**3GPP TSG-RAN WG3 Meeting #119bis**

**Online, 17th – 26th April 2023**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** | **1129** | **rev** | **3** | **Current version:** | **1** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Introduction of Network Energy Saving |
|  |  |
| ***Source to WG:*** | Ericsson, Huawei, Samsung, ZTE |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | Netw\_Energy\_NR-Core |  | ***Date:*** | 2023-04-06 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | *Rel-18* |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | The specification should support Rel 18 Network Energy Saving as specified in RP-230566. |
|  |  |
| ***Summary of change:*** | gNB-CU Configuration Update procedure is impacted to support Beam level activation;Paging procedure and UE Context Release procedure are impacted to support restricted paging in limited areas. |
|  |  |
| ***Consequences if not approved:*** | Not possible to support Rel-18 NES of higher layer. |
|  |  |
| ***Clauses affected:*** | 8.2.5.2, 8.3.3.2, 8.7.1.2, 9.2.6,9.2.1.10, 9.2.1.11, 9.2.2.6, ASN.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS38.423 CR1018 |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

### 8.2.5 gNB-CU Configuration Update

#### 8.2.5.1 General

The purpose of the gNB-CU Configuration Update procedure is to update application level configuration data needed for the gNB-DU and gNB-CU to interoperate correctly on the F1 interface. This procedure does not affect existing UE-related contexts, if any. The procedure uses non-UE associated signalling.

#### 8.2.5.2 Successful Operation



Figure 8.2.5.2-1: gNB-CU Configuration Update procedure: Successful Operation

The gNB-CU initiates the procedure by sending a GNB-CU CONFIGURATION UPDATE message including the appropriate updated configuration data to the gNB-DU. The gNB-DU responds with a GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data. If an information element is not included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall interpret that the corresponding configuration data is not changed and shall continue to operate the F1-C interface with the existing related configuration data.

The updated configuration data shall be stored in the respective node and used as long as there is an operational TNL association or until any further update is performed.

If *Cells to be Activated List Item* IE is contained in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall activate the cell indicated by *NR CGI* IE and reconfigure the physical cell identity for which the *NR PCI* IE is included.

If *SSBs to be Activated List* IE is included in the *Cells to be Activated List Item* IE within the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall, if supported, only activate the SSB beams indicated by *SSB to be Activated* IE.

If *Cells to be Deactivated List Item* IE is contained in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall deactivate the cell indicated by *NR CGI* IE.

If *Cells to be Activated List Item* IE is contained in the GNB-CU CONFIGURATION UPDATE message and the indicated cells are already activated, the gNB-DU shall update the cell information received in *Cells to be Activated List Item* IE.

If *Cells to be Activated List Item* IE is included in the GNB-CU CONFIGURATION UPDATE message, and the information for the cell indicated by the *NR CGI* IE includes the *IAB Info IAB-donor-CU* IE, the gNB-DU shall, if supported, apply the *IAB STC Info* IE therein to the indicated cell.

If the *gNB-CU System Information* IE is contained in the gNB-CU CONFIGURATION UPDATE message, the gNB-DU shall include the *Dedicated SI Delivery Needed UE List* IE in the GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message for UEs that are unable to receive system information from broadcast.

If *Dedicated SI Delivery Needed UE List* IE is contained in the GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-CU should take it into account when informing the UE of the updated system information via the dedicated RRC message.

If the *gNB-CU TNL Association To Add List* IE is contained in the gNB-CU CONFIGURATION UPDATE message, the gNB-DU shall, if supported, use it to establish the TNL association(s) with the gNB-CU. The gNB-DU shall report to the gNB-CU, in the gNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message, the successful establishment of the TNL association(s) with the gNB-CU as follows:

- A list of TNL address(es) with which the gNB-DU successfully established the TNL association shall be included in the gNB-CU *TNL Association Setup List* IE;

- A list of TNL address(es) with which the gNB-DU failed to establish the TNL association shall be included in the *gNB-CU TNL Association Failed To Setup List* IE.

If the GNB-CU CONFIGURATION UPDATE message includes *gNB-CU TNL Association To Remove List* IE, and the *Endpoint IP address* IE and the *Port Number* IE for both TNL endpoints of the TNL association(s) are included in the *gNB-CU TNL Association To Remove List* IE, the gNB-DU shall, if supported, initiate removal of the TNL association(s) indicated by both received TNL endpoints towards the gNB-CU. If the *Endpoint IP address* IE, or the *Endpoint IP address* IE and the *Port Number* IE for one or both of the TNL endpoints is included in the *gNB-CU TNL Association To Remove List* IE, the gNB-DU shall, if supported, initiate removal of the TNL association(s) indicated by the received endpoint IP address(es).

If the *gNB-CU TNL Association To Update List* IE is contained in the gNB-CU CONFIGURATION UPDATE message the gNB-DU shall, if supported, overwrite the previously stored information for the related TNL Association(s).

If in the gNB-CU CONFIGURATION UPDATE message the *TNL* *Association usage* IE is included in the *gNB-CU TNL Association To Add List* IE or the *gNB-CU TNL Association To Update List* IE, the gNB-DU node shall, if supported, use it as described in TS 38.472 [22].

For NG-RAN, the gNB-CU shall include the *gNB-CU System Information* IE in the GNB-CU CONFIGURATION UPDATE message. The *SIB type to Be Updated List* IE shall contain the full list of SIBs to be broadcast*.*

If *Protected E-UTRA Resources List* IE is contained in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall protect the corresponding resource of the cells indicated by *E-UTRA Cells* *List* IE for spectrum sharing between E-UTRA and NR.

If the GNB-CU CONFIGURATION UPDATE message contains the *Protected E-UTRA Resource Indication* IE, the receiving gNB-DU should forward it to lower layers and use it for cell-level resource coordination. The gNB-DU shall consider the received *Protected E-UTRA Resource Indication* IE when expressing its desired resource allocation during gNB-DU Resource Coordination procedure. The gNB-DU shall consider the received *Protected E-UTRA Resource Indication* IE content valid until reception of a new update of the IE for the same gNB-DU.

