only* are referred by an index which corresponds to the position of a band combination in the *supportedBandCombinationListNEDC-Only* increased by the number of entries in *supportedBandCombinationList*. Band combination entries in *supportedBandCombinationList-UplinkTxSwitch* are referred by an index which corresponds to the position of a band combination in the *supportedBandCombinationList-UplinkTxSwitch* increased by the number of entries in *supportedBandCombinationList*. |
| ***requestedFeatureSets***  The position in the *FeatureSetCombination* which identifies one *FeatureSetUplink*/*Downlink* for each band entry in the associated band combination |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *FDD* | This field is mandatory present if dl-FreqInfo-NR is included and concerns an FDD carrier; otherwise the field is absent. |

*END OF CHANGES*

*START OF CHANGES*

# Annex B (informative): RRC Information

## B.1 Protection of RRC messages

The following list provides information which messages can be sent (unprotected) prior to AS security activation and which messages can be sent unprotected after AS security activation. Those messages indicated "-" in "P" column should never be sent unprotected by gNB or UE. Further requirements are defined in the procedural text.

P…Messages that can be sent (unprotected) prior to AS security activation

A – I…Messages that can be sent without integrity protection after AS security activation

A – C…Messages that can be sent unciphered after AS security activation

NA… Message can never be sent after AS security activation

| Message | P | A-I | A-C | Comment |
| --- | --- | --- | --- | --- |
| *CounterCheck* | - | - | - |  |
| *CounterCheckResponse* | - | - | - |  |
| *DedicatedSIBRequest* | + | - | - |  |
| *DLDedicatedMessageSegment* | NOTE 1 | | | |
| *DLInformationTransfer* | + | - | - |  |
| *DLInformationTransferMRDC* | - | - | - |  |
| *FailureInformation* | - | - | - |  |
| *IndirectPathFailureInformation* | - | - | - |  |
| *LocationMeasurementIndication* | - | - | - |  |
| *MCGFailureInformation* | - | - | - |  |
| *MeasurementReportAppLayer* | - | - | - |  |
| *MBSBroadcastConfiguration* | + | + | + |  |
| *MBSInterestIndication* | - | - | - |  |
| *MBSMulticastConfiguration* | + | + | + |  |
| *MIB* | + | + | + |  |
| *MeasurementReport* | - | - | - | Measurement configuration may be sent prior to AS security activation. But: In order to protect privacy of UEs, *MeasurementReport* is only sent from the UE after successful AS security activation. |
| *MobilityFromNRCommand* | - | - | - |  |
| *Paging* | + | + | + |  |
| *RRCReconfiguration* | + | - | - | The message shall not be sent unprotected before AS security activation if it is used to perform handover or to establish SRB2, SRB4, multicast MRBs and DRBs, or if the *RRCReconfiguration* message includes the *LTM-Config* IE. |
| *RRCReconfigurationComplete* | + | - | - | Unprotected, if sent as response to *RRCReconfiguration* which was sent before AS security activation. |
| *RRCReestablishment* | - | - | + | Integrity protection applied, but no ciphering. |
| *RRCReestablishmentComplete* | - | - | - |  |
| *RRCReestablishmentRequest* | - | - | + | This message is not protected by PDCP operation. However, a *shortMAC-I* is included. |
| *RRCReject* | + | + | + | Justification for A-I and A-C: the message can be sent in SRB0 in RRC\_INACTIVE state, after the AS security is activated. |
| *RRCRelease* | + | - | - | Justification for P: If the RRC connection only for signalling not requiring DRBs or ciphered messages, or the signalling connection has to be released prematurely, this message is sent as unprotected. *RRCRelease* message sent before AS security activation cannot include *deprioritisationReq, suspendConfig, redirectedCarrierInfo, cellReselectionPriorities* information fields. |
| *RRCResume* | - | - | - |  |
| *RRCResumeComplete* | - | - | - |  |
| *RRCResumeRequest* | - | - | + | This message is not protected by PDCP operation. However, a *resumeMAC-I* is included. |
| *RRCResumeRequest1* | - | - | + | This message is not protected by PDCP operation. However, a *resumeMAC-I* is included. |
| *RRCSetup* | + | + | + | Justification for A-I and A-C: the message can be sent in SRB0 in RRC\_INACTIVE or RRC\_CONNECTED states, after the AS security is activated. |
| *RRCSetupComplete* | + | NA | NA |  |
| *RRCSetupRequest* | + | NA | NA |  |
| *RRCSystemInfoRequest* | + | + | + | Justification for A-I and A-C: the message can be sent in SRB0 in RRC\_INACTIVE state, after the AS security is activated. |
| *SIB1* | + | + | + |  |
| *SCGFailureInformation* | - | - | - |  |
| *SCGFailureInformationEUTRA* | - | - | - |  |
| *SecurityModeCommand* | + | NA | NA | Integrity protection applied, but no ciphering (integrity verification done after the message received by RRC). |
| *SecurityModeComplete* | - | - | + | The message is sent after AS security activation. Integrity protection applied, but no ciphering. Ciphering is applied after completing the procedure. |
| *SecurityModeFailure* | + | NA | NA | Neither integrity protection nor ciphering applied. |
| *SidelinkUEInformationNR* | + | - | - | The message shall not be sent unprotected before AS security activation if *sl-CapabilityInformationSidelink* information field is included in the message. |
| *SystemInformation* | + | + | + |  |
| *UEAssistanceInformation* | - | - | - |  |
| *UECapabilityEnquiry* | + | - | - | The network should retrieve UE capabilities only after AS security activation. |
| *UECapabilityInformation* | + | - | - |  |
| *ULDedicatedMessageSegment* | NOTE 1 | | | |
| *UEInformationRequest* | - | - | - |  |
| *UEInformationResponse* | - | - | - | In order to protect privacy of UEs, *UEInformationResponse* is only sent from the UE after successful security activation |
| *UEPositioningAssistanceInfo* | - | - | - |  |
| *ULInformationTransfer* | + | - | - |  |
| *ULInformationTransferIRAT* | NOTE 2 | | | |
| *ULInformationTransferMRDC* | - | - | - |  |
| NOTE 1: This message type carries segments of other RRC messages. The protection of an instance of this message is the same as for the message which this message is carrying.  NOTE 2: This message type carries others RRC messages. The protection of an instance of this message is the same as for the message which this message is carrying. | | | | |

*END OF CHANGES*