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1 Scope

The present document specifies the 5G radio network layer signalling protocol for the F1 interface. The F1 interface provides means for interconnecting a gNB-CU and a gNB-DU of a gNB within an NG-RAN, or for interconnecting a gNB-CU and a gNB-DU of an en-gNB within an E-UTRAN. The F1 Application Protocol (F1AP) supports the functions of F1 interface by signalling procedures defined in the present document. F1AP is developed in accordance to the general principles stated in TS 38.401 [4] and TS 38.470 [2].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 38.470: "NG-RAN; F1 general aspects and principles".
- [3] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".
- [4] 3GPP TS 38.401: "NG-RAN; Architecture Description".
- [5] ITU-T Recommendation X.691 (2002-07): "Information technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".
- [6] 3GPP TS 38.300: "NR; Overall description; Stage-2".
- [7] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".
- [8] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".
- [9] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)".
- [10] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [11] 3GPP TS 23.203: "Policy and charging control architecture".
- [12] ITU-T Recommendation X.680 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [13] ITU-T Recommendation X.681 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Information object specification".
- [14] 3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error".
- [15] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".
- [16] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".
- [17] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception".
- [18] 3GPP TS 29.281: "General Packet Radio System (GPRS); Tunnelling Protocol User Plane (GTPv1-U) ".

- [19] 3GPP TS 38.414: "NG-RAN; NG data transport".
- [20] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".
- [21] 3GPP TS 23.501: "System Architecture for the 5G System".
- [22] 3GPP TS 38.472: "NG-RAN; F1 signalling transport".
- [23] 3GPP TS 23.003: "Numbering, addressing and identification".
- [24] 3GPP TS 38.304: " NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state ".

3 Definitions and abbreviations

3.1 Definitions

elementary procedure: F1AP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between gNB-CU and gNB-DU. These Elementary Procedures are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as standalone procedures, which can be active in parallel. The usage of several F1AP EPs together is specified in stage 2 specifications (e.g., TS 38.470 [2]).

An EP consists of an initiating message and possibly a response message. Two kinds of EPs are used:

- **Class 1:** Elementary Procedures with response (success and/or failure).
- **Class 2:** Elementary Procedures without response.

For Class 1 EPs, the types of responses can be as follows:

Successful:

- A signalling message explicitly indicates that the elementary procedure successfully completed with the receipt of the response.

Unsuccessful:

- A signalling message explicitly indicates that the EP failed.
- On time supervision expiry (i.e., absence of expected response).

Successful and Unsuccessful:

- One signalling message reports both successful and unsuccessful outcome for the different included requests. The response message used is the one defined for successful outcome.

Class 2 EPs are considered always successful.

EN-DC operation: Used in this specification when the F1AP is applied for gNB-CU and gNB-DU in E-UTRAN.

gNB: as defined in TS 38.300 [6].

gNB-CU: as defined in TS 38.401 [4].

gNB-CU UE F1AP ID: as defined in TS 38.401 [4].

gNB-DU: as defined in TS 38.401 [4].

gNB-DU UE F1AP ID: as defined in TS 38.401 [4].

en-gNB: as defined in TS 37.340 [7].

UE-associated signalling: When F1AP messages associated to one UE uses the UE-associated logical F1-connection for association of the message to the UE in gNB-DU and gNB-CU.

UE-associated logical F1-connection: The UE-associated logical F1-connection uses the identities *GNB-CU UE FIAP ID* and *GNB-DU UE FIAP ID* according to the definition in TS 38.401 [4]. For a received UE associated FIAP message the gNB-CU identifies the associated UE based on the *GNB-CU UE FIAP ID IE* and the gNB-DU identifies the associated UE based on the *GNB-DU UE FIAP ID IE*. The UE-associated logical F1-connection may exist before the F1 UE context is setup in gNB-DU.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

5GC	5G Core Network
5QI	5G QoS Identifier
AMF	Access and Mobility Management Function
CN	Core Network
CG	Cell Group
CGI	Cell Global Identifier
CP	Control Plane
DL	Downlink
EN-DC	E-UTRA-NR Dual Connectivity
EPC	Evolved Packet Core
IMEISV	International Mobile station Equipment Identity and Software Version number
NSSAI	Network Slice Selection Assistance Information
RANAC	RAN Area Code
RRC	Radio Resource Control
S-NSSAI	Single Network Slice Selection Assistance Information
SUL	Supplementary Uplink
TAC	Tracking Area Code
TAI	Tracking Area Identity

4 General

4.1 Procedure specification principles

The principle for specifying the procedure logic is to specify the functional behaviour of the terminating node exactly and completely. Any rule that specifies the behaviour of the originating node shall be possible to be verified with information that is visible within the system.

The following specification principles have been applied for the procedure text in clause 8:

- The procedure text discriminates between:

- 1) Functionality which "shall" be executed.

The procedure text indicates that the receiving node "shall" perform a certain function Y under a certain condition. If the receiving node supports procedure X but cannot perform functionality Y requested in the REQUEST message of a Class 1 EP, the receiving node shall respond with the message used to report unsuccessful outcome for this procedure, containing an appropriate cause value.

- 2) Functionality which "shall, if supported" be executed.

The procedure text indicates that the receiving node "shall, if supported," perform a certain function Y under a certain condition. If the receiving node supports procedure X, but does not support functionality Y, the receiving node shall proceed with the execution of the EP, possibly informing the requesting node about the not supported functionality.

- Any required inclusion of an optional IE in a response message is explicitly indicated in the procedure text. If the procedure text does not explicitly indicate that an optional IE shall be included in a response message, the optional IE shall not be included. For requirements on including *Criticality Diagnostics* IE, see clause 10.

4.2 Forwards and backwards compatibility

The forwards and backwards compatibility of the protocol is assured by mechanism where all current and future messages, and IEs or groups of related IEs, include ID and criticality fields that are coded in a standard format that will not be changed in the future. These parts can always be decoded regardless of the standard version.

4.3 Specification notations

For the purposes of the present document, the following notations apply:

Procedure	When referring to an elementary procedure in the specification the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. Handover Preparation procedure.
Message	When referring to a message in the specification the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. HANDOVER REQUEST message.
IE	When referring to an information element (IE) in the specification the <i>Information Element Name</i> is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. <i>E-RAB ID</i> IE.
Value of an IE	When referring to the value of an information element (IE) in the specification the "Value" is written as it is specified in the specification enclosed by quotation marks, e.g. "Value".

5 F1AP services

F1AP provides the signalling service between gNB-DU and the gNB-CU that is required to fulfil the F1AP functions described in clause 7. F1AP services are divided into two groups:

Non UE-associated services:	They are related to the whole F1 interface instance between the gNB-DU and gNB-CU utilising a non UE-associated signalling connection.
UE-associated services:	They are related to one UE. F1AP functions that provide these services are associated with a UE-associated signalling connection that is maintained for the UE in question.

Unless explicitly indicated in the procedure specification, at any instance in time one protocol endpoint shall have a maximum of one ongoing F1AP procedure related to a certain UE.

6 Services expected from signalling transport

The signalling connection shall provide in sequence delivery of F1AP messages. F1AP shall be notified if the signalling connection breaks.

7 Functions of F1AP

The functions of F1AP are described in TS 38.470 [2].

8 F1AP procedures

8.1 List of F1AP Elementary procedures

In the following tables, all EPs are divided into Class 1 and Class 2 EPs (see subclause 3.1 for explanation of the different classes):

Table 1: Class 1 procedures

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Reset	RESET	RESET ACKNOWLEDGE	
F1 Setup	F1 SETUP REQUEST	F1 SETUP RESPONSE	F1 SETUP FAILURE
gNB-DU Configuration Update	GNB-DU CONFIGURATION UPDATE	GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE	GNB-DU CONFIGURATION UPDATE FAILURE
gNB-CU Configuration Update	GNB-CU CONFIGURATION UPDATE	GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE	GNB-CU CONFIGURATION UPDATE FAILURE
UE Context Setup	UE CONTEXT SETUP REQUEST	UE CONTEXT SETUP RESPONSE	UE CONTEXT SETUP FAILURE
UE Context Release (gNB-CU initiated)	UE CONTEXT RELEASE COMMAND	UE CONTEXT RELEASE COMPLETE	
UE Context Modification (gNB-CU initiated)	UE CONTEXT MODIFICATION REQUEST	UE CONTEXT MODIFICATION RESPONSE	UE CONTEXT MODIFICATION FAILURE
UE Context Modification Required (gNB-DU initiated)	UE CONTEXT MODIFICATION REQUIRED	UE CONTEXT MODIFICATION CONFIRM	
Write-Replace Warning	WRITE-REPLACE WARNING REQUEST	WRITE-REPLACE WARNING RESPONSE	
PWS Cancel	PWS CANCEL REQUEST	PWS CANCEL RESPONSE	
GNB-DU RESOURCE COORDINATION	GNB-DU RESOURCE COORDINATION REQUEST	GNB-DU RESOURCE COORDINATION RESPONSE	

Table 2: Class 2 procedures

Elementary Procedure	Message
Error Indication	ERROR INDICATION
UE Context Release Request (gNB-DU initiated)	UE CONTEXT RELEASE REQUEST
Initial UL RRC Message Transfer	INITIAL UL RRC MESSAGE TRANSFER
DL RRC Message Transfer	DL RRC MESSAGE TRANSFER
UL RRC Message Transfer	UL RRC MESSAGE TRANSFER
UE Inactivity Notification	UE INACTIVITY NOTIFICATION
System Information Delivery	SYSTEM INFORMATION DELIVERY COMMAND
Paging	PAGING
Notify	NOTIFY
PWS Restart Indication	PWS RESTART INDICATION
PWS Failure Indication	PWS FAILURE INDICATION
gNB-DU Status Indication	GNB-DU STATUS INDICATION

8.2 Interface Management procedures

8.2.1 Reset

8.2.1.1 General

The purpose of the Reset procedure is to initialise or re-initialise the F1AP UE-related contexts, in the event of a failure in the gNB-CU or gNB-DU. This procedure does not affect the application level configuration data exchanged during, e.g., the F1 Setup procedure.

The procedure uses non-UE associated signalling.

8.2.1.2 Successful Operation

8.2.1.2.1 Reset Procedure Initiated from the gNB-CU

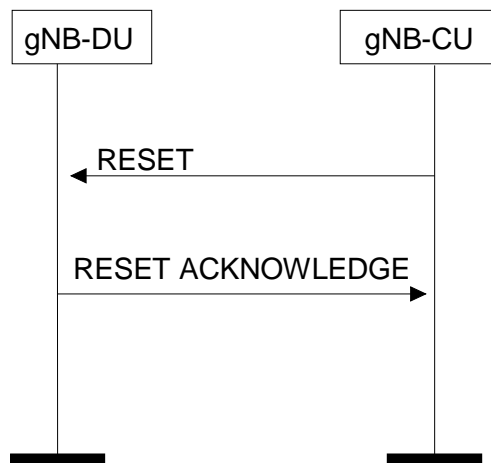


Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU. Successful operation

In the event of a failure at the gNB-CU, which has resulted in the loss of some or all transaction reference information, a RESET message shall be sent to the gNB-DU.

At reception of the RESET message the gNB-DU shall release all allocated resources on F1 and radio resources related to the UE association(s) indicated explicitly or implicitly in the RESET message and remove the indicated UE contexts including F1AP ID.

After the gNB-DU has released all assigned F1 resources and the UE F1AP IDs for all indicated UE associations which can be used for new UE-associated logical F1-connections over the F1 interface, the gNB-DU shall respond with the RESET ACKNOWLEDGE message. The gNB-DU does not need to wait for the release of radio resources to be completed before returning the RESET ACKNOWLEDGE message.

If the RESET message contains the *UE-associated logical F1-connection list* IE, then:

- The gNB-DU shall use the *gNB-CU UE F1AP ID* IE and/or the *gNB-DU UE F1AP ID* IE to explicitly identify the UE association(s) to be reset.
- The gNB-DU shall include in the RESET ACKNOWLEDGE message, for each UE association to be reset, the *UE-associated logical F1-connection Item* IE in the *UE-associated logical F1-connection list* IE. The *UE-associated logical F1-connection Item* IEs shall be in the same order as received in the RESET message and shall include also unknown UE-associated logical F1-connections. Empty *UE-associated logical F1-connection Item* IEs, received in the RESET message, may be omitted in the RESET ACKNOWLEDGE message.
- If the *gNB-CU UE F1AP ID* IE is included in the *UE-associated logical F1-connection Item* IE for a UE association, the gNB-DU shall include the *gNB-CU UE F1AP ID* IE in the corresponding *UE-associated logical F1-connection Item* IE in the RESET ACKNOWLEDGE message.
- If the *gNB-DU UE F1AP ID* IE is included in the *UE-associated logical F1-connection Item* IE for a UE association, the gNB-DU shall include the *gNB-DU UE F1AP ID* IE in the corresponding *UE-associated logical F1-connection Item* IE in the RESET ACKNOWLEDGE message.

Interactions with other procedures:

If the RESET message is received, any other ongoing procedure (except for another Reset procedure) on the same F1 interface related to a UE association, indicated explicitly or implicitly in the RESET message, shall be aborted.

8.2.1.2.2 Reset Procedure Initiated from the gNB-DU

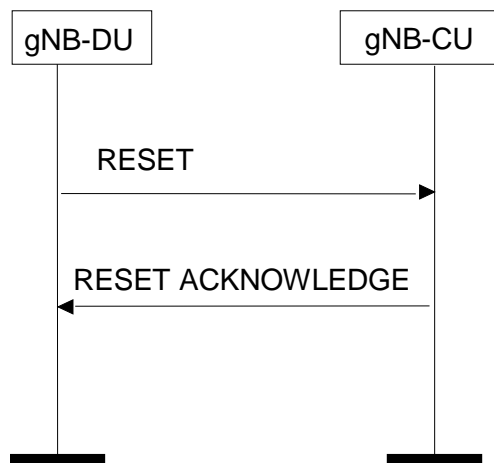


Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-DU. Successful operation

In the event of a failure at the gNB-DU, which has resulted in the loss of some or all transaction reference information, a RESET message shall be sent to the gNB-CU.

At reception of the RESET message the gNB-CU shall release all allocated resources on F1 related to the UE association(s) indicated explicitly or implicitly in the RESET message and remove the F1AP ID for the indicated UE associations.

After the gNB-CU has released all assigned F1 resources and the UE F1AP IDs for all indicated UE associations which can be used for new UE-associated logical F1-connections over the F1 interface, the gNB-CU shall respond with the RESET ACKNOWLEDGE message.

If the RESET message contains the *UE-associated logical F1-connection list IE*, then:

- The gNB-CU shall use the *gNB-CU UE F1AP ID IE* and/or the *gNB-DU UE F1AP ID IE* to explicitly identify the UE association(s) to be reset.
- The gNB-CU shall in the RESET ACKNOWLEDGE message include, for each UE association to be reset, the *UE-associated logical F1-connection Item IE* in the *UE-associated logical F1-connection list IE*. The *UE-associated logical F1-connection Item IEs* shall be in the same order as received in the RESET message and shall include also unknown UE-associated logical F1-connections. Empty *UE-associated logical F1-connection Item IEs*, received in the RESET message, may be omitted in the RESET ACKNOWLEDGE message.
- If the *gNB-CU UE F1AP ID IE* is included in the *UE-associated logical F1-connection Item IE* for a UE association, the gNB-CU shall include the *gNB-CU UE F1AP ID IE* in the corresponding *UE-associated logical F1-connection Item IE* in the RESET ACKNOWLEDGE message.
- If the *gNB-DU UE F1AP ID IE* is included in a *UE-associated logical F1-connection Item IE* for a UE association, the gNB-CU shall include the *gNB-DU UE F1AP ID IE* in the corresponding *UE-associated logical F1-connection Item IE* in the RESET ACKNOWLEDGE message.

Interactions with other procedures:

If the RESET message is received, any other ongoing procedure (except for another Reset procedure) on the same F1 interface related to a UE association, indicated explicitly or implicitly in the RESET message, shall be aborted.

8.2.1.3 Abnormal Conditions

Not applicable.

8.2.2 Error Indication

8.2.2.1 General

The Error Indication procedure is initiated by a node in order to report detected errors in one incoming message, provided they cannot be reported by an appropriate failure message.

If the error situation arises due to reception of a message utilising UE associated signalling, then the Error Indication procedure uses UE associated signalling. Otherwise the procedure uses non-UE associated signalling.

8.2.2.2 Successful Operation

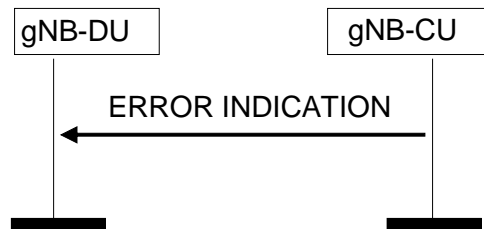


Figure 8.2.2.2-1: Error Indication procedure, gNB-CU originated. Successful operation

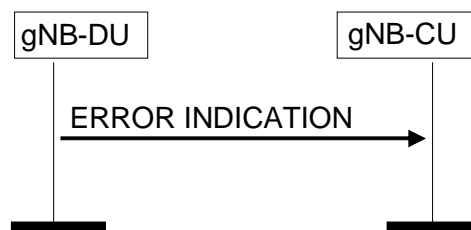


Figure 8.2.2.2-2: Error Indication procedure, gNB-DU originated. Successful operation

When the conditions defined in clause 10 are fulfilled, the Error Indication procedure is initiated by an ERROR INDICATION message sent from the receiving node.

The ERROR INDICATION message shall contain at least either the *Cause* IE or the *Criticality Diagnostics* IE. In case the Error Indication procedure is triggered by utilising UE associated signalling the *gNB-CU UE F1AP ID* IE and *gNB-DU UE F1AP ID* IE shall be included in the ERROR INDICATION message. If one or both of the *gNB-CU UE F1AP ID* IE and the *gNB-DU UE F1AP ID* IE are not correct, the cause shall be set to appropriate value, e.g., "Unknown or already allocated gNB-CU UE F1AP ID", "Unknown or already allocated gNB-DU UE F1AP ID" or "Unknown or inconsistent pair of UE F1AP ID".

8.2.2.3 Abnormal Conditions

Not applicable.

8.2.3 F1 Setup

8.2.3.1 General

The purpose of the F1 Setup procedure is to exchange application level data needed for the gNB-DU and the gNB-CU to correctly interoperate on the F1 interface. This procedure shall be the first F1AP procedure triggered after a TNL association has become operational. The procedure uses non-UE associated signalling.

This procedure erases any existing application level configuration data in the two nodes and replaces it by the one received. This procedure also re-initialises the F1AP UE-related contexts (if any) and erases all related signalling connections in the two nodes like a Reset procedure would do.

8.2.3.2 Successful Operation

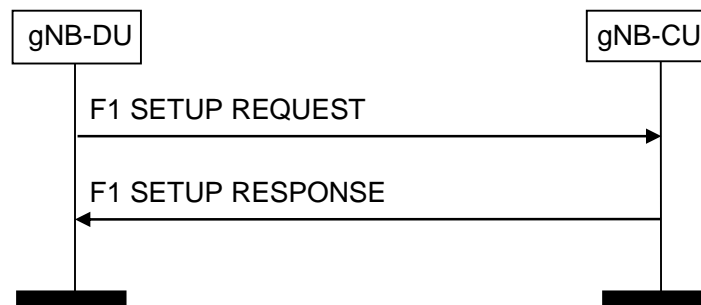


Figure 8.2.3.2-1: F1 Setup procedure: Successful Operation

The gNB-DU initiates the procedure by sending a F1 SETUP REQUEST message including the appropriate data to the gNB-CU. The gNB-CU responds with a F1 SETUP RESPONSE message including the appropriate data.

If the F1 SETUP REQUEST message contains the *gNB-DU Name* IE, the gNB-CU may use this IE as a human readable name of the gNB-DU.

If the F1 SETUP REQUEST message contains the *gNB-DU Served Cells List* IE, the gNB-CU shall take into account as specified in TS 38.401 [4].

For NG-RAN, the gNB-DU shall include the *gNB-DU System Information* IE and the *TAI Slice Support List* IE.

The gNB-CU may include the *Cells to be Activated List* IE in the F1 SETUP RESPONSE message. The *Cells to be Activated List* IE includes a list of cells that the gNB-CU requests the gNB-DU to activate. The gNB-DU shall activate the cells included in the *Cells to be Activated List* IE and reconfigure the physical cell identity for cells for which the *NR PCI* IE is included.

For NG-RAN, the gNB-CU shall include the *gNB-CU System Information* IE in the F1 SETUP RESPONSE message.

The exchanged data shall be stored in respective node and used as long as there is an operational TNL association. When this procedure is finished, the F1 interface is operational and other F1 messages may be exchanged.

For NG-RAN, the gNB-DU may include the *RAN Area Code* IE in the F1 SETUP REQUEST message. The gNB-CU may use it according to TS 38.300 [6].

For NG-RAN, the gNB-CU may include *Available PLMN List* IE if the available PLMN(s) are different from what gNB-DU has provided in F1 SETUP REQUEST message, gNB-DU shall take this into account and only broadcast the PLMN(s) included in this received *Available PLMN List* IE.

8.2.3.3 Unsuccessful Operation

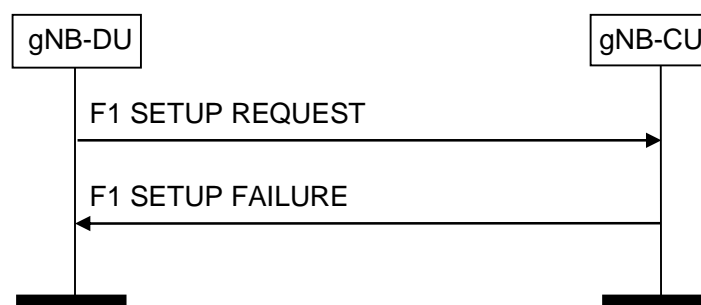


Figure 8.2.3.3-1: F1 Setup procedure: Unsuccessful Operation

If the gNB-CU cannot accept the setup, it should respond with a F1 SETUP FAILURE and appropriate cause value.

If the F1 SETUP FAILURE message includes the *Time To Wait* IE, the gNB-DU shall wait at least for the indicated time before reinitiating the F1 setup towards the same gNB-CU.

8.2.3.4 Abnormal Conditions

If the gNB-DU cannot activate cell(s) indicated by *Cells to be Activated List Item* IE in the F1 SETUP RESPONSE message, the gNB-DU shall initiate gNB-DU Configuration Update procedure to indicate the cell(s) that are currently active.

8.2.4 gNB-DU Configuration Update

8.2.4.1 General

The purpose of the gNB-DU Configuration Update procedure is to update application level configuration data needed for the gNB-DU and the 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.

8.2.4.2 Successful Operation

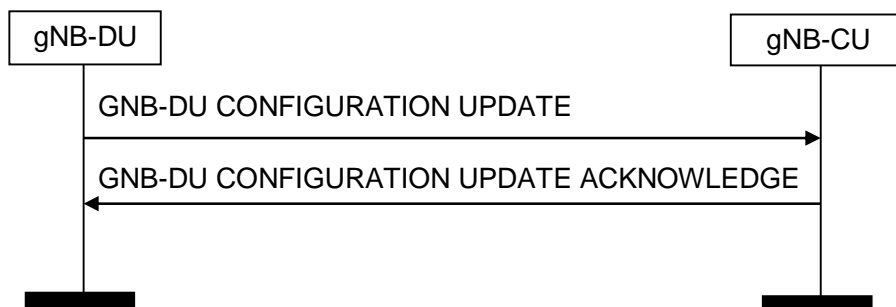


Figure 8.2.4.2-1: gNB-DU Configuration Update procedure: Successful Operation

The gNB-DU initiates the procedure by sending a GNB-DU CONFIGURATION UPDATE message to the gNB-CU including an appropriate set of updated configuration data that it has just taken into operational use. The gNB-CU responds with GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data.

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

If *Served Cells To Add Item* IE is contained in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall add cell information according to the information in the *Served Cell Information IE*. For NG-RAN, the gNB-DU shall include the *gNB-DU System Information IE*.

If *Served Cells To Modify Item* IE is contained in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall modify information of cell indicated by *Old NR CGI IE* according to the information in the *Served Cell Information IE*. Further, if the *gNB-DU System Information IE* is present the gNB-CU shall store and replace any previous information received.

If *Served Cells To Delete Item* IE is contained in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall delete information of cell indicated by *Old NR CGI IE*.

If *Cells Status Item* IE is contained in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall update the information about the cells.

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

If *Cells to be Activated List Item* IE is contained in the GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE 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*.

For NG-RAN, the gNB-CU shall include the *gNB-CU System Information IE* in the GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message.

For NG-RAN, the gNB-DU may include the *RAN Area Code* IE in the GNB-DU CONFIGURATION UPDATE message. The gNB-CU shall store and replace any previously provided *RAN Area Code* IE by the received *RAN Area Code* IE.

If *Available PLMN List* IE is contained in GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-DU shall update the available PLMN list and the corresponding system information.

8.2.4.3 Unsuccessful Operation

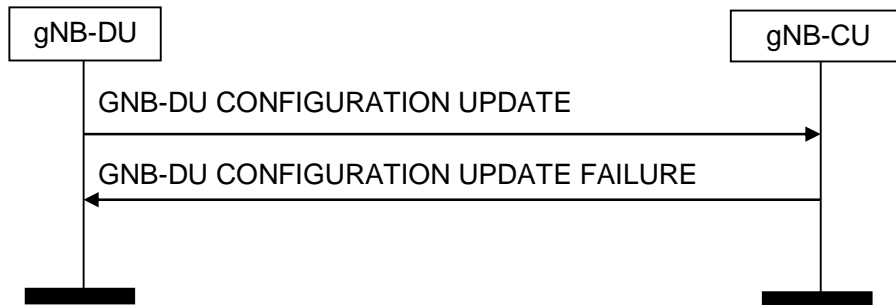


Figure 8.2.4.3-1: gNB-DU Configuration Update procedure: Unsuccessful Operation

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

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

8.2.4.4 Abnormal Conditions

If the gNB-DU cannot activate cell(s) indicated by *Cells to be Activated List Item* IE in the GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-DU shall initiate gNB-DU Configuration Update procedure to indicate the cell(s) that are currently active.

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

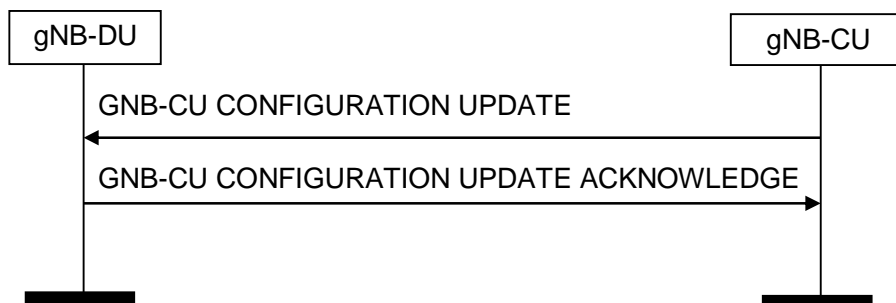


Figure 8.2.5.2-1: gNB-CU Configuration Update procedure: Successful Operation

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.

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 *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 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 TNL Association To Remove List IE* is contained in the gNB-CU CONFIGURATION UPDATE message the gNB-DU shall, if supported, initiate removal of the TNL association(s) indicated by the received gNB-CU Transport Layer Address towards the gNB-CU.

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.

If the *TNL usage IE* or the *TNL Association Weight Factor 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.

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 *List of E-UTRA Cells 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* is contained in GNB-CU CONFIGURATION UPDATE message, the gNB-DU shall update the available PLMN list and 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 inactive as defined in TS 38.401 [4].

8.2.5.3 Unsuccessful Operation

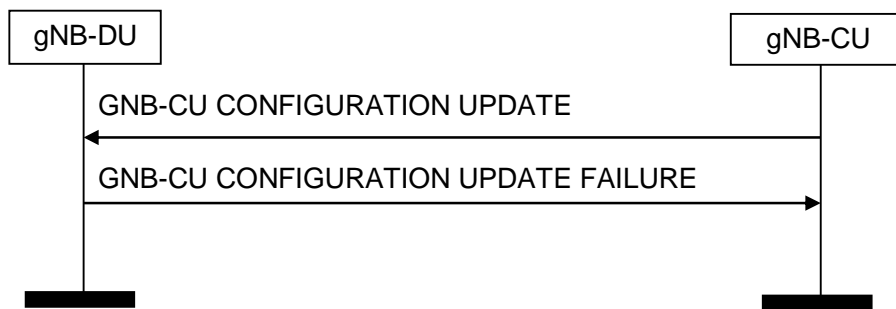


Figure 8.2.5.3-1: gNB-CU Configuration Update: Unsuccessful Operation

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.

8.2.5.4 Abnormal Conditions

Not applicable.

8.2.6 gNB-DU Resource Coordination

8.2.6.1 General

The purpose of the gNB-DU Resource Coordination procedure is to enable coordination of radio resource allocation between a gNB-CU and a gNB-DU for the purpose of spectrum sharing between E-UTRA and NR. This procedure is to be used only for the purpose of spectrum sharing between E-UTRA and NR.

The procedure uses non-UE-associated signalling.

8.2.6.2 Successful Operation

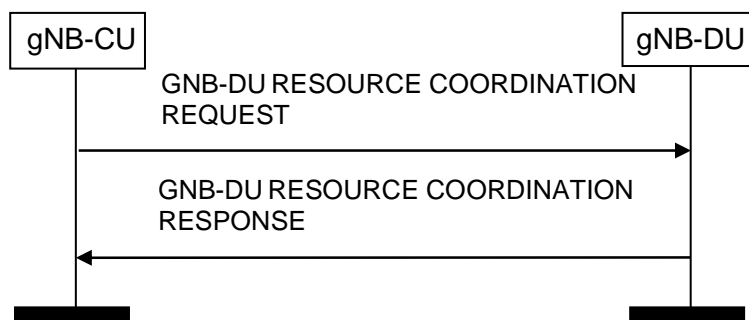


Figure 8.2.6.2-1: gNB-DU Resource Coordination, successful operation

A gNB-CU initiates the procedure by sending the GNB-DU RESOURCE COORDINATION REQUEST message to a gNB-DU over the F1 interface. The gNB-DU extracts the *E-UTRA – NR Cell Resource Coordination Request Container* IE and it replies by sending the GNB-DU RESOURCE COORDINATION RESPONSE message. In case of E-UTRA-initiated gNB-DU Resource Coordination procedure, the *E-UTRA – NR Cell Resource Coordination Request Container* in the GNB-DU RESOURCE COORDINATION REQUEST message and the *E-UTRA – NR Cell Resource Coordination Response Container* in the GNB-DU RESOURCE COORDINATION RESPONSE message shall be included.

In case of NR-initiated gNB-DU Resource Coordination procedure, the *E-UTRA – NR Cell Resource Coordination Response Container* in the GNB-DU RESOURCE COORDINATION RESPONSE message shall be included.

8.2.7 gNB-DU Status Indication

8.2.7.1 General

The purpose of the gNB-DU Status Indication procedure is informing the gNB-CU that the gNB-DU is overloaded so that overload reduction actions can be applied. The procedure uses non-UE associated signalling.

8.2.7.2 Successful Operation

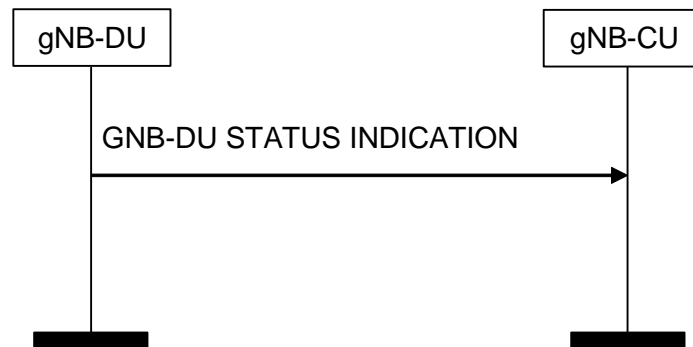


Figure 8.2.7.2-1: gNB-DU Status Indication procedure

If the *gNB-DU Overload Information* IE in the GNB-DU STATUS INDICATION message indicates that the gNB-DU is overloaded, the gNB-CU shall apply overload reduction actions until informed, with a new GNB-DU STATUS INDICATION message, that the overload situation has ceased.

The detailed overload reduction policy is up to gNB-CU implementation.

8.2.7.3 Abnormal Conditions

Void.

8.3 UE Context Management procedures

8.3.1 UE Context Setup

8.3.1.1 General

The purpose of the UE Context Setup procedure is to establish the UE Context including, among others, SRB, and DRB configuration. The procedure uses UE-associated signalling.

8.3.1.2 Successful Operation

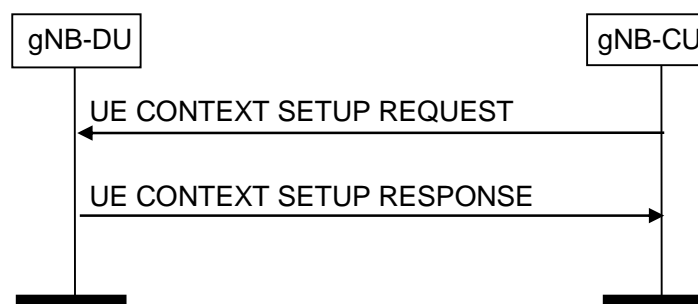


Figure 8.3.1.2-1: UE Context Setup Request procedure: Successful Operation

The gNB-CU initiates the procedure by sending UE CONTEXT SETUP REQUEST message to the gNB-DU. If the gNB-DU succeeds to establish the UE context, it replies to the gNB-CU with UE CONTEXT SETUP RESPONSE. If no UE-associated logical F1-connection exists, the UE-associated logical F1-connection shall be established as part of the procedure.