If *Available PLMN List* IE, and optionally also *Extended Available PLMN List* IE, is contained in GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall overwrite the whole available PLMN list and update the corresponding system information.

If *Available SNPN ID List* IE is contained in GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall overwrite the whole available SNPN ID list and update the corresponding system information.

If *Cells Failed to be Activated Item* IE is contained in the GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-CU shall consider that the indicated cells are out-of-service as defined in TS 38.401 [4].

If the *Neighbour Cell Information List* IE is present in the GNB-CU CONFIGURATION UPDATE message, the receiving gNB-DU shall use the received information for Cross Link Interference management and/or NR-DC power coordination. The gNB-DU shall consider the received *Neighbour Cell Information List* IE content valid until reception of an update of the IE for the same cell(s). If the *Intended TDD DL-UL Configuration NR* IE is absent from the *Neighbour Cell Information List* IE, whereas the corresponding *NR CGI* IE is present, the receiving gNB-DU shall remove the previously stored *Neighbour Cell Information* IE corresponding to the NR CGI.

If the GNB-CU CONFIGURATION UPDATE message includes *Transport Layer Address Info* IE, the gNB-DU shall, if supported, take into account for IPSec tunnel establishment.

If the GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message includes *Transport Layer Address Info* IE, the gNB-CU shall, if supported, take into account for IPSec tunnel establishment.

If the GNB-CU CONFIGURATION UPDATE message contains the *Uplink BH Non-UP Traffic Mapping* IE, the gNB-DU shall, if supported, consider the information therein for mapping of non-UP uplink traffic.

If the *IAB Barred* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall, if supported, consider it as an indication of whether the cell allows IAB-node access or not.

If the *BAP Address* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall, if supported, store the received BAP address and use it as specified in TS 38.340 [30].

If the *CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message, and the *NR CGI* IE contained in the *Affected Cells and Beams* IE is served by the gNB-DU, the gNB-DU may use it to determine a new cell and/or beam configuration.

If the *CCO Assistance Information* IE is contained in the GNB-CU CONFIGURATION UPDATE message and the *NR CGI* IE contained in the *Affected Cells and Beams* IE is not served by the gNB-DU, the gNB-DU may use it to adjust coverage of its cells.

If the *Cells for SON* IE is present in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU may store or update this information and it behaves as follows:

- For each served cell indicated by the *NR CGI* IE included within the *Cells for SON Item* IE, the gNB-DU may adjust the PRACH configuration of this served cell.

- If the *Neighbour NR Cells for SON List* IE is present in the *Cells for SON Item* IE, the gNB-DU may take the PRACH configuration of neighbour cells included in the *Neighbour NR Cells for SON List* IE into consideration when adjusting the PRACH configuration of the served cell.

If the *gNB-CU Name* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU may store it or update this IE value if already stored, and use it as a human readable name of the gNB-CU. If the *Extended gNB-CU Name* IE is included in the GNB-CU CONFIGURATION UPDATE message, the gNB-DU may store it or update this IE value if already stored, and use it as a human readable name of the gNB-CU and shall ignore the *gNB-CU Name* IE if also included.

If the *Cells and SSBs Activated List* IE is contained in the GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-CU shall consider that the SSB beams indicated by the *SSBs activated List* IE as activated.

Editor’s Note: the *Cells and SSBs Activated List* IE need to be further refined.

#### 8.2.5.3 Unsuccessful Operation



Figure 8.2.5.3-1: gNB-CU Configuration Update: Unsuccessful Operation

If the gNB-DU cannot accept the update, it shall respond with a GNB-CU CONFIGURATION UPDATE FAILURE message and appropriate cause value.

If the GNB-CU CONFIGURATION UPDATE FAILURE message includes the *Time To Wait* IE, the gNB-CU shall wait at least for the indicated time before reinitiating the GNB-CU CONFIGURATION UPDATE message towards the same gNB-DU.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 8.3.3 UE Context Release (gNB-CU initiated)

#### 8.3.3.1 General

The purpose of the UE Context Release procedure is to enable the gNB-CU to order the release of the UE-associated logical connection or candidate cells in conditional handover or conditional PSCell addition or conditional PSCell change. The procedure uses UE-associated signalling.

#### 8.3.3.2 Successful Operation



Figure 8.3.3.2-1: UE Context Release (gNB-CU initiated) procedure. Successful operation

The gNB-CU initiates the procedure by sending the UE CONTEXT RELEASE COMMAND message to the gNB-DU.

Upon reception of the UE CONTEXT RELEASE COMMAND message, the gNB-DU shall release all related signalling and user data transport resources and reply with the UE CONTEXT RELEASE COMPLETE message. If the *CG-SDT Kept Indicator* IE is contained in the UE CONTEXT RELEASE COMMAND message and set to "true", the gNB-DU shall, if supported, consider that the UE is sent to RRC\_INACTIVE state with CG-SDT configuration and store the configured CG-SDT resources, C-RNTI, CS-RNTI, the CG-SDT related RLC configurations and F1-U connections associated with the SDT bearers while releasing the UE context.

If the *old gNB-DU UE F1AP ID* IE is included in the UE CONTEXT RELEASE COMMAND message, the gNB-DU shall additionally release the UE context associated with the old gNB-DU UE F1AP ID.

If the UE CONTEXT RELEASE COMMAND message contains the *RRC-Container IE*, the gNB-DU shall send the RRC container to the UE via the SRB indicated by the *SRB ID* IE.

If the UE CONTEXT RELEASE COMMAND message includes the *Execute Duplication* IE, the gNB-DU shall perform CA based duplication, if configured, for the SRB for the included *RRC-Container* IE.

If the *Candidate Cells To Be Cancelled List* IE is included in the UE CONTEXT RELEASE COMMAND message, the gNB-DU shall consider that the gNB-CU is cancelling only the conditional handover or conditional PSCell addition or conditional PSCell change associated to the cells identified by the included NR CGIs and associated to the UE-associated signaling identified by the *gNB-CU UE F1AP ID* IE and the *gNB-DU UE F1AP ID* IE.

If the *Positioning Context Reservation Indication* IE is included in the UE CONTEXT RELEASE COMMAND message, the gNB-DU shall not release the positioning context including the SRS configuration for the UE.

If the *Recommended SSBs for Paging List* IE is included in the UE CONTEXT RELEASE COMPLETE message, the gNB-CU shall, if supported, store it and may use it as assistance information for subsequent paging.

**Interactions with UE Context Setup procedure:**

The UE Context Release procedure may be performed before the UE Context Setup procedure to release an existing UE-associated logical F1-connection and related resources in the gNB-DU, e.g. when gNB-CU rejects UE access it shall trigger UE Context Release procedure with the cause value of UE rejection.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 8.7.1 Paging

#### 8.7.1.1 General

The purpose of the Paging procedure is used to provide the paging information to enable the gNB-DU to page a UE. The procedure uses non-UE associated signalling.

#### 8.7.1.2 Successful Operation



Figure 8.7.1.2-1: Paging procedure. Successful operation.

The gNB-CU initiates the procedure by sending a PAGING message.

The *Paging DRX* IE may be included in the PAGING message, and if present the gNB-DU may use it to determine the final paging cycle for the UE.

The *Paging Priority* IE may be included in the PAGING message, and if present the gNB-DU may use it according to TS 23.501 [21].

At the reception of the PAGING message, the gNB-DU shall perform paging of the UE in cells which belong to cells as indicated in the *Paging Cell List* IE.

The *Paging Origin* IE may be included in the PAGING message, and if present the gNB-DU shall transfer it to the UE.

The *RAN UE Paging DRX* IE may be included in the PAGING message, and if present the gNB-DU may use it according to TS 38.304 [24].

The *CN UE Paging DRX* IE may be included in the PAGING message, and if present the gNB-DU may use it according to TS 38.304 [24].

The *NR Paging eDRX Information* IE may be included in the PAGING message, and if present the gNB-DU may use it according to TS 38.304 [24].

The *NR Paging eDRX Information for RRC INACTIVE* IE may be included in the PAGING message, and if present the gNB-DU shall, if supported, use it according to TS 38.304 [24].

The *Paging Cause* IE may be included in the PAGING message. If present the gNB-DU shall, if supported, send it to UE according to TS 38.331 [8].

The *PEIPS Assistance Information* IE may be included in the PAGING message, and if present the gNB-DU shall, if supported, use it for paging subgrouping of the UE, as specified in TS 38.300 [6].

The *UEID Subgrouping Support Indication* IE may be included in *UE Paging Capability* IE in the PAGING message, and if present the gNB-DU shall, if supported, use it for paging subgrouping of the UE, as specified in TS 38.300 [6].

The *RedCap Indication* IE may be included in the *UE Paging Capability* IE in the PAGING message, and if present the gNB-DU shall, if supported, use it for paging of RedCap UEs.

The *Last Used Cell Indication* IE may be included in the *Paging Cell Item IEs* IE of the PAGING message, and if present the gNB-DU shall, if supported, consider the cell identified by the *NR CGI* IE as the last used cell of the paged UE, and use it as specified in TS 38.331 [8].

The *Recommended SSBs List* IE may be included in the *Paging Cell Item IEs* IE of the PAGING message, and if present the gNB-DU shall, if supported, use it to send the paging message over the indicated SSB beams.

The *PEI Subgrouping Support Indication* IE may be included in the *Paging Cell Item IEs* IE in the PAGING message, and if present the gNB-DU shall, if supported, consider that the cell identified by the *NR CGI* IE is supported by the UE to receive the paging early indication as described in TS 38.300 [6] and TS 38.304 [24].

The *UE Paging Capability* IE may be included in the PAGING message, and if present the gNB-DU shall, if supported, take it into account when paging the UE.

#### 8.7.1.3 Abnormal Conditions

Not applicable.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 9.2.6 Paging messages

#### 9.2.6.1 PAGING

This message is sent by the gNB-CU and is used to request the gNB-DU to page UEs.

Direction: gNB-CU → gNB-DU

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.3.1.1 |  | YES | ignore |
| UE Identity Index value | M |  | 9.3.1.39 |  | YES | reject |
| CHOICE *Paging Identity* | M |  |  |  | YES | reject |
| *>RAN UE Paging identity* |  |  |  |  |  |  |
| >>RAN UE Paging identity | M |  | 9.3.1.43 |  | - |  |
| *>CN UE paging identity* |  |  |  |  |  |  |
| >>CN UE paging identity  | M |  | 9.3.1.44 |  | - |  |
| Paging DRX | O |  | 9.3.1.40 | It is defined as the minimum between the RAN UE Paging DRX and CN UE Paging DRX | YES | ignore |
| Paging Priority | O |  | 9.3.1.41 |  | YES | ignore |
| **Paging Cell List**  |  | *1* |  |  | YES | ignore |
| **>Paging Cell Item IEs** |  | *1 .. <maxnoofPagingCells>* |  |  | EACH | ignore |
| >>NR CGI | M |  | 9.3.1.12 |  | - |  |
| >>Last Used Cell Indication | O |  | ENUMERATED(true, …) |  | YES | ignore |
| >>PEI Subgrouping Support Indication | O |  | ENUMERATED(true, …) |  | YES | ignore |
| **>>****Recommended SSBs List** |  | *0 .. <* *maxnoofSSBAreas >* |  |  | EACH | ignore |
|  >>>SSB Index | O |  | INTEGER (0..63) |  Identifier of the recommended SSB beam for paging | - |  |
| Paging Origin | O |  | 9.3.1.79 |  | YES | ignore |
| RAN UE Paging DRX | O |  | Paging DRX9.3.1.40 | This IE indicates the RAN paging cycle as defined in TS 38.304 [24]. | YES | ignore |
| CN UE Paging DRX | O |  | Paging DRX9.3.1.40 | This IE indicates the UE specific paging cycle as defined in TS 38.304 [24]. | YES | ignore |
| NR Paging eDRX Information | O |  | 9.3.1.258 |  | YES | ignore |
| NR Paging eDRX Information for RRC INACTIVE | O |  | 9.3.1.259 |  | YES | ignore |
| Paging Cause | O |  | ENUMERATED(voice, …)  | This IE indicates the paging cause is IMS voice, refer to TS 23.501[21]. | YES | ignore |
| PEIPS Assistance Information | O |  | 9.3.1.269 |  | YES | ignore |
| UE Paging Capability  | O |  | 9.3.1.270 |  | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofPagingCells | Maximum no. of paging cells, the maximum value is 512.  |
| *maxnoofSSBAreas* | Maximum no. SSB Areas that can be served by a cell. Value is 64. FFS |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 9.2.1.10 GNB-CU CONFIGURATION UPDATE

This message is sent by the gNB-CU to transfer updated information associated to an F1-C interface instance.

NOTE: If F1-C signalling transport is shared among several F1-C interface instances, this message may transfer updated information associated to several F1-C interface instances.

Direction: gNB-CU → gNB-DU

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| Transaction ID | M |  | 9.3.1.23 |  | YES | reject |
| **Cells to be Activated List** |  | *0..1* |  | List of cells to be activated or modified | YES | reject |
| **>Cells to be Activated List Item** |  | *1.. <maxCellingNBDU>* |  |  | EACH | reject |
| >> NR CGI | M |  | 9.3.1.12 |  | - |  |
| >> NR PCI  | O |  | INTEGER (0..1007) | Physical Cell ID | - |  |
| >> gNB-CU System Information | O |  | 9.3.1.42 | RRC container with system information owned by gNB-CU | YES | reject |
| >>Available PLMN List | O |  | 9.3.1.65 |  | YES | ignore |
| >>Extended Available PLMN List | O |  | 9.3.1.76 | This is included if *Available PLMN List* IE is included and if more than 6 Available PLMNs is to be signalled. | YES | ignore |
| >>IAB Info IAB-donor-CU | O |  | 9.3.1.105 | IAB-related configuration sent by the IAB-donor-CU. | YES | ignore |
| >>Available SNPN ID List | O |  | 9.3.1.163 | Indicates the available SNPN ID list.If this IE is included, the content of the *Available PLMN List* IE and *Extended Available PLMN List* IE if present in the *Cells to be Activated List Item* IE is ignored. | YES | ignore |
| >>MBS Broadcast Neighbour Cell List | O |  | 9.3.1.226 |  | YES | ignore |
| **>>****SSBs to be Activated List** |  | *0 .. <* *maxnoofSSBAreas>* |  | If present, only the listed SSBs are requested to be activated | EACH | reject |
|  >>>SSB Index | M |  | INTEGER (0..63) | Identifier of the SSB beam that are requested to be activated | - |  |
| **Cells to be Deactivated List** |  | *0..1* |  | List of cells to be deactivated | YES | reject |
| **>Cells to be Deactivated List Item** |  | *1.. <maxCellingNBDU>* |  |  | EACH | reject |
| >> NR CGI | M |  | 9.3.1.12 |  | - |  |
| **gNB-CU TNL Association To Add List**  |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU TNL Association To Add Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | EACH | ignore |
| >>TNL Association Transport Layer Information | M |  | CP Transport Layer Address9.3.2.4 | Transport Layer Address of the gNB-CU. | - |  |
| >>TNL Association Usage | M |  | ENUMERATED (ue, non-ue, both, ...) | Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.472 [22]. | - |  |
| **gNB-CU TNL Association To Remove List**  |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU TNL Association To Remove Item IEs** |  | *1..<maxnoofTNLAssociation>* |  |  | EACH | ignore |
| >>TNL Association Transport Layer Address | M |  | CP Transport Layer Address9.3.2.4 | Transport Layer Address of the gNB-CU. | - |  |
| >>TNL Association Transport Layer Address gNB-DU | O |  | CP Transport Layer Address9.3.2.4 | Transport Layer Address of the gNB-DU. | YES | reject |
| **gNB-CU TNL Association To Update List**  |  | *0..1* |  |  | YES | ignore |
| **>gNB-CU TNL Association To Update Item IEs** |  | *1..<maxnoofTNLAssociations>* |  |  | EACH | ignore |
| >>TNL Association Transport Layer Address | M |  | CP Transport Layer Address9.3.2.4 | Transport Layer Address of the gNB-CU. | - |  |
| >>TNL Association Usage | O |  | ENUMERATED (ue, non-ue, both, ...) | Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.472 [22]. | - |  |
| **Cells to be barred List** |  | *0..1* |  | List of cells to be barred. | YES | ignore |
| **>Cells to be barred List Item** |  | *1.. <maxCellingNBDU>* |  |  | EACH | ignore |
| >>NR CGI | M |  | 9.3.1.12 |  | - |  |
| >>Cell Barred | M |  | ENUMERATED (barred, not-barred, ...) |  | - |  |
| >>IAB Barred | O |  | ENUMERATED (barred, not-barred, ...) |  | - |  |
| **Protected E-UTRA Resources List** |  | *0..1* |  | List of Protected E-UTRA Resources. | YES | reject |
| **>Protected E-UTRA Resources List Item** |  | *1.. <maxCellineNB>* |  |  | EACH | reject |
| >>Spectrum Sharing Group ID | M |  | INTEGER (1.. maxCellineNB) | Indicates the E-UTRA cells involved in resource coordination with the NR cells affiliated with the same Spectrum Sharing Group ID. | - |  |
| **>> E-UTRA Cells List** |  | *1* |  | List of applicable E-UTRA cells.  | - |  |
| **>>> E-UTRA Cells List Item** |  | *1 .. <maxCellineNB>* |  |  | - |  |
| >>>>EUTRA Cell ID | M |  | BIT STRING (SIZE(28)) | Indicates the E-UTRAN Cell Identifier IE contained in the ECGI as defined in subclause 9.2.14 in TS 36.423 [9]. | - |  |
| >>>>Served E-UTRA Cell Information | M |  | 9.3.1.64 |  | - |  |
| **Neighbour Cell Information List** |  | *0..1* |  |  | YES | ignore |
| **>Neighbour Cell Information List Item** |  | *1 .. <maxCellingNBDU>* |  |  | EACH | ignore |
| >>NR CGI | M |  | 9.3.1.12 |  | - |  |
| >>Intended TDD DL-UL Configuration | O |  | 9.3.1.89 |  | - |  |
| Transport Layer Address Info | O |  | 9.3.2.5 |  | YES | ignore |
| Uplink BH Non-UP Traffic Mapping | O |  | 9.3.1.103 |  | YES | reject |
| BAP Address | O |  | 9.3.1.111 | Indicates a BAP address assigned to the IAB-donor-DU. | YES | ignore |
| CCO Assistance Information | O |  | 9.3.1.211 | Indicates CCO Assistance Information for cells and beams served by the gNB-DU of the same NG-RAN node or for cells and beams not served by the gNB-DU. | YES | Ignore |
| Cells for SON List | O |  | 9.3.1.214 |  | YES | ignore |
| gNB-CU Name | O |  | PrintableString(SIZE(1..150,...)) | Human readable name of the gNB-CU.  | YES | ignore |
| Extended gNB-CU Name | O |  | 9.3.1.206 |  | YES | ignore |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxCellingNBDU | Maximum numbers of cells that can be served by a gNB-DU. Value is 512. |
| maxnoofTNLAssociations | Maximum numbers of TNL Associations between the gNB-CU and the gNB-DU. Value is 32. |
| maxCellineNB | Maximum no. cells that can be served by an eNB. Value is 256. |
| *maxnoofSSBAreas* | Maximum no. SSB Areas that can be served by a cell. Value is 64. FFS |

#### 9.2.1.11 GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE

This message is sent by a gNB-DU to a gNB-CU to acknowledge update of information associated to an F1-C interface instance.

NOTE: If F1-C signalling transport is shared among several F1-C interface instance, this message may transfer updated information associated to several F1-C interface instances.

Direction: gNB-DU → gNB-CU

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| Transaction ID | M |  | 9.3.1.23 |  | YES | reject |
| **Cells Failed to be Activated List** |  | *0..1* |  | List of cells which are failed to be activated | YES | reject |
| **>Cells Failed to be Activated Item** |  | *1.. <maxCellingNBDU>* |  |  | EACH | reject |
| >> NR CGI | M |  | 9.3.1.12 |  | - |  |
| >>Cause | M |  | 9.3.1.2 |  | - |  |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | ignore |
| **gNB-CU TNL Association Setup List**  |  | 0..1 |  |  | YES | ignore |
| **>gNB-CU TNL Association Setup Item IEs** |  | 1..<maxnoofTNLAssociations> |  |  | EACH | ignore |
| >>TNL Association Transport Layer Address | M |  | CP Transport Layer Address9.3.2.4 | Transport Layer Address of the gNB-CU | - |  |
| **gNB-CU TNL Association Failed to Setup List** |  | 0..1 |  |  | YES | ignore |
| **>gNB-CU TNL Association Failed To Setup Item IEs** |  | 1..<maxnoofTNLAssociations> |  |  | EACH | ignore |
| >>TNL Association Transport Layer Address | M |  | CP Transport Layer Address9.3.2.4 | Transport Layer Address of the gNB-CU | - |  |
| >>Cause | M |  | 9.3.1.2 |  | - |  |
| **Dedicated SI Delivery Needed UE List** |  | *0..1* |  | List of UEs unable to receive system information from broadcast | YES | ignore |
| **>Dedicated SI Delivery Needed UE List** |  | *1 .. <maxnoofUEIDs>* |  |  | EACH | ignore |
| >>gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  | - | - |
| >>NR CGI | M |  | 9.3.1.12 |  | - | - |
| Transport Layer Address Info | O |  | 9.3.2.5 |  | YES | ignore |
| **Cells with SSBs Activated List** |  | *0.. <**maxCellingNBDU>* |  | Presented only when the SSBs within the cell are activated | YES | ignore |
| >NR CGI | M |  | 9.3.1.12 |  | - |  |
| **>SSBs activated List** |  | *1 .. < maxnoofSSBAreas >* |  |  | EACH | ignore |
|  >>SSB Index | O |  | INTEGER (0..63) | Identifier of the SSB beam activated | - |  |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxCellingNBDU | Maximum no. cells that can be served by a gNB-DU. Value is 512. |
| maxnoofTNLAssociations | Maximum no. of TNL Associations between the gNB-CU and the gNB-DU. Value is 32. |
| maxnoofUEIDs | Maximum no. of UEs that can be served by a gNB-DU. Value is 65536. |
| *maxnoofSSBAreas* | Maximum no. SSB Areas that can be served by a cell. Value is 64. FFS |

Editor’s Note: The Cells and SSBs Activated List IE may be further refined.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#### 9.2.2.6 UE CONTEXT RELEASE COMPLETE

This message is sent by the gNB-DU to confirm the release of the UE-associated logical F1 connection or candidate cells in conditional handover or conditional PSCell addition or conditional PSCell change.

Direction: gNB-DU → gNB-CU

| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| --- | --- | --- | --- | --- | --- | --- |
| Message Type | M |  | 9.3.1.1 |  | YES | reject |
| gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  | YES | reject |
| gNB-DU UE F1AP ID | M |  | 9.3.1.5 |  | YES | reject |
| Criticality Diagnostics | O |  | 9.3.1.3 |  | YES | Ignore |
| **Recommended SSBs for Paging List** |  | *0 .. <* *maxCellingNBDU>* |  |  | YES | ignore |
| >NR CGI | M |  | 9.3.1.12 |  | - |  |
| **>SSBs for Paging List** |  | *1 .. < maxnoofSSBAreas >* |  |  | EACH | ignore |
| >>SSB Index | O |   | INTEGER (0..63) | Identifier of the recommended SSB beam for paging | - |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| *maxnoofSSBAreas* | Maximum no. SSB Areas that can be served by a cell. Value is 64. FFS |

Editor’s Note: The Recommended SSBs for Paging List IE may be further refined.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 9.4.4 PDU Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- PDU definitions for F1AP.

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

F1AP-PDU-Contents {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- IE parameter types from other modules.

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

IMPORTS

 BroadcastMRBs-FailedToBeModified-Item,

 BroadcastMRBs-FailedToBeSetup-Item,

 BroadcastMRBs-FailedToBeSetupMod-Item,

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

GNBCUConfigurationUpdateAcknowledge ::= SEQUENCE {

 protocolIEs ProtocolIE-Container { { GNBCUConfigurationUpdateAcknowledgeIEs} },

 ...

}

GNBCUConfigurationUpdateAcknowledgeIEs F1AP-PROTOCOL-IES ::= {

 { ID id-TransactionID CRITICALITY reject TYPE TransactionID PRESENCE mandatory }|

 { ID id-Cells-Failed-to-be-Activated-List CRITICALITY reject TYPE Cells-Failed-to-be-Activated-List PRESENCE optional}|

 { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional }|

 { ID id-GNB-CU-TNL-Association-Setup-List CRITICALITY ignore TYPE GNB-CU-TNL-Association-Setup-List PRESENCE optional }|

 { ID id-GNB-CU-TNL-Association-Failed-To-Setup-List CRITICALITY ignore TYPE GNB-CU-TNL-Association-Failed-To-Setup-List PRESENCE optional }|

 { ID id-Dedicated-SIDelivery-NeededUE-List CRITICALITY ignore TYPE Dedicated-SIDelivery-NeededUE-List PRESENCE optional }|

 { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|

 { ID id-Cells-With-SSBs-Activated-List CRITICALITY ignore TYPE Cells-With-SSBs-Activated-List PRESENCE optional }|,

 ...

}

Cells-Failed-to-be-Activated-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-Failed-to-be-Activated-List-ItemIEs } }

GNB-CU-TNL-Association-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF ProtocolIE-SingleContainer { { GNB-CU-TNL-Association-Setup-ItemIEs } }

GNB-CU-TNL-Association-Failed-To-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF ProtocolIE-SingleContainer { { GNB-CU-TNL-Association-Failed-To-Setup-ItemIEs } }

Cells-Failed-to-be-Activated-List-ItemIEs F1AP-PROTOCOL-IES ::= {

 { ID id-Cells-Failed-to-be-Activated-List-Item CRITICALITY reject TYPE Cells-Failed-to-be-Activated-List-Item PRESENCE mandatory },

 ...

}

GNB-CU-TNL-Association-Setup-ItemIEs F1AP-PROTOCOL-IES ::= {

 { ID id-GNB-CU-TNL-Association-Setup-Item CRITICALITY ignore TYPE GNB-CU-TNL-Association-Setup-Item PRESENCE mandatory },

 ...

}

GNB-CU-TNL-Association-Failed-To-Setup-ItemIEs F1AP-PROTOCOL-IES ::= {

 { ID id-GNB-CU-TNL-Association-Failed-To-Setup-Item CRITICALITY ignore TYPE GNB-CU-TNL-Association-Failed-To-Setup-Item PRESENCE mandatory },

 ...

}

Cells-With-SSBs-Activated-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF Cells-With-SSBs-Activated-List-Item

Cells-With-SSBs-Activated-List-Item::= SEQUENCE {

 nGCGI NRCGI,

 sSBs-activated-List SSBs-activated-List,

 iE-Extensions ProtocolExtensionContainer { { Cells-With-SSBs-Activated-List-Item-ExtIEs} } OPTIONAL

}

Cells-With-SSBs-Activated-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

SSBs-activated-List ::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF SSB-Index;

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- UE CONTEXT RELEASE COMPLETE

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

UEContextReleaseComplete ::= SEQUENCE {

 protocolIEs ProtocolIE-Container { { UEContextReleaseCompleteIEs} },

 ...

}

UEContextReleaseCompleteIEs F1AP-PROTOCOL-IES ::= {

 { ID id-gNB-CU-UE-F1AP-ID CRITICALITY reject TYPE GNB-CU-UE-F1AP-ID PRESENCE mandatory }|

 { ID id-gNB-DU-UE-F1AP-ID CRITICALITY reject TYPE GNB-DU-UE-F1AP-ID PRESENCE mandatory }|

 { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional }|

 { ID id-Recommended-SSBs-for-Paging-List CRITICALITY ignore TYPE Recommended-SSBs-for-Paging-List PRESENCE optional },

 ...

}

Recommended-SSBs-for-Paging-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF Recommended-SSBs-for-Paging-List-Item

Recommended-SSBs-for-Paging-List-Item::= SEQUENCE {

 nGCGI NRCGI,

 sSBs-forPaging-List SSBs-forPaging-List,

 iE-Extensions ProtocolExtensionContainer { { Recommended-SSBs-for-Paging-List-Item-ExtIEs} } OPTIONAL

}

Recommended-SSBs-for-Paging-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

SSBs-forPaging-List ::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF SSB-Index;

### 9.4.5 Information Element Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Information Element Definitions

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

F1AP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

 id-gNB-CUSystemInformation,

 id-HandoverPreparationInformation,

 id-TAISliceSupportList,

 id-RANAC,

 id-BearerTypeChange,

 id-Cell-Direction,

 id-Cell-Type,

 id-CellGroupConfig,

 id-AvailablePLMNList,

 id-PDUSessionID,

 id-ULPDUSessionAggregateMaximumBitRate,

 id-DC-Based-Duplication-Configured,

 id-DC-Based-Duplication-Activation,

 id-Duplication-Activation,

 id-DLPDCPSNLength,

 id-ULPDCPSNLength,

 id-RLC-Status,

 id-MeasurementTimingConfiguration,

 id-DRB-Information,

 id-QoSFlowMappingIndication,

 id-ServingCellMO,

 id-RLCMode,

 id-ExtendedServedPLMNs-List,

 id-ExtendedAvailablePLMN-List,

 id-DRX-LongCycleStartOffset,

 id-SelectedBandCombinationIndex,

 id-SelectedFeatureSetEntryIndex,

 id-Ph-InfoSCG,

 id-latest-RRC-Version-Enhanced,

 id-RequestedBandCombinationIndex,

 id-RequestedFeatureSetEntryIndex,

 id-DRX-Config,

 id-UEAssistanceInformation,

 id-PDCCH-BlindDetectionSCG,

 id-Requested-PDCCH-BlindDetectionSCG,

 id-BPLMN-ID-Info-List,

 id-NotificationInformation,

 id-TNLAssociationTransportLayerAddressgNBDU,

 id-portNumber,

 id-AdditionalSIBMessageList,

 id-IgnorePRACHConfiguration,

 id-CG-Config,

 id-Ph-InfoMCG,

 id-AggressorgNBSetID,

 id-VictimgNBSetID,

 id-MeasGapSharingConfig,

 id-systemInformationAreaID,

 id-areaScope,

 id-IntendedTDD-DL-ULConfig,

 id-QosMonitoringRequest,

 id-BHInfo,

 id-IAB-Info-IAB-DU,

 id-IAB-Info-IAB-donor-CU,

 id-IAB-Barred,

 id-SIB12-message,

 id-SIB13-message,

 id-SIB14-message,

 id-UEAssistanceInformationEUTRA,

 id-SL-PHY-MAC-RLC-Config,

 id-SL-ConfigDedicatedEUTRA-Info,

 id-AlternativeQoSParaSetList,

 id-CurrentQoSParaSetIndex,

 id-CarrierList,

 id-ULCarrierList,

 id-FrequencyShift7p5khz,

 id-SSB-PositionsInBurst,

 id-NRPRACHConfig,

 id-TDD-UL-DLConfigCommonNR,

 id-CNPacketDelayBudgetDownlink,

 id-CNPacketDelayBudgetUplink,

 id-ExtendedPacketDelayBudget,

 id-TSCTrafficCharacteristics,

 id-AdditionalPDCPDuplicationTNL-List,

 id-RLCDuplicationInformation,

 id-AdditionalDuplicationIndication,

 id-mdtConfiguration,

 id-TraceCollectionEntityURI,

 id-NID,

 id-NPNSupportInfo,

 id-NPNBroadcastInformation,

 id-AvailableSNPN-ID-List,

 id-SIB10-message,

 id-RequestedP-MaxFR2,

 id-DLCarrierList,

 id-ExtendedTAISliceSupportList,

 id-E-CID-MeasurementQuantities-Item,

 id-ConfiguredTACIndication,

 id-NRCGI,

 id-SFN-Offset,

 id-TransmissionStopIndicator,

 id-SrsFrequency,

 id-EstimatedArrivalProbability,

 id-Supported-MBS-FSA-ID-List,

 id-TRPType,

 id-SRSSpatialRelationPerSRSResource,

 id-MBS-Broadcast-NeighbourCellList,

 id-PDCPTerminatingNodeDLTNLAddrInfo,

 id-ENBDLTNLAddress,

 id-PRS-Resource-ID,

 id-LocationMeasurementInformation,

 id-SliceRadioResourceStatus,

 id-CompositeAvailableCapacity-SUL,

 id-NR-U,

 id-NR-U-Channel-List,

 id-MIMOPRBusageInformation,

 id-IngressNonF1terminatingTopologyIndicator,

 id-NonF1terminatingTopologyIndicator,

 id-EgressNonF1terminatingTopologyIndicator,

 id-rBSetConfiguration,

 id-frequency-Domain-HSNA-Configuration-List,

 id-child-IAB-Nodes-NA-Resource-List,

 id-Parent-IAB-Nodes-NA-Resource-Configuration-List,

 id-uL-FreqInfo,

 id-uL-Transmission-Bandwidth,

 id-dL-FreqInfo,

 id-dL-Transmission-Bandwidth,

 id-uL-NR-Carrier-List,

 id-dL-NR-Carrier-List,

 id-nRFreqInfo,

 id-transmission-Bandwidth,

 id-nR-Carrier-List,

 id-permutation,

 id-M5ReportAmount,

 id-M6ReportAmount,

 id-M7ReportAmount,

 id-SurvivalTime,

 id-PDCMeasurementQuantities-Item,

 id-OnDemandPRS,

 id-AoA-SearchWindow,

 id-ZoAInformation,

 id-ARPLocationInfo,

 id-ARP-ID,

 id-MultipleULAoA,

 id-UL-SRS-RSRPP,

 id-SRSResourcetype,

 id-ExtendedAdditionalPathList,

 id-LoS-NLoSInformation,

 id-NumberOfTRPRxTEG,

 id-NumberOfTRPRxTxTEG,

 id-TRPTxTEGAssociation,

 id-TRPTEGInformation,

 id-TRPRx-TEGInformation,

 id-TRPBeamAntennaInformation,

 id-Redcap-Bcast-Information,

 id-NR-TADV,

 id-SDT-MAC-PHY-CG-Config,

 id-CG-SDTindicatorSetup,

 id-CG-SDTindicatorMod,

 id-SDTRLCBearerConfiguration,

 id-SRBMappingInfo,

 id-DRBMappingInfo,

 id-LastUsedCellIndication,

 id-Recommended-SSBs-List,

 id-Recommended-SSBs-for-Paging-List,

 id-SSBs-toBeActivated-List,

 id-Cells-With-SSBs-Activated-List,

 id-SIB17-message,

 id-MUSIM-GapConfig,

 id-SIB20-message,

 id-pathPower,

 id-DU-RX-MT-RX-Extend,

 id-DU-TX-MT-TX-Extend,

 id-DU-RX-MT-TX-Extend,

 id-DU-TX-MT-RX-Extend,

 id-TAINSAGSupportList,

 id-SL-RLC-ChannelToAddModList,

 id-SIB15-message,

 id-InterFrequencyConfig-NoGap,

 id-MBSInterestIndication,

 id-L571Info,

 id-L1151Info,

 id-SCS-480,

 id-SCS-960,

 id-SRSPortIndex,

 id-PEISubgroupingSupportIndication,

 id-NeedForGapsInfoNR,

 id-NeedForGapNCSGInfoNR,

 id-NeedForGapNCSGInfoEUTRA,

 id-Source-MRB-ID,

 id-RedCapIndication,

 id-UL-GapFR2-Config,

 id-ConfigRestrictInfoDAPS,

 id-MulticastF1UContextReferenceCU,

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- C

CAGID ::= BIT STRING (SIZE(32))

Cancel-all-Warning-Messages-Indicator ::= ENUMERATED {true, ...}

Candidate-SpCell-Item ::= SEQUENCE {

 candidate-SpCell-ID NRCGI ,

 iE-Extensions ProtocolExtensionContainer { { Candidate-SpCell-ItemExtIEs } } OPTIONAL,

 ...

}

Candidate-SpCell-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Cells-to-be-Activated-List-Item ::= SEQUENCE {

 nRCGI NRCGI,

 nRPCI NRPCI OPTIONAL,

 iE-Extensions ProtocolExtensionContainer { { Cells-to-be-Activated-List-ItemExtIEs} } OPTIONAL,

 ...

}

Cells-to-be-Activated-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 { ID id-gNB-CUSystemInformation CRITICALITY reject EXTENSION GNB-CUSystemInformation PRESENCE optional }|

 { ID id-AvailablePLMNList CRITICALITY ignore EXTENSION AvailablePLMNList PRESENCE optional }|

 { ID id-ExtendedAvailablePLMN-List CRITICALITY ignore EXTENSION ExtendedAvailablePLMN-List PRESENCE optional }|

 { ID id-IAB-Info-IAB-donor-CU CRITICALITY ignore EXTENSION IAB-Info-IAB-donor-CU PRESENCE optional}|

 { ID id-AvailableSNPN-ID-List CRITICALITY ignore EXTENSION AvailableSNPN-ID-List PRESENCE optional }|

 { ID id-MBS-Broadcast-NeighbourCellList CRITICALITY ignore EXTENSION MBS-Broadcast-NeighbourCellList PRESENCE optional }|

 { ID id-SSBs-toBeActivated-List CRITICALITY reject EXTENSION SSBs-toBeActivated-List PRESENCE optional },

 ...

}

SSBs-toBeActivated-List ::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF SSB-Index,

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- P

PacketDelayBudget ::= INTEGER (0..1023, ...)

PacketErrorRate ::= SEQUENCE {

 pER-Scalar PER-Scalar,

 pER-Exponent PER-Exponent,

 iE-Extensions ProtocolExtensionContainer { {PacketErrorRate-ExtIEs} } OPTIONAL,

 ...

}

PacketErrorRate-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

PER-Scalar ::= INTEGER (0..9, ...)

PER-Exponent ::= INTEGER (0..9, ...)

PagingCell-Item ::= SEQUENCE {

 nRCGI NRCGI ,

 iE-Extensions ProtocolExtensionContainer { { PagingCell-ItemExtIEs } } OPTIONAL

}

PagingCell-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 { ID id-LastUsedCellIndication CRITICALITY ignore EXTENSION LastUsedCellIndication PRESENCE optional }|

 { ID id-PEISubgroupingSupportIndication CRITICALITY ignore EXTENSION PEISubgroupingSupportIndication PRESENCE optional }|

 { ID id-Recommended-SSBs-List CRITICALITY ignore EXTENSION Recommended-SSBs-List PRESENCE optional },

 ...

}

Recommended-SSBs-List ::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF RecommendedSSBItem-List-Item

RecommendedSSBItem-List-Item::= SEQUENCE {

 sSB-Index SSB-Index,

 iE-Extensions ProtocolExtensionContainer { { RecommendedSSBItem-List-Item-ExtIEs} } OPTIONAL

}

RecommendedSSBItem-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 9.4.7 Constant Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Constant definitions

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

F1AP-Constants {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Lists

--

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

maxEARFCN INTEGER ::= 262143

maxnoofAllowedAreas INTEGER ::= 16

maxnoofAMFRegions INTEGER ::= 16

maxnoofAoIs INTEGER ::= 64

maxnoofBluetoothName INTEGER ::= 4

maxnoofBPLMNs INTEGER ::= 12

maxnoofCAGs INTEGER ::= 12

maxnoofCAGsperPLMN INTEGER ::= 256

maxnoofCellIDforMDT INTEGER ::= 32

maxnoofCellsinAoI INTEGER ::= 256

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

maxnoofSuccessfulHOReports INTEGER ::= 64

maxnoofPSCellsPerSN INTEGER ::= 8

maxnoofNR-UChannelIDs INTEGER ::= 16

maxnoofCellsinCHO INTEGER ::= 8

maxnoofCHOexecutioncond INTEGER ::= 2

maxnoofServedCellsIAB INTEGER ::= 512

maxnoofSSBarea INTEGER ::=64 (FFS)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Skip the unchanged

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

id-UplinkTxDirectCurrentTwoCarrierListInfo ProtocolIE-ID ::= 684

id-UE-MulticastMRBs-ToBeSetup-atModify-List ProtocolIE-ID ::= 685

id-UE-MulticastMRBs-ToBeSetup-atModify-Item ProtocolIE-ID ::= 686

id-MC-PagingCell-List ProtocolIE-ID ::= 687

id-MC-PagingCell-Item ProtocolIE-ID ::= 688

id-SRSPosRRCInactiveQueryIndication ProtocolIE-ID ::= 689

id-Recommended-SSBs-List ProtocolIE-ID ::= 6xx

id-Recommended-SSBs-for-Paging-List ProtocolIE-ID ::= 6xx+1

id-SSBs-toBeActivated-List ProtocolIE-ID ::= 6xx+2

id-Cells-With-SSBs-Activated-List ProtocolIE-ID ::= 6xx+3

END

-- ASN1STOP