If the *SpCell UL Configured* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall configure UL for the indicated SpCell accordingly.

If the *SCell To Be Setup List* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall act as specified in TS 38.401 [4]. If the *SCell UL Configured* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall configure UL for the indicated SCell accordingly.

If the *DRX Cycle* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall use the provided value from the gNB-CU.

If the *UL Configuration* IE in *DRB to Be Setup Item* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall take it into account for UL scheduling.

If the *SRB To Be Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall act as specified in TS 38.401 [4]. If *Duplication Indication* IE is contained in the *SRB To Be Setup List* IE, the gNB-DU shall, if supported, setup two RLC entities for the indicated SRB.

If the *DRB To Be Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall act as specified in TS 38.401 [4].

If two *UL UP TNL Information* IEs are included in UE CONTEXT SETUP REQUEST message for a DRB, gNB-DU shall include two *DL UP TNL Information* IEs in UE CONTEXT SETUP RESPONSE message. gNB-CU and gNB-DU use the *UL UP TNL Information* IEs and *DL UP TNL Information* IEs to support packet duplication for intra-gNB-DU CA as defined in TS 38.470 [2].

If *Duplication Activation IE* is included in the UE CONTEXT SETUP REQUEST message for a DRB, gNB-DU should take it into account when activating/deactivating CA based PDCP duplication for the DRB.

If *DC Based Duplication Configured* IE is included in the UE CONTEXT SETUP REQUEST message for a DRB, gNB-DU shall regard that DC based PDCP duplication is configured for this DRB and it should take the responsibility of PDCP duplication activation/deactivation. If *DC Based Duplication Activation* IE is included in the UE CONTEXT SETUP REQUEST message for a DRB, gNB-DU should take it into account when activating/deactivating DC based PDCP duplication for this DRB.

For EN-DC operation, and if the *Subscriber Profile ID for RAT/Frequency priority* IE is received from an MeNB, the UE CONTEXT SETUP REQUEST message shall contain the *Subscriber Profile ID for RAT/Frequency priority* IE. The gNB-DU shall store the received Subscriber Profile ID for RAT/Frequency priority in the UE context and use it as defined in TS 36.300 [20].

If the *Index to RAT/Frequency Selection Priority* IE is available at the gNB-CU, the *Index to RAT/Frequency Selection Priority* IE shall be included in the UE CONTEXT SETUP REQUEST. The gNB-DU may use it for RRM purposes.

The gNB-DU shall report to the gNB-CU, in the UE CONTEXT SETUP RESPONSE message, the result for all the requested DRBs and SRBs in the following way:

- A list of DRBs which are successfully established shall be included in the *DRB Setup List* IE;
- A list of DRBs which failed to be established shall be included in the *DRB Failed to Setup List* IE;
- A list of SRBs which failed to be established shall be included in the *SRB Failed to Setup List* IE.

When the gNB-DU reports the unsuccessful establishment of a DRB or SRB, the cause value should be precise enough to enable the gNB-CU to know the reason for the unsuccessful establishment.

For EN-DC operation, the gNB-CU shall include in the UE CONTEXT SETUP REQUEST the *E-UTRAN QoS* IE. The allocation of resources according to the values of the *Allocation and Retention Priority* IE included in the *E-UTRAN QoS* IE shall follow the principles described for the E-RAB Setup procedure in TS 36.413 [15].

For NG-RAN operation, the gNB-CU shall include in the UE CONTEXT SETUP REQUEST the *DRB Information* IE.

For DC operation, the *CG-ConfigInfo* IE shall be included in the CU to DU RRC Information IE.

For EN-DC operation, if the gNB-CU includes the SMTC information of the measured frequency(ies) in the *MeasurementTimingConfiguration* IE of the *CU to DU RRC Information* IE that is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall generate the measurement gaps based on the received SMTC information. Then the gNB-DU shall send the measurement gaps information to the gNB-CU in the *MeasGapConfig* IE of the *DU to CU RRC Information* IE that is included in the UE CONTEXT SETUP RESPONSE message.

If the gNB-CU received the MeNB Resource Coordination Information as defined in TS 36.423 [9], it shall transparently transfer it to the gNB-DU via the *Resource Coordination Transfer Container IE* in the UE CONTEXT SETUP REQUEST message. The gNB-DU shall use the information received in the *Resource Coordination Transfer Container IE* for reception of MeNB Resource Coordination Information at the gNB acting as secondary node as described in TS 36.423 [9].

If the *Resource Coordination Transfer Container IE* is included in the UE CONTEXT SETUP RESPONSE, the gNB-CU shall transparently transfer this information for the purpose of resource coordination as described in TS 36.423 [9].

If the *Masked IMEISV IE* is contained in the UE CONTEXT SETUP REQUEST message the gNB-DU shall, if supported, use it to determine the characteristics of the UE for subsequent handling.

If the *SCell Failed To Setup List IE* is contained in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall regard the corresponding SCell(s) failed to be established with an appropriate cause value for each SCell failed to setup.

If the *Inactivity Monitoring Request IE* is contained in the UE CONTEXT SETUP REQUEST message, gNB-DU may consider that the gNB-CU has requested the gNB-DU to perform UE inactivity monitoring. If the *Inactivity Monitoring Response IE* is contained in the UE CONTEXT SETUP RESPONSE message and set to "Not-supported", the gNB-CU shall consider that the gNB-DU does not support UE inactivity monitoring for the UE.

If the *Full Configuration IE* is contained in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall consider that the gNB-DU has generated the *CellGroupConfig IE* using full configuration.

If the *C-RNTI IE* is included in the UE CONTEXT SETUP RESPONSE, the gNB-CU shall consider that the C-RNTI has been allocated by the gNB-DU for this UE context.

The UE Context Setup Procedure is not used to configure SRB0.

If the UE CONTEXT SETUP REQUEST message contains the *RRC-Container IE*, the gNB-DU shall send the corresponding RRC message to the UE via SRB1.

If the *Notification Control IE* is included in the *DRB to Be Setup List IE* and it is set to active, the gNB-DU shall, if supported, monitor the QoS of the DRB and notify the gNB-CU if the QoS cannot be fulfilled any longer or if the QoS can be fulfilled again. The *Notification Control IE* can only be applied to GBR bearers.

If the *UL PDU Session Aggregate Maximum Bit Rate IE* is included in the *QoS Flow Level QoS Parameters IE* contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall store the received UL PDU Session Aggregate Maximum Bit Rate and use it for non-GBR Bearers for the concerned PDU sessions and the concerned UE as specified in TS 23.501 [21].

The gNB-CU shall include the *gNB-DU UE Aggregate Maximum Bit Rate Uplink IE* in the UE CONTEXT SETUP REQUEST message. The gNB-DU shall use the received gNB-DU UE Aggregate Maximum Bit Rate Uplink for non-GBR Bearers for the concerned UE.

8.3.1.3 Unsuccessful Operation

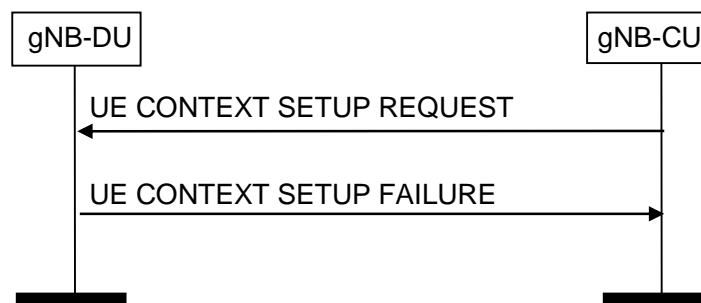


Figure 8.3.1.3-1: UE Context Setup Request procedure: unsuccessful Operation

If the gNB-DU is not able to establish an F1 UE context, or cannot even establish one bearer it shall consider the procedure as failed and reply with the UE CONTEXT SETUP FAILURE message.

If the gNB-DU is not able to accept the *SpCell ID IE* in UE CONTEXT SETUP REQUEST message, it shall reply with the UE CONTEXT SETUP FAILURE message with an appropriate cause value. Further, if the *Candidate SpCell List IE* is included in the UE CONTEXT SETUP REQUEST message and the gNB-DU is not able to accept the *SpCell ID*

IE, the gNB-DU shall, if supported, include the *Potential SpCell List* IE in the UE CONTEXT SETUP FAILURE message and the gNB-CU should take this into account for selection of an opportune SpCell. The gNB-DU shall include the cells in the *Potential SpCell List* IE in a priority order, where the first cell in the list is the one most desired and the last one is the one least desired (e.g., based on load conditions). If the *Potential SpCell List* IE is present but no *Potential SpCell Item* IE is present, the gNB-CU should assume that none of the cells in the *Candidate SpCell List* IE are acceptable for the gNB-DU.

8.3.1.4 Abnormal Conditions

Not applicable.

8.3.2 UE Context Release Request (gNB-DU initiated)

8.3.2.1 General

The purpose of the UE Context Release Request procedure is to enable the gNB-DU to request the gNB-CU to release the UE-associated logical F1-connection. The procedure uses UE-associated signalling.

8.3.2.2 Successful Operation

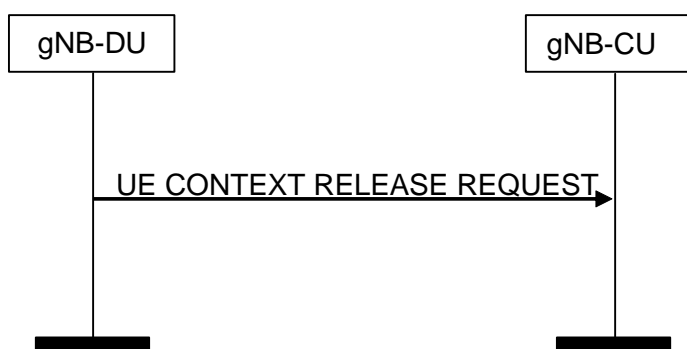


Figure 8.3.2.2-1: UE Context Release (gNB-DU initiated) procedure. Successful operation

The gNB-DU controlling a UE-associated logical F1-connection initiates the procedure by generating a UE CONTEXT RELEASE REQUEST message towards the affected gNB-CU node.

The UE CONTEXT RELEASE REQUEST message shall indicate the appropriate cause value.

Interactions with UE Context Release procedure:

The UE Context Release procedure may be initiated upon reception of a UE CONTEXT RELEASE REQUEST message.

8.3.2.3 Abnormal Conditions

Not applicable.

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. The procedure uses UE-associated signalling.

8.3.3.2 Successful Operation

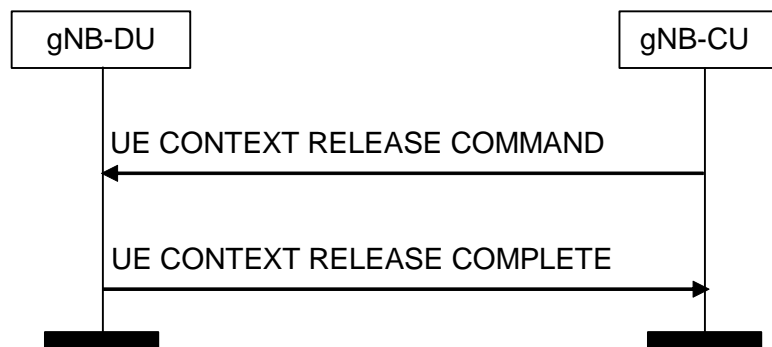


Figure 8.3.3.2-1: UE Context Release (gNB-CU initiated) procedure. Successful operation

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 *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 includes the *Execute Duplication* IE, the gNB-DU shall perform CA based duplication, if configured, for the SRB for the included *RRC-Container* IE.

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.

8.3.3.4 Abnormal Conditions

Not applicable.

8.3.4 UE Context Modification (gNB-CU initiated)

8.3.4.1 General

The purpose of the UE Context Modification procedure is to modify the established UE Context, e.g., establishing, modifying and releasing radio resources. This procedure is also used to command the gNB-DU to stop data transmission for the UE for mobility (see TS 38.401 [4]). The procedure uses UE-associated signalling.

8.3.4.2 Successful Operation

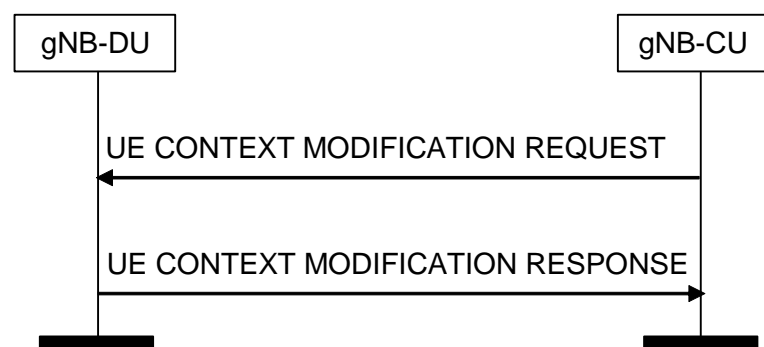


Figure 8.3.4.2-1: UE Context Modification procedure. Successful operation

The F1AP UE CONTEXT MODIFICATION REQUEST message is initiated by the gNB-CU.

If the *SpCell ID* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall replace any previously received value and regard it as a reconfiguration with sync as defined in TS 38.331 [8]. If the *ServCellIndex* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall take this into account for the indicated SpCell. If the *SpCell UL Configured* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall configure UL for the indicated SpCell accordingly.

If the *SCell To Be Setup List* IE or *SCell To Be Removed List* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall act as specified in TS 38.401 [4]. If the *SCell To Be Setup List* IE is included in the UE CONTEXT MODIFICATION REQUEST message and the indicated SCell(s) are already setup, the gNB-DU shall replace any previously received value. If the *SCell UL Configured* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall configure UL for the indicated SCell accordingly.

If the *DRX Cycle* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall use the provided value from the gNB-CU. If the *DRX configuration indicator* IE is contained in the UE CONTEXT MODIFICATION REQUEST message and set to "release", the gNB-DU shall release DRX configuration.

If the *SRB To Be Setup List* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall act as specified in the TS 38.401 [4], and replace any previously received value. If *Duplication Indication* IE is contained in the *SRB To Be Setup List* IE, the gNB-DU shall, if supported, setup two RLC entities for the indicated SRB.

If the *DRB To Be Setup List* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall act as specified in the TS 38.401 [4].

If two *UL UP TNL Information* IEs are included in UE CONTEXT MODIFICATION REQUEST message for a DRB, gNB-DU shall include two *DL UP TNL Information* IEs in UE CONTEXT MODIFICATION RESPONSE message. gNB-CU and gNB-DU use the *UL UP TNL Information* IEs and *DL UP TNL Information* IEs to support packet duplication for intra-gNB-DU CA as defined in TS 38.470 [2].

If *Duplication Activation* IE is included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, gNB-DU should take it into account when activating/deactivating CA based PDCP duplication for the DRB.

If *DC Based Duplication Configured* IE is included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, gNB-DU shall regard that DC based PDCP duplication is configured for this DRB and it should take the responsibility of PDCP duplication activation/deactivation. If *DC Based Duplication Activation* IE is included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, gNB-DU should take it into account when activating/deactivating DC based PDCP duplication for this DRB.

If the *UL Configuration* IE in *DRB to Be Setup Item* IE or *DRB to Be Modified Item* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall take it into account for UL scheduling. The gNB-CU may include the *RRC Reconfiguration Complete Indicator* IE in the UE CONTEXT MODIFICATION REQUEST message to inform the gNB-DU that the ongoing reconfiguration procedure has been successfully performed by the UE. The gNB-DU does not need to wait for this confirmation for using the new UE configuration or taking other actions towards the UE. It is up to gNB-DU implementation when to use the new UE configuration configured.

If the *RLC Failure Indication* IE is included in UE CONTEXT MODIFICATION REQUEST message, the gNB-DU should consider that the RLC entity indicated by such IE needs to be re-established when the CA-based packet duplication is active.

If the UE CONTEXT MODIFICATION REQUEST message contains the *RRC-Container* IE, the gNB-DU shall send the corresponding RRC message to the UE via SRB1. If the UE CONTEXT MODIFICATION REQUEST 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 UE CONTEXT MODIFICATION REQUEST message contains the *Transmission Stop Indicator* IE, the gNB-DU shall stop or restart (if already stopped) data transmission for the UE, according to the value of this IE. It is up to gNB-DU implementation when to stop or restart the UE scheduling.

For EN-DC operation, if the *DRB to Be Setup List* IE is present in the UE CONTEXT MODIFICATION REQUEST message the gNB-CU shall include the *E-UTRAN QoS* IE. The allocation of resources according to the values of the *Allocation and Retention Priority* IE included in the *E-UTRAN QoS* IE shall follow the principles described for the E-RAB Setup procedure in TS 36.413 [15]. For NG-RAN operation, the gNB-CU shall include the *DRB Information* IE in the UE CONTEXT MODIFICATION REQUEST message.

If the gNB-CU received the MeNB Resource Coordination Information as defined in TS 36.423 [9], after completion of UE Context Setup procedures, the gNB-CU shall transparently transfer it to the gNB-DU via the *Resource Coordination Transfer Container IE* in the UE CONTEXT MODIFICATION REQUEST message. The gNB-DU shall use the information received in the *Resource Coordination Transfer Container IE* for reception of MeNB Resource Coordination Information at the gNB acting as secondary node as described in TS 36.423 [9].

For EN-DC operation, and if the *Subscriber Profile ID for RAT/Frequency priority IE* is received from an MeNB, the UE CONTEXT MODIFICATION REQUEST message shall contain the *Subscriber Profile ID for RAT/Frequency priority IE*. The gNB-DU shall store the received Subscriber Profile ID for RAT/Frequency priority in the UE context and use it as defined in TS 36.300 [20].

If the *Index to RAT/Frequency Selection Priority IE* is modified at the gNB-CU, the *Index to RAT/Frequency Selection Priority IE* shall be included in the UE CONTEXT MODIFICATION REQUEST. The gNB-DU may use it for RRM purposes.

If the UE CONTEXT MODIFICATION REQUEST message contains the *Uplink TxDirectCurrentList Information IE*, the gNB-DU may take that into account when selecting L1 configuration.

Upon reception of the UE Context Modification Request message, the gNB-DU shall perform the modifications, and if successful reports the update in the UE CONTEXT MODIFICATION RESPONSE message.

The gNB-DU shall report to the gNB-CU, in the UE CONTEXT MODIFICATION RESPONSE message, the result for all the requested or modified DRBs and SRBs in the following way:

- A list of DRBs which are successfully established shall be included in the DRB Setup List IE;
- A list of DRBs which failed to be established shall be included in the DRB Failed to Setup List IE;
- A list of DRBs which are successfully modified shall be included in the DRB Modified List IE;
- A list of DRBs which failed to be modified shall be included in the DRB Failed to be Modified List IE;
- A list of SRBs which failed to be established shall be included in the SRB Failed to Setup List IE.

When the gNB-DU reports the unsuccessful establishment of a DRB or SRB, the cause value should be precise enough to enable the gNB-CU to know the reason for the unsuccessful establishment.

If the *Resource Coordination Transfer Container IE* is included in the UE CONTEXT MODIFICATION RESPONSE, the gNB-CU shall transparently transfer this information for the purpose of resource coordination as described in TS 36.423 [9].

If the UE CONTEXT MODIFICATION RESPONSE message contains the *DU To CU RRC Information IE*, the gNB-CU shall take this into account.

If the *SCell Failed To Setup List IE* is contained in the UE CONTEXT MODIFICATION RESPONSE message, the gNB-CU shall regard the corresponding SCell(s) failed to be established with an appropriate cause value for each SCell failed to setup.

If the *C-RNTI IE* is included in the UE CONTEXT MODIFICATION RESPONSE, the gNB-CU shall consider that the C-RNTI has been allocated by the gNB-DU for this UE context.

If the *Inactivity Monitoring Request IE* is contained in the UE CONTEXT MODIFICATION REQUEST message, gNB-DU may consider that the gNB-CU has requested the gNB-DU to perform UE inactivity monitoring. If the *Inactivity Monitoring Response IE* is contained in the UE CONTEXT MODIFICATION RESPONSE message and set to "Not-supported", the gNB-CU shall consider that the gNB-DU does not support UE inactivity monitoring for the UE.

The UE Context Setup Procedure is not used to configure SRB0.

If the *Notification Control IE* is included in the *DRB to Be Setup List IE* or the *DRB to Be Modified List IE* and it is set to active, the gNB-DU shall, if supported, monitor the QoS of the DRB and notify the gNB-CU if the QoS cannot be fulfilled any longer or if the QoS can be fulfilled again. The *Notification Control IE* can only be applied to GBR bearers.

If the *UL PDU Session Aggregate Maximum Bit Rate IE* is included in the *QoS Flow Level QoS Parameters IE* contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall replace the received UL PDU Session Aggregate Maximum Bit Rate and use it as specified in TS 23.501 [21].

If the *gNB-DU UE Aggregate Maximum Bit Rate Uplink* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall:

- replace the previously provided gNB-DU UE Aggregate Maximum Bit Rate Uplink with the new received gNB-DU UE Aggregate Maximum Bit Rate Uplink;
- use the received gNB-DU UE Aggregate Maximum Bit Rate Uplink for non-GBR Bearers for the concerned UE.

If the *RLC Status IE* is included in the UE CONTEXT MODIFICATION RESPONSE message, the gNB-CU shall assume that RLC has been reestablished at the gNB-DU and may trigger PDCP data recovery.

If the *gNB-DU Configuration Query* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, gNB-DU shall include the *CellGroupConfig* IE in the *DU To CU RRC Information* IE in the UE CONTEXT MODIFICATION RESPONSE message.

8.3.4.3 Unsuccessful Operation

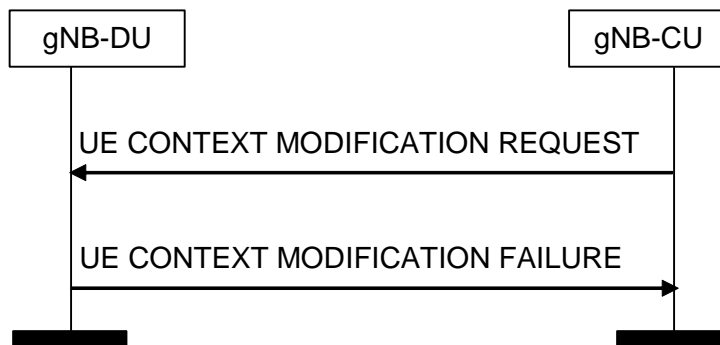


Figure 8.3.4.3-1: UE Context Modification procedure. Unsuccessful operation

In case none of the requested modifications of the UE context can be successfully performed, the gNB-DU shall respond with the UE CONTEXT MODIFICATION FAILURE message with an appropriate cause value.

If the gNB-DU is not able to accept the *SpCell ID* IE in UE CONTEXT MODIFICATION REQUEST message, it shall reply with the UE CONTEXT MODIFICATION FAILURE message.

8.3.4.4 Abnormal Conditions

Not applicable.

8.3.5 UE Context Modification Required (gNB-DU initiated)

8.3.5.1 General

The purpose of the UE Context Modification Required procedure is to modify the established UE Context, e.g., modifying and releasing radio bearer resources. The procedure uses UE-associated signalling.

8.3.5.2 Successful Operation

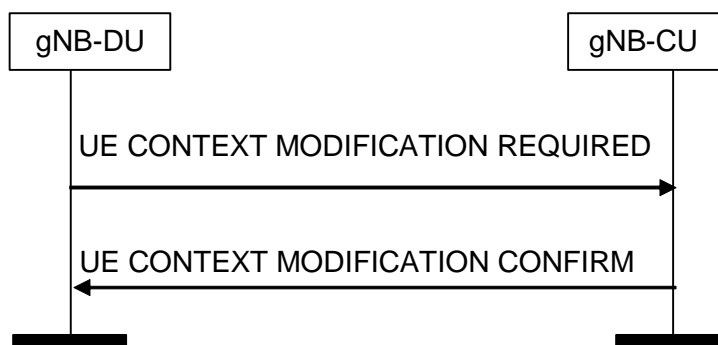


Figure 8.3.5.2-1: UE Context Modification Required procedure. Successful operation

The F1AP UE CONTEXT MODIFICATION REQUIRED message is initiated by the gNB-DU.

The gNB-CU reports the successful update of the UE context in the UE CONTEXT MODIFICATION CONFIRM message.

If two *DL UP TNL Information* IEs are included in UE CONTEXT MODIFICATION REQUIRED message for a DRB, gNB-CU shall include two *UL UP TNL Information* IEs in UE CONTEXT MODIFICATION CONFIRM message. gNB-CU and gNB-DU use the *UL UP TNL Information* IEs and *DL UP TNL Information* IEs to support packet duplication for intra-gNB-DU CA as defined in TS 38.470 [2].

If the *Resource Coordination Transfer Container* IE is included in the UE CONTEXT MODIFICATION REQUIRED, the gNB-CU shall transparently transfer this information for the purpose of resource coordination as described in TS 36.423 [9].

If the gNB-CU received the MeNB Resource Coordination Information as defined in TS 36.423 [9], after completion of UE Context Modification Required procedures, the gNB-CU shall transparently transfer it to the gNB-DU via the *Resource Coordination Transfer Container* IE in the UE CONTEXT MODIFICATION CONFIRM message. The gNB-DU shall use the information received in the *Resource Coordination Transfer Container* IE for reception of MeNB Resource Coordination Information at the gNB acting as secondary node as described in TS 36.423 [9].

If the UE CONTEXT MODIFICATION REQUIRED message contains the *DU To CU RRC Information* IE, the gNB-CU shall take this into account.

If the UE CONTEXT MODIFICATION CONFIRM 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 UE CONTEXT MODIFICATION REQUIRED message contains the *RLC Status* IE, the gNB-CU shall assume that RLC has been reestablished at the gNB-DU and may trigger PDCP data recovery.

8.3.5.3 Abnormal Conditions

Not applicable.

8.3.6 UE Inactivity Notification

8.3.6.1 General

This procedure is initiated by the gNB-DU to indicate the UE activity event.

The procedure uses UE-associated signalling.

8.3.6.2 Successful Operation



Figure 8.3.6.2-1: UE Inactivity Notification procedure.

The gNB-DU initiates the procedure by sending the UE INACTIVITY NOTIFICATION message to the gNB-CU.

8.3.6.3 Abnormal Conditions

Not applicable.

8.3.7 Notify

8.3.7.1 General

The purpose of the Notify procedure is to enable the gNB-DU to inform the gNB-CU that the QoS of an already established GBR DRB cannot be fulfilled any longer or that it can be fulfilled again. The procedure uses UE-associated signalling.

8.3.7.2 Successful Operation

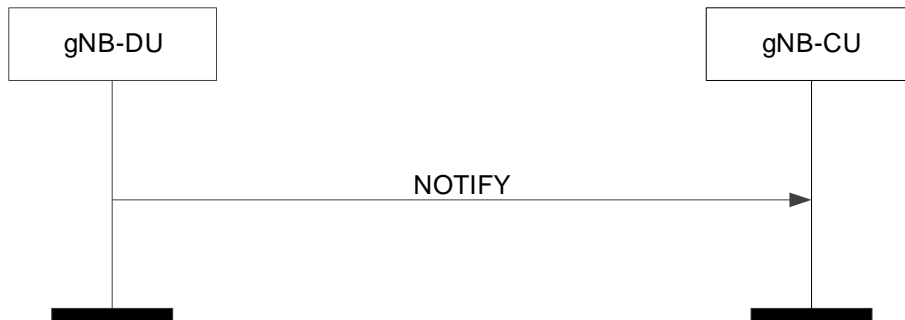


Figure 8.3.7.2-1: Notify procedure. Successful operation.

The gNB-DU initiates the procedure by sending a NOTIFY message.

The NOTIFY message shall contain the list of the GBR DRBs associated with notification control for which the QoS is not fulfilled anymore or for which the QoS is fulfilled again by the gNB-DU.

Upon reception of the NOTIFY message, the gNB-CU may identify which are the affected PDU sessions and QoS flows. The gNB-CU may inform the 5GC that the QoS for these PDU sessions or QoS flows is not fulfilled any longer or it is fulfilled again.

8.3.7.3 Abnormal Conditions

Not applicable.

8.4 RRC Message Transfer procedures

8.4.1 Initial UL RRC Message Transfer

8.4.1.1 General

The purpose of the Initial UL RRC Message Transfer procedure is to transfer the initial RRC message to the gNB-CU.

8.4.1.2 Successful operation



Figure 8.4.1.2-1: Initial UL RRC Message Transfer procedure.

The establishment of the UE-associated logical F1-connection shall be initiated as part of the procedure.

If the *DU to CU RRC Information IE* is not included in the INITIAL UL RRC MESSAGE TRANSFER the gNB-CU should reject the UE under the assumption that the gNB-DU is not able to serve such UE. If the gNB-DU is able to serve the UE, the gNB-DU shall include the *DU to CU RRC Information IE*.

If the *SUL Access Indication IE* is included in the INITIAL UL RRC MESSAGE TRANSFER, the gNB-CU shall consider that the UE has performed access on SUL carrier.

8.4.1.3 Abnormal Conditions

Not applicable.

8.4.2 DL RRC Message Transfer

8.4.2.1 General

The purpose of the DL RRC Message Transfer procedure is to transfer an RRC message. The procedure uses UE-associated signalling.

8.4.2.2 Successful operation



Figure 8.4.2.2-1: DL RRC Message Transfer procedure

If a UE-associated logical F1-connection exists, the DL RRC MESSAGE TRANSFER message shall contain the *gNB-DU UE F1AP ID IE*, which should be used by gNB-DU to lookup the stored UE context. If no UE-associated logical F1-connection exists, the UE-associated logical F1-connection shall be established at reception of the DL RRC MESSAGE TRANSFER message.

If the *Index to RAT/Frequency Selection Priority IE* is included in the DL RRC MESSAGE TRANSFER, the gNB-DU may use it for RRM purposes.

The DL RRC MESSAGE TRANSFER message shall include, if available, the *old gNB-DU UE F1AP ID IE* so that the gNB-DU can retrieve the existing UE context in RRC connection reestablishment procedure, as defined in TS 38.401 [4].

The DL RRC MESSAGE TRANSFER message shall include, if SRB duplication is activated, the *Execute Duplication IE*, so that the gNB-DU can perform CA based duplication for the SRB.

If the gNB-DU identifies the UE-associated logical F1-connection by the *gNB-DU UE F1AP ID IE* in the DL RRC MESSAGE TRANSFER message and the *old gNB-DU UE F1AP ID IE* is included, it shall release the old gNB-DU UE F1AP ID and the related configurations associated with the old gNB-DU UE F1AP ID.

8.4.2.3 Abnormal Conditions

Not applicable.

8.4.3 UL RRC Message Transfer

8.4.3.1 General

The purpose of the UL RRC Message Transfer procedure is to transfer an RRC message as an UL PDCP-PDU to the gNB-CU. The procedure uses UE-associated signalling.

8.4.3.2 Successful operation



Figure 8.4.3.2-1: UL RRC Message Transfer procedure

When the gNB-DU has received from the radio interface an RRC message to which a UE-associated logical F1-connection for the UE exists, the gNB-DU shall send the UPLINK RRC TRANSFER message to the gNB-CU including the RRC message as a *RRC-Container* IE.

8.4.3.3 Abnormal Conditions

Not applicable.

8.5 Warning Message Transmission Procedures

8.5.1 Write-Replace Warning

8.5.1.1 General

The purpose of Write-Replace Warning procedure is to start or overwrite the broadcasting of warning messages. The procedure uses non UE-associated signalling.

8.5.1.2 Successful Operation

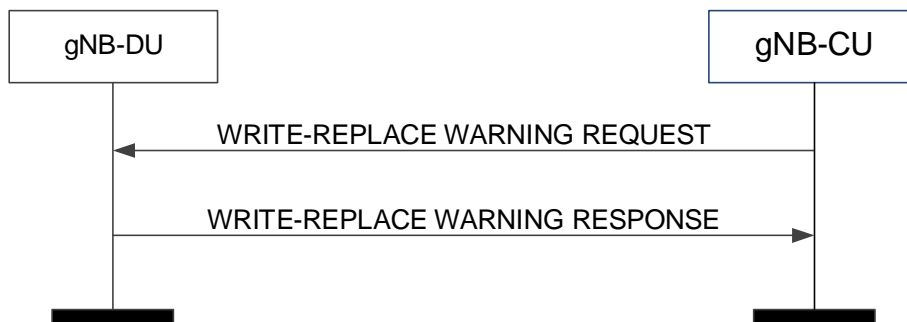


Figure 8.5.1.2-1: Write-Replace Warning procedure: successful operation

The gNB-CU initiates the procedure by sending a WRITE-REPLACE WARNING REQUEST message to the gNB-DU.

Upon receipt of the WRITE-REPLACE WARNING REQUEST message, the gNB-DU shall prioritise its resources to process the warning message.

The gNB-DU acknowledges the WRITE-REPLACE WARNING REQUEST message by sending a WRITE-REPLACE WARNING RESPONSE message to the gNB-CU.

8.5.1.3 Unsuccessful Operation

Not applicable.

8.5.1.4 Abnormal Conditions

Not applicable.

8.5.2 PWS Cancel

8.5.2.1 General

The purpose of the PWS Cancel procedure is to cancel an already ongoing broadcast of a warning message. The procedure uses non UE-associated signalling.

8.5.2.2 Successful Operation

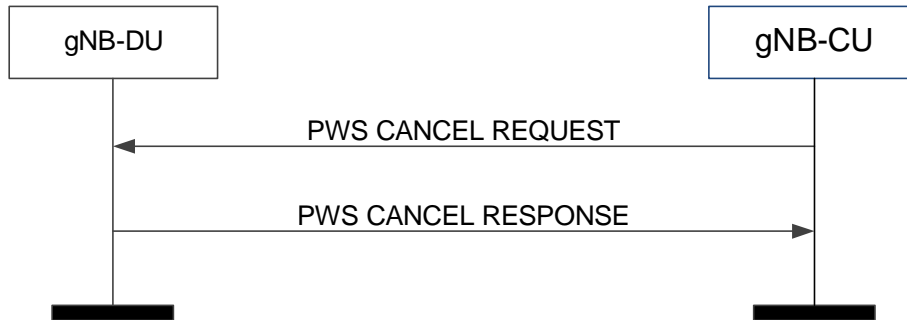


Figure 8.5.2.2-1: PWS Cancel procedure: successful operation

The gNB-CU initiates the procedure by sending a PWS CANCEL REQUEST message to the gNB-DU.

The gNB-DU shall acknowledge the PWS CANCEL REQUEST message by sending the PWS CANCEL RESPONSE message.

8.5.1.3 Unsuccessful Operation

Not applicable.

8.5.1.4 Abnormal Conditions

Not applicable.

8.5.3 PWS Restart Indication

8.5.3.1 General

The purpose of PWS Restart Indication procedure is to inform the gNB-CU that PWS information for some or all cells of the gNB-DU are available for reloading from the CBC if needed. The procedure uses non UE-associated signalling.

8.5.3.2 Successful Operation

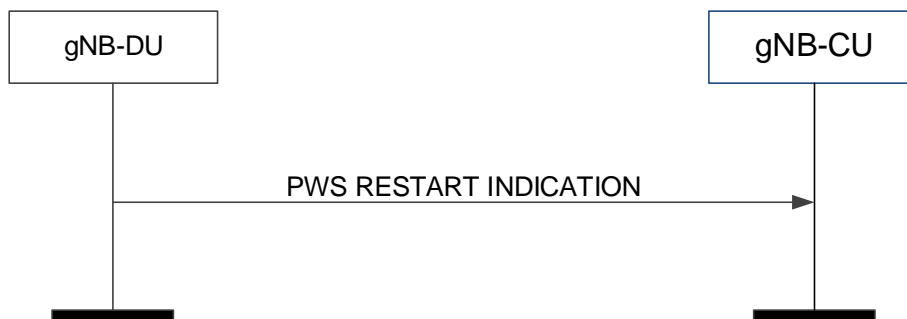


Figure 8.5.3.2-1: PWS restart indication

The gNB-DU initiates the procedure by sending a PWS RESTART INDICATION message to the gNB-CU.

8.5.3.3 Abnormal Conditions

Not applicable.

8.5.4 PWS Failure Indication

8.5.4.1 General

The purpose of the PWS Failure Indication procedure is to inform the gNB-CU that ongoing PWS operation for one or more cells of the gNB-DU has failed. The procedure uses non UE-associated signalling.

8.5.4.2 Successful Operation

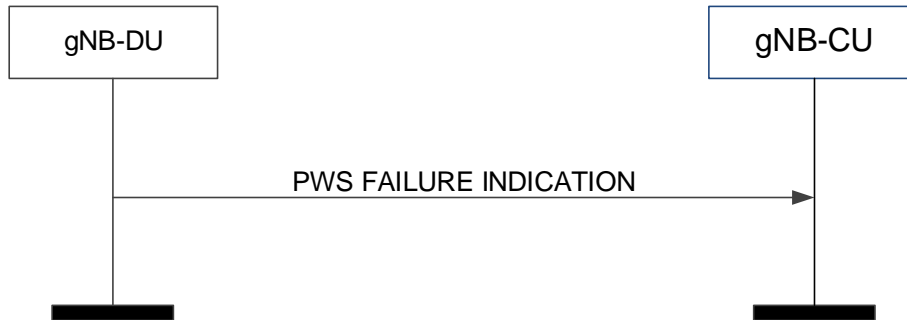


Figure 8.5.4.2-1: PWS failure indication

The gNB-DU initiates the procedure by sending a PWS FAILURE INDICATION message to the gNB-CU.

8.5.4.3 Abnormal Conditions

Not applicable.

8.6 System Information Procedures

8.6.1 System Information Delivery

8.6.1.1 General

The purpose of the System Information Delivery procedure is to command the gNB-DU to broadcast the requested Other SI. The procedure uses non-UE associated signalling.

8.6.1.2 Successful Operation

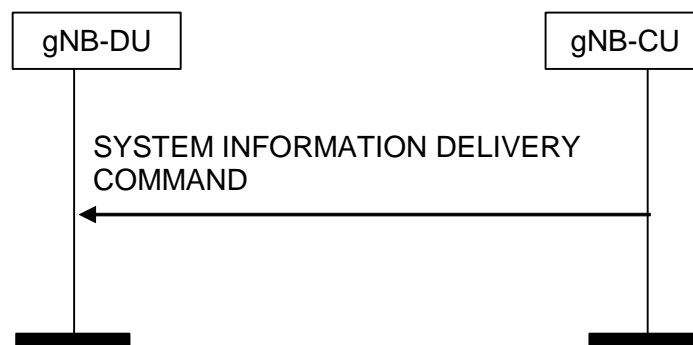


Figure 8.6.1.2-1: System Information Delivery procedure. Successful operation.

The gNB-CU initiates the procedure by sending a SYSTEM INFORMATION DELIVERY COMMAND message to the gNB-DU.

Upon reception of the SYSTEM INFORMATION DELIVERY COMMAND message, the gNB-DU shall broadcast the requested Other SI, and delete the UE context corresponding to the *Confirmed UE ID* IE, if any.

8.6.1.3 Abnormal Conditions

Not applicable.

8.7 Paging procedures

8.7.1 Paging

8.7.1.1 General

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

8.7.1.2 Successful Operation

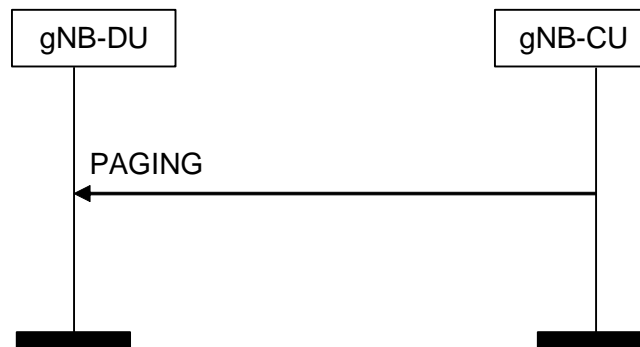


Figure 8.7.1.2-1: Paging procedure. Successful operation.

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.

8.7.1.3 Abnormal Conditions

Not applicable.

9 Elements for F1AP Communication

9.1 General

Subclauses 9.2 and 9.3 present the F1AP message and IE definitions in tabular format. The corresponding ASN.1 definition is presented in subclause 9.4. In case there is contradiction between the tabular format and the ASN.1 definition, the ASN.1 shall take precedence, except for the definition of conditions for the presence of conditional IEs, where the tabular format shall take precedence.

The messages have been defined in accordance to the guidelines specified in TR 25.921 [14].

When specifying IEs which are to be represented by bitstrings, if not otherwise specifically stated in the semantics description of the concerned IE or elsewhere, the following principle applies with regards to the ordering of bits:

- The first bit (leftmost bit) contains the most significant bit (MSB);
- The last bit (rightmost bit) contains the least significant bit (LSB);
- When importing bitstrings from other specifications, the first bit of the bitstring contains the first bit of the concerned information;

The following attributes are used for the tabular description of the messages and information elements: Presence, Range Criticality and Assigned Criticality. Their definition and use can be found in TS 38.413 [3].

9.2 Message Functional Definition and Content

9.2.1 Interface Management messages

9.2.1.1 RESET

This message is sent by both the gNB-CU and the gNB-DU and is used to request that the F1 interface, or parts of the F1 interface, to be reset.

Direction: gNB-CU → gNB-DU and 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
Cause	M		9.3.1.2		YES	ignore
CHOICE <i>Reset Type</i>	M				YES	reject
>F1 interface						
>>Reset All	M		ENUMERATED (Reset all,...)		-	
>Part of F1 interface						
>>UE-associated logical F1-connection list		1			-	
>>>UE-associated logical F1-connection Item		1 .. <maxnoofIndividualF1ConnectionsToReset>			EACH	reject
>>>> gNB-CU UE F1AP ID	O		9.3.1.4		-	
>>>> gNB-DU UE F1AP ID	O		9.3.1.5		-	

Range bound	Explanation
maxnoofIndividualF1ConnectionsToReset	Maximum no. of UE-associated logical F1-connections allowed to reset in one message. Value is 65536.

9.2.1.2 RESET ACKNOWLEDGE

This message is sent by both the gNB-CU and the gNB-DU as a response to a RESET message.

Direction: gNB-DU → gNB-CU and 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
UE-associated logical F1-connection list		0..1			YES	ignore
>UE-associated logical F1-connection Item		1 .. <maxnoofIndividualF1ConnectionsToReset>			EACH	ignore
>>gNB-CU UE F1AP ID	O		9.3.1.4		-	
>>gNB-DU UE F1AP ID	O		9.3.1.5		-	
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofIndividualF1ConnectionsToReset	Maximum no. of UE-associated logical F1-connections allowed to reset in one message. Value is 65536.

9.2.1.3 ERROR INDICATION

This message is sent by both the gNB-CU and the gNB-DU and is used to indicate that some error has been detected in the node.

Direction: gNB-CU → gNB-DU and 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	ignore
Transaction ID	M		9.3.1.23		YES	reject
gNB-CU UE F1AP ID	O		9.3.1.4		YES	ignore
gNB-DU UE F1AP ID	O		9.3.1.5		YES	ignore
Cause	O		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.4 F1 SETUP REQUEST

This message is sent by the gNB-DU to transfer information for a TNL association.

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
gNB-DU ID	M		9.3.1.9		YES	reject
gNB-DU Name	O		PrintableString(SIZE(1..150,...))		YES	ignore
gNB-DU Served Cells List		0.. 1		List of cells configured in the gNB-DU	YES	reject
>gNB-DU Served Cells Item		1.. <maxCellingNBDU>			EACH	reject
>>Served Cell Information	M		9.3.1.10	Information about the cells configured in the gNB-DU	-	-
>>gNB-DU System Information	O		9.3.1.18	RRC container with system information owned by gNB-DU	-	-
gNB-DU RRC version	M		RRC version 9.3.1.70		YES	reject

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.1.5 F1 SETUP RESPONSE

This message is sent by the gNB-CU to transfer information for a TNL association.

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
gNB-CU Name	O		PrintableString (SIZE(1..150,..))	Human readable name of the gNB-CU.	YES	ignore
Cells to be Activated List		0.. 1			YES	reject
>Cells to be Activated List Item		1.. <maxCellingNBDU>		List of cells to be activated	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	-	-
>>Available PLMN List	O		9.3.1.65		YES	ignore
gNB-CU RRC version	M		RRC version 9.3.1.70		YES	reject

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.1.6 F1 SETUP FAILURE

This message is sent by the gNB-CU to indicate F1 Setup failure.

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
Cause	M		9.3.1.2		YES	ignore
Time to wait	O		9.3.1.13		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.7 GNB-DU CONFIGURATION UPDATE

This message is sent by the gNB-DU to transfer updated information for a TNL association.

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
Served Cells To Add List		0..1		Complete list of added cells served by the gNB-DU	YES	reject
>Served Cells To Add Item		1 .. <maxCellingNBDU>			EACH	reject

>>Served Cell Information	M		9.3.1.10	Information about the cells configured in the gNB-DU	-	-
>>gNB-DU System Information	O		9.3.1.18	RRC container with system information owned by gNB-DU	-	-
Served Cells To Modify List		0..1		Complete list of modified cells served by the gNB-DU	YES	reject
>Served Cells To Modify Item		1 .. <maxCellingNBD U>			EACH	reject
>>Old NR CGI	M		9.3.1.12		-	-
>>Served Cell Information	M		9.3.1.10	Information about the cells configured in the gNB-DU	-	-
>>gNB-DU System Information	O		9.3.1.18	RRC container with system information owned by gNB-DU	-	-
Served Cells To Delete List		0..1		Complete list of deleted cells served by the gNB-DU	YES	reject
>Served Cells To Delete Item		1.. <maxCellingNBD U>			EACH	reject
>>Old NR CGI	M		9.3.1.12		-	-
Cells Status List		0..1		Complete list of active cells	YES	reject
> Cells Status Item		0 .. <maxCellingNBD U>			EACH	reject
>> NR CGI	M		9.3.1.12		-	-
>>Cell Status	M		9.3.1.68		-	-

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.1.8 GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE

This message is sent by a gNB-CU to a gNB-DU to acknowledge update of information for a TNL association.

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	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	-	-
>>> Available PLMN List	O		9.3.1.65		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.1.9 GNB-DU CONFIGURATION UPDATE FAILURE

This message is sent by the gNB-CU to indicate gNB-DU Configuration Update failure.

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
Cause	M		9.3.1.2		YES	ignore
Time to wait	O		9.3.1.13		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.10 GNB-CU CONFIGURATION UPDATE

This message is sent by the gNB-CU to transfer updated information for a TNL association.

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		
>>> Available PLMN List	O		9.3.1.65		YES	ignore
Cells to be Deactivated List		0..1		List of cells to be deactivated	YES	reject
>Cells to be Deactivated List Item		1.. <maxCellingNBD U>			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..<maxnoofTNLA ssociations>			EACH	ignore
>> TNL Association Transport Layer Information	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU.	YES	ignore
>> 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].	YES	ignore
gNB-CU TNL Association To Remove List		0..1			YES	ignore
>gNB-CU TNL Association To Remove Item IEs		1..<maxnoofTNLA ssociation>			EACH	ignore
>> TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU.	YES	ignore
gNB-CU TNL Association To Update List		0..1			YES	ignore
>gNB-CU TNL Association To Update Item IEs		1..<maxnoofTNLA ssociations>			EACH	ignore
>> TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU.	YES	ignore

>>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].	YES	ignore
Cells to be barred List		0..1		List of cells to be barred.	YES	ignore
>Cells to be barred List Item		1..<maxCellingNBD U>			EACH	ignore
>>NR CGI	M		9.3.1.12		-	-
>> Cell Barred	M		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 Global Identifier as defined in subclause 9.2.14 in TS 36.423 [9].	-	-
>>>>Served E-UTRA Cell Information	M		9.3.1.64		-	-

Range bound	Explanation
maxCellingNBDU	Maximum number of cells that can be served by a gNB-DU. Value is 512.
maxnoofTNLAassociations	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.

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 for a TNL association.

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..<maxnoofTNLAassociations>			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU	YES	ignore
gNB-CU TNL Association Failed to Setup Lis		0..1			YES	ignore
>gNB-CU TNL Association Failed To Setup Item IEs		1..<maxnoofTNLAassociations>			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU	YES	ignore
>>Cause	M		9.3.1.2			

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.
maxnoofTNLAassociations	Maximum no. of TNL Associations between the gNB-CU and the gNB-DU. Value is 32.

9.2.1.12 GNB-CU CONFIGURATION UPDATE FAILURE

This message is sent by the gNB-DU to indicate gNB-CU Configuration Update failure.

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
Cause	M		9.3.1.2		YES	ignore
Time to wait	O		9.3.1.13		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.13 GNB-DU RESOURCE COORDINATION REQUEST

This message is sent by a gNB-CU to a gNB-DU, to express the desired resource allocation for data traffic, for the sake of resource coordination. The message triggers gNB-DU resource coordination (for NR-initiated resource coordination), to indicate an initial resource offer by the E-UTRA node (for E-UTRA-initiated gNB-DU Resource Coordination), or to indicate the agreed resource allocation that is to be executed.

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
Request type	M		ENUMERATED (offer, execution, ...)		YES	reject
E-UTRA – NR Cell Resource Coordination Request Container	O		OCTET STRING	Includes the X2AP E-UTRA – NR CELL RESOURCE COORDINATION REQUEST message as defined in subclause 9.1.4.24 in TS 36.423 [9].	YES	reject

9.2.1.14 GNB-DU RESOURCE COORDINATION RESPONSE

This message is sent by a gNB-DU to a gNB-CU, to express the desired resource allocation for data traffic, as a response to the GNB-DU RESOURCE COORDINATION REQUEST.

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
E-UTRA – NR Cell Resource Coordination Response Container	M		OCTET STRING	Includes the X2AP E-UTRA – NR CELL RESOURCE COORDINATION RESPONSE message as defined in subclause 9.1.4.25 in TS 36.423 [9].	YES	reject

9.2.1.15 GNB-DU STATUS INDICATION

This message is sent by the gNB-DU to indicate to the gNB-CU its status of overload.

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
gNB-DU Overload Information	M		ENUMERATED (overloaded, not-overloaded)		YES	reject

9.2.2 UE Context Management messages

9.2.2.1 UE CONTEXT SETUP REQUEST

This message is sent by the gNB-CU to request the setup of a UE context.

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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	O		9.3.1.5		YES	ignore
SpCell ID	M		NR CGI 9.3.1.12	Special Cell as defined in TS 38.321 [16]. For handover case, this IE shall be considered as target cell.	YES	reject
ServCellIndex	M		INTEGER (0..31)			
SpCell UL Configured	O		Cell UL Configured 9.3.1.33		YES	ignore
Candidate SpCell List		0..1			YES	ignore
>Candidate SpCell Item IEs		1 .. <maxnoofCandidateSpCells>			EACH	ignore
>>Candidate SpCell ID	M		NR CGI 9.3.1.12	Special Cell as defined in TS 38.321 [16]	-	-
CU to DU RRC Information	M		9.3.1.25		YES	reject
DRX Cycle	O		DRX Cycle 9.3.1.24		YES	ignore
Resource Coordination Transfer Container	O		OCTET STRING	Includes the <i>MeNB Resource Coordination Information</i> IE as defined in subclause 9.2.116 of TS 36.423 [9].	YES	ignore
SCell To Be Setup List		0..1			YES	ignore
>SCell to Be Setup Item IEs		1.. <maxnoofSCells>			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB	-	-
>>SCellIndex	M		INTEGER (1..31)			
>>SCell UL Configured	O		Cell UL Configured 9.3.1.33			
SRB to Be Setup List		0..1			YES	reject
>SRB to Be Setup Item IEs		1 .. <maxnoofSRBs>			EACH	reject
>>SRB ID	M		9.3.1.7			
>>Duplication Indication	O		ENUMERATED (true, ..., false)	If included, it should be set to true.	YES	ignore
DRB to Be Setup List		0..1			YES	reject
>DRB to Be Setup Item IEs		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>CHOICE QoS Information	M				YES	reject
>>>E-UTRAN QoS	M		9.3.1.19	Shall be used for EN-DC case to convey E-RAB Level QoS Parameters		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>DRB Information		1		Shall be used for NG-RAN cases		
>>>>DRB QoS	M		9.3.1.45			
>>>>S-NSSAI	M		9.3.1.38			
>>>>Notification Control	O		9.3.1.56		-	-
>>>>Flows Mapped to DRB Item		1 .. <maxnoofQoSFlows>				
>>>>>QoS Flow Indicator	M		9.3.1.63			
>>>>>QoS Flow Level QoS Parameters	M		9.3.1.45			
>>UL UP TNL Information to be setup List		1				
>>> UL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofULUPTNLInformation>				
>>>>UL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-CU endpoint of the F1 transport bearer. For delivery of UL PDUs.	-	-
>> RLC Mode	M		9.3.1.27		-	
>> UL Configuration	O		UL Configuration 9.3.1.31	Information about UL usage in gNB-DU.		
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication		
>> DC Based Duplication Configured	O		ENUMERATED (true, ...)	Indication on whether DC based PDCP duplication is configured or not.	YES	reject
>>DC Based Duplication Activation	O		9.3.1.36	Information on the initial state of DC based UL PDCP duplication	YES	reject
>>PDCP SN length	M		ENUMERATED (12bits, 18bits, ...)		YES	ignore
Inactivity Monitoring Request	O		ENUMERATED (true, ...)		YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject
RRC-Container	O		9.3.1.6	Includes the <i>DL-DCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 [8], encapsulated in a PDCP PDU.	YES	ignore
Masked IMEISV	O		9.3.1.55		YES	ignore
Serving PLMN	O		PLMN ID 9.3.1.14	Indicates the PLMN serving the UE.	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
gNB-DU UE Aggregate Maximum Bit Rate Uplink	M		Bit Rate 9.3.1.22	The gNB-DU UE Aggregate Maximum Bit Rate Uplink is to be enforced by the gNB-DU.	YES	ignore

Range bound	Explanation
maxnoofSCells	Maximum no. of SCells allowed towards one UE, the maximum value is 32.
maxnoofSRBs	Maximum no. of SRB allowed towards one UE, the maximum value is 8.
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.
maxnoofULUPTNLInformation	Maximum no. of ULUP TNL Information allowed towards one DRB, the maximum value is 2.
maxnoofCandidateSpCells	Maximum no. of SpCells allowed towards one UE, the maximum value is 64.
maxnoofQoSFlows	Maximum no. of flows allowed to be mapped to one DRB, the maximum value is 64.

9.2.2.2 UE CONTEXT SETUP RESPONSE

This message is sent by the gNB-DU to confirm the setup of a UE context.

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
DU To CU RRC Information	M		9.3.1.26		YES	reject
C-RNTI	O		9.3.1.32	C-RNTI allocated at the gNB-DU	YES	ignore
Resource Coordination Transfer Container	O		OCTET STRING	Includes the <i>SgNB Resource Coordination Information</i> IE as defined in subclause 9.2.117 of TS 36.423 [9].	YES	ignore
Full Configuration	O		ENUMERATED (full, ...)		YES	reject
DRB Setup List		0..1		The List of DRBs which are successfully established.	YES	ignore
>DRB Setup Item list		1 .. <maxnoofDRBs>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>LCID	O		9.3.1.35	LCID for the primary path if PDCP duplication is applied		
>>DL UP TNL Information to be setup List		1				
>>> DL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofDLUPTNLInformation>				
>>>>DL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-DU endpoint of the F1 transport bearer. For delivery of DL PDUs.		
SRB Failed to Setup List		0..1			YES	ignore
>SRB Failed to Setup Item		1 .. <maxnoofSRBs>			EACH	ignore
>>SRB ID	M		9.3.1.7		-	-
>>Cause	O		9.3.1.2		YES	ignore
DRB Failed to Setup List		0..1			YES	ignore
>DRB Failed to Setup Item		1 .. <maxnoofDRBs>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	-
>>Cause	O		9.3.1.2		YES	ignore
SCell Failed To Setup List		0..1			YES	ignore
>SCell Failed to Setup Item		1 .. <maxnoofSCells>			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB		
>>Cause	O		9.3.1.2			

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Inactivity Monitoring Response	O		ENUMERATED (not-supported, ...)		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofSCells	Maximum no. of SCells allowed towards one UE, the maximum value is 64.
maxnoofSRBs	Maximum no. of SRB allowed towards one UE, the maximum value is 8.
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.
maxnoofDLUPTNLInformation	Maximum no. of DL UP TNL Information allowed towards one DRB, the maximum value is 2.

9.2.2.3 UE CONTEXT SETUP FAILURE

This message is sent by the gNB-DU to indicate that the setup of the UE context was unsuccessful.

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	O		9.3.1.5		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Potential SpCell List		0..1			YES	ignore
>Potential SpCell Item IEs		0 .. <maxnoofPotentialSpCells>			EACH	ignore
>>Potential SpCell ID	M		NR CGI 9.3.1.12	Special Cell as defined in TS 38.321 [16]		

Range bound	Explanation
maxnoofPotentialSpCells	Maximum no. of SpCells allowed towards one UE, the maximum value is 64.

9.2.2.4 UE CONTEXT RELEASE REQUEST

This message is sent by the gNB-DU to request the gNB-CU to release the UE-associated logical F1.

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
Cause	M		9.3.1.2		YES	ignore

9.2.2.5 UE CONTEXT RELEASE COMMAND

This message is sent by the gNB-CU to request the gNB-DU to release the UE-associated logical F1 connection.

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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
Cause	M		9.3.1.2		YES	ignore
RRC-Container	O		9.3.1.6	Includes the <i>DL-DCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 encapsulated in a PDCP PDU, or the <i>DL-CCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 [8].	YES	ignore
SRB ID	O		9.3.1.7	It shall be included if the <i>RRC-Container</i> IE is present. The gNB-DU shall send the RRC message on the indicated SRB.	YES	ignore
old gNB-DU UE F1AP ID	O		9.3.1.5	Include it if RRCReestablishmentRequest is not accepted	YES	ignore
Execute Duplication	O		ENUMERATED (true, ...)	This IE may be sent only if duplication has been configured for the UE.	YES	ignore

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.

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

9.2.2.7 UE CONTEXT MODIFICATION REQUEST

This message is sent by the gNB-CU to provide UE Context information changes to the gNB-DU.

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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
SpCell ID	O		NR CGI 9.3.1.12	Special Cell as defined in TS 38.321 [16]. For handover case, this IE shall be considered as target cell.	YES	ignore
ServCellIndex	O		INTEGER (0..31)			
SpCell UL Configured	O		Cell UL Configured 9.3.1.33		YES	ignore
DRX Cycle	O		DRX Cycle 9.3.1.24		YES	ignore
CU to DU RRC Information	O		9.3.1.25		YES	reject
Transmission Stop Indicator	O		9.3.1.11		YES	ignore
Resource Coordination Transfer Container	O		OCTET STRING	Includes the <i>MeNB Resource Coordination Information</i> IE as defined in subclause 9.2.116 of TS 36.423 [9].	YES	ignore
RRC Reconfiguration Complete Indicator	O		9.3.1.30		YES	ignore
RRC-Container	O		9.3.1.6	Includes the RRCConnectionReconfiguration message as defined in TS 38.331 [8], encapsulated in a PDCP PDU.	YES	ignore
SCell To Be Setup List		<i>0..1</i>			YES	ignore
>SCell to Be Setup Item IEs		<i>1.. <maxnoofS Cells></i>			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB	-	-
>>SCellIndex	M		INTEGER (1..31)			
>>SCell UL Configured	O		Cell UL Configured 9.3.1.33			
SCell To Be Removed List		<i>0..1</i>			YES	ignore
>SCell to Be Removed Item IEs		<i>1 .. <maxnoofS Cells></i>			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB	-	-
SRB to Be Setup List		<i>0..1</i>			YES	reject
>SRB to Be Setup Item IEs		<i>1..<maxnoof SRBs></i>			EACH	reject
>>SRB ID	M		9.3.1.7			
>>Duplication Indication	O		ENUMERATED (true, ..., false)		YES	ignore
DRB to Be Setup List		<i>0..1</i>			YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>DRB to Be Setup Item IEs		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>CHOICE QoS Information	M				YES	reject
>>>E-UTRAN QoS	M		9.3.1.19	Shall be used for EN-DC case to convey E-RAB Level QoS Parameters		
>>>DRB Information		1		Shall be used for NG-RAN cases		
>>>>DRB QoS	M		9.3.1.45			
>>>>S-NSSAI	M		9.3.1.38			
>>>>Notification Control	O		9.3.1.56		-	-
>>>>Flows Mapped to DRB Item		1 .. <maxnoofQoSFlows>				
>>>>>QoS Flow Indicator	M		9.3.1.63			
>>>>>QoS Flow Level QoS Parameters	M		9.3.1.45			
>>UL UP TNL Information to be setup List		1				
>>>UL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofULUPTNLInformation>				
>>>>UL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-CU endpoint of the F1 transport bearer. For delivery of UL PDUs.	-	-
>> RLC Mode	M		9.3.1.27		-	
>>UL Configuration	O		UL Configuration 9.3.1.31	Information about UL usage in gNB-DU.		
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication		
>> DC Based Duplication Configured	O		ENUMERATED (true, ...)	Indication on whether DC based PDCP duplication is configured or not.	YES	reject
>>DC Based Duplication Activation	O		9.3.1.36	Information on the initial state of DC based UL PDCP duplication	YES	reject
>>PDCP SN length	M		ENUMERATED (12bits, 18bits, ...)		YES	ignore
DRB to Be Modified List		0..1			YES	reject
>DRB to Be Modified Item IEs		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>CHOICE QoS Information	O				YES	reject
>>>E-UTRAN QoS	M		9.3.1.19	Shall be used for EN-DC case to convey E-RAB Level QoS Parameters		
>>>DRB Information		1		Shall be used for NG-RAN cases		
>>>>DRB QoS	M		9.3.1.45			
>>>>S-NSSAI	M		9.3.1.38			
>>>>Notification Control	O		9.3.1.56		-	-
>>>>Flows Mapped to DRB Item		1 .. <maxnoofQoSFlows>				
>>>>>QoS Flow Indicator	M		9.3.1.63			
>>>>>QoS Flow Level QoS Parameters	M		9.3.1.45			
>> UL UP TNL Information to be setup List		0..1				
>>> UL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofULUPTNLInformation>				
>>>>UL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-CU endpoint of the F1 transport bearer. For delivery of UL PDUs.	-	-
>>UL Configuration	O		UL Configuration 9.3.1.31	Information about UL usage in gNB-DU.		
>>PDCP SN length	O		ENUMERATED(12bits,18 bits , ...)		YES	ignore
SRB To Be Released List		0..1			YES	reject
>SRB To Be Released Item IEs		1.. <maxnoofSRBs>			EACH	reject
>>SRB ID	M		9.3.1.7			
DRB to Be Released List		0..1			YES	reject
>DRB to Be Released Item IEs		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
Inactivity Monitoring Request	O		ENUMERATED (true, ...)		YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject
DRX configuration indicator	O		ENUMERATED(release,..)		YES	ignore
RLC Failure Indication	O		9.3.1.66		YES	ignore
Uplink TxDirectCurrentList Information	O		9.3.1.67		YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
GNB-DU Configuration Query	O		ENUMERATED (true, ...)	Used to request the gNB-DU to provide its configuration.	YES	reject
gNB-DU UE Aggregate Maximum Bit Rate Uplink	O		Bit Rate 9.3.1.22	The gNB-DU UE Aggregate Maximum Bit Rate Uplink is to be enforced by the gNB-DU.	YES	ignore
Execute Duplication	O		ENUMERATED (true, ...)	This IE may be sent only if duplication has been configured for the UE.	YES	Ignore

Range bound	Explanation
maxnoofSCells	Maximum no. of SCells allowed towards one UE, the maximum value is 32.
maxnoofSRBs	Maximum no. of SRB allowed towards one UE, the maximum value is 8.
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.
maxnoofULUPTNLInformation	Maximum no. of UL UP TNL Information allowed towards one DRB, the maximum value is 2.

9.2.2.8 UE CONTEXT MODIFICATION RESPONSE

This message is sent by the gNB-DU to confirm the modification of a UE context.

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
Resource Coordination Transfer Container	O		OCTET STRING	Includes the <i>SgNB Resource Coordination Information</i> IE as defined in subclause 9.2.117 of TS 36.423 [9].	YES	ignore
DU To CU RRC Information	O		9.3.1.26		YES	reject
DRB Setup List		0..1		The List of DRBs which are successfully established.	YES	ignore
>DRB Setup Item IEs		1 .. <maxnoofDRBs>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>LCID	O		9.3.1.35	LCID for primary path if PDCP duplication is applied		
>>DL UP TNL Information to be setup List		1				
>>>DL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofDLUPTNLInformation>				
>>>>DL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-DU endpoint of the F1 transport bearer. For delivery of DL PDUs.		
DRB Modified List		0..1		The List of DRBs which are successfully modified.	YES	ignore
>DRB Modified Item IEs		1 .. <maxnoofDRBs>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>LCID	O		9.3.1.35	LCID for primary path if PDCP duplication is applied		
>>DL UP TNL Information to be setup List		1				
>>>DL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofDLUPTNLInformation>				

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>>DL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-DU endpoint of the F1 transport bearer. For delivery of DL PDUs.		
>>RLC Status	O		9.3.1.69	Indicates the RLC has been re-established at the gNB-DU.		
SRB Failed to be Setup List		0..1		The List of SRBs which are failed to be established.	YES	ignore
>SRB Failed to be Setup Item IEs		1 .. <maxnoofSRBs>			EACH	ignore
>>SRB ID	M		9.3.1.8		-	
>>Cause	O		9.3.1.2		-	-
DRB Failed to be Setup List		0..1		The List of DRBs which are failed to be setup.	YES	ignore
>DRB Failed to be Setup Item IEs		1 .. <maxnoofDRBs>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>Cause	O		9.3.1.2		-	-
DRB Failed to be Modified List		0..1		The List of DRBs which are failed to be modified.	YES	ignore
>DRB Failed to be Modified Item IEs		1 .. <maxnoofDRBs>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>Cause	O		9.3.1.2		-	-
SCell Failed To Setup List		0..1			YES	ignore
>SCell Failed to Setup Item		1 .. <maxnoofSCells>			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB		
>>Cause	O		9.3.1.2			
Inactivity Monitoring Response	O		ENUMERATED (Not-supported, ...)		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
C-RNTI	O		9.3.1.32	C-RNTI allocated at the gNB-DU	YES	ignore

Range bound	Explanation
maxnoofSRBs	Maximum no. of SRB allowed towards one UE, the maximum value is 8.
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.
maxnoofDLUPTNLInformation	Maximum no. of DL UP TNL Information allowed towards one DRB, the maximum value is 2.

9.2.2.9 UE CONTEXT MODIFICATION FAILURE

This message is sent by the gNB-DU to indicate a context modification failure.

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
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.2.10 UE CONTEXT MODIFICATION REQUIRED

This message is sent by the gNB-DU to request the modification of a UE context.

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
Resource Coordination Transfer Container	O		OCTET STRING	Includes the <i>SgNB Resource Coordination Information</i> IE as defined in subclause 9.2.117 of TS 36.423 [9].	YES	ignore
DU To CU RRC Information	O		9.3.1.26		YES	reject
DRB Required to Be Modified List		0..1			YES	reject
>DRB Required to Be Modified Item IEs		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>DL UP TNL Information to be setup List		0..1				
>>>DL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofDL UPTNLInformation>				
>>>>DL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-CU endpoint of the F1 transport bearer. For delivery of DL PDUs.	-	-
>>RLC Status	O		9.3.1.69	Indicates the RLC has been re-established at the gNB-DU.	-	-
SRB Required to be Released List		0..1			YES	reject
>SRB Required to be Released List Item IEs		1 .. <maxnoofSRBs>			EACH	reject
>>SRB ID	M		9.3.1.7		-	
DRB Required to be Released List		0..1			YES	reject
>DRB Required to be Released List Item IEs		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
Cause	M		9.3.1.2		YES	ignore

Range bound	Explanation
maxnoofSRBs	Maximum no. of SRB allowed towards one UE, the maximum value is 8.
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.
maxnoofDLUPTNLInformation	Maximum no. of DL UP TNL Information allowed towards one DRB, the maximum value is 2.

9.2.2.11 UE CONTEXT MODIFICATION CONFIRM

This message is sent by the gNB-CU to inform the gNB-DU the successful modification.

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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
Resource Coordination Transfer Container	O		OCTET STRING	Includes the <i>MeNB Resource Coordination Information</i> IE as defined in subclause 9.2.116 of TS 36.423 [9].	YES	ignore
DRB Modified List		<i>0..1</i>		The List of DRBs which are successfully modified.	YES	ignore
>DRB Modified Item IEs		<i>1 .. <maxnoofDRBs></i>			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>UL UP TNL Information to be setup List		<i>1</i>				
>>>UL UP TNL Information to Be Setup Item IEs		<i>1 .. <maxnoofULUPTNLInformation></i>				
>>>>UL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-DU endpoint of the F1 transport bearer. For delivery of UL PDUs.		
RRC-Container	O		9.3.1.6	Includes the <i>RRCCoordinateReconfiguration</i> message as defined in TS 38.331 [8], encapsulated in a PDCP PDU.	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Execute Duplication	O		ENUMERATED (true, ...)	This IE may be sent only if duplication has been configured for the UE.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.
maxnoofULUPTNLInformation	Maximum no. of UL UP TNL Information allowed towards one DRB, the maximum value is 2.

9.2.2.12 UE INACTIVITY NOTIFICATION

This message is sent by the gNB-DU to provide information about the UE activity to the gNB-CU.

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
DRB Activity List		1			YES	reject
>DRB Activity Item		1 .. <maxnoof DRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	-
>>DRB Activity	M		ENUMERATED (Active, Not active, ...)		-	-

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRB allowed towards one UE, the maximum value is 64.

9.2.2.13 NOTIFY

This message is sent by the gNB-DU to notify the gNB-CU that the QoS for already established DRBs associated with notification control is not fulfilled any longer or it is fulfilled again.

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	ignore
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
DRB Notify List		1			YES	reject
>DRB Notify Item IEs		<1 .. maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	-
>>Notification Cause	M		ENUMERATED (Fulfilled, Not-Fulfilled, ...)		-	-

9.2.3 RRC Message Transfer messages

9.2.3.1 INITIAL UL RRC MESSAGE TRANSFER

This message is sent by the gNB-DU to transfer the initial layer 3 message to the gNB-CU over the F1 interface.

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	ignore
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
NR CGI	M		9.3.1.12	NG-RAN Cell Global Identifier (NR CGI)	YES	reject
C-RNTI	M		9.3.1.32	C-RNTI allocated at the gNB-DU	YES	reject
RRC-Container	M		9.3.1.6	Includes the <i>UL-CCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
DU to CU RRC Container	O		OCTET STRING	<i>CellGroupConfig</i> IE as defined in subclause 6.3.2 in TS 38.331. Required at least to carry SRB1 configuration	YES	reject
SUL Access Indication	O		ENUMERATED (true, ...)		YES	ignore

9.2.3.2 DL RRC MESSAGE TRANSFER

This message is sent by the gNB-CU to transfer the layer 3 message to the gNB-DU over the F1 interface.

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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
old gNB-DU UE F1AP ID	O		9.3.1.5	Include it if RRCConnectionReestablishment is included in RRC-Container	YES	reject
SRB ID	M		9.3.1.7		YES	reject
Execute Duplication	O		ENUMERATED (true, ...)		YES	ignore
RRC-Container	M		9.3.1.6	Includes the <i>DL-DCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 encapsulated in a PDCP PDU, or the <i>DL-CCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject

9.2.3.3 UL RRC MESSAGE TRANSFER

This message is sent by the gNB-DU to transfer the layer 3 message to the gNB-CU over the F1 interface.

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	ignore
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
SRB ID	M		9.3.1.7		YES	reject
RRC-Container	M		9.3.1.6	Includes the <i>UL-DCCH-Message</i> IE as defined in subclause 6.2 of TS 38.331 [8], encapsulated in a PDCP PDU.	YES	reject

9.2.4 Warning Message Transmission Messages

9.2.4.1 WRITE-REPLACE WARNING REQUEST

This message is sent by the gNB-CU to request the start or overwrite of the broadcast of a warning message.

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
PWS System Information	M		9.3.1.58	This IE includes the system information for public warning, as defined in TS 38.331 [8].	YES	reject
Cell To Be Broadcast List		0..1			YES	reject
>Cell to Be Broadcast Item IEs		1.. <maxCellingNBdu>			EACH	reject
>>NR CGI	M		9.3.1.12		-	-
Repetition Period	M		9.3.1.59		YES	reject
Number of Broadcasts Requested	M		9.3.1.60		YES	reject

Range bound	Explanation
maxCellingNBdu	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.4.2 WRITE-REPLACE WARNING RESPONSE

This message is sent by the gNB-DU to acknowledge the gNB-CU on the start or overwrite request of a warning message.

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
Cell Broadcast Completed List		0..1			YES	reject
>Cell Broadcast Completed Item IEs		1.. <maxCellingNB DU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	-
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxCellingNB-DU	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.4.3 PWS CANCEL REQUEST

This message is forwarded by the gNB-CU to gNB-DU to cancel an already ongoing broadcast of a warning message

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
Cell Broadcast To Be Cancelled List		0..1			YES	reject
>Cell Broadcast to Be Cancelled Item IEs		1.. <maxCellingNB- DU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	-
Cancel-all Warning Messages Indicator	O		9.3.1.55	ENUMERATED (true, ...)	YES	reject

Range bound	Explanation
maxCellingNB-DU	Maximum no. cells that can be served by a gNB-DU. Value is 512.

9.2.4.4 PWS CANCEL RESPONSE

This message is sent by the gNB-DU to indicate the list of warning areas where cancellation of the broadcast of the identified message was successful and unsuccessful.

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
Cell Broadcast Cancelled List		0..1			YES	reject
>Cell Broadcast Cancelled Item IEs		1.. <maxnoofCellsinGNBDU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	-
>>Number of Broadcasts	M		INTEGER (0..65535)	This IE is set to '0' if valid results are not known or not available. It is set to 65535 if the counter results have overflowed.	-	-
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.4.5 PWS RESTART INDICATION

This message is sent by the gNB-DU to inform the gNB-CU that PWS information for some or all cells of the gNB-DU are available if needed.

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	ignore
NR CGI List for Restart List		0..1			YES	reject
>NR CGI List for Restart Item IEs		1.. <maxnoofCellsin gNB-DU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	-

Range bound	Explanation
maxnoofCellsinGNBDU	Maximum no. of cells that can be served by an gNB-DU. Value is 512.

9.2.4.6 PWS FAILURE INDICATION

This message is sent by the gNB-DU to inform the gNB-CU that ongoing PWS operation for one or more cells of the gNB-DU has failed.

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	ignore
PWS failed NR CGI List		0..1			YES	reject
>PWS failed NR CGI Item IEs		1..<maxnoofCellsingNBDU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	-

Range bound	Explanation
maxnoofCellsingNBDU	Maximum no. of cells that can be served by an gNB-DU. Value is 512.

9.2.5 System Information messages

9.2.5.1 SYSTEM INFORMATION DELIVERY COMMAND

This message is sent by the gNB-CU and is used to enable the gNB-DU to broadcast the requested other SI.

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
NR CGI	M		9.3.1.12	NR cell identifier	-	
SIType List	M		9.3.1.62			
Confirmed UE ID	M		gNB-DU UE F1AP ID 9.3.1.5		YES	reject

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	reject
UE Identity Index value	M		9.3.1.39		YES	reject
Choice Paging Identity	M					
>RAN UE Paging identity			9.3.1.43		YES	reject
>CN UE paging identity			9.3.1.44		YES	reject
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		-	

Range bound	Explanation
maxnoofPagingCells	Maximum no. of paging cells, the maximum value is 512.

9.3 Information Element Definitions

9.3.1 Radio Network Layer Related IEs

9.3.1.1 Message Type

The *Message Type* IE uniquely identifies the message being sent. It is mandatory for all messages.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Message Type				
>Procedure Code	M		INTEGER (0..255)	
>Type of Message	M		CHOICE (Initiating Message, Successful Outcome, Unsuccessful Outcome, ...)	

9.3.1.2 Cause

The purpose of the *Cause* IE is to indicate the reason for a particular event for the FIAP protocol.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE Cause Group	M			
>Radio Network Layer				
>>Radio Network Layer Cause	M		ENUMERATED (Unspecified, RL failure-RLC, Unknown or already allocated gNB-CU UE F1AP ID, Unknown or already allocated gNB-DU UE F1AP ID, Unknown or inconsistent pair of UE F1AP ID, Interaction with other procedure, Not supported QCI Value, Action Desirable for Radio Reasons, No Radio Resources Available, Procedure cancelled, Normal Release, ..., Cell not available, RL failure-others, UE rejection, Resources not available for the slice)	
>Transport Layer				
>>Transport Layer Cause	M		ENUMERATED (Unspecified, Transport Resource Unavailable, ...)	
>Protocol				
>>Protocol Cause	M		ENUMERATED (Transfer Syntax Error, Abstract Syntax Error (Reject), Abstract Syntax Error (Ignore and Notify), Message not Compatible with Receiver State, Semantic Error, Abstract Syntax Error (Falsely Constructed Message), Unspecified, ...)	
>Misc				
>>Miscellaneous Cause	M		ENUMERATED (Control Processing Overload, Not enough User Plane Processing Resources, Hardware Failure, O&M Intervention, Unspecified, ...)	

The meaning of the different cause values is described in the following table. In general, "not supported" cause values indicate that the related capability is missing. On the other hand, "not available" cause values indicate that the related capability is present, but insufficient resources were available to perform the requested action.

Radio Network Layer cause	Meaning
Unspecified	Sent for radio network layer cause when none of the specified cause values applies.
RL Failure-RLC	The action is due to an RL failure caused by exceeding the maximum number of ARQ retransmissions.
Unknown or already allocated gNB-CU UE F1AP ID	The action failed because the gNB-CU UE F1AP ID is either unknown, or (for a first message received at the gNB-CU) is known and already allocated to an existing context.
Unknown or already allocated gNB-DU UE F1AP ID	The action failed because the gNB-DU UE F1AP ID is either unknown, or (for a first message received at the gNB-DU) is known and already allocated to an existing context.
Unknown or inconsistent pair of UE F1AP ID	The action failed because both UE F1AP IDs are unknown, or are known but do not define a single UE context.
Interaction with other procedure	The action is due to an ongoing interaction with another procedure.
Not supported QCI Value	The action failed because the requested QCI is not supported.
Action Desirable for Radio Reasons	The reason for requesting the action is radio related.
No Radio Resources Available	The cell(s) in the requested node don't have sufficient radio resources available.
Procedure cancelled	The sending node cancelled the procedure due to other urgent actions to be performed.
Normal Release	The action is due to a normal release of the UE (e.g. because of mobility) and does not indicate an error.
Cell Not Available	The action failed due to no cell available in the requested node.
RL Failure-others	The action is due to an RL failure caused by other radio link failures than exceeding the maximum number of ARQ retransmissions.
UE rejection	The action is due to gNB-CU's rejection of a UE access request.
Resources not available for the slice	The requested resources are not available for the slice.

Transport Layer cause	Meaning
Unspecified	Sent when none of the above cause values applies but still the cause is Transport Network Layer related.
Transport Resource Unavailable	The required transport resources are not available.

Protocol cause	Meaning
Transfer Syntax Error	The received message included a transfer syntax error.
Abstract Syntax Error (Reject)	The received message included an abstract syntax error and the concerning criticality indicated "reject".
Abstract Syntax Error (Ignore And Notify)	The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify".
Message Not Compatible With Receiver State	The received message was not compatible with the receiver state.
Semantic Error	The received message included a semantic error.
Abstract Syntax Error (Falsely Constructed Message)	The received message contained IEs or IE groups in wrong order or with too many occurrences.
Unspecified	Sent when none of the above cause values applies but still the cause is Protocol related.

Miscellaneous cause	Meaning
Control Processing Overload	Control processing overload.
Not Enough User Plane Processing Resources Available	No enough resources are available related to user plane processing.
Hardware Failure	Action related to hardware failure.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the above cause values applies and the cause is not related to any of the categories Radio Network Layer, Transport Network Layer, NAS or Protocol.

9.3.1.3 Criticality Diagnostics

The *Criticality Diagnostics* IE is sent by the gNB-DU or the gNB-CU when parts of a received message have not been comprehended or were missing, or if the message contained logical errors. When applicable, it contains information about which IEs were not comprehended or were missing.

For further details on how to use the *Criticality Diagnostics* IE, (see clause 10). The conditions for inclusion of the *Transaction ID* IE are described in clause 10.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error.
Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure).
Transaction ID	O		9.3.1.23	
Information Element Criticality Diagnostics		<i>0 .. <maxnoof Errors></i>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE ID of the not understood or missing IE.
>Type of Error	M		ENUMERATED(not understood, missing, ...)	

Range bound	Explanation
maxnoofErrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnoofErrors is 256.

9.3.1.4 gNB-CU UE F1AP ID

The gNB-CU UE F1AP ID uniquely identifies the UE association over the F1 interface within the gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU UE F1AP ID	M		INTEGER (0 .. 2 ³² -1)	

9.3.1.5 gNB-DU UE F1AP ID

The gNB-DU UE F1AP ID uniquely identifies the UE association over the F1 interface within the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-DU UE F1AP ID	M		INTEGER (0 .. 2 ³² -1)	

9.3.1.6 RRC-Container

This information element contains a gNB-CU→UE or a UE → gNB-CU message that is transferred without interpretation in the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC-Container	M		OCTET STRING	

9.3.1.7 SRB ID

This IE uniquely identifies a SRB for a UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SRB ID	M		INTEGER (0..3, ...)	Corresponds to the <i>SRB-Identity</i> defined in TS 38.331 [8].

9.3.1.8 DRB ID

This IE uniquely identifies a DRB for a UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB ID	M		INTEGER (1..32, ...)	Corresponds to the <i>DRB-Identity</i> defined in TS 38.331 [8].

9.3.1.9 gNB-DU ID

The gNB-DU ID uniquely identifies the gNB-DU at least within a gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-DU ID	M		INTEGER (0 .. 2 ³⁶ -1)	The gNB-DU ID is independently configured from cell identifiers, i.e. no connection between gNB-DU ID and cell identifiers.

9.3.1.10 Served Cell Information

This IE contains cell configuration information of a cell in the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
NR CGI	M		9.3.1.12		-	-
NR PCI	M		INTEGER (0..1007)	Physical Cell ID		
5GS TAC	O		9.3.1.29	5GS Tracking Area Code	-	-
Configured EPS TAC	O		9.3.1.29a		-	
Served PLMNs		<i>1..<maxnoofB PLMNs></i>		Broadcast PLMNs	-	-
>PLMN Identity	M		9.3.1.14		-	-
>TAI Slice Support List	O		Slice Support List 9.3.1.37	Supported S-NSSAIs per TA.	-	-
CHOICE <i>NR-Mode-Info</i>	M				-	-
> <i>FDD</i>						
>> FDD Info		<i>1</i>			-	-
>>>UL FreqInfo	M		NR Frequency Info 9.3.1.17		-	-
>>>DL FreqInfo	M		NR Frequency Info 9.3.1.17		-	-
>>>UL Transmission Bandwidth	M		NR Transmission Bandwidth 9.3.1.15		-	-
>>>DL Transmission Bandwidth	M		NR Transmission Bandwidth 9.3.1.15		-	-
> <i>TDD</i>					-	-
>> TDD Info		<i>1</i>			-	-
>>> NR FreqInfo	M		NR Frequency Info 9.3.1.17		-	-
>>> Transmission Bandwidth	M		NR Transmission Bandwidth 9.3.1.15		-	-
Measurement Timing Configuration	M		OCTET STRING	Contains the <i>MeasurementTimingConfiguration</i> inter-node message defined in TS 38.331 [8].	-	-
RANAC	O		9.3.1.57	RAN Area Code	YES	ignore

Range bound	Explanation
maxnoofBPLMNs	Maximum no. of Broadcast PLMN Ids. Value is 6.

9.3.1.11 Transmission Stop Indicator

This IE indicates the gNB-DU to stop the data transmission for the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transmission Stop Indicator	M		ENUMERATED (stop, ..., restart)	

9.3.1.12 NR CGI

The NR Cell Global Identifier (NR CGI) is used to globally identify a cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.1.14	
NR Cell Identity	M		BIT STRING (36)	

9.3.1.13 Time To wait

This IE defines the minimum allowed waiting times.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Time to wait	M		ENUMERATED(1s, 2s, 5s, 10s, 20s, 60s)	

9.3.1.14 PLMN Identity

This information element indicates the PLMN Identity.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		OCTET STRING (3)	<ul style="list-style-type: none"> - digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).

9.3.1.15 Transmission Bandwidth

The *Transmission Bandwidth* IE is used to indicate the UL or DL transmission bandwidth.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR SCS	M		ENUMERATED (scs15, scs30, scs60, scs120, ...)	The values scs15, scs30, scs60 and scs120 corresponds to the sub carrier spacing in TS 38.104 [17].
NRB	M		ENUMERATED (nrb11, nrb18, nrb24, nrb25, nrb31, nrb32, nrb38, nrb51, nrb52, nrb65, nrb66, nrb78, nrb79, nrb93, nrb106, nrb107, nrb121, nrb132, nrb133, nrb135, nrb160, nrb162, nrb189, nrb216, nrb217, nrb245, nrb264, nrb270, nrb273, ...)	This IE is used to indicate the UL or DL transmission bandwidth expressed in units of resource blocks "NRB" (TS 38.104 [17]). The values nrb11, nrb18, etc. correspond to the number of resource blocks "NRB" 11, 18, etc.

9.3.1.16 Void

Reserved for future use.

9.3.1.17 NR Frequency Info

The NR Frequency Info defines the carrier frequency used in a cell for a given direction (UL or DL) in FDD or for both UL and DL directions in TDD or for an SUL carrier.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR ARFCN	M		INTEGER (0..maxNRARFCN)	RF Reference Frequency as defined in TS 38.104 [17] section 5.4.2.1. The frequency provided in this IE identifies the absolute frequency position of the reference resource block (Common RB 0) of the carrier. Its lowest subcarrier is also known as Point A.
SUL Information	O		9.3.1.28	
Frequency Band List		1		
>Frequency Band Item		1..<maxnoofNrCellBands>		
>>NR Frequency Band	M		INTEGER (1..1024 ...)	Operating Band as defined in TS 38.104 [17] section 5.4.2.3. The value 1 corresponds to NR operating band n1, value 2 corresponds to NR operating band n2, etc.
>>>Supported SUL band List		0..<maxnoofNrCellBands>		
>>>>Supported SUL band Item	M		INTEGER (1..1024, ...)	Supplementary NR Operating Band as defined in TS 38.104 [17] section 5.4.2.3 that can be used for SUL duplex mode as per TS 38.101-1 table 5.2.-1. The value 80 corresponds to NR operating band n80, value 81 corresponds to NR operating band n81, etc.

Range bound	Explanation
maxNRARFCN	Maximum value of NR ARFCNs. Value is 3279165.
maxnoofNrCellBands	Maximum no. of frequency bands supported for a NR cell. Value is 32.

9.3.1.18 gNB-DU System Information

This IE contains the system information generated by the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MIB message	M		OCTET STRING	MIB message, as defined in TS 38.331 [8].
SIB1 message	M		OCTET STRING	SIB1 message, as defined in TS 38.331 [8].

9.3.1.19 E-UTRAN QoS

This IE defines the QoS to be applied to a DRB for EN-DC case.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QCI	M		INTEGER (0..255)	QoS Class Identifier defined in TS 23.401 [10]. Logical range and coding specified in TS 23.203 [11].	–	–
Allocation and Retention Priority	M		9.3.1.20		–	–
GBR QoS Information	O		9.3.1.21	This IE applies to GBR bearers only and shall be ignored otherwise.	–	–

9.3.1.20 Allocation and Retention Priority

This IE specifies the relative importance compared to other E-RABs for allocation and retention of the E-UTRAN Radio Access Bearer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Priority Level	M		INTEGER (0..15)	Desc.: This IE should be understood as "priority of allocation and retention" (see TS 23.401 [10]). Usage: Value 15 means "no priority". Values between 1 and 14 are ordered in decreasing order of priority, i.e. 1 is the highest and 14 the lowest. Value 0 shall be treated as a logical error if received.
Pre-emption Capability	M		ENUMERATED(shall not trigger pre-emption, may trigger pre-emption)	Desc.: This IE indicates the pre-emption capability of the request on other E-RABs Usage: The E-RAB shall not pre-empt other E-RABs or, the E-RAB may pre-empt other E-RABs The Pre-emption Capability indicator applies to the allocation of resources for an E-RAB and as such it provides the trigger to the pre-emption procedures/processes of the eNB.
Pre-emption Vulnerability	M		ENUMERATED(not pre-emptable, pre-emptable)	Desc.: This IE indicates the vulnerability of the E-RAB to pre-emption of other E-RABs. Usage: The E-RAB shall not be pre-empted by other E-RABs or the E-RAB may be pre-empted by other RABs. Pre-emption Vulnerability indicator applies for the entire duration of the E-RAB, unless modified, and as such indicates whether the E-RAB is a target of the pre-emption procedures/processes of the eNB.

9.3.1.21 GBR QoS Information

This IE indicates the maximum and guaranteed bit rates of a GBR E-RAB for downlink and uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
E-RAB Maximum Bit Rate Downlink	M		Bit Rate 9.3.1.22	Maximum Bit Rate in DL (i.e. from EPC to E-UTRAN) for the bearer. Details in TS 23.401 [10].	–	–
E-RAB Maximum Bit Rate Uplink	M		Bit Rate 9.3.1.22	Maximum Bit Rate in UL (i.e. from E-UTRAN to EPC) for the bearer. Details in TS 23.401 [10].	–	–
E-RAB Guaranteed Bit Rate Downlink	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate (provided that there is data to deliver) in DL (i.e. from EPC to E-UTRAN) for the bearer. Details in TS 23.401 [10].	–	–
E-RAB Guaranteed Bit Rate Uplink	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate (provided that there is data to deliver) in UL (i.e. from E-UTRAN to EPC) for the bearer. Details in TS 23.401 [10].	–	–

9.3.1.22 Bit Rate

This IE indicates the number of bits delivered by NG-RAN in UL or to NG-RAN in DL within a period of time, divided by the duration of the period. It is used, for example, to indicate the maximum or guaranteed bit rate for a GBR QoS flow, or an aggregated maximum bit rate.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Bit Rate	M		INTEGER (0..4,000,000,000,000,...)	The unit is: bit/s

9.3.1.23 Transaction ID

The *Transaction ID* IE uniquely identifies a procedure among all ongoing parallel procedures of the same type initiated by the same protocol peer. Messages belonging to the same procedure shall use the same Transaction ID. The Transaction ID is determined by the initiating peer of a procedure.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transaction ID	M		INTEGER (0..255, ...)	

9.3.1.24 DRX Cycle

The *DRX Cycle* IE is to indicate the desired DRX cycle.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Long DRX Cycle Length	M		ENUMERATED (ms10, ms20, ms32, ms40, ms60, ms64, ms70, ms80, ms128, ms160, ms256, ms320, ms512, ms640, ms1024, ms1280, ms2048, ms2560, ms5120, ms10240, ...)	This IE is defined in TS 38.331 [8]
Short DRX Cycle Length	O		ENUMERATED (ms2, ms3, ms4, ms5, ms6, ms7, ms8, ms10, ms14, ms16, ms20, ms30, ms32, ms35, ms40, ms64, ms80, ms128, ms160, ms256, ms320, ms512, ms640, ...)	This IE is defined in TS 38.331 [8]
Short DRX Cycle Timer	O		INTEGER (1..16)	This IE is defined in TS 38.331 [8]

9.3.1.25 CU to DU RRC Information

This IE contains the RRC Information that are sent from gNB-CU to gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CG-ConfigInfo	O		OCTET STRING	CG-ConfigInfo, as defined in TS 38.331 [8].
UE-CapabilityRAT-ContainerList	O		OCTET STRING	UE-CapabilityRAT-ContainerList, as defined in TS 38.331 [8].
MeasConfig	O		OCTET STRING	MeasConfig, as defined in TS 38.331 (without MeasGapConfig). For EN-DC operation, includes the list of FR2 frequencies for which the gNB-CU requests the gNB-DU to generate gaps. For NG-RAN, includes the list of FR1 and/or FR2 frequencies for which the gNB-CU requests the gNB-DU to generate gaps and the gap type (per-UE or per-FR).
Handover Preparation Information	O		OCTET STRING	HandoverPreparationInformation, as defined in TS 38.331 [8].
CellGroupConfig	O		OCTET STRING	CellGroupConfig, as defined in TS 38.331 [8].
Measurement Timing Configuration	O		OCTET STRING	Contains the <i>MeasurementTimingConfiguration</i> inter-node message defined in TS 38.331 [8]. In EN-DC, it is included when the gaps for FR2 are requested to be configured by the MeNB.

9.3.1.26 DU to CU RRC Information

This IE contains the RRC Information that are sent from the gNB-DU to the gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CellGroupConfig	M		OCTET STRING	CellGroupConfig, as defined in TS 38.331 [8].
MeasGapConfig	O		OCTET STRING	MeasGapConfig as defined in TS 38.331 [8]. For EN-DC operation, includes the gap for FR2, as requested by the gNB-CU via MeasConfig IE. For NG-RAN, includes the gap(s) for FR1 and/or FR2, as requested by the gNB-CU via MeasConfig IE and according to the requested gap type (per-UE or per-FR).
Requested P-MaxFR1	O		OCTET STRING	requestedP-MaxFR1, as defined in TS 38.331 [8]. For EN-DC operation, this IE should be included, as requested by the gNB-CU via CG-ConfigInfo IE.

9.3.1.27 RLC Mode

The *RLC Mode* IE indicates the RLC Mode used for a DRB.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
RLC Mode			ENUMERATED (RLC-AM, RLC-UM-Bidirectional, RLC-UM-Unidirectional-UL, RLC-UM-Unidirectional-DL, ...)	

9.3.1.28 SUL Information

This IE provides information about the SUL carrier.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SUL ARFCN	M		INTEGER (0.. maxNRARFCN)	RF Reference Frequency as defined in TS 38.104 [17] section 5.4.2.1. The frequency provided in this IE identifies the absolute frequency position of the reference resource block (Common RB 0) of the SUL carrier. Its lowest subcarrier is also known as Point A.
SUL Transmission Bandwidth	M		NR Transmission Bandwidth 9.3.1.15	

Range bound	Explanation
maxNRARFCN	Maximum value of NR ARFCNs. Value is 3279165.

9.3.1.29 5GS TAC

This information element is used to identify Tracking Area Code.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
5GS TAC	M		OCTET STRING (SIZE (3))	

9.3.1.29a Configured EPS TAC

This information element is used to identify a configured EPS Tracking Area Code in order to enable application of Roaming and Access Restrictions for EN-DC as specified in TS 37.340 [7]. This IE is configured for the cell, but not broadcast.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Configured EPS TAC	M		OCTET STRING (SIZE (2))	

9.3.1.30 RRC Reconfiguration Complete Indicator

This IE indicates the successful reconfiguration performed in the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RRC Reconfiguration Complete Indicator	M		ENUMERATED (true, ...)	

9.3.1.31 UL Configuration

This IE indicates how the UL scheduling is configured at gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UL UE Configuration	M		ENUMERATED (no-data, shared, only, ..)	Indicates how the UE uses the UL at gNB-DU, for which "no-data" indicates that the UL scheduling is not performed at gNB-DU, "shared" indicates that the UL scheduling is performed at both gNB-DU and another node, and "only" indicates that the UL scheduling is only performed at the gNB-DU.

9.3.1.32 C-RNTI

This IE contains the C-RNTI information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
C-RNTI	M		INTEGER (0..65535, ...)	C-RNTI as defined in TS 38.331 [8].

9.3.1.33 Cell UL Configured

This IE indicates whether the gNB-CU requests the gNB-DU to configure the uplink as no UL, UL, SUL or UL+SUL for the indicated cell for the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell UL Configured	M		ENUMERATED (none, UL, SUL, UL and SUL, ...)	Further details are defined in TS 38.331 [8]

9.3.1.34 RAT-Frequency Priority Information

The RAT-Frequency Priority Information contains either the *Subscriber Profile ID for RAT/Frequency priority* IE or the *Index to RAT/Frequency Selection Priority* IE. These parameters are used to define local configuration for RRM strategies.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE RAT-Frequency Priority Information	M			
>EN-DC				
>>Subscriber Profile ID for RAT/Frequency priority	O		INTEGER (1.. 256, ...)	
>NG-RAN				
>> <i>Index to RAT/Frequency Selection Priority</i>	O		INTEGER (1.. 256, ...)	

9.3.1.35 LCID

This IE uniquely identifies a LCID for the associated SRB or DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LCID	M		INTEGER (1..32, ...)	Corresponds to the <i>LogicalChannelIdentity</i> defined in TS 38.331 [8].

9.3.1.36 Duplication activation

The *Duplication Activation* IE indicates whether UL PDCP Duplication is activated or not.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Duplication Activation	M		ENUMERATED (Active, Inactive, ...)	

9.3.1.37 Slice Support List

This IE indicates the list of supported slices.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Slice Support Item IEs		1..<maxno ofSliceltems>			-	-
>S-NSSAI	M		9.3.1.38		-	

Range bound	Explanation
maxnoofSliceltems	Maximum no. of signalled slice support items. Value is 1024.

9.3.1.38 S-NSSAI

This IE indicates the S-NSSAI.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SST	M		OCTET STRING (SIZE(1))	
SD	O		OCTET STRING (SIZE(3))	

9.3.1.39 UE Identity Index value

This IE is used by the gNB-DU to calculate the Paging Frame.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>UE Identity Index Value</i>	M			
>Length-10				
>>Index Length 10	M		BIT STRING (SIZE(10))	Coded as specified in TS 38.304 [24].

9.3.1.40 Paging DRX

This IE indicates the Paging DRX as defined in TS 38.304 [24].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Paging DRX	M		ENUMERATED(32, 64, 128, 256, ...)	Unit in radio frame.

9.3.1.41 Paging Priority

This IE indicates the paging priority for paging a UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Paging Priority	M		ENUMERATED (PrioLevel1, PrioLevel2, PrioLevel3, PrioLevel4, PrioLevel5, PrioLevel6, PrioLevel7, PrioLevel8, ...)	Lower value codepoint indicates higher priority.

9.3.1.42 gNB-CU System Information

This IE contains the system information encoded by the gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SIB type to Be Updated List		1		
>SIB type to Be Updated Item IEs		1... <maxnoofSIBTypes>		
>>SIB type	M		INTEGER (2..32, ...)	Indicates a certain SIB block, e.g. 2 means sibType2, 3 for sibType3, etc.
>>SIB message	M		OCTET STRING	SIB message containing SIB as defined in TS 38.331 [8].
>>Value Tag	M		INTEGER (0..31)	

Range bound	Explanation
maxnoofSIBTypes	Maximum no. of SIB types, the maximum value is 32.

9.3.1.43 RAN UE Paging identity

This IE indicates the RAN UE Paging identity.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
I-RNTI	M		BIT STRING (SIZE(40))	

9.3.1.44 CN UE Paging Identity

The 5G-S-TMSI is used as UE identifier for CN paging.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>CN UE paging identity</i>	M			
>5G-S-TMSI				
>>5G-S-TMSI	M		BIT STRING (SIZE(48))	Details defined in TS 38.413 [3]

9.3.1.45 QoS Flow Level QoS Parameters

This IE defines the QoS to be applied to a QoS flow or to a DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE <i>QoS Characteristics</i>	M				YES	reject
> <i>Non-dynamic 5QI</i>					-	
>>Non Dynamic 5QI Descriptor	M		9.3.1.49		-	
> <i>Dynamic 5QI</i>					-	
>>Dynamic 5QI Descriptor	M		9.3.1.47		-	
NG-RAN Allocation and Retention Priority	M		9.3.1.48		-	
GBR QoS Flow Information	O		9.3.1.46	This IE shall be present for GBR QoS Flows only.	-	
Reflective QoS Attribute	O		ENUMERATED (subject to, ...)	Details in TS 23.501 [21]. This IE applies to non-GBR flows only and shall be ignored otherwise.	-	
PDU Session ID	O		INTEGER (0 ..255)	As specified in TS 23.501 [21].	-	
UL PDU Session Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.22	The gNB-DU PDU session Aggregate Maximum Bit Rate Uplink which is to be enforced by the gNB-DU	-	

9.3.1.46 GBR QoS Flow Information

This IE indicates QoS parameters for a GBR QoS flow or GBR bearer for downlink and uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Maximum Flow Bit Rate Downlink	M		Bit Rate 9.3.1.22	Maximum Bit Rate in DL. Details in TS 23.501 [21].	-	-
Maximum Flow Bit Rate Uplink	M		Bit Rate 9.3.1.22	Maximum Bit Rate in UL. Details in TS 23.501 [21].	-	-
Guaranteed Flow Bit Rate Downlink	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate (provided there is data to deliver) in DL. Details in TS 23.501 [21].	-	-
Guaranteed Flow Bit Rate Uplink	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate (provided there is data to deliver). Details in TS 23.501 [21].	-	-
Maximum Packet Loss Rate Downlink	O		Maximum Packet Loss Rate 9.3.1.50	Indicates the maximum rate for lost packets that can be tolerated in the downlink direction. Details in TS 23.501 [21].	-	-
Maximum Packet Loss Rate Uplink	O		Maximum Packet Loss Rate 9.3.1.50	Indicates the maximum rate for lost packets that can be tolerated in the uplink direction. Details in TS 23.501 [21].	-	-

9.3.1.47 Dynamic 5QI Descriptor

This IE indicates the QoS Characteristics for a Non-standardised or not pre-configured 5QI for downlink and uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Priority Level	M		INTEGER (1..127)	For details see TS 23.501 [21].
Packet Delay Budget	M		9.3.1.51	For details see TS 23.501 [21].
Packet Error Rate	M		9.3.1.52	For details see TS 23.501 [21].
5QI	O		INTEGER (0..255,...)	This IE contains the dynamically assigned 5QI as specified in TS 23.501 [21].
Delay Critical	C- ifGBRflow		ENUMERATED (delay critical, non-delay critical)	For details see TS 23.501 [21].
Averaging Window	C- ifGBRflow		9.3.1.53	For details see TS 23.501 [21].
Maximum Data Burst Volume	O		9.3.1.54	For details see TS 23.501 [21]. This IE shall be included if the <i>Delay Critical</i> IE is set to "delay critical" and shall be ignored otherwise.

Condition	Explanation
ifGBRflow	This IE shall be present if the <i>GBR QoS Flow Information</i> IE is present in the <i>QoS Flow Level QoS Parameters</i> IE.

9.3.1.48 NG-RAN Allocation and Retention Priority

This IE specifies the relative importance of a QoS flow or a DRB compared to other QoS flows or DRBs for allocation and retention of NG-RAN resources.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NG-RAN Allocation and Retention Priority				
>Priority Level	M		INTEGER (1..15)	Desc.: This IE defines the relative importance of a resource request (see TS 23.501 [21]). Usage: Values are ordered in decreasing order of priority, i.e., with 1 as the highest priority and 15 as the lowest priority. Further usage is defined in TS 23.501 [21].
>Pre-emption Capability	M		ENUMERATED (shall not trigger pre-emption, may trigger pre-emption)	Desc.: This IE indicates the pre-emption capability of the request on other QoS flows. Usage: The QoS flow shall not pre-empt other QoS flows or, the QoS flow may pre-empt other QoS flows. The Pre-emption Capability indicator applies to the allocation of resources for a QoS flow and as such it provides the trigger to the pre-emption procedures/processes of the NG-RAN node.
>Pre-emption Vulnerability	M		ENUMERATED (not pre-emptable, pre-emptable)	Desc.: This IE indicates the vulnerability of the QoS flow to pre-emption of other QoS flows. Usage: The QoS flow shall not be pre-empted by other QoS flows or the QoS flow may be pre-empted by other QoS flows. The Pre-emption Vulnerability indicator applies for the entire duration of the QoS flow, unless modified and as such indicates whether the QoS flow is a target of the pre-emption procedures/processes of the NG-RAN node.

9.3.1.49 Non Dynamic 5QI Descriptor

This IE indicates the QoS Characteristics for a standardized or pre-configured 5QI for downlink and uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
5QI	M		INTEGER (0..255,...)	This IE contains the standardized or pre-configured 5QI as specified in TS 23.501 [21]
Priority Level	O		INTEGER (1..127)	For details see TS 23.501 [21]. When included overrides standardized or pre-configured value.
Averaging Window	O		9.3.1.53	This IE applies to GBR QoS Flows only. For details see TS 23.501 [21]. When included overrides standardized or pre-configured value.
Maximum Data Burst Volume	O		9.3.1.54	For details see TS 23.501 [21]. When included overrides standardized or pre-configured value. If the 5QI refers to a non-delay critical QoS flow the IE shall be ignored.

9.3.1.50 Maximum Packet Loss Rate

This IE indicates the Maximum Packet Loss Rate.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Maximum Packet Loss Rate	M		INTEGER(0..1000)	Ratio of lost packets per number of packets sent, expressed in tenth of percent.

9.3.1.51 Packet Delay Budget

This IE indicates the Packet Delay Budget for a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Packet Delay Budget	M		INTEGER (0..1023, ...)	Upper bound value for the delay that a packet may experience expressed in unit of 0.5ms.

9.3.1.52 Packet Error Rate

This IE indicates the Packet Error Rate for a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Scalar	M		INTEGER (0..9, ...)	The packet error rate is expressed as Scalar x 10-k where k is the Exponent.
Exponent	M		INTEGER (0..9, ...)	

9.3.1.53 Averaging Window

This IE indicates the Averaging Window for a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Averaging Window	M		INTEGER (0..4095, ...)	Unit: ms. The default value is 2000ms.

9.3.1.54 Maximum Data Burst Volume

This IE indicates the Maximum Data Burst Volume for a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Maximum Data Burst Volume	M		INTEGER (0..4095, ...)	Unit: byte.

9.3.1.55 Masked IMEISV

This information element contains the IMEISV value with a mask, to identify a terminal model without identifying an individual Mobile Equipment.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Masked IMEISV	M		BIT STRING (SIZE (64))	Coded as the International Mobile station Equipment Identity and Software Version Number (IMEISV) defined in TS 23.003 [23] with the last 4 digits of the SNR masked by setting the corresponding bits to 1. The first to fourth bits correspond to the first digit of the IMEISV, the fifth to eighth bits correspond to the second digit of the IMEISV, and so on.

9.3.1.56 Notification Control

The *Notification Control* IE indicates whether the notification control for a given DRB is active or not-active. If the notification control is set to active, the gNB-DU shall, if supported, monitor the QoS of the DRB and notify the gNB-CU.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Notification Control	M		ENUMERATED(Active, Not-Active, ...)	

9.3.1.57 RAN Area Code

This information element is used to uniquely identify a RAN Area Code.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RANAC	M		INTEGER (0..255)	RAN Area Code

9.3.1.58 PWS System Information

This IE contains the system information used for public warning.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SI message	M		OCTET STRING	SI message containing only the SIBs for public warning, as defined in TS 38.331 [8]. This IE may be re-defined.

9.3.1.59 Repetition Period

This IE indicates the periodicity of the warning message to be broadcast.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Repetition Period	M		INTEGER (0..2 ¹⁷ -1)	The unit of value 1 to 2 ¹⁷ -1 is [second].

9.3.1.60 Number of Broadcasts Requested

This IE indicates the number of times a message is to be broadcast.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Number of Broadcasts Requested	M		INTEGER (0..65535)	

9.3.1.61 Void

9.3.1.62 SIType List

This IE is used by gNB-CU to provide SI list of other SI for gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SI type item IEs		1.. <maxnoofSI Types>		
>SI Type	M		INTEGER (1..32, ...)	Indicates a certain SI type required to be broadcasted by the gNB-DU.

Range bound	Explanation
maxnoofSITypes	Maximum no. of SI types, the maximum value is 32.

9.3.1.63 QoS Flow Indicator

This IE identifies a QoS Flow within a PDU Session. The definition and use of the QoS Flow Indicator is specified in TS 23.501 [21].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Indicator	M		INTEGER (0 ..63)	

9.3.1.64 Served E-UTRA Cell Information

This IE contains served cell information of an E-UTRA cell for spectrum sharing between E-UTRA and NR.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE <i>EUTRA-Mode-Info</i>	M				–	–
> <i>FDD</i>						
>> FDD Info		1			–	–
>>>UL Offset to Point A	M		INTEGER (0..2199,...)	Indicates the offset to the center of the NR carrier for UL.	–	–
>>>DL Offset to Point A	M		INTEGER (0..2199,...)	Indicates the offset to the center of the NR carrier for DL.	–	–
> <i>TDD</i>					–	–
>> TDD Info		1			–	–
>>>Offset to Point A	M		INTEGER (0..2199,...)	Indicates the offset to the center of the NR carrier.	–	–
Protected E-UTRA Resource Indication	O		OCTET STRING	Indicates the Protected E-UTRA Resource Indication as defined in subclause 9.2.125 of TS 36.423 [9].	YES	ignore

9.3.1.65 Available PLMN List

This IE indicates the list of available PLMN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Available PLMN Item IEs		1..<maxnoofB PLMNs >			-	-
>PLMN Identity	M		9.3.1.14		-	

Range bound	Explanation
maxnoofBPLMNs	Maximum no. of Broadcast PLMN Ids. Value is 6.

9.3.1.66 RLC Failure Indication

This IE indicates the LCID associated with the RLC entity needing re-establishment.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Associated LCID	M		9.3.1.35	

9.3.1.67 Uplink TxDirectCurrentList Information

This IE contains the Uplink TxDirectCurrentList information that is configured by the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Uplink TxDirectCurrentList Information	M		OCTET STRING	<i>UplinkTxDirectCurrentList</i> as defined in TS 38.331 [8].

9.3.1.68 Cell Status

This IE indicates the status of a cell served by the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell State	M		ENUMERATED (Active, Inactive, ...)	Indicates the state of the cell. Active and Inactive cell states are defined in TS 38.401 [4]. The gNB-CU shall not activate a cell that is reported Inactive using this IE.
Switching Off Ongoing	O		ENUMERATED (True, ...)	This IE indicates that the gNB-DU will delete the cell after some time using a new gNB-DU Configuration Update procedure. When this IE is set to "True" the <i>Cell State</i> IE shall be set to "Active".

9.3.1.69 RLC Status

This IE indicates about the RLC configuration change included in the container towards the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Reestablishment Indication	O		ENUMERATED (reestablished, ...)	Indicates that following a change in the radio status, the RLC has been re-established.

9.3.1.70 RRC Version

This information element is used to identify RRC version corresponding to TS 38.331 [8].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Latest RRC Version	M		OCTET STRING (SIZE (3))	Latest supported RRC version in the release corresponding to TS 38.331 [8]. For a 3GPP specification version x.y.z, x is encoded by the leftmost byte, y by the middle byte, and z by the rightmost byte.

9.3.2 Transport Network Layer Related IEs

9.3.2.1 UP Transport Layer Information

The *UP Transport Layer Information* IE identifies an F1 transport bearer associated to a DRB. It contains a Transport Layer Address and a GTP Tunnel Endpoint Identifier. The Transport Layer Address is an IP address to be used for the F1 user plane transport. The GTP Tunnel Endpoint Identifier is to be used for the user plane transport between gNB-CU and gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>Transport Layer Information</i>	M			
> <i>GTP Tunnel</i>				
>>Transport Layer Address	M		9.3.2.3	
>>GTP-TEID	M		9.3.2.2	

9.3.2.2 GTP-TEID

The *GTP-TEID* IE is the GTP Tunnel Endpoint Identifier to be used for the user plane transport between the gNB-CU and gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
GTP-TEID	M		OCTET STRING (SIZE(4))	For details and range, see TS 29.281 [18].

9.3.2.3 Transport Layer Address

This *Transport Layer Address* IE is an IP address.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transport Layer Address	M		BIT STRING (SIZE(1..160, ...))	The Radio Network Layer is not supposed to interpret the address information. It should pass it to the Transport Layer for interpretation. For details, see TS 38.414 [19].

9.3.2.4 CP Transport Layer Information

This IE is used to provide the NG control plane transport layer information associated with an NG-RAN node – AMF pair.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>CP Transport Layer Information</i>				
> <i>Endpoint-IP-address</i>				
>> Endpoint IP address	M		Transport Layer Address 9.3.2.3	

9.4 Message and Information Element Abstract Syntax (with ASN.1)

9.4.1 General

F1AP ASN.1 definition conforms to ITU-T Recommendation X.691 [5], ITU-T Recommendation X.680 [12] and ITU-T Recommendation X.681 [13].

The ASN.1 definition specifies the structure and content of F1AP messages. F1AP messages can contain any IEs specified in the object set definitions for that message without the order or number of occurrence being restricted by ASN.1. However, for this version of the standard, a sending entity shall construct an F1AP message according to the PDU definitions module and with the following additional rules:

- IEs shall be ordered (in an IE container) in the order they appear in object set definitions.

- Object set definitions specify how many times IEs may appear. An IE shall appear exactly once if the presence field in an object has value "mandatory". An IE may appear at most once if the presence field in an object has value "optional" or "conditional". If in a tabular format there is multiplicity specified for an IE (i.e., an IE list) then in the corresponding ASN.1 definition the list definition is separated into two parts. The first part defines an IE container list where the list elements reside. The second part defines list elements. The IE container list appears as an IE of its own. For this version of the standard an IE container list may contain only one kind of list elements.

NOTE: In the above "IE" means an IE in the object set with an explicit ID. If one IE needs to appear more than once in one object set, then the different occurrences will have different IE IDs.

If an F1AP message that is not constructed as defined above is received, this shall be considered as Abstract Syntax Error, and the message shall be handled as defined for Abstract Syntax Error in clause 10.

9.4.2 Usage of private message mechanism for non-standard use

The private message mechanism for non-standard use may be used:

- for special operator- (and/or vendor) specific features considered not to be part of the basic functionality, i.e., the functionality required for a complete and high-quality specification in order to guarantee multivendor interoperability;
- by vendors for research purposes, e.g., to implement and evaluate new algorithms/features before such features are proposed for standardisation.

The private message mechanism shall not be used for basic functionality. Such functionality shall be standardised.

9.4.3 Elementary Procedure Definitions

```
-- *****
--
-- Elementary Procedure definitions
--
-- *****

FLAP-PDU-Descriptions {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) flap (3) version1 (1) flap-PDU-Descriptions (0)}

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- IE parameter types from other modules.
--
-- *****

IMPORTS
    Criticality,
    ProcedureCode

FROM FlAP-CommonDataTypes
    Reset,
    ResetAcknowledge,
    FlSetupRequest,
    FlSetupResponse,
    FlSetupFailure,
    GNBDCUConfigurationUpdate,
    GNBDCUConfigurationUpdateAcknowledge,
    GNBDCUConfigurationUpdateFailure,
    GNBDCUConfigurationUpdate,
    GNBDCUConfigurationUpdateAcknowledge,
    GNBDCUConfigurationUpdateFailure,
    UEContextSetupRequest,
    UEContextSetupResponse,
    UEContextSetupFailure,
    UEContextReleaseCommand,
    UEContextReleaseComplete,
    UEContextModificationRequest,
    UEContextModificationResponse,
    UEContextModificationFailure,
    UEContextModificationRequired,
    UEContextModificationConfirm,
    ErrorIndication,
    UEContextReleaseRequest,
    DLRRCCMessageTransfer,
    ULRRCCMessageTransfer,
    GNBDCUResourceCoordinationRequest,
```

```
GNBDUResourceCoordinationResponse,
PrivateMessage,
UEInactivityNotification,
InitialULRRCCMessageTransfer,
SystemInformationDeliveryCommand,
Paging,
Notify,
WriteReplaceWarningRequest,
WriteReplaceWarningResponse,
PWSCancelRequest,
PWSCancelResponse,
PWSRestartIndication,
PWSFailureIndication,
GNBDUStatusIndication

FROM FlAP-PDU-Contents
  id-Reset,
  id-FlSetup,
  id-gNBDCUConfigurationUpdate,
  id-gNBCUCUConfigurationUpdate,
  id-UEContextSetup,
  id-UEContextRelease,
  id-UEContextModification,
  id-UEContextModificationRequired,
  id-ErrorIndication,
  id-UEContextReleaseRequest,
  id-DLRRCCMessageTransfer,
  id-ULRRCCMessageTransfer,
  id-GNBDUResourceCoordination,
  id-privateMessage,
  id-UEInactivityNotification,
  id-InitialULRRCCMessageTransfer,
  id-SystemInformationDeliveryCommand,
  id-Paging,
  id-Notify,
  id-WriteReplaceWarning,
  id-PWSCancel,
  id-PWSRestartIndication,
  id-PWSFailureIndication,
  id-GNBDUStatusIndication

FROM FlAP-Constants

  ProtocolIE-SingleContainer{},
  FlAP-PROTOCOL-IES

FROM FlAP-Containers;

-- *****
--
-- Interface Elementary Procedure Class
--
```

```

-- *****
FlAP-ELEMENTARY-PROCEDURE ::= CLASS {
    &InitiatingMessage          ,
    &SuccessfulOutcome          OPTIONAL,
    &UnsuccessfulOutcome        OPTIONAL,
    &procedureCode              ProcedureCode UNIQUE,
    &criticality                 Criticality   DEFAULT ignore
}
WITH SYNTAX {
    INITIATING MESSAGE          &InitiatingMessage
    [SUCCESSFUL OUTCOME        &SuccessfulOutcome]
    [UNSUCCESSFUL OUTCOME      &UnsuccessfulOutcome]
    PROCEDURE CODE             &procedureCode
    [CRITICALITY               &criticality]
}
-- *****
--
-- Interface PDU Definition
--
-- *****

FlAP-PDU ::= CHOICE {
    initiatingMessage    InitiatingMessage,
    successfulOutcome    SuccessfulOutcome,
    unsuccessfulOutcome  UnsuccessfulOutcome,
    choice-extension     ProtocolIE-SingleContainer { { FlAP-PDU-ExtIEs } }
}

FlAP-PDU-ExtIEs FlAP-PROTOCOL-IES ::= {
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode    FlAP-ELEMENTARY-PROCEDURE.&procedureCode    ( { FlAP-ELEMENTARY-PROCEDURES } ),
    criticality      FlAP-ELEMENTARY-PROCEDURE.&criticality      ( { FlAP-ELEMENTARY-PROCEDURES } { @procedureCode } ),
    value           FlAP-ELEMENTARY-PROCEDURE.&InitiatingMessage ( { FlAP-ELEMENTARY-PROCEDURES } { @procedureCode } )
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode    FlAP-ELEMENTARY-PROCEDURE.&procedureCode    ( { FlAP-ELEMENTARY-PROCEDURES } ),
    criticality      FlAP-ELEMENTARY-PROCEDURE.&criticality      ( { FlAP-ELEMENTARY-PROCEDURES } { @procedureCode } ),
    value           FlAP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome ( { FlAP-ELEMENTARY-PROCEDURES } { @procedureCode } )
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode    FlAP-ELEMENTARY-PROCEDURE.&procedureCode    ( { FlAP-ELEMENTARY-PROCEDURES } ),
    criticality      FlAP-ELEMENTARY-PROCEDURE.&criticality      ( { FlAP-ELEMENTARY-PROCEDURES } { @procedureCode } ),
    value           FlAP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome ( { FlAP-ELEMENTARY-PROCEDURES } { @procedureCode } )
}
-- *****
--

```



```

-- Interface Elementary Procedure List
--
-- *****

FLAP-ELEMENTARY-PROCEDURES FLAP-ELEMENTARY-PROCEDURE ::= {
    FLAP-ELEMENTARY-PROCEDURES-CLASS-1 |
    FLAP-ELEMENTARY-PROCEDURES-CLASS-2,
    ...
}

FLAP-ELEMENTARY-PROCEDURES-CLASS-1 FLAP-ELEMENTARY-PROCEDURE ::= {
    reset |
    flSetup |
    gNBDUConfigurationUpdate |
    gNBCUConfigurationUpdate |
    uEContextSetup |
    uEContextRelease |
    uEContextModification |
    uEContextModificationRequired |
    writeReplaceWarning |
    pWSCancel |
    gNBDUResourceCoordination |
    ...}

FLAP-ELEMENTARY-PROCEDURES-CLASS-2 FLAP-ELEMENTARY-PROCEDURE ::= {
    errorIndication |
    uEContextReleaseRequest |
    dLRRCMessagesTransfer |
    uLRRCMessagesTransfer |
    uEInactivityNotification |
    privateMessage |
    initialULRRCMessagesTransfer |
    systemInformationDelivery |
    paging |
    notify |
    pWSRestartIndication |
    pWSFailureIndication |
    gNBDUStatusIndication |
    ...
}
-- *****
--
-- Interface Elementary Procedures
--
-- *****

reset FLAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      Reset
    SUCCESSFUL OUTCOME      ResetAcknowledge
    PROCEDURE CODE          id-Reset
    CRITICALITY             reject
}

```

```
f1Setup FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      F1SetupRequest
  SUCCESSFUL OUTCOME      F1SetupResponse
  UNSUCCESSFUL OUTCOME   OUTCOME F1SetupFailure
  PROCEDURE CODE          id-F1Setup
  CRITICALITY             reject
}

gNBDCUConfigurationUpdate FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      GNBDCUConfigurationUpdate
  SUCCESSFUL OUTCOME      GNBDCUConfigurationUpdateAcknowledge
  UNSUCCESSFUL OUTCOME   GNBDCUConfigurationUpdateFailure
  PROCEDURE CODE          id-gNBDCUConfigurationUpdate
  CRITICALITY             reject
}

gNBCUCUConfigurationUpdate FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      GNBCUCUConfigurationUpdate
  SUCCESSFUL OUTCOME      GNBCUCUConfigurationUpdateAcknowledge
  UNSUCCESSFUL OUTCOME   GNBCUCUConfigurationUpdateFailure
  PROCEDURE CODE          id-gNBCUCUConfigurationUpdate
  CRITICALITY             reject
}

ueContextSetup FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      UEContextSetupRequest
  SUCCESSFUL OUTCOME      UEContextSetupResponse
  UNSUCCESSFUL OUTCOME   UEContextSetupFailure
  PROCEDURE CODE          id-UEContextSetup
  CRITICALITY             reject
}

ueContextRelease FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      UEContextReleaseCommand
  SUCCESSFUL OUTCOME      UEContextReleaseComplete
  PROCEDURE CODE          id-UEContextRelease
  CRITICALITY             reject
}

ueContextModification FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      UEContextModificationRequest
  SUCCESSFUL OUTCOME      UEContextModificationResponse
  UNSUCCESSFUL OUTCOME   UEContextModificationFailure
  PROCEDURE CODE          id-UEContextModification
  CRITICALITY             reject
}

ueContextModificationRequired FLAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      UEContextModificationRequired
  SUCCESSFUL OUTCOME      UEContextModificationConfirm
  PROCEDURE CODE          id-UEContextModificationRequired
  CRITICALITY             reject
}
```

```
writeReplaceWarning FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      WriteReplaceWarningRequest
  SUCCESSFUL OUTCOME      WriteReplaceWarningResponse
  PROCEDURE CODE          id-WriteReplaceWarning
  CRITICALITY             reject
}

PWSCancel FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      PWSCancelRequest
  SUCCESSFUL OUTCOME      PWSCancelResponse
  PROCEDURE CODE          id-PWSCancel
  CRITICALITY             reject
}

errorIndication FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      ErrorIndication
  PROCEDURE CODE          id-ErrorIndication
  CRITICALITY             ignore
}

UEContextReleaseRequest FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      UEContextReleaseRequest
  PROCEDURE CODE          id-UEContextReleaseRequest
  CRITICALITY             ignore
}

initialULRRCTestMessageTransfer FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      InitialULRRCTestMessageTransfer
  PROCEDURE CODE          id-InitialULRRCTestMessageTransfer
  CRITICALITY             ignore
}

DLRRCTestMessageTransfer FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      DLRRCTestMessageTransfer
  PROCEDURE CODE          id-DLRRCTestMessageTransfer
  CRITICALITY             ignore
}

ULRRCTestMessageTransfer FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      ULRRCTestMessageTransfer
  PROCEDURE CODE          id-ULRRCTestMessageTransfer
  CRITICALITY             ignore
}

UEInactivityNotification FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      UEInactivityNotification
  PROCEDURE CODE          id-UEInactivityNotification
  CRITICALITY             ignore
}

GNBDRResourceCoordination FlAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      GNBDRResourceCoordinationRequest
```

```
    SUCCESSFUL OUTCOME      GNBDUResourceCoordinationResponse
    PROCEDURE CODE          id-GNBDUResourceCoordination
    CRITICALITY              reject
}

privateMessage FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PrivateMessage
    PROCEDURE CODE          id-privateMessage
    CRITICALITY              ignore
}

systemInformationDelivery FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      SystemInformationDeliveryCommand
    PROCEDURE CODE          id-SystemInformationDeliveryCommand
    CRITICALITY              ignore
}

paging FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      Paging
    PROCEDURE CODE          id-Paging
    CRITICALITY              ignore
}

notify FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      Notify
    PROCEDURE CODE          id-Notify
    CRITICALITY              ignore
}

pWSRestartIndication FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PWSRestartIndication
    PROCEDURE CODE          id-PWSRestartIndication
    CRITICALITY              ignore
}

pWSFailureIndication FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PWSFailureIndication
    PROCEDURE CODE          id-PWSFailureIndication
    CRITICALITY              ignore
}

gNBDUStatusIndication FlAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNBDUStatusIndication
    PROCEDURE CODE          id-GNBDUStatusIndication
    CRITICALITY              ignore
}

END
```

9.4.4 PDU Definitions

```
-- *****
--
-- PDU definitions for FLAP.
--
-- *****

FLAP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) flap (3) version1 (1) flap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- IE parameter types from other modules.
--
-- *****

IMPORTS
    Candidate-SpCell-Item,
    Cause,
    Cells-Failed-to-be-Activated-List-Item,
    Cells-Status-Item,
    Cells-to-be-Activated-List-Item,
    Cells-to-be-Deactivated-List-Item,
    CellULConfigured,
    CriticalityDiagnostics,
    C-RNTI,
    CUtoDURRCInformation,
    DRB-Activity-Item,
    DRBID,
    DRBs-FailedToBeModified-Item,
    DRBs-FailedToBeSetup-Item,
    DRBs-FailedToBeSetupMod-Item,
    DRB-Notify-Item,
    DRBs-ModifiedConf-Item,
    DRBs-Modified-Item,
    DRBs-Required-ToBeModified-Item,
    DRBs-Required-ToBeReleased-Item,
    DRBs-Setup-Item,
    DRBs-SetupMod-Item,
    DRBs-ToBeModified-Item,
    DRBs-ToBeReleased-Item,
    DRBs-ToBeSetup-Item,
    DRBs-ToBeSetupMod-Item,
    DRXCycle,
    DRXConfigurationIndicator,
    DUtoCURRCInformation,
    EUTRANQoS,
```

ExecuteDuplication,
FullConfiguration,
GNB-CU-UE-FlAP-ID,
GNB-DU-UE-FlAP-ID,
GNB-DU-ID,
GNB-DU-Served-Cells-Item,
GNB-DU-System-Information,
GNB-CU-Name,
GNB-DU-Name,
InactivityMonitoringRequest,
InactivityMonitoringResponse,
NotificationControl,
NR CGI,
NR PCI,
Potential-SpCell-Item,
RAT-FrequencyPriorityInformation,
ResourceCoordinationTransferContainer,
RRCContainer,
RRCRConfigurationCompleteIndicator,
SCellIndex,
SCell-ToBeRemoved-Item,
SCell-ToBeSetup-Item,
SCell-ToBeSetupMod-Item,
SCell-FailedtoSetup-Item,
SCell-FailedtoSetupMod-Item,
ServCellIndex,
Served-Cell-Information,
Served-Cells-To-Add-Item,
Served-Cells-To-Delete-Item,
Served-Cells-To-Modify-Item,
SRBID,
SRBs-FailedToBeSetup-Item,
SRBs-FailedToBeSetupMod-Item,
SRBs-Required-ToBeReleased-Item,
SRBs-ToBeReleased-Item,
SRBs-ToBeSetup-Item,
SRBs-ToBeSetupMod-Item,
TimeToWait,
TransactionID,
TransmissionStopIndicator,
UE-associatedLogicalFl-ConnectionItem,
DUtoCURRCCContainer,
PagingCell-Item,
SItype-List,
UEIdentityIndexValue,
GNB-CU-TNL-Association-Setup-Item,
GNB-CU-TNL-Association-Failed-To-Setup-Item,
GNB-CU-TNL-Association-To-Add-Item,
GNB-CU-TNL-Association-To-Remove-Item,
GNB-CU-TNL-Association-To-Update-Item,
MaskedIMEISV,
PagingDRX,
PagingPriority,
PagingIdentity,

Cells-to-be-Barred-Item,
PWSSystemInformation,
Broadcast-To-Be-Cancelled-Item,
Cells-Broadcast-Cancelled-Item,
NR-CGI-List-For-Restart-Item,
PWS-Failed-NR-CGI-Item,
RepetitionPeriod,
NumberOfBroadcastRequest,
Cells-To-Be-Broadcast-Item,
Cells-Broadcast-Completed-Item,
Cancel-all-Warning-Messages-Indicator,
EUTRA-NR-CellResourceCoordinationReq-Container,
EUTRA-NR-CellResourceCoordinationReqAck-Container,
RequestType,
PLMN-Identity,
RLCFailureIndication,
UplinkTxDirectCurrentListInformation,
SULAccessIndication,
Protected-EUTRA-Resources-Item,
GNB-DUConfigurationQuery,
BitRate,
RRC-Version,
GNBDUOverloadInformation

FROM FlAP-IEs

PrivateIE-Container{ },
ProtocolExtensionContainer{ },
ProtocolIE-Container{ },
ProtocolIE-ContainerPair{ },
ProtocolIE-SingleContainer{ },
FlAP-PRIVATE-IES,
FlAP-PROTOCOL-EXTENSION,
FlAP-PROTOCOL-IES,
FlAP-PROTOCOL-IES-PAIR

FROM FlAP-Containers

id-Candidate-SpCell-Item,
id-Candidate-SpCell-List,
id-Cause,
id-Cancel-all-Warning-Messages-Indicator,
id-Cells-Failed-to-be-Activated-List,
id-Cells-Failed-to-be-Activated-List-Item,
id-Cells-Status-Item,
id-Cells-Status-List,
id-Cells-to-be-Activated-List,
id-Cells-to-be-Activated-List-Item,
id-Cells-to-be-Deactivated-List,
id-Cells-to-be-Deactivated-List-Item,
id-ConfirmedUEID,
id-CriticalityDiagnostics,
id-C-RNTI,
id-CUtoDURRCInformation,

id-DRB-Activity-Item,
id-DRB-Activity-List,
id-DRBs-FailedToBeModified-Item,
id-DRBs-FailedToBeModified-List,
id-DRBs-FailedToBeSetup-Item,
id-DRBs-FailedToBeSetup-List,
id-DRBs-FailedToBeSetupMod-Item,
id-DRBs-FailedToBeSetupMod-List,
id-DRBs-ModifiedConf-Item,
id-DRBs-ModifiedConf-List,
id-DRBs-Modified-Item,
id-DRBs-Modified-List,
id-DRB-Notify-Item,
id-DRB-Notify-List,
id-DRBs-Required-ToBeModified-Item,
id-DRBs-Required-ToBeModified-List,
id-DRBs-Required-ToBeReleased-Item,
id-DRBs-Required-ToBeReleased-List,
id-DRBs-Setup-Item,
id-DRBs-Setup-List,
id-DRBs-SetupMod-Item,
id-DRBs-SetupMod-List,
id-DRBs-ToBeModified-Item,
id-DRBs-ToBeModified-List,
id-DRBs-ToBeReleased-Item,
id-DRBs-ToBeReleased-List,
id-DRBs-ToBeSetup-Item,
id-DRBs-ToBeSetup-List,
id-DRBs-ToBeSetupMod-Item,
id-DRBs-ToBeSetupMod-List,
id-DRXCycle,
id-DUtoCURRCInformation,
id-ExecuteDuplication,
id-FullConfiguration,
id-gNB-CU-UE-FlAP-ID,
id-gNB-DU-UE-FlAP-ID,
id-gNB-DU-ID,
id-gNB-DU-Served-Cells-Item,
id-gNB-DU-Served-Cells-List,
id-gNB-CU-Name,
id-gNB-DU-Name,
id-InactivityMonitoringRequest,
id-InactivityMonitoringResponse,
id-oldgNB-DU-UE-FlAP-ID,
id-Potential-SpCell-Item,
id-Potential-SpCell-List,
id-RAT-FrequencyPriorityInformation,
id-ResetType,
id-ResourceCoordinationTransferContainer,
id-RRContainer,
id-RRRconfigurationCompleteIndicator,
id-SCell-FailedtoSetup-List,
id-SCell-FailedtoSetup-Item,
id-SCell-FailedtoSetupMod-List,

id-SCell-FailedtoSetupMod-Item,
id-SCell-ToBeRemoved-Item,
id-SCell-ToBeRemoved-List,
id-SCell-ToBeSetup-Item,
id-SCell-ToBeSetup-List,
id-SCell-ToBeSetupMod-Item,
id-SCell-ToBeSetupMod-List,
id-Served-Cells-To-Add-Item,
id-Served-Cells-To-Add-List,
id-Served-Cells-To-Delete-Item,
id-Served-Cells-To-Delete-List,
id-Served-Cells-To-Modify-Item,
id-Served-Cells-To-Modify-List,
id-ServCellIndex,
id-SpCell-ID,
id-SpCellULConfigured,
id-SRBID,
id-SRBs-FailedToBeSetup-Item,
id-SRBs-FailedToBeSetup-List,
id-SRBs-FailedToBeSetupMod-Item,
id-SRBs-FailedToBeSetupMod-List,
id-SRBs-Required-ToBeReleased-Item,
id-SRBs-Required-ToBeReleased-List,
id-SRBs-ToBeReleased-Item,
id-SRBs-ToBeReleased-List,
id-SRBs-ToBeSetup-Item,
id-SRBs-ToBeSetup-List,
id-SRBs-ToBeSetupMod-Item,
id-SRBs-ToBeSetupMod-List,
id-TimeToWait,
id-TransactionID,
id-TransmissionStopIndicator,
id-UE-associatedLogicalFl1-ConnectionItem,
id-UE-associatedLogicalFl1-ConnectionListResAck,
id-DUtoCURRCCContainer,
id-NR CGI,
id-PagingCell-Item,
id-PagingCell-List,
id-PagingDRX,
id-PagingPriority,
id-SItype-List,
id-UEIdentityIndexValue,
id-GNB-CU-TNL-Association-Setup-List,
id-GNB-CU-TNL-Association-Setup-Item,
id-GNB-CU-TNL-Association-Failed-To-Setup-List,
id-GNB-CU-TNL-Association-Failed-To-Setup-Item,
id-GNB-CU-TNL-Association-To-Add-Item,
id-GNB-CU-TNL-Association-To-Add-List,
id-GNB-CU-TNL-Association-To-Remove-Item,
id-GNB-CU-TNL-Association-To-Remove-List,
id-GNB-CU-TNL-Association-To-Update-Item,
id-GNB-CU-TNL-Association-To-Update-List,
id-MaskedIMEISV,
id-PagingIdentity,

```

id-Cells-to-be-Barred-List,
id-Cells-to-be-Barred-Item,
id-PWSSystemInformation,
id-RepetitionPeriod,
id-NumberOfBroadcastRequest,
id-Cells-To-Be-Broadcast-List,
id-Cells-To-Be-Broadcast-Item,
id-Cells-Broadcast-Completed-List,
id-Cells-Broadcast-Completed-Item,
id-Broadcast-To-Be-Cancelled-List,
id-Broadcast-To-Be-Cancelled-Item,
id-Cells-Broadcast-Cancelled-List,
id-Cells-Broadcast-Cancelled-Item,
id-NR-CGI-List-For-Restart-List,
id-NR-CGI-List-For-Restart-Item,
id-PWS-Failed-NR-CGI-List,
id-PWS-Failed-NR-CGI-Item,
id-EUTRA-NR-CellResourceCoordinationReq-Container,
id-EUTRA-NR-CellResourceCoordinationReqAck-Container,
id-Protected-EUTRA-Resources-List,
id-RequestType,
id-ServingPLMN,
id-DRXConfigurationIndicator,
id-RLCFailureIndication,
id-UplinkTxDirectCurrentListInformation,
id-SULAccessIndication,
id-Protected-EUTRA-Resources-Item,
id-GNB-DUConfigurationQuery,
id-GNB-DU-UE-AMBR-UL,
id-GNB-CU-RRC-Version,
id-GNB-DU-RRC-Version,
id-GNBDUOverloadInformation,
maxCellingNBDU,
maxnoofCandidateSpCells,
maxnoofDRBs,
maxnoofErrors,
maxnoofIndividualF1ConnectionsToReset,
maxnoofPotentialSpCells,
maxnoofSCells,
maxnoofSRBs,
maxnoofPagingCells,
maxnoofTNLAssociations,
maxCellineNB

```

FROM FlAP-Constants;

```

-- *****
--
-- RESET ELEMENTARY PROCEDURE
--
-- *****
-- *****

```

```

--
-- Reset
--
-- *****

Reset ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {ResetIEs} },
    ...
}

ResetIEs FlAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-Cause                  CRITICALITY ignore  TYPE Cause                        PRESENCE mandatory }|
    { ID id-ResetType              CRITICALITY reject  TYPE ResetType                    PRESENCE mandatory },
    ...
}

ResetType ::= CHOICE {
    fl-Interface                ResetAll,
    partOfFl-Interface          UE-associatedLogicalFl-ConnectionListRes,
    choice-extension            ProtocolIE-SingleContainer { { ResetType-ExtIEs } }
}

ResetType-ExtIEs FlAP-PROTOCOL-IES ::= {
    ...
}

ResetAll ::= ENUMERATED {
    reset-all,
    ...
}

UE-associatedLogicalFl-ConnectionListRes ::= SEQUENCE (SIZE(1.. maxnoofIndividualFlConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-associatedLogicalFl-ConnectionItemRes } }

UE-associatedLogicalFl-ConnectionItemRes FlAP-PROTOCOL-IES ::= {
    { ID id-UE-associatedLogicalFl-ConnectionItem  CRITICALITY reject  TYPE UE-associatedLogicalFl-ConnectionItem  PRESENCE mandatory},
    ...
}

-- *****
--
-- Reset Acknowledge
--
-- *****

ResetAcknowledge ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {ResetAcknowledgeIEs} },
    ...
}

ResetAcknowledgeIEs FlAP-PROTOCOL-IES ::= {

```

```

    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE
mandatory   }|
    { ID id-UE-associatedLogicalFl-ConnectionListResAck  CRITICALITY ignore  TYPE UE-associatedLogicalFl-ConnectionListResAck  PRESENCE
optional    }|
    { ID id-CriticalityDiagnostics  CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

```

```

UE-associatedLogicalFl-ConnectionListResAck ::= SEQUENCE (SIZE(1.. maxnoofIndividualFlConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-
associatedLogicalFl-ConnectionItemResAck } }

```

```

UE-associatedLogicalFl-ConnectionItemResAck  FLAP-PROTOCOL-IES ::= {
  { ID id-UE-associatedLogicalFl-ConnectionItem  CRITICALITY ignore  TYPE UE-associatedLogicalFl-ConnectionItem  PRESENCE mandatory },
  ...
}

```

```

-- *****
--
-- ERROR INDICATION ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Error Indication
--
-- *****

```

```

ErrorIndication ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          {{ErrorIndicationIEs}},
  ...
}

```

```

ErrorIndicationIEs FLAP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory}|
  { ID id-gNB-CU-UE-FlAP-ID      CRITICALITY ignore  TYPE GNB-CU-UE-FlAP-ID      PRESENCE optional }|
  { ID id-gNB-DU-UE-FlAP-ID      CRITICALITY ignore  TYPE GNB-DU-UE-FlAP-ID      PRESENCE optional }|
  { ID id-Cause                  CRITICALITY ignore  TYPE Cause                  PRESENCE optional }|
  { ID id-CriticalityDiagnostics  CRITICALITY ignore  TYPE CriticalityDiagnostics  PRESENCE optional },
  ...
}

```

```

-- *****
--
-- Fl SETUP ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Fl Setup Request
--
-- *****

```

```

FlSetupRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {FlSetupRequestIEs} },
    ...
}

FlSetupRequestIEs FlAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory } |
    { ID id-gNB-DU-ID              CRITICALITY reject  TYPE GNB-DU-ID              PRESENCE mandatory } |
    { ID id-gNB-DU-Name            CRITICALITY ignore TYPE GNB-DU-Name            PRESENCE optional   } |
    { ID id-gNB-DU-Served-Cells-List CRITICALITY reject  TYPE GNB-DU-Served-Cells-List PRESENCE optional   } |
    { ID id-GNB-DU-RRC-Version     CRITICALITY reject  TYPE RRC-Version           PRESENCE mandatory  },
    ...
}

GNB-DU-Served-Cells-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { GNB-DU-Served-Cells-ItemIEs } }

GNB-DU-Served-Cells-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-GNB-DU-Served-Cells-Item CRITICALITY reject  TYPE          GNB-DU-Served-Cells-Item PRESENCE mandatory  },
    ...
}

-- *****
--
-- Fl Setup Response
--
-- *****

FlSetupResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {FlSetupResponseIEs} },
    ...
}

FlSetupResponseIEs FlAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory } |
    { ID id-gNB-CU-Name            CRITICALITY ignore TYPE GNB-CU-Name            PRESENCE optional   } |
    { ID id-Cells-to-be-Activated-List CRITICALITY reject  TYPE Cells-to-be-Activated-List PRESENCE optional   } |
    { ID id-GNB-CU-RRC-Version     CRITICALITY reject  TYPE RRC-Version           PRESENCE mandatory  },
    ...
}

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

Cells-to-be-Activated-List-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-Cells-to-be-Activated-List-Item CRITICALITY reject  TYPE Cells-to-be-Activated-List-Item PRESENCE mandatory},
    ...
}

-- *****

```

```

--
-- Fl Setup Failure
--
-- *****

FlSetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {FlSetupFailureIEs} },
    ...
}

FlSetupFailureIEs FLAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-Cause                  CRITICALITY ignore  TYPE Cause                          PRESENCE mandatory }|
    { ID id-TimeToWait             CRITICALITY ignore  TYPE TimeToWait                     PRESENCE optional }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- GNB-DU CONFIGURATION UPDATE ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- GNB-DU CONFIGURATION UPDATE
--
-- *****

GNBDUConfigurationUpdate ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { {GNBDUConfigurationUpdateIEs} },
    ...
}

GNBDUConfigurationUpdateIEs FLAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-Served-Cells-To-Add-List CRITICALITY reject  TYPE Served-Cells-To-Add-List PRESENCE optional }|
    { ID id-Served-Cells-To-Modify-List CRITICALITY reject  TYPE Served-Cells-To-Modify-List PRESENCE optional }|
    { ID id-Served-Cells-To-Delete-List CRITICALITY reject  TYPE Served-Cells-To-Delete-List PRESENCE optional }|
    { ID id-Cells-Status-List       CRITICALITY reject  TYPE Cells-Status-List       PRESENCE optional },
    ...
}

Served-Cells-To-Add-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Served-Cells-To-Add-ItemIEs } }
Served-Cells-To-Modify-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Served-Cells-To-Modify-ItemIEs } }
Served-Cells-To-Delete-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Served-Cells-To-Delete-ItemIEs } }
Cells-Status-List ::= SEQUENCE (SIZE(0.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-Status-ItemIEs } }

Served-Cells-To-Add-ItemIEs FLAP-PROTOCOL-IES ::= {
    { ID id-Served-Cells-To-Add-Item CRITICALITY reject  TYPE Served-Cells-To-Add-Item PRESENCE mandatory },
    ...
}

```

```

Served-Cells-To-Modify-ItemIES FlAP-PROTOCOL-IES ::= {
  { ID id-Served-Cells-To-Modify-Item          CRITICALITY reject  TYPE          Served-Cells-To-Modify-Item          PRESENCE mandatory
  },
  ...
}

Served-Cells-To-Delete-ItemIES FlAP-PROTOCOL-IES ::= {
  { ID id-Served-Cells-To-Delete-Item          CRITICALITY reject  TYPE          Served-Cells-To-Delete-Item          PRESENCE mandatory  },
  ...
}

Cells-Status-ItemIES FlAP-PROTOCOL-IES ::= {
  { ID id-Cells-Status-Item                    CRITICALITY reject  TYPE          Cells-Status-Item                    PRESENCE mandatory  },
  ...
}

-- *****
--
-- GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE
--
-- *****

GNBDUConfigurationUpdateAcknowledge ::= SEQUENCE {
  protocolIES          ProtocolIE-Container    { {GNBDUConfigurationUpdateAcknowledgeIES} },
  ...
}

GNBDUConfigurationUpdateAcknowledgeIES FlAP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory  }|
  { ID id-Cells-to-be-Activated-List  CRITICALITY reject  TYPE Cells-to-be-Activated-List  PRESENCE optional  }|
  { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional  },
  ...
}

-- *****
--
-- GNB-DU CONFIGURATION UPDATE FAILURE
--
-- *****

GNBDUConfigurationUpdateFailure ::= SEQUENCE {
  protocolIES          ProtocolIE-Container    { {GNBDUConfigurationUpdateFailureIES} },
  ...
}

GNBDUConfigurationUpdateFailureIES FlAP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory  }|
  { ID id-Cause                    CRITICALITY ignore  TYPE Cause                    PRESENCE mandatory  }|
  { ID id-TimeToWait                CRITICALITY ignore  TYPE TimeToWait                PRESENCE optional  }|
  { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional  },
  ...
}

```

```
-- *****
--
-- GNB-CU CONFIGURATION UPDATE ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- GNB-CU CONFIGURATION UPDATE
--
-- *****
```

```
GNBCUConfigurationUpdate ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container    { { GNBCUConfigurationUpdateIEs } },
  ...
}
```

```
GNBCUConfigurationUpdateIEs FLAP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory } |
  { ID id-Cells-to-be-Activated-List CRITICALITY reject TYPE Cells-to-be-Activated-List PRESENCE optional } |
  { ID id-Cells-to-be-Deactivated-List CRITICALITY reject TYPE Cells-to-be-Deactivated-List PRESENCE optional } |
  { ID id-GNB-CU-TNL-Association-To-Add-List CRITICALITY ignore TYPE GNB-CU-TNL-Association-To-Add-List PRESENCE optional } |
  { ID id-GNB-CU-TNL-Association-To-Remove-List CRITICALITY ignore TYPE GNB-CU-TNL-Association-To-Remove-List PRESENCE optional } |
  { ID id-GNB-CU-TNL-Association-To-Update-List CRITICALITY ignore TYPE GNB-CU-TNL-Association-To-Update-List PRESENCE optional } |
  { ID id-Cells-to-be-Barred-List CRITICALITY ignore TYPE Cells-to-be-Barred-List PRESENCE optional } |
  { ID id-Protected-EUTRA-Resources-List CRITICALITY reject TYPE Protected-EUTRA-Resources-List PRESENCE optional },
  ...
}
```

```
Cells-to-be-Deactivated-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-to-be-Deactivated-List-ItemIEs } }
GNB-CU-TNL-Association-To-Add-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF ProtocolIE-SingleContainer { { GNB-CU-TNL-Association-To-Add-ItemIEs } }
GNB-CU-TNL-Association-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF ProtocolIE-SingleContainer { { GNB-CU-TNL-Association-To-Remove-ItemIEs } }
GNB-CU-TNL-Association-To-Update-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF ProtocolIE-SingleContainer { { GNB-CU-TNL-Association-To-Update-ItemIEs } }
Cells-to-be-Barred-List ::= SEQUENCE(SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-to-be-Barred-ItemIEs } }
```

```
Cells-to-be-Deactivated-List-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-Cells-to-be-Deactivated-List-Item          CRITICALITY reject TYPE Cells-to-be-Deactivated-List-Item
    PRESENCE mandatory },
  ...}

```

```
GNB-CU-TNL-Association-To-Add-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-TNL-Association-To-Add-Item          CRITICALITY ignore TYPE GNB-CU-TNL-Association-To-Add-Item          PRESENCE mandatory },
  ...}

```

```
GNB-CU-TNL-Association-To-Remove-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-TNL-Association-To-Remove-Item          CRITICALITY ignore TYPE GNB-CU-TNL-Association-To-Remove-Item          PRESENCE
    mandatory },
  ...}

```



```

GNB-CU-TNL-Association-To-Update-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-TNL-Association-To-Update-Item          CRITICALITY ignore  TYPE          GNB-CU-TNL-Association-To-Update-Item          PRESENCE
mandatory },
...}

Cells-to-be-Barred-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-Cells-to-be-Barred-Item          CRITICALITY ignore  TYPE          Cells-to-be-Barred-Item          PRESENCE mandatory },
  ...
}

Protected-EUTRA-Resources-List ::= SEQUENCE (SIZE(1.. maxCellineNB)) OF ProtocolIE-SingleContainer { { Protected-EUTRA-Resources-ItemIEs } }
Protected-EUTRA-Resources-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-Protected-EUTRA-Resources-Item          CRITICALITY reject  TYPE          Protected-EUTRA-Resources-Item          PRESENCE
mandatory},
  ...}

-- *****
--
-- GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE
--
-- *****

GNBCUConfigurationUpdateAcknowledge ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { GNBCUConfigurationUpdateAcknowledgeIEs } },
  ...
}

GNBCUConfigurationUpdateAcknowledgeIEs FlAP-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 },
  ...
}

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 FlAP-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 FlAP-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 FlAP-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  },
  ...}

```

```

-- *****
--
-- GNB-CU CONFIGURATION UPDATE FAILURE
--
-- *****

```

```

GNBCUConfigurationUpdateFailure ::= SEQUENCE {
  protocolIES      ProtocolIE-Container      { { GNBCUConfigurationUpdateFailureIES } },
  ...
}

```

```

GNBCUConfigurationUpdateFailureIES FlAP-PROTOCOL-IES ::= {
  { ID id-TransactionID      CRITICALITY reject  TYPE TransactionID      PRESENCE mandatory  }|
  { ID id-Cause              CRITICALITY ignore  TYPE Cause              PRESENCE mandatory  }|
  { ID id-TimeToWait         CRITICALITY ignore  TYPE TimeToWait         PRESENCE optional  }|
  { ID id-CriticalityDiagnostics  CRITICALITY ignore  TYPE CriticalityDiagnostics  PRESENCE optional  },
  ...
}

```

```

-- *****
--
-- GNB-DU RESOURCE COORDINATION REQUEST
--
-- *****

```

```

GNBDUResourceCoordinationRequest ::= SEQUENCE {
  protocolIES      ProtocolIE-Container      {{GNBDUResourceCoordinationRequest-IEs}},
  ...
}

```

```

GNBDUResourceCoordinationRequest-IEs FlAP-PROTOCOL-IES ::= {
  { ID id-TransactionID      CRITICALITY reject  TYPE TransactionID      PRESENCE mandatory  }|
  { ID id-RequestType CRITICALITY reject  TYPE RequestType      PRESENCE mandatory  }|
  { ID id-EUTRA-NR-CellResourceCoordinationReq-Container  CRITICALITY reject  TYPE EUTRA-NR-CellResourceCoordinationReq-Container  PRESENCE
mandatory},
  ...
}

```

```

-- *****
--
-- GNB-DU RESOURCE COORDINATION RESPONSE
--
-- *****

```

```

GNBDUResourceCoordinationResponse ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      {{GNBDUResourceCoordinationResponse-IEs}},
    ...
}

GNBDUResourceCoordinationResponse-IEs FLAP-PROTOCOL-IES ::= {
    { ID id-TransactionID                CRITICALITY reject  TYPE TransactionID                PRESENCE mandatory }|
    { ID id-EUTRA-NR-CellResourceCoordinationReqAck-Container  CRITICALITY reject  TYPE EUTRA-NR-CellResourceCoordinationReqAck-Container  PRESENCE mandatory},
    ...
}

-- *****
--
-- UE Context Setup ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- UE CONTEXT SETUP REQUEST
--
-- *****

UEContextSetupRequest ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { UEContextSetupRequestIEs} },
    ...
}

UEContextSetupRequestIEs FLAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-FLAP-ID                CRITICALITY reject  TYPE GNB-CU-UE-FLAP-ID                PRESENCE mandatory }|
    { ID id-gNB-DU-UE-FLAP-ID                CRITICALITY ignore  TYPE GNB-DU-UE-FLAP-ID                PRESENCE optional }|
    { ID id-SpCell-ID                        CRITICALITY reject  TYPE NRCGI                            PRESENCE mandatory }|
    { ID id-ServCellIndex                    CRITICALITY reject  TYPE ServCellIndex                    PRESENCE mandatory }|
    { ID id-SpCellULConfigured               CRITICALITY ignore  TYPE CellULConfigured                 PRESENCE optional }|
    { ID id-CUtoDURRCInformation             CRITICALITY reject  TYPE CUtoDURRCInformation             PRESENCE mandatory }|
    { ID id-Candidate-SpCell-List            CRITICALITY ignore  TYPE Candidate-SpCell-List            PRESENCE optional }|
    { ID id-DRXCycle                         CRITICALITY ignore  TYPE DRXCycle                         PRESENCE optional }|
    { ID id-ResourceCoordinationTransferContainer  CRITICALITY ignore  TYPE ResourceCoordinationTransferContainer  PRESENCE optional }|
    { ID id-SCell-ToBeSetup-List             CRITICALITY ignore  TYPE SCell-ToBeSetup-List             PRESENCE optional }|
    { ID id-SRBs-ToBeSetup-List              CRITICALITY reject  TYPE SRBs-ToBeSetup-List              PRESENCE optional }|
    { ID id-DRBs-ToBeSetup-List              CRITICALITY reject  TYPE DRBs-ToBeSetup-List              PRESENCE optional }|
    { ID id-InactivityMonitoringRequest      CRITICALITY reject  TYPE InactivityMonitoringRequest      PRESENCE optional }|
    { ID id-RAT-FrequencyPriorityInformation  CRITICALITY reject  TYPE RAT-FrequencyPriorityInformation  PRESENCE optional }|
    { ID id-RRCContainer                     CRITICALITY ignore  TYPE RRCContainer                     PRESENCE optional }|
    { ID id-MaskedIMEISV                     CRITICALITY ignore  TYPE MaskedIMEISV                     PRESENCE optional }|
    { ID id-ServingPLMN                      CRITICALITY ignore  TYPE PLMN-Identity                    PRESENCE optional }|
    { ID id-GNB-DU-UE-AMBR-UL                CRITICALITY ignore  TYPE BitRate                           PRESENCE mandatory },
    ...
}

Candidate-SpCell-List ::= SEQUENCE (SIZE(1..maxnoofCandidateSpCells)) OF ProtocolIE-SingleContainer { { Candidate-SpCell-ItemIEs} }
SCell-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofSCells)) OF ProtocolIE-SingleContainer { { SCell-ToBeSetup-ItemIEs} }
SRBs-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-ToBeSetup-ItemIEs} }

```

```

DRBs-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-ToBeSetup-ItemIEs } }

Candidate-SpCell-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-Candidate-SpCell-Item          CRITICALITY ignore  TYPE Candidate-SpCell-Item          PRESENCE mandatory  },
  ...
}

SCell-ToBeSetup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-SCell-ToBeSetup-Item          CRITICALITY ignore  TYPE SCell-ToBeSetup-Item          PRESENCE mandatory  },
  ...
}

SRBs-ToBeSetup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-SRBs-ToBeSetup-Item          CRITICALITY reject   TYPE SRBs-ToBeSetup-Item          PRESENCE mandatory},
  ...
}

DRBs-ToBeSetup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-DRBs-ToBeSetup-Item          CRITICALITY reject   TYPE DRBs-ToBeSetup-Item          PRESENCE mandatory},
  ...
}

-- *****
--
-- UE CONTEXT SETUP RESPONSE
--
-- *****

UEContextSetupResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { UEContextSetupResponseIEs } },
  ...
}

UEContextSetupResponseIEs FlAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject   TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory  }|
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject   TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory  }|
  { ID id-DUtoCURRCInformation        CRITICALITY reject   TYPE DUtoCURRCInformation        PRESENCE mandatory  }|
  { ID id-C-RNTI                      CRITICALITY ignore   TYPE C-RNTI                      PRESENCE optional   }|
  { ID id-ResourceCoordinationTransferContainer CRITICALITY ignore   TYPE ResourceCoordinationTransferContainer PRESENCE optional   }|
  { ID id-FullConfiguration           CRITICALITY reject   TYPE FullConfiguration           PRESENCE optional   }|
  { ID id-DRBs-Setup-List             CRITICALITY ignore   TYPE DRBs-Setup-List             PRESENCE optional   }|
  { ID id-SRBs-FailedToBeSetup-List   CRITICALITY ignore   TYPE SRBs-FailedToBeSetup-List   PRESENCE optional   }|
  { ID id-DRBs-FailedToBeSetup-List   CRITICALITY ignore   TYPE DRBs-FailedToBeSetup-List   PRESENCE optional   }|
  { ID id-SCell-FailedtoSetup-List    CRITICALITY ignore   TYPE SCell-FailedtoSetup-List    PRESENCE optional   }|
  { ID id-InactivityMonitoringResponse CRITICALITY reject   TYPE InactivityMonitoringResponse PRESENCE optional   }|
  { ID id-CriticalityDiagnostics       CRITICALITY ignore   TYPE CriticalityDiagnostics       PRESENCE optional   },
  ...
}

```

```

DRBs-Setup-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-Setup-ItemIEs} }
SRBs-FailedToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-FailedToBeSetup-ItemIEs} }
DRBs-FailedToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-FailedToBeSetup-ItemIEs} }
SCell-FailedtoSetup-List ::= SEQUENCE (SIZE(1..maxnoofSCells)) OF ProtocolIE-SingleContainer { { SCell-FailedtoSetup-ItemIEs} }

DRBs-Setup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-DRBs-Setup-Item          CRITICALITY ignore  TYPE DRBs-Setup-Item          PRESENCE mandatory},
  ...
}

SRBs-FailedToBeSetup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-SRBs-FailedToBeSetup-Item  CRITICALITY ignore  TYPE SRBs-FailedToBeSetup-Item  PRESENCE mandatory},
  ...
}

DRBs-FailedToBeSetup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-DRBs-FailedToBeSetup-Item  CRITICALITY ignore  TYPE DRBs-FailedToBeSetup-Item  PRESENCE mandatory},
  ...
}

SCell-FailedtoSetup-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-SCell-FailedtoSetup-Item    CRITICALITY ignore  TYPE SCell-FailedtoSetup-Item    PRESENCE mandatory},
  ...
}

-- *****
--
-- UE CONTEXT SETUP FAILURE
--
-- *****

UEContextSetupFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { UEContextSetupFailureIEs} },
  ...
}

UEContextSetupFailureIEs FlAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY ignore  TYPE GNB-DU-UE-FlAP-ID          PRESENCE optional }|
  { ID id-Cause                       CRITICALITY ignore  TYPE Cause                       PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics       CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional }|
  { ID id-Potential-SpCell-List       CRITICALITY ignore  TYPE Potential-SpCell-List       PRESENCE optional },
  ...
}

Potential-SpCell-List ::= SEQUENCE (SIZE(0..maxnoofPotentialSpCells)) OF ProtocolIE-SingleContainer { { Potential-SpCell-ItemIEs} }

Potential-SpCell-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-Potential-SpCell-Item      CRITICALITY ignore  TYPE Potential-SpCell-Item      PRESENCE mandatory },
  ...
}

-- *****

```

```

--
-- UE Context Release Request ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- UE Context Release Request
--
-- *****

UEContextReleaseRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      {{ UEContextReleaseRequestIEs}},
    ...
}

UEContextReleaseRequestIEs FLAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-Cause                      CRITICALITY ignore  TYPE Cause                     PRESENCE mandatory }|
    ...
}

-- *****
--
-- UE Context Release (gNB-CU initiated) ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- UE CONTEXT RELEASE COMMAND
--
-- *****

UEContextReleaseCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { UEContextReleaseCommandIEs } },
    ...
}

UEContextReleaseCommandIEs FLAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-Cause                      CRITICALITY ignore  TYPE Cause                     PRESENCE mandatory }|
    { ID id-RRCContainer              CRITICALITY ignore  TYPE RRCContainer              PRESENCE optional }|
    { ID id-SRBID                     CRITICALITY ignore  TYPE SRBID                     PRESENCE optional }|
    { ID id-oldgNB-DU-UE-FlAP-ID       CRITICALITY ignore  TYPE GNB-DU-UE-FlAP-ID         PRESENCE optional }|
    { ID id-ExecuteDuplication         CRITICALITY ignore  TYPE ExecuteDuplication        PRESENCE optional },
    ...
}

-- *****
--

```

```

-- UE CONTEXT RELEASE COMPLETE
--
-- *****
UEContextReleaseComplete ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { UEContextReleaseCompleteIEs } },
  ...
}

UEContextReleaseCompleteIEs FLAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics      CRITICALITY ignore TYPE CriticalityDiagnostics      PRESENCE optional }, ...
}

-- *****
--
-- UE Context Modification ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- UE CONTEXT MODIFICATION REQUEST
--
-- *****

UEContextModificationRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { UEContextModificationRequestIEs } },
  ...
}

UEContextModificationRequestIEs FLAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-SpCell-ID                  CRITICALITY ignore TYPE NRCGI                  PRESENCE optional }|
  { ID id-ServCellIndex              CRITICALITY reject TYPE ServCellIndex              PRESENCE optional }|
  { ID id-SpCellULConfigured         CRITICALITY ignore TYPE CellULConfigured         PRESENCE optional }|
  { ID id-DRXCycle                   CRITICALITY ignore TYPE DRXCycle                   PRESENCE optional }|
  { ID id-CUtoDURRCInformation        CRITICALITY reject TYPE CUtoDURRCInformation        PRESENCE optional }|
  { ID id-TransmissionStopIndicator  CRITICALITY ignore TYPE TransmissionStopIndicator  PRESENCE optional }|
  { ID id-ResourceCoordinationTransferContainer CRITICALITY ignore TYPE ResourceCoordinationTransferContainer PRESENCE optional }|
  { ID id-RRRCconfigurationCompleteIndicator CRITICALITY ignore TYPE RRRCconfigurationCompleteIndicator PRESENCE optional }|
  { ID id-RRCCContainer               CRITICALITY reject TYPE RRCCContainer               PRESENCE optional }|
  { ID id-SCell-ToBeSetupMod-List     CRITICALITY ignore TYPE SCell-ToBeSetupMod-List     PRESENCE optional }|
  { ID id-SCell-ToBeRemoved-List     CRITICALITY ignore TYPE SCell-ToBeRemoved-List     PRESENCE optional }|
  { ID id-SRBs-ToBeSetupMod-List     CRITICALITY reject TYPE SRBs-ToBeSetupMod-List     PRESENCE optional }|
  { ID id-DRBs-ToBeSetupMod-List     CRITICALITY reject TYPE DRBs-ToBeSetupMod-List     PRESENCE optional }|
  { ID id-DRBs-ToBeModified-List     CRITICALITY reject TYPE DRBs-ToBeModified-List     PRESENCE optional }|
  { ID id-SRBs-ToBeReleased-List     CRITICALITY reject TYPE SRBs-ToBeReleased-List     PRESENCE optional }|
  { ID id-DRBs-ToBeReleased-List     CRITICALITY reject TYPE DRBs-ToBeReleased-List     PRESENCE optional }|
  { ID id-InactivityMonitoringRequest CRITICALITY reject TYPE InactivityMonitoringRequest PRESENCE optional }|
  { ID id-RAT-FrequencyPriorityInformation CRITICALITY reject TYPE RAT-FrequencyPriorityInformation PRESENCE optional }|
}

```

```

    { ID id-DRXConfigurationIndicator          CRITICALITY ignore  TYPE DRXConfigurationIndicator          PRESENCE optional } |
    { ID id-RLCFailureIndication              CRITICALITY ignore  TYPE RLCFailureIndication              PRESENCE optional } |
    { ID id-UplinkTxDirectCurrentListInformation CRITICALITY ignore  TYPE UplinkTxDirectCurrentListInformation PRESENCE optional } |
    { ID id-GNB-DUConfigurationQuery          CRITICALITY reject  TYPE GNB-DUConfigurationQuery          PRESENCE optional } |
    { ID id-GNB-DU-UE-AMBR-UL                CRITICALITY ignore  TYPE BitRate                            PRESENCE optional } |
    { ID id-ExecuteDuplication                CRITICALITY ignore  TYPE ExecuteDuplication                PRESENCE optional },
    ...
}

SCell-ToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSCells)) OF ProtocolIE-SingleContainer { { SCell-ToBeSetupMod-ItemIEs } }
SCell-ToBeRemoved-List ::= SEQUENCE (SIZE(1..maxnoofSCells)) OF ProtocolIE-SingleContainer { { SCell-ToBeRemoved-ItemIEs } }
SRBs-ToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-ToBeSetupMod-ItemIEs } }
DRBs-ToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-ToBeSetupMod-ItemIEs } }

DRBs-ToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-ToBeModified-ItemIEs } }
SRBs-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-ToBeReleased-ItemIEs } }
DRBs-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-ToBeReleased-ItemIEs } }

SCell-ToBeSetupMod-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-SCell-ToBeSetupMod-Item          CRITICALITY ignore  TYPE SCell-ToBeSetupMod-Item          PRESENCE mandatory },
    ...
}

SCell-ToBeRemoved-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-SCell-ToBeRemoved-Item          CRITICALITY ignore  TYPE SCell-ToBeRemoved-Item          PRESENCE mandatory },
    ...
}

SRBs-ToBeSetupMod-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-SRBs-ToBeSetupMod-Item          CRITICALITY reject  TYPE SRBs-ToBeSetupMod-Item          PRESENCE mandatory},
    ...
}

DRBs-ToBeSetupMod-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-DRBs-ToBeSetupMod-Item          CRITICALITY reject  TYPE DRBs-ToBeSetupMod-Item          PRESENCE mandatory},
    ...
}

DRBs-ToBeModified-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-DRBs-ToBeModified-Item          CRITICALITY reject  TYPE DRBs-ToBeModified-Item          PRESENCE mandatory},
    ...
}

SRBs-ToBeReleased-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-SRBs-ToBeReleased-Item          CRITICALITY reject  TYPE SRBs-ToBeReleased-Item          PRESENCE mandatory},
    ...
}

DRBs-ToBeReleased-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-DRBs-ToBeReleased-Item          CRITICALITY reject  TYPE DRBs-ToBeReleased-Item          PRESENCE mandatory},
    ...
}

```



```

}
-- *****
--
-- UE CONTEXT MODIFICATION RESPONSE
--
-- *****

UEContextModificationResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { UEContextModificationResponseIEs } },
    ...
}

UEContextModificationResponseIEs FLAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory } |
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory } |
    { ID id-ResourceCoordinationTransferContainer CRITICALITY ignore TYPE ResourceCoordinationTransferContainer PRESENCE optional } |
    { ID id-DUtoCURRCInformation        CRITICALITY reject TYPE DUtoCURRCInformation        PRESENCE optional } |
    { ID id-DRBs-SetupMod-List          CRITICALITY ignore TYPE DRBs-SetupMod-List          PRESENCE optional } |
    { ID id-DRBs-Modified-List          CRITICALITY ignore TYPE DRBs-Modified-List          PRESENCE optional } |
    { ID id-SRBs-FailedToBeSetupMod-List CRITICALITY ignore TYPE SRBs-FailedToBeSetupMod-List CRITICALITY ignore TYPE SRBs-FailedToBeSetupMod-List PRESENCE optional } |
    { ID id-DRBs-FailedToBeSetupMod-List CRITICALITY ignore TYPE DRBs-FailedToBeSetupMod-List PRESENCE optional } |
    { ID id-SCell-FailedtoSetupMod-List CRITICALITY ignore TYPE SCell-FailedtoSetupMod-List PRESENCE optional } |
    { ID id-DRBs-FailedToBeModified-List CRITICALITY ignore TYPE DRBs-FailedToBeModified-List PRESENCE optional } |
    { ID id-InactivityMonitoringResponse CRITICALITY reject TYPE InactivityMonitoringResponse PRESENCE optional } |
    { ID id-CriticalityDiagnostics       CRITICALITY ignore TYPE CriticalityDiagnostics       PRESENCE optional } |
    { ID id-C-RNTI                       CRITICALITY ignore TYPE C-RNTI                       PRESENCE optional } ,
    ...
}

DRBs-SetupMod-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-SetupMod-ItemIEs } }
DRBs-Modified-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-Modified-ItemIEs } }
DRBs-FailedToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-FailedToBeModified-ItemIEs } }
SRBs-FailedToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-FailedToBeSetupMod-ItemIEs } }
DRBs-FailedToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-FailedToBeSetupMod-ItemIEs } }
SCell-FailedtoSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSCells)) OF ProtocolIE-SingleContainer { { SCell-FailedtoSetupMod-ItemIEs } }

DRBs-SetupMod-ItemIEs FLAP-PROTOCOL-IES ::= {
    { ID id-DRBs-SetupMod-Item          CRITICALITY ignore          TYPE DRBs-SetupMod-Item          PRESENCE mandatory } ,
    ...
}

DRBs-Modified-ItemIEs FLAP-PROTOCOL-IES ::= {
    { ID id-DRBs-Modified-Item          CRITICALITY ignore          TYPE DRBs-Modified-Item          PRESENCE mandatory } ,
    ...
}

SRBs-FailedToBeSetupMod-ItemIEs FLAP-PROTOCOL-IES ::= {
    { ID id-SRBs-FailedToBeSetupMod-Item CRITICALITY ignore          TYPE SRBs-FailedToBeSetupMod-Item PRESENCE mandatory } ,
    ...
}

```

```

DRBs-FailedToBeSetupMod-ItemIES FlAP-PROTOCOL-IES ::= {
  { ID id-DRBs-FailedToBeSetupMod-Item          CRITICALITY ignore  TYPE DRBs-FailedToBeSetupMod-Item          PRESENCE mandatory },
  ...
}

DRBs-FailedToBeModified-ItemIES FlAP-PROTOCOL-IES ::= {
  { ID id-DRBs-FailedToBeModified-Item          CRITICALITY ignore  TYPE DRBs-FailedToBeModified-Item          PRESENCE mandatory },
  ...
}

SCell-FailedtoSetupMod-ItemIES FlAP-PROTOCOL-IES ::= {
  { ID id-SCell-FailedtoSetupMod-Item          CRITICALITY ignore  TYPE SCell-FailedtoSetupMod-Item          PRESENCE mandatory },
  ...
}

-- *****
--
-- UE CONTEXT MODIFICATION FAILURE
--
-- *****

UEContextModificationFailure ::= SEQUENCE {
  protocolIES          ProtocolIE-Container    { { UEContextModificationFailureIES } },
  ...
}

UEContextModificationFailureIES FlAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory } |
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory } |
  { ID id-Cause                      CRITICALITY ignore  TYPE Cause                      PRESENCE mandatory } |
  { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional },
  ...
}

-- *****
--
-- UE Context Modification Required (gNB-DU initiated) ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- UE CONTEXT MODIFICATION REQUIRED
--
-- *****

UEContextModificationRequired ::= SEQUENCE {
  protocolIES          ProtocolIE-Container    { { UEContextModificationRequiredIES } },
  ...
}

```

```

}

UEContextModificationRequiredIEs FLAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory } |
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory } |
  { ID id-ResourceCoordinationTransferContainer CRITICALITY ignore  TYPE ResourceCoordinationTransferContainer PRESENCE optional } |
  { ID id-DUtoCURRCInformation        CRITICALITY reject  TYPE DUtoCURRCInformation      PRESENCE optional } |
  { ID id-DRBs-Required-ToBeModified-List CRITICALITY reject  TYPE DRBs-Required-ToBeModified-List PRESENCE optional } |
  { ID id-SRBs-Required-ToBeReleased-List CRITICALITY reject  TYPE SRBs-Required-ToBeReleased-List PRESENCE optional } |
  { ID id-DRBs-Required-ToBeReleased-List CRITICALITY reject  TYPE DRBs-Required-ToBeReleased-List PRESENCE optional } |
  { ID id-Cause                       CRITICALITY ignore  TYPE Cause                     PRESENCE mandatory } ,
  ...
}

DRBs-Required-ToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-Required-ToBeModified-ItemIEs } }
DRBs-Required-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-Required-ToBeReleased-ItemIEs } }

SRBs-Required-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-Required-ToBeReleased-ItemIEs } }

DRBs-Required-ToBeModified-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-DRBs-Required-ToBeModified-Item          CRITICALITY reject  TYPE DRBs-Required-ToBeModified-Item          PRESENCE mandatory } ,
  ...
}

DRBs-Required-ToBeReleased-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-DRBs-Required-ToBeReleased-Item          CRITICALITY reject  TYPE DRBs-Required-ToBeReleased-Item          PRESENCE mandatory } ,
  ...
}

SRBs-Required-ToBeReleased-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-SRBs-Required-ToBeReleased-Item          CRITICALITY reject  TYPE SRBs-Required-ToBeReleased-Item          PRESENCE mandatory } ,
  ...
}

-- *****
--
-- UE CONTEXT MODIFICATION CONFIRM
--
-- *****

UEContextModificationConfirm ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { UEContextModificationConfirmIEs } } ,
  ...
}

UEContextModificationConfirmIEs FLAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory } |
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory } |
  { ID id-ResourceCoordinationTransferContainer CRITICALITY ignore  TYPE ResourceCoordinationTransferContainer PRESENCE optional } |
  { ID id-DRBs-ModifiedConf-List      CRITICALITY ignore  TYPE DRBs-ModifiedConf-List      PRESENCE optional } |
  { ID id-RRCContainer                 CRITICALITY ignore  TYPE RRCContainer                 PRESENCE optional } |
  { ID id-CriticalityDiagnostics       CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional } |
  { ID id-ExecuteDuplication           CRITICALITY ignore  TYPE ExecuteDuplication           PRESENCE optional } ,
}

```

```

    ...
}

DRBs-ModifiedConf-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-ModifiedConf-ItemIEs } }

DRBs-ModifiedConf-ItemIEs FLAP-PROTOCOL-IES ::= {
    { ID id-DRBs-ModifiedConf-Item          CRITICALITY ignore  TYPE DRBs-ModifiedConf-Item          PRESENCE mandatory },
    ...
}

-- *****
--
-- WRITE-REPLACE WARNING ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- Write-Replace Warning Request
--
-- *****

WriteReplaceWarningRequest ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { {WriteReplaceWarningRequestIEs} },
    ...
}

WriteReplaceWarningRequestIEs FLAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-PWSSystemInformation   CRITICALITY reject  TYPE PWSSystemInformation   PRESENCE mandatory }|
    { ID id-RepetitionPeriod       CRITICALITY reject  TYPE RepetitionPeriod       PRESENCE mandatory }|
    { ID id-NumberOfBroadcastRequest CRITICALITY reject  TYPE NumberOfBroadcastRequest PRESENCE mandatory }|
    { ID id-Cells-To-Be-Broadcast-List CRITICALITY reject  TYPE Cells-To-Be-Broadcast-List PRESENCE optional },
    ...
}

Cells-To-Be-Broadcast-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-To-Be-Broadcast-List-ItemIEs } }

Cells-To-Be-Broadcast-List-ItemIEs FLAP-PROTOCOL-IES ::= {
    { ID id-Cells-To-Be-Broadcast-Item          CRITICALITY reject  TYPE Cells-To-Be-Broadcast-Item          PRESENCE mandatory },
    ...
}

-- *****
--
-- Write-Replace Warning Response
--
-- *****

WriteReplaceWarningResponse ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { {WriteReplaceWarningResponseIEs} },
    ...
}

WriteReplaceWarningResponseIEs FLAP-PROTOCOL-IES ::= {

```

```

{ ID id-TransactionID                CRITICALITY reject TYPE TransactionID                PRESENCE mandatory }|
{ ID id-Cells-Broadcast-Completed-List CRITICALITY reject TYPE Cells-Broadcast-Completed-List PRESENCE optional }|
{ ID id-CriticalityDiagnostics        CRITICALITY ignore TYPE CriticalityDiagnostics        PRESENCE optional },
...
}
Cells-Broadcast-Completed-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-Broadcast-Completed-List-ItemIEs } }

Cells-Broadcast-Completed-List-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-Cells-Broadcast-Completed-Item CRITICALITY reject TYPE Cells-Broadcast-Completed-Item PRESENCE mandatory },
  ...
}

-- *****
--
-- PWS CANCEL ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- PWS Cancel Request
--
-- *****

PWSCancelRequest ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {PWSCancelRequestIEs} },
  ...
}
PWSCancelRequestIEs FLAP-PROTOCOL-IES ::= {
  { ID id-TransactionID                CRITICALITY reject TYPE TransactionID                PRESENCE mandatory }|
  { ID id-NumberOfBroadcastRequest     CRITICALITY reject TYPE NumberOfBroadcastRequest     PRESENCE mandatory }|
  { ID id-Broadcast-To-Be-Cancelled-List CRITICALITY reject TYPE Broadcast-To-Be-Cancelled-List PRESENCE optional }|
  { ID id-Cancel-all-Warning-Messages-Indicator CRITICALITY reject TYPE Cancel-all-Warning-Messages-Indicator PRESENCE optional }
  ,
  ...
}
Broadcast-To-Be-Cancelled-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Broadcast-To-Be-Cancelled-List-ItemIEs } }

Broadcast-To-Be-Cancelled-List-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-Broadcast-To-Be-Cancelled-Item CRITICALITY reject TYPE Broadcast-To-Be-Cancelled-Item PRESENCE mandatory },
  ...
}

-- *****
--
-- PWS Cancel Response
--
-- *****

PWSCancelResponse ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {PWSCancelResponseIEs} },

```

```

...
}

PWSCancelResponseIEs FlAP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
  { ID id-Cells-Broadcast-Cancelled-List  CRITICALITY reject  TYPE Cells-Broadcast-Cancelled-List  PRESENCE optional }|
  { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
  ...
}

Cells-Broadcast-Cancelled-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Cells-Broadcast-Cancelled-List-ItemIEs } }

Cells-Broadcast-Cancelled-List-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-Cells-Broadcast-Cancelled-Item          CRITICALITY reject  TYPE          Cells-Broadcast-Cancelled-Item          PRESENCE mandatory },
  ...
}

-- *****
--
-- UE Inactivity Notification ELEMENTARY PROCEDURE
--
-- *****
--
-- *****
--
-- UE Inactivity Notification
--
-- *****

UEInactivityNotification ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          {{ UEInactivityNotificationIEs}},
  ...
}

UEInactivityNotificationIEs FlAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
  { ID id-DRB-Activity-List          CRITICALITY reject  TYPE DRB-Activity-List          PRESENCE mandatory } ,
  ...
}

DRB-Activity-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRB-Activity-ItemIEs } }

DRB-Activity-ItemIEs FlAP-PROTOCOL-IES ::= {
  { ID id-DRB-Activity-Item          CRITICALITY reject  TYPE DRB-Activity-Item          PRESENCE mandatory},
  ...
}

-- *****
--
-- Initial UL RRC Message Transfer ELEMENTARY PROCEDURE
--
-- *****

```

```

-- *****
--
-- INITIAL UL RRC Message Transfer
--
-- *****

InitialULRRCTransfer ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      {{ InitialULRRCTransferIEs}},
    ...
}

InitialULRRCTransferIEs FLAP-PROTOCOL-IES ::= {
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-NRCGI                      CRITICALITY reject  TYPE NRCGI                      PRESENCE mandatory }|
    { ID id-C-RNTI                     CRITICALITY reject  TYPE C-RNTI                     PRESENCE mandatory }|
    { ID id-RRCTransfer                CRITICALITY reject  TYPE RRCTransfer                PRESENCE mandatory }|
    { ID id-DUtoCURRCTransfer          CRITICALITY reject  TYPE DUtoCURRCTransfer          PRESENCE optional }|
    { ID id-SULAccessIndication        CRITICALITY ignore  TYPE SULAccessIndication        PRESENCE optional },
    ...
}

-- *****
--
-- DL RRC Message Transfer ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- DL RRC Message Transfer
--
-- *****

DLRRCTransfer ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      {{ DLRRCTransferIEs}},
    ...
}

DLRRCTransferIEs FLAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-oldgNB-DU-UE-FlAP-ID       CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE optional }|
    { ID id-SRBID                      CRITICALITY reject  TYPE SRBID                      PRESENCE mandatory }|
    { ID id-ExecuteDuplication          CRITICALITY ignore  TYPE ExecuteDuplication          PRESENCE optional }|
    { ID id-RRCTransfer                CRITICALITY reject  TYPE RRCTransfer                PRESENCE mandatory }|
    { ID id-RAT-FrequencyPriorityInformation CRITICALITY reject  TYPE RAT-FrequencyPriorityInformation PRESENCE optional },
    ...
}

-- *****
--
-- UL RRC Message Transfer ELEMENTARY PROCEDURE
--
-- *****

```

```

-- *****
--
-- UL RRC Message Transfer
--
-- *****

ULRRCTestMessageTransfer ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      {{ ULRRCTestMessageTransferIEs}},
    ...
}

ULRRCTestMessageTransferIEs FlAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory } |
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory } |
    { ID id-SRBID                       CRITICALITY reject TYPE SRBID                       PRESENCE mandatory } |
    { ID id-RRCTestContainer            CRITICALITY reject TYPE RRCTestContainer        PRESENCE mandatory } ,
    ...
}

-- *****
--
-- PRIVATE MESSAGE
--
-- *****

PrivateMessage ::= SEQUENCE {
    privateIEs          PrivateIE-Container {{PrivateMessage-IEs}},
    ...
}

PrivateMessage-IEs FlAP-PRIVATE-IES ::= {
    ...
}

-- *****
--
-- System Information ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- System information Delivery Command
--
-- *****

SystemInformationDeliveryCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      {{ SystemInformationDeliveryCommandIEs}},
    ...
}

SystemInformationDeliveryCommandIEs FlAP-PROTOCOL-IES ::= {

```



```

    { ID id-NRCGI                CRITICALITY reject  TYPE NRCGI                PRESENCE mandatory }|
    { ID id-SItype-List          CRITICALITY reject  TYPE SItype-List          PRESENCE mandatory }|
    { ID id-ConfirmedUEID        CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID   PRESENCE mandatory },
    ...
}

-- *****
--
-- Paging PROCEDURE
--
-- *****

--
-- Paging
--
-- *****

Paging ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    {{ PagingIEs}},
    ...
}

PagingIEs FlAP-PROTOCOL-IES ::= {
    { ID id-UEIdentityIndexValue    CRITICALITY reject  TYPE UEIdentityIndexValue    PRESENCE mandatory }|
    { ID id-PagingIdentity           CRITICALITY reject  TYPE PagingIdentity           PRESENCE optional }|
    { ID id-PagingDRX                CRITICALITY ignore  TYPE PagingDRX                PRESENCE optional }|
    { ID id-PagingPriority            CRITICALITY ignore  TYPE PagingPriority            PRESENCE optional }|
    { ID id-PagingCell-List          CRITICALITY ignore  TYPE PagingCell-list          PRESENCE optional },
    ...
}

PagingCell-list ::= SEQUENCE (SIZE(1.. maxnoofPagingCells)) OF ProtocolIE-SingleContainer { { PagingCell-ItemIEs } }

PagingCell-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-PagingCell-Item          CRITICALITY ignore  TYPE PagingCell-Item          PRESENCE mandatory },
    ...
}

-- *****
--
-- Notify
--
-- *****

Notify ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    {{ NotifyIEs}},
    ...
}

NotifyIEs FlAP-PROTOCOL-IES ::= {

```

```

    { ID id-gNB-CU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-CU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-gNB-DU-UE-FlAP-ID          CRITICALITY reject  TYPE GNB-DU-UE-FlAP-ID          PRESENCE mandatory }|
    { ID id-DRB-Notify-List            CRITICALITY reject  TYPE DRB-Notify-List           PRESENCE mandatory },
    ...
}

DRB-Notify-List ::= SEQUENCE (SIZE(1)) OF ProtocolIE-SingleContainer { { DRB-Notify-ItemIEs } }

DRB-Notify-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-DRB-Notify-Item            CRITICALITY reject  TYPE DRB-Notify-Item           PRESENCE mandatory},
    ...
}

-- *****
--
-- PWS RESTART INDICATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- PWS Restart Indication
--
-- *****

PWSRestartIndication ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { PWSRestartIndicationIEs } },
    ...
}

PWSRestartIndicationIEs FlAP-PROTOCOL-IES ::= {
    { ID id-NR-CGI-List-For-Restart-List  CRITICALITY reject  TYPE          NR-CGI-List-For-Restart-List PRESENCE optional },
    ...
}

NR-CGI-List-For-Restart-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { NR-CGI-List-For-Restart-List-ItemIEs } }

NR-CGI-List-For-Restart-List-ItemIEs FlAP-PROTOCOL-IES ::= {
    { ID id-NR-CGI-List-For-Restart-Item  CRITICALITY reject  TYPE          NR-CGI-List-For-Restart-Item   PRESENCE mandatory },
    ...
}

-- *****
--
-- PWS FAILURE INDICATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- PWS Failure Indication
--
-- *****

```

```

PWSFailureIndication ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { { PWSFailureIndicationIEs } },
  ...
}
PWSFailureIndicationIEs FLAP-PROTOCOL-IES ::= {
  { ID id-PWS-Failed-NR-CGI-List CRITICALITY reject TYPE PWS-Failed-NR-CGI-List PRESENCE optional },
  ...
}
PWS-Failed-NR-CGI-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { PWS-Failed-NR-CGI-List-ItemIEs } }

PWS-Failed-NR-CGI-List-ItemIEs FLAP-PROTOCOL-IES ::= {
  { ID id-PWS-Failed-NR-CGI-Item CRITICALITY reject TYPE PWS-Failed-NR-CGI-Item PRESENCE mandatory },
  ...
}

-- *****
--
-- gNB-DU STATUS INDICATION ELEMENTARY PROCEDURE
--
-- *****

-- *****
--
-- gNB-DU Status Indication
--
-- *****

GNBDUStatusIndication ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {GNBDUStatusIndicationIEs } },
  ...
}

GNBDUStatusIndicationIEs FLAP-PROTOCOL-IES ::= {
  { ID id-TransactionID CRITICALITY reject TYPE TransactionID PRESENCE mandatory } |
  { ID id-GNBDOverloadInformation CRITICALITY reject TYPE GNBDOverloadInformation PRESENCE mandatory } |
  ...
}

END

```

9.4.5 Information Element Definitions

```

-- *****
--
-- Information Element Definitions
--
-- *****

FLAP-IEs {
  itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
  ngran-access (22) modules (3) flap (3) version1 (1) flap-IEs (2) }

```

```
DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN
```

```
IMPORTS
```

```
id-gNB-CUSystemInformation,  
id-HandoverPreparationInformation,  
id-TAISliceSupportList,  
id-RANAC,  
id-CellGroupConfig,  
id-AvailablePLMNList,  
id-PDUSessionID,  
id-ULPDUSessionAggregateMaximumBitRate,  
id-DC-Based-Duplication-Configured,  
id-DC-Based-Duplication-Activation,  
id-PDCPSNLength,  
id-RLC-Status,  
id-MeasurementTimingConfiguration,  
id-DRB-Information,  
maxNRARFCN,  
maxnoofErrors,  
maxnoofBPLMNs,  
maxnoofDLUPTNLInformation,  
maxnoofNrCellBands,  
maxnoofULUPTNLInformation,  
maxnoofQoSFlows,  
maxnoofSliceItems,  
maxnoofSIBTypes,  
maxnoofSITypes,  
maxCellineNB
```

```
FROM FlAP-Constants
```

```
Criticality,  
ProcedureCode,  
ProtocolIE-ID,  
TriggeringMessage
```

```
FROM FlAP-CommonDataTypes
```

```
ProtocolExtensionContainer{},  
FlAP-PROTOCOL-EXTENSION,  
ProtocolIE-SingleContainer{},  
FlAP-PROTOCOL-IES
```

```
FROM FlAP-Containers;
```

```
-- A
```

```
AllocationAndRetentionPriority ::= SEQUENCE {  
priorityLevel PriorityLevel,  
pre-emptionCapability Pre-emptionCapability,  
pre-emptionVulnerability Pre-emptionVulnerability,
```

```

    iE-Extensions          ProtocolExtensionContainer { {AllocationAndRetentionPriority-ExtIEs} } OPTIONAL,
    ...
}

AllocationAndRetentionPriority-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

AvailablePLMNList ::= SEQUENCE (SIZE(1..maxnoofBPLMNs)) OF AvailablePLMNList-Item

AvailablePLMNList-Item ::= SEQUENCE {
    pLMNIdentity          PLMN-Identity,
    iE-Extensions          ProtocolExtensionContainer { { AvailablePLMNList-Item-ExtIEs} } OPTIONAL
}

AvailablePLMNList-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

AveragingWindow ::= INTEGER (0..4095, ...)

-- B

BitRate ::= INTEGER (0..4000000000000, ...)

BroadcastPLMNs-List ::= SEQUENCE (SIZE(1..maxnoofBPLMNs)) OF BroadcastPLMNs-Item

BroadcastPLMNs-Item ::= SEQUENCE {
    pLMN-Identity          PLMN-Identity,
    iE-Extensions          ProtocolExtensionContainer { { BroadcastPLMNs-ItemExtIEs} } OPTIONAL,
    ...
}

BroadcastPLMNs-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
{ ID id-TAISliceSupportList CRITICALITY ignore EXTENSION SliceSupportList PRESENCE optional },
    ...
}

-- C

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 FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Cause ::= CHOICE {

```

```
    radioNetwork      CauseRadioNetwork,
    transport         CauseTransport,
    protocol          CauseProtocol,
    misc              CauseMisc,
    choice-extension  ProtocolIE-SingleContainer { { Cause-ExtIEs} }
}

Cause-ExtIEs FLAP-PROTOCOL-IES ::= {
    ...
}

CauseMisc ::= ENUMERATED {
    control-processing-overload,
    not-enough-user-plane-processing-resources,
    hardware-failure,
    om-intervention,
    unspecified,
    ...
}

CauseProtocol ::= ENUMERATED {
    transfer-syntax-error,
    abstract-syntax-error-reject,
    abstract-syntax-error-ignore-and-notify,
    message-not-compatible-with-receiver-state,
    semantic-error,
    abstract-syntax-error-falsely-constructed-message,
    unspecified,
    ...
}

CauseRadioNetwork ::= ENUMERATED {
    unspecified,
    rl-failure-rlc,
    unknown-or-already-allocated-gnb-cu-ue-flap-id,
    unknown-or-already-allocated-gnd-du-ue-flap-id,
    unknown-or-inconsistent-pair-of-ue-flap-id,
    interaction-with-other-procedure,
    not-supported-qci-Value,
    action-desirable-for-radio-reasons,
    no-radio-resources-available,
    procedure-cancelled,
    normal-release,
    ...,
    cell-not-available,
    rl-failure-others,
    ue-rejection,
    resources-not-available-for-the-slice
}

CauseTransport ::= ENUMERATED {
    unspecified,
    transport-resource-unavailable,
    ...
}
```

```

}

CellGroupConfig ::= OCTET STRING

Cell-State ::= ENUMERATED {
    active,
    inactive,
    ...
}

Cell-Status ::= SEQUENCE {
    cell-state          Cell-State,
    switchingOffOngoing ENUMERATED {true, ...} OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { Cell-Status-ExtIEs } } OPTIONAL,
    ...
}

Cell-Status-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Cells-Failed-to-be-Activated-List-Item ::= SEQUENCE {
    nRCGI              NRCGI,
    cause              Cause,
    iE-Extensions      ProtocolExtensionContainer { { Cells-Failed-to-be-Activated-List-ItemExtIEs } } OPTIONAL,
    ...
}

Cells-Failed-to-be-Activated-List-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Cells-Status-Item ::= SEQUENCE {
    nRCGI              NRCGI,
    cell-status        Cell-Status,
    iE-Extensions      ProtocolExtensionContainer { { Cells-Status-ItemExtIEs } } OPTIONAL,
    ...
}

Cells-Status-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Cells-To-Be-Broadcast-Item ::= SEQUENCE {
    nRCGI              NRCGI,
    iE-Extensions      ProtocolExtensionContainer { { Cells-To-Be-Broadcast-ItemExtIEs } } OPTIONAL,
    ...
}

Cells-To-Be-Broadcast-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Cells-Broadcast-Completed-Item ::= SEQUENCE {

```

```

    nRCGI          NRCGI,
    iE-Extensions  ProtocolExtensionContainer { { Cells-Broadcast-Completed-ItemExtIEs } } OPTIONAL,
    ...
}

Cells-Broadcast-Completed-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Broadcast-To-Be-Cancelled-Item ::= SEQUENCE {
    nRCGI          NRCGI,
    iE-Extensions  ProtocolExtensionContainer { { Broadcast-To-Be-Cancelled-ItemExtIEs } } OPTIONAL,
    ...
}

Broadcast-To-Be-Cancelled-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

Cells-Broadcast-Cancelled-Item ::= SEQUENCE {
    nRCGI          NRCGI,
    numberOfBroadcasts  NumberOfBroadcasts,
    iE-Extensions  ProtocolExtensionContainer { { Cells-Broadcast-Cancelled-ItemExtIEs } } OPTIONAL,
    ...
}

Cells-Broadcast-Cancelled-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

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  FLAP-PROTOCOL-EXTENSION ::= {
    { ID id-gNB-CUSystemInformation CRITICALITY reject  EXTENSION GNB-CUSystemInformation          PRESENCE optional }|
    { ID id-AvailablePLMNList          CRITICALITY ignore  EXTENSION AvailablePLMNList          PRESENCE optional },
    ...
}

Cells-to-be-Deactivated-List-Item ::= SEQUENCE {
    nRCGI          NRCGI          ,
    iE-Extensions  ProtocolExtensionContainer { { Cells-to-be-Deactivated-List-ItemExtIEs } } OPTIONAL,
    ...
}

Cells-to-be-Deactivated-List-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

```



```

Cells-to-be-Barred-Item ::= SEQUENCE {
    nRCGI          NRCGI,
    cellBarred     CellBarred,
    iE-Extensions  ProtocolExtensionContainer { { Cells-to-be-Barred-Item-ExtIEs } } OPTIONAL
}

Cells-to-be-Barred-Item-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

CellBarred ::= ENUMERATED {barred, not-barred, ...}

CellULConfigured ::= ENUMERATED {none, ul, sul, ul-and-sul, ...}

CNUEPagingIdentity ::= CHOICE {
    fiveG-S-TMSI      BIT STRING (SIZE(48)),
    choice-extension  ProtocolIE-SingleContainer { { CNUEPagingIdentity-ExtIEs } }
}

CNUEPagingIdentity-ExtIEs FLAP-PROTOCOL-IES ::= {
    ...
}

CP-TransportLayerAddress ::= CHOICE {
    endpoint-IP-address      TransportLayerAddress,
    endpoint-IP-address-and-port  Endpoint-IP-address-and-port,
    choice-extension         ProtocolIE-SingleContainer { { CP-TransportLayerAddress-ExtIEs } }
}

CP-TransportLayerAddress-ExtIEs FLAP-PROTOCOL-IES ::= {
    ...
}

CriticalityDiagnostics ::= SEQUENCE {
    procedureCode          ProcedureCode                OPTIONAL,
    triggeringMessage       TriggeringMessage           OPTIONAL,
    procedureCriticality    Criticality                  OPTIONAL,
    transactionID          TransactionID                 OPTIONAL,
    iEsCriticalityDiagnostics  CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer {{CriticalityDiagnostics-ExtIEs}}  OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1.. maxnoofErrors)) OF CriticalityDiagnostics-IE-Item

CriticalityDiagnostics-IE-Item ::= SEQUENCE {
    iECriticality          Criticality,
    iE-ID                 ProtocolIE-ID,
    typeOfError           TypeOfError,
}

```

```

    iE-Extensions          ProtocolExtensionContainer {{CriticalityDiagnostics-IE-Item-ExtIEs}} OPTIONAL,
    ...
}

CriticalityDiagnostics-IE-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

C-RNTI ::= INTEGER (0..65535, ...)

CUtoDURRCInformation ::= SEQUENCE {
    cG-ConfigInfo          CG-ConfigInfo          OPTIONAL,
    uE-CapabilityRAT-ContainerList  UE-CapabilityRAT-ContainerList  OPTIONAL,
    measConfig             MeasConfig             OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { { CUtoDURRCInformation-ExtIEs } } OPTIONAL,
    ...
}

CUtoDURRCInformation-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    { ID id-HandoverPreparationInformation  CRITICALITY ignore  EXTENSION HandoverPreparationInformation  PRESENCE optional }|
    { ID id-CellGroupConfig                 CRITICALITY ignore  EXTENSION CellGroupConfig                 PRESENCE optional }|
    { ID id-MeasurementTimingConfiguration  CRITICALITY ignore  EXTENSION MeasurementTimingConfiguration  PRESENCE optional },
    ...
}

-- D

DCBasedDuplicationConfigured ::= ENUMERATED {true, ... }

DLUPTNLInformation-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofDLUPTNLInformation)) OF DLUPTNLInformation-ToBeSetup-Item

DLUPTNLInformation-ToBeSetup-Item ::= SEQUENCE {
    dLUPTNLInformation  UPTransportLayerInformation ,
    iE-Extensions       ProtocolExtensionContainer { { DLUPTNLInformation-ToBeSetup-ItemExtIEs } } OPTIONAL,
    ...
}

DLUPTNLInformation-ToBeSetup-ItemExtIEs      FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Activity-Item ::= SEQUENCE {
    dRBID              DRBID,
    dRB-Activity        DRB-Activity          OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { { DRB-Activity-ItemExtIEs } } OPTIONAL,
    ...
}

DRB-Activity-ItemExtIEs      FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Activity ::= ENUMERATED {active, not-active}

```

```

DRBID ::= INTEGER (1..32, ...)

DRBs-FailedToBeModified-Item ::= SEQUENCE {
    dRBID          DRBID,
    cause          Cause OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRBs-FailedToBeModified-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-FailedToBeModified-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-FailedToBeSetup-Item ::= SEQUENCE {
    dRBID          DRBID,
    cause          Cause OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRBs-FailedToBeSetup-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-FailedToBeSetup-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-FailedToBeSetupMod-Item ::= SEQUENCE {
    dRBID          DRBID,
    cause          Cause OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRBs-FailedToBeSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-FailedToBeSetupMod-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Information ::= SEQUENCE {
    dRB-QoS        QoSFlowLevelQoSParameters,
    sNSSAI         SNSSAI,
    notificationControl NotificationControl OPTIONAL,
    flows-Mapped-To-DRB-List Flows-Mapped-To-DRB-List,
    iE-Extensions ProtocolExtensionContainer { { DRB-Information-ItemExtIEs } } OPTIONAL
}

DRB-Information-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-Modified-Item ::= SEQUENCE {
    dRBID          DRBID,
    lCID           LCID OPTIONAL,
    dLUPTNLInformation-ToBeSetup-List DLUPTNLInformation-ToBeSetup-List,
    iE-Extensions ProtocolExtensionContainer { { DRBs-Modified-ItemExtIEs } } OPTIONAL,
    ...
}

```

```

}

DRBs-Modified-ItemExtIEs    FLAP-PROTOCOL-EXTENSION ::= {
  { ID id-RLC-Status          CRITICALITY ignore          EXTENSION RLC-Status          PRESENCE optional },
  ...
}

DRBs-ModifiedConf-Item ::= SEQUENCE {
  dRBID                      DRBID,
  uLUPTNLInformation-ToBeSetup-List  ULUPTNLInformation-ToBeSetup-List ,
  iE-Extensions    ProtocolExtensionContainer { { DRBs-ModifiedConf-ItemExtIEs } } OPTIONAL,
  ...
}

DRBs-ModifiedConf-ItemExtIEs    FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

DRB-Notify-Item ::= SEQUENCE {
  dRBID                      DRBID,
  notification-Cause    Notification-Cause,
  iE-Extensions    ProtocolExtensionContainer { { DRB-Notify-ItemExtIEs } } OPTIONAL,
  ...
}

DRB-Notify-ItemExtIEs    FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

DRBs-Required-ToBeModified-Item ::= SEQUENCE {
  dRBID                      DRBID,
  dLUPTNLInformation-ToBeSetup-List  DLUPTNLInformation-ToBeSetup-List ,
  iE-Extensions    ProtocolExtensionContainer { { DRBs-Required-ToBeModified-ItemExtIEs } } OPTIONAL,
  ...
}

DRBs-Required-ToBeModified-ItemExtIEs    FLAP-PROTOCOL-EXTENSION ::= {
  { ID id-RLC-Status          CRITICALITY ignore          EXTENSION RLC-Status          PRESENCE optional },
  ...
}

DRBs-Required-ToBeReleased-Item ::= SEQUENCE {
  dRBID                      DRBID,
  iE-Extensions    ProtocolExtensionContainer { { DRBs-Required-ToBeReleased-ItemExtIEs } } OPTIONAL,
  ...
}

DRBs-Required-ToBeReleased-ItemExtIEs    FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

DRBs-Setup-Item ::= SEQUENCE {
  dRBID                      DRBID,
  lCID                      LCID          OPTIONAL,

```

```

    dLUPTNLInformation-ToBeSetup-List      DLUPTNLInformation-ToBeSetup-List      ,
    iE-Extensions ProtocolExtensionContainer { { DRBs-Setup-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-Setup-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-SetupMod-Item ::= SEQUENCE {
    dRBID          DRBID,
    lCID          LCID          OPTIONAL,
    dLUPTNLInformation-ToBeSetup-List      DLUPTNLInformation-ToBeSetup-List      ,
    iE-Extensions ProtocolExtensionContainer { { DRBs-SetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-SetupMod-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-ToBeModified-Item ::= SEQUENCE {
    dRBID          DRBID,
    qosInformation QoSInformation OPTIONAL,
    uLUPTNLInformation-ToBeSetup-List      ULUPTNLInformation-ToBeSetup-List      ,
    ulConfiguration ULConfiguration OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRBs-ToBeModified-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-ToBeModified-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    { ID id-PDCPSNLength          CRITICALITY ignore EXTENSION PDCPSNLength PRESENCE optional },
    ...
}

DRBs-ToBeReleased-Item ::= SEQUENCE {
    dRBID          DRBID,
    iE-Extensions ProtocolExtensionContainer { { DRBs-ToBeReleased-ItemExtIEs } } OPTIONAL,
    ...
}

DRBs-ToBeReleased-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-ToBeSetup-Item ::= SEQUENCE {
    dRBID          DRBID,
    qosInformation QoSInformation,
    uLUPTNLInformation-ToBeSetup-List      ULUPTNLInformation-ToBeSetup-List      ,
    rLCMode        RLCMode,
    ulConfiguration ULConfiguration OPTIONAL,
    duplicationActivation DuplicationActivation OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRBs-ToBeSetup-ItemExtIEs } } OPTIONAL,

```

```

}
...
}
DRBs-ToBeSetup-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  { ID id-DC-Based-Duplication-Configured  CRITICALITY reject  EXTENSION DCBasedDuplicationConfigured  PRESENCE optional } |
  { ID id-DC-Based-Duplication-Activation  CRITICALITY reject  EXTENSION DuplicationActivation  PRESENCE optional } |
  { ID id-PDCPSNLength  CRITICALITY ignore  EXTENSION PDCPSNLength  PRESENCE mandatory },
  ...
}

DRBs-ToBeSetupMod-Item ::= SEQUENCE {
  drbID DRbID,
  qosInformation QoSInformation,
  ulUPTNLInformation-ToBeSetup-List ULUPTNLInformation-ToBeSetup-List,
  rLCMode RLCMode,
  ulConfiguration ULConfiguration OPTIONAL,
  duplicationActivation DuplicationActivation OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { { DRBs-ToBeSetupMod-ItemExtIEs } } OPTIONAL,
  ...
}

DRBs-ToBeSetupMod-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  { ID id-DC-Based-Duplication-Configured  CRITICALITY reject  EXTENSION DCBasedDuplicationConfigured  PRESENCE optional } |
  { ID id-DC-Based-Duplication-Activation  CRITICALITY reject  EXTENSION DuplicationActivation  PRESENCE optional } |
  { ID id-PDCPSNLength  CRITICALITY ignore  EXTENSION PDCPSNLength  PRESENCE optional },
  ...
}

DRXCycle ::= SEQUENCE {
  longDRXCycleLength LongDRXCycleLength,
  shortDRXCycleLength ShortDRXCycleLength OPTIONAL,
  shortDRXCycleTimer ShortDRXCycleTimer OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { { DRXCycle-ExtIEs } } OPTIONAL,
  ...
}

DRXCycle-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

DRXConfigurationIndicator ::= ENUMERATED{ release, ...}

DutoCURRCContainer ::= OCTET STRING

DutoCURRCInformation ::= SEQUENCE {
  cellGroupConfig CellGroupConfig,
  measGapConfig MeasGapConfig OPTIONAL,
  requestedP-MaxFR1 OCTET STRING OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { { DutoCURRCInformation-ExtIEs } } OPTIONAL,
  ...
}

DutoCURRCInformation-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {

```

```

    ...
}
DuplicationActivation ::= ENUMERATED{active,inactive,... }
DuplicationIndication ::= ENUMERATED {true, ... , false }
Dynamic5QIDescriptor ::= SEQUENCE {
    qoSPriorityLevel          INTEGER (1..127),
    packetDelayBudget        PacketDelayBudget,
    packetErrorRate          PacketErrorRate,
    fiveQI                   INTEGER (0..255, ...) OPTIONAL,
    delayCritical            ENUMERATED {delay-critical, non-delay-critical} OPTIONAL,
    averagingWindow         AveragingWindow OPTIONAL,
    maxDataBurstVolume      MaxDataBurstVolume OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { Dynamic5QIDescriptor-ExtIEs } } OPTIONAL
}
Dynamic5QIDescriptor-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
-- E
Endpoint-IP-address-and-port ::=SEQUENCE {
    endpointIPAddress TransportLayerAddress,
    iE-Extensions       ProtocolExtensionContainer { { Endpoint-IP-address-and-port-ExtIEs} } OPTIONAL
}
Endpoint-IP-address-and-port-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
EUTRACellsingNBUDUCoordination-List ::= SEQUENCE (SIZE (1.. maxCelllineNB)) OF EUTRACellsingNBUDUCoordination-List-item
EUTRACellsingNBUDUCoordination-List-item ::= SEQUENCE {
    eUTRA-Cell-ID          EUTRA-Cell-ID,
    served-EUTRA-Cells-Information Served-EUTRA-Cells-Information,
    iE-Extensions ProtocolExtensionContainer { { EUTRACellsingNBUDUCoordination-List-itemExtIEs } } OPTIONAL
}
EUTRACellsingNBUDUCoordination-List-itemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
EUTRA-Cell-ID ::= BIT STRING (SIZE(28))
EUTRANQoS ::= SEQUENCE {
    qCI          QCI,
    allocationAndRetentionPriority AllocationAndRetentionPriority,
    gbrQoSInformation GBR-QoSInformation OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { EUTRANQoS-ExtIEs } } OPTIONAL,
    ...
}

```

```

}
EUTRANQoS-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
  ...
}
ExecuteDuplication ::= ENUMERATED{true,...}

EUTRA-Mode-Info ::= CHOICE {
  eUTRAFDD          EUTRA-FDD-Info,
  eUTRATDD          EUTRA-TDD-Info,
  choice-extension  ProtocolIE-SingleContainer { { EUTRA-Mode-Info-ExtIEs } }
}

EUTRA-Mode-Info-ExtIEs FLAP-PROTOCOL-IES ::= {
  ...
}

EUTRA-NR-CellResourceCoordinationReq-Container ::= OCTET STRING
EUTRA-NR-CellResourceCoordinationReqAck-Container ::= OCTET STRING

EUTRA-FDD-Info ::= SEQUENCE {
  uL-offsetToPointA          OffsetToPointA,
  dL-offsetToPointA          OffsetToPointA,
  iE-Extensions              ProtocolExtensionContainer { {EUTRA-FDD-Info-ExtIEs} } OPTIONAL,
  ...
}

EUTRA-FDD-Info-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

EUTRA-TDD-Info ::= SEQUENCE {
  offsetToPointA              OffsetToPointA,
  iE-Extensions              ProtocolExtensionContainer { {EUTRA-TDD-Info-ExtIEs} } OPTIONAL,
  ...
}

EUTRA-TDD-Info-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- F

FDD-Info ::= SEQUENCE {
  uL-NRFreqInfo              NRFreqInfo,
  dL-NRFreqInfo              NRFreqInfo,
  uL-Transmission-Bandwidth  Transmission-Bandwidth,
  dL-Transmission-Bandwidth  Transmission-Bandwidth,
  iE-Extensions              ProtocolExtensionContainer { {FDD-Info-ExtIEs} } OPTIONAL,
  ...
}

```



```

FDD-Info-ExtIEs FlAP-PROTOCOL-EXTENSION ::= {
    ...
}

Flows-Mapped-To-DRB-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF Flows-Mapped-To-DRB-Item

Flows-Mapped-To-DRB-Item ::= SEQUENCE {
    qosFlowIndicator                QoSFlowIndicator,
    qosFlowLevelQoSParameters      QoSFlowLevelQoSParameters,
    iE-Extensions                   ProtocolExtensionContainer { { Flows-Mapped-To-DRB-ItemExtIEs } } OPTIONAL
}

Flows-Mapped-To-DRB-ItemExtIEs FlAP-PROTOCOL-EXTENSION ::= {
    ...
}

FreqBandNrItem ::= SEQUENCE {
    freqBandIndicatorNr             INTEGER (1..1024,...),
    supportedSULBandList            SEQUENCE (SIZE(0..maxnoofNrCellBands)) OF SupportedSULFreqBandItem,
    iE-Extensions                   ProtocolExtensionContainer { { FreqBandNrItem-ExtIEs } } OPTIONAL,
    ...
}

FreqBandNrItem-ExtIEs FlAP-PROTOCOL-EXTENSION ::= {
    ...
}

FullConfiguration ::= ENUMERATED {full, ...}

-- G

GBR-QoSInformation ::= SEQUENCE {
    e-RAB-MaximumBitrateDL          BitRate,
    e-RAB-MaximumBitrateUL          BitRate,
    e-RAB-GuaranteedBitrateDL       BitRate,
    e-RAB-GuaranteedBitrateUL       BitRate,
    iE-Extensions                   ProtocolExtensionContainer { { GBR-QoSInformation-ExtIEs } } OPTIONAL,
    ...
}

GBR-QoSInformation-ExtIEs FlAP-PROTOCOL-EXTENSION ::= {
    ...
}

GBR-QoSFlowInformation ::= SEQUENCE {
    maxFlowBitRateDownlink          BitRate,
    maxFlowBitRateUplink            BitRate,
    guaranteedFlowBitRateDownlink   BitRate,
    guaranteedFlowBitRateUplink     BitRate,
    maxPacketLossRateDownlink       MaxPacketLossRate OPTIONAL,
    maxPacketLossRateUplink         MaxPacketLossRate OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { GBR-QoSFlowInformation-ExtIEs } } OPTIONAL,
}

```

```

    ...
}

GBR-QosFlowInformation-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CUSystemInformation ::= SEQUENCE {
    sibtypetobeupdatedlist SEQUENCE (SIZE(1.. maxnoofSIBTypes)) OF SibtypetobeupdatedListItem,
    iE-Extensions          ProtocolExtensionContainer { { GNB-CUSystemInformation-ExtIEs} } OPTIONAL,
    ...
}

GNB-CUSystemInformation-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-TNL-Association-Setup-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TransportLayerAddress ,
    iE-Extensions          ProtocolExtensionContainer { { GNB-CU-TNL-Association-Setup-Item-ExtIEs} } OPTIONAL
}

GNB-CU-TNL-Association-Setup-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-TNL-Association-Failed-To-Setup-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TransportLayerAddress ,
    cause                               Cause,
    iE-Extensions          ProtocolExtensionContainer { { GNB-CU-TNL-Association-Failed-To-Setup-Item-ExtIEs} } OPTIONAL
}

GNB-CU-TNL-Association-Failed-To-Setup-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-TNL-Association-To-Add-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TransportLayerAddress ,
    tNLAssociationUsage                 TNLAssociationUsage,
    iE-Extensions          ProtocolExtensionContainer { { GNB-CU-TNL-Association-To-Add-Item-ExtIEs} } OPTIONAL
}

GNB-CU-TNL-Association-To-Add-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-TNL-Association-To-Remove-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TransportLayerAddress ,
    iE-Extensions          ProtocolExtensionContainer { { GNB-CU-TNL-Association-To-Remove-Item-ExtIEs} } OPTIONAL
}

GNB-CU-TNL-Association-To-Remove-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {

```

```

}
...
}

GNB-CU-TNL-Association-To-Update-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TransportLayerAddress ,
    tNLAssociationUsage TNLAssociationUsage OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { GNB-CU-TNL-Association-To-Update-Item-ExtIEs } } OPTIONAL
}

GNB-CU-TNL-Association-To-Update-Item-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UE-FLAP-ID ::= INTEGER (0..4294967295)
GNB-DU-UE-FLAP-ID ::= INTEGER (0..4294967295)
GNB-DU-ID ::= INTEGER (0..68719476735)
GNB-CU-Name ::= PrintableString(SIZE(1..150,...))
GNB-DU-Name ::= PrintableString(SIZE(1..150,...))

GNB-DU-Served-Cells-Item ::= SEQUENCE {
    served-Cell-Information Served-Cell-Information,
    gNB-DU-System-Information GNB-DU-System-Information OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { GNB-DU-Served-Cells-ItemExtIEs } } OPTIONAL,
    ...
}

GNB-DU-Served-Cells-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-DU-System-Information ::= SEQUENCE {
    mIB-message MIB-message,
    sIB1-message SIB1-message,
    iE-Extensions ProtocolExtensionContainer { { GNB-DU-System-Information-ExtIEs } } OPTIONAL,
    ...
}

GNB-DU-System-Information-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-DUConfigurationQuery ::= ENUMERATED {true, ...}
GNBDUOverloadInformation ::= ENUMERATED {overloaded, not-overloaded}
GTP-TEID ::= OCTET STRING (SIZE (4))
GTP Tunnel ::= SEQUENCE {
    transportLayerAddress TransportLayerAddress,

```

```
    gTP-TEID          GTP-TEID,
    iE-Extensions     ProtocolExtensionContainer { { GTPtunnel-ExtIEs } } OPTIONAL,
    ...
}

GTPtunnel-ExtIEs FlAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- H

HandoverPreparationInformation ::= OCTET STRING

-- I
InactivityMonitoringRequest ::= ENUMERATED { true,...}
InactivityMonitoringResponse ::= ENUMERATED { not-supported,...}

-- J

-- K

-- L

LCID ::= INTEGER (1..32, ...)

LongDRXCycleLength ::= ENUMERATED
{ms10, ms20, ms32, ms40, ms60, ms64, ms70, ms80, ms128, ms160, ms256, ms320, ms512, ms640, ms1024, ms1280, ms2048, ms2560, ms5120, ms10240, ...}

-- M

MaskedIMEISV ::= BIT STRING (SIZE (64))

MaxDataBurstVolume ::= INTEGER (0..4095, ...)
MaxPacketLossRate ::= INTEGER (0..1000)

MIB-message ::= OCTET STRING

MeasConfig ::= OCTET STRING

MeasGapConfig ::= OCTET STRING

MeasurementTimingConfiguration ::= OCTET STRING

-- N

NGRANAllocationAndRetentionPriority ::= SEQUENCE {
    priorityLevel          PriorityLevel,
    pre-emptionCapability  Pre-emptionCapability,
    pre-emptionVulnerability Pre-emptionVulnerability,
    iE-Extensions         ProtocolExtensionContainer { {NGRANAllocationAndRetentionPriority-ExtIEs} } OPTIONAL
}

NGRANAllocationAndRetentionPriority-ExtIEs FlAP-PROTOCOL-EXTENSION ::= {
```

```

}
...
}
NR-CGI-List-For-Restart-Item ::= SEQUENCE {
  nRCGI          NRCGI,
  iE-Extensions  ProtocolExtensionContainer { { NR-CGI-List-For-Restart-ItemExtIEs } } OPTIONAL,
  ...
}

NR-CGI-List-For-Restart-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

NonDynamic5QIDescriptor ::= SEQUENCE {
  fiveQI          INTEGER (0..255, ...),
  qoSPriorityLevel  INTEGER (1..127)          OPTIONAL,
  averagingWindow  AveragingWindow          OPTIONAL,
  maxDataBurstVolume  MaxDataBurstVolume    OPTIONAL,
  iE-Extensions  ProtocolExtensionContainer { { NonDynamic5QIDescriptor-ExtIEs } } OPTIONAL
}

NonDynamic5QIDescriptor-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

Notification-Cause ::= ENUMERATED {fulfilled, not-fulfilled, ...}

NotificationControl ::= ENUMERATED {active, not-active, ...}

NRFreqInfo ::= SEQUENCE {
  nRARFCN          INTEGER (0..maxNRARFCN),
  sul-Information  SUL-Information          OPTIONAL,
  freqBandListNr  SEQUENCE (SIZE(1..maxnoofNrCellBands)) OF FreqBandNrItem,
  iE-Extensions  ProtocolExtensionContainer { { NRFreqInfoExtIEs } } OPTIONAL,
  ...
}

NRFreqInfoExtIEs          FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

NRCGI ::= SEQUENCE {
  pLMN-Identity      PLMN-Identity,
  nRCellIdentity     NRCellIdentity,
  iE-Extensions     ProtocolExtensionContainer { {NRCGI-ExtIEs} } OPTIONAL,
  ...
}

NRCGI-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

NR-Mode-Info ::= CHOICE {
  fDD          FDD-Info,

```

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    tDD      TDD-Info,
    choice-extension      ProtocolIE-SingleContainer { { NR-Mode-Info-ExtIEs } }
}

NR-Mode-Info-ExtIEs FLAP-PROTOCOL-IES ::= { ...
}

NRCellIdentity ::= BIT STRING (SIZE(36))

NRNRB ::= ENUMERATED { nrb11, nrb18, nrb24, nrb25, nrb31, nrb32, nrb38, nrb51, nrb52, nrb65, nrb66, nrb78, nrb79, nrb93, nrb106, nrb107, nrb121,
nrb132, nrb133, nrb135, nrb160, nrb162, nrb189, nrb216, nrb217, nrb245, nrb264, nrb270, nrb273, ...}

NRPCI ::= INTEGER(0..1007)

NRSCS ::= ENUMERATED { scs15, scs30, scs60, scs120, ...}

NumberOfBroadcasts ::= INTEGER (0..65535)

NumberofBroadcastRequest ::= INTEGER (0..65535)

-- O

OffsetToPointA ::= INTEGER (0..2199,...)

-- P

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

PacketErrorRate ::= SEQUENCE {
    pER-Scalar      PER-Scalar,
    pER-Exponent    PER-Exponent,
    iE-Extensions  ProtocolExtensionContainer { {PacketErrorRate-ExtIEs} } OPTIONAL,
    ...
}

PacketErrorRate-ExtIEs FLAP-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 FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

PagingDRX ::= ENUMERATED {

```

```

v32,
v64,
v128,
v256,
...
}
PagingIdentity ::= CHOICE {
  rANUEPagingIdentity RANUEPagingIdentity,
  cNUEPagingIdentity CNUEPagingIdentity,
  choice-extension      ProtocolIE-SingleContainer { { PagingIdentity-ExtIEs } }
}

PagingIdentity-ExtIEs FlAP-PROTOCOL-IES ::= {
  ...
}

PagingPriority ::= ENUMERATED { priolevel1, priolevel2, priolevel3, priolevel4, priolevel5, priolevel6, priolevel7, priolevel8,...}

PDCPSNLength ::= ENUMERATED { twelve-bits, eighteen-bits,...}

PDUSessionID ::= INTEGER (0..255)

PLMN-Identity ::= OCTET STRING (SIZE(3))

Pre-emptionCapability ::= ENUMERATED {
  shall-not-trigger-pre-emption,
  may-trigger-pre-emption
}

Pre-emptionVulnerability ::= ENUMERATED {
  not-pre-emptable,
  pre-emptable
}

PriorityLevel ::= INTEGER { spare (0), highest (1), lowest (14), no-priority (15) } (0..15)

ProtectedEUTRAResourceIndication ::= OCTET STRING

Protected-EUTRA-Resources-Item ::= SEQUENCE {
  spectrumSharingGroupID SpectrumSharingGroupID,
  eUTRACellsingNBUDUCoordination-List EUTRACellsingNBUDUCoordination-List,
  iE-Extensions ProtocolExtensionContainer { { Protected-EUTRA-Resources-ItemExtIEs } } OPTIONAL
}

Protected-EUTRA-Resources-ItemExtIEs FlAP-PROTOCOL-EXTENSION ::= {
  ...
}

Potential-SpCell-Item ::= SEQUENCE {
  potential-SpCell-ID NRCGI ,
  iE-Extensions ProtocolExtensionContainer { { Potential-SpCell-ItemExtIEs } } OPTIONAL,
  ...
}

```

```

Potential-SpCell-ItemExtIEs      FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

PWS-Failed-NR-CGI-Item ::= SEQUENCE {
  nRCGI          NRCGI,
  numberOfBroadcasts  NumberOfBroadcasts,
  iE-Extensions  ProtocolExtensionContainer { { PWS-Failed-NR-CGI-ItemExtIEs } } OPTIONAL,
  ...
}

PWS-Failed-NR-CGI-ItemExtIEs      FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

PWSSystemInformation ::= OCTET STRING

-- Q

QCI ::= INTEGER (0..255)

QoS-Characteristics ::= CHOICE {
  non-Dynamic-5QI          NonDynamic5QIDescriptor,
  dynamic-5QI              Dynamic5QIDescriptor,
  choice-extension        ProtocolIE-SingleContainer { { QoS-Characteristics-ExtIEs } }
}

QoS-Characteristics-ExtIEs FLAP-PROTOCOL-IES ::= {
  ...
}

QoSFlowIndicator ::= INTEGER (0..63)

QoSFlowLevelQoSParameters ::= SEQUENCE {
  qos-Characteristics          QoS-Characteristics,
  nGRANAllocationRetentionPriority  NGRANAllocationAndRetentionPriority,
  gBR-QoS-Flow-Information    GBR-QoSFlowInformation          OPTIONAL,
  reflective-QoS-Attribute    ENUMERATED {subject-to, ...}          OPTIONAL,
  iE-Extensions              ProtocolExtensionContainer { { QoSFlowLevelQoSParameters-ExtIEs } } OPTIONAL
}

QoSFlowLevelQoSParameters-ExtIEs      FLAP-PROTOCOL-EXTENSION ::= {
  { ID id-PDUSessionID          CRITICALITY ignore  EXTENSION PDUSessionID          PRESENCE optional}|
  { ID id-ULPDUSessionAggregateMaximumBitRate  CRITICALITY ignore  EXTENSION BitRate          PRESENCE optional},
  ...
}

QoSInformation ::= CHOICE {
  eUTRANQoS          EUTRANQoS,
  choice-extension  ProtocolIE-SingleContainer { { QoSInformation-ExtIEs } }
}

QoSInformation-ExtIEs FLAP-PROTOCOL-IES ::= {
  { ID id-DRB-Information          CRITICALITY ignore TYPE DRB-Information          PRESENCE optional},

```



```
    ...
}
-- R
RANAC ::= INTEGER (0..255)
RANUEPagingIdentity ::= SEQUENCE {
    iRNTI BIT STRING (SIZE(40)),
    iE-Extensions ProtocolExtensionContainer { { RANUEPagingIdentity-ExtIEs } } OPTIONAL
}
RANUEPagingIdentity-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
RAT-FrequencyPriorityInformation ::= CHOICE {
    subscriberProfileIDforRFP SubscriberProfileIDforRFP,
    rAT-FrequencySelectionPriority RAT-FrequencySelectionPriority,
    choice-extension ProtocolIE-SingleContainer { { RAT-FrequencyPriorityInformation-ExtIEs } }
}
RAT-FrequencyPriorityInformation-ExtIEs FLAP-PROTOCOL-IES ::= {
    ...
}
RAT-FrequencySelectionPriority ::= INTEGER (1.. 256, ...)
Reestablishment-Indication ::= ENUMERATED {
    reestablished,
    ...
}
RequestType ::= ENUMERATED {offer, execution, ...}
ResourceCoordinationTransferContainer ::= OCTET STRING
RepetitionPeriod ::= INTEGER (0..131071, ...)
RLCFailureIndication ::= SEQUENCE {
    associatedLCID LCID,
    iE-Extensions ProtocolExtensionContainer { {RLCFailureIndication-ExtIEs} } OPTIONAL
}
RLCFailureIndication-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
RLCMode ::= ENUMERATED {
    rlc-am,
    rlc-um-bidirectional,
    rlc-um-unidirectional-ul,
    rlc-um-unidirectional-dl,
    ...
}
```

```

RLC-Status ::= SEQUENCE {
    reestablishment-Indication Reestablishment-Indication,
    iE-Extensions              ProtocolExtensionContainer { { RLC-Status-ExtIEs } } OPTIONAL,
    ...
}

RLC-Status-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

RRCContainer ::= OCTET STRING

RRCRconfigurationCompleteIndicator ::= ENUMERATED {true, ...}

RRC-Version ::= SEQUENCE {
    latest-RRC-Version      BIT STRING (SIZE(3)),
    iE-Extensions          ProtocolExtensionContainer { { RRC-Version-ExtIEs } } OPTIONAL}

RRC-Version-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- S

SCell-FailedtoSetup-Item ::= SEQUENCE {
    sCell-ID      NRCGI ,
    cause        Cause OPTIONAL ,
    iE-Extensions ProtocolExtensionContainer { { SCell-FailedtoSetup-ItemExtIEs } } OPTIONAL,
    ...
}

SCell-FailedtoSetup-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SCell-FailedtoSetupMod-Item ::= SEQUENCE {
    sCell-ID      NRCGI ,
    cause        Cause OPTIONAL ,
    iE-Extensions ProtocolExtensionContainer { { SCell-FailedtoSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

SCell-FailedtoSetupMod-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SCell-ToBeRemoved-Item ::= SEQUENCE {
    sCell-ID      NRCGI ,
    iE-Extensions ProtocolExtensionContainer { { SCell-ToBeRemoved-ItemExtIEs } } OPTIONAL,
    ...
}

SCell-ToBeRemoved-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {

```

```

}
...
}
SCell-ToBeSetup-Item ::= SEQUENCE {
    sCell-ID          NRCGI          ,
    sCellIndex        SCellIndex,
    sCellULConfigured CellULConfigured OPTIONAL,
    iE-Extensions     ProtocolExtensionContainer { { SCell-ToBeSetup-ItemExtIEs } } OPTIONAL,
    ...
}
SCell-ToBeSetup-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
SCell-ToBeSetupMod-Item ::= SEQUENCE {
    sCell-ID          NRCGI          ,
    sCellIndex        SCellIndex,
    sCellULConfigured CellULConfigured OPTIONAL,
    iE-Extensions     ProtocolExtensionContainer { { SCell-ToBeSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}
SCell-ToBeSetupMod-ItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}
SCellIndex ::= INTEGER (1..31, ...)
CG-ConfigInfo ::= OCTET STRING
ServCellIndex ::= INTEGER (0..31, ...)
Served-Cell-Information ::= SEQUENCE {
    nRCGI              NRCGI,
    nRPCI              NRPCI,
    fiveGS-TAC         FiveGS-TAC          OPTIONAL,
    configured-EPS-TAC Configured-EPS-TAC  OPTIONAL,
    servedPLMNs        BroadcastPLMNs-List,
    nR-Mode-Info        NR-Mode-Info,
    measurementTimingConfiguration OCTET STRING,
    iE-Extensions       ProtocolExtensionContainer { {Served-Cell-Information-ExtIEs} } OPTIONAL,
    ...
}
Served-Cell-Information-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    { ID id-RANAC      CRITICALITY ignore EXTENSION RANAC      PRESENCE optional },
    ...
}
Served-Cells-To-Add-Item ::= SEQUENCE {
    served-Cell-Information Served-Cell-Information,
    gNB-DU-System-Information GNB-DU-System-Information OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { Served-Cells-To-Add-ItemExtIEs } } OPTIONAL,

```

```

}
...
}
Served-Cells-To-Add-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}
Served-Cells-To-Delete-Item ::= SEQUENCE {
  oldNR CGI          NR CGI ,
  iE-Extensions      ProtocolExtensionContainer { { Served-Cells-To-Delete-ItemExtIEs } } OPTIONAL,
  ...
}
Served-Cells-To-Delete-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}
Served-Cells-To-Modify-Item ::= SEQUENCE {
  oldNR CGI          NR CGI ,
  served-Cell-Information  Served-Cell-Information ,
  gNB-DU-System-Information  GNB-DU-System-Information  OPTIONAL ,
  iE-Extensions      ProtocolExtensionContainer { { Served-Cells-To-Modify-ItemExtIEs } } OPTIONAL,
  ...
}
Served-Cells-To-Modify-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}
Served-EUTRA-Cells-Information ::= SEQUENCE {
  eUTRA-Mode-Info          EUTRA-Mode-Info,
  protectedEUTRAResourceIndication  ProtectedEUTRAResourceIndication,
  iE-Extensions          ProtocolExtensionContainer { {Served-EUTRA-Cell-Information-ExtIEs} } OPTIONAL,
  ...
}
Served-EUTRA-Cell-Information-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}
ShortDRXCycleLength ::= ENUMERATED {ms2, ms3, ms4, ms5, ms6, ms7, ms8, ms10, ms14, ms16, ms20, ms30, ms32, ms35, ms40, ms64, ms80, ms128, ms160,
ms256, ms320, ms512, ms640, ...}
ShortDRXCycleTimer ::= INTEGER (1..16)
SIB1-message ::= OCTET STRING
SItypes ::= INTEGER (1..32, ...)
SItypes-List ::= SEQUENCE (SIZE(1.. maxnoofSITypes)) OF SItypes-Item
SItypes-Item ::= SEQUENCE {
  sItypes          SItypes ,
  iE-Extensions    ProtocolExtensionContainer { { SItypes-ItemExtIEs } }  OPTIONAL
}

```

```

}

SIBtype-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

SibtypetobeupdatedListItem ::= SEQUENCE {
  sIBtype          INTEGER (2..32,...),
  sIBmessage       OCTET STRING,
  valueTag         INTEGER (0..31,...),
  iE-Extensions   ProtocolExtensionContainer { { SibtypetobeupdatedListItem-ExtIEs } }  OPTIONAL,
  ...
}

SibtypetobeupdatedListItem-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

SliceSupportList ::= SEQUENCE (SIZE(1.. maxnoofSliceItems)) OF SliceSupportItem

SliceSupportItem ::= SEQUENCE {
  sNSSAI  SNSSAI,
  iE-Extensions  ProtocolExtensionContainer { { SliceSupportItem-ExtIEs } }  OPTIONAL
}

SliceSupportItem-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

SNSSAI ::= SEQUENCE {
  sST      OCTET STRING (SIZE(1)),
  sD      OCTET STRING (SIZE(3))  OPTIONAL  ,
  iE-Extensions  ProtocolExtensionContainer { { SNSSAI-ExtIEs } }  OPTIONAL
}

SNSSAI-ExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

SpectrumSharingGroupID ::= INTEGER (1..maxCelllineNB)

SRBID ::= INTEGER (0..3, ...)

SRBs-FailedToBeSetup-Item  ::= SEQUENCE {
  sRBID      SRBID  ,
  cause      Cause  OPTIONAL,
  iE-Extensions  ProtocolExtensionContainer { { SRBs-FailedToBeSetup-ItemExtIEs } }  OPTIONAL,
  ...
}

SRBs-FailedToBeSetup-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
  ...
}

```

```

SRBs-FailedToBeSetupMod-Item ::= SEQUENCE {
    sRBID          SRBID ,
    cause          Cause          OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-FailedToBeSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-FailedToBeSetupMod-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-Required-ToBeReleased-Item ::= SEQUENCE {
    sRBID          SRBID,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-Required-ToBeReleased-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-Required-ToBeReleased-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-ToBeReleased-Item ::= SEQUENCE {
    sRBID          SRBID,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-ToBeReleased-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-ToBeReleased-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-ToBeSetup-Item ::= SEQUENCE {
    sRBID          SRBID ,
    duplicationIndication  DuplicationIndication  OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-ToBeSetup-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-ToBeSetup-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-ToBeSetupMod-Item ::= SEQUENCE {
    sRBID          SRBID,
    duplicationIndication  DuplicationIndication  OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-ToBeSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-ToBeSetupMod-ItemExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```
SUL-Information ::= SEQUENCE {
    SUL-NRARFCN                INTEGER (0..maxNRARFCN),
    SUL-transmission-Bandwidth  Transmission-Bandwidth,
    iE-Extensions              ProtocolExtensionContainer { { SUL-InformationExtIEs } } OPTIONAL,
    ...
}

SUL-InformationExtIEs  FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

SubscriberProfileIDforRFP ::= INTEGER (1..256, ...)

SULAccessIndication ::= ENUMERATED {true,...}

SupportedSULFreqBandItem ::= SEQUENCE {
    freqBandIndicatorNr        INTEGER (1..1024,...),
    iE-Extensions              ProtocolExtensionContainer { { SupportedSULFreqBandItem-ExtIEs } } OPTIONAL,
    ...
}

SupportedSULFreqBandItem-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- T

FiveGS-TAC ::= OCTET STRING (SIZE(3))

Configured-EPS-TAC ::= OCTET STRING (SIZE(2))

TDD-Info ::= SEQUENCE {
    nRFreqInfo                NRFreqInfo,
    transmission-Bandwidth    Transmission-Bandwidth,
    iE-Extensions              ProtocolExtensionContainer { { TDD-Info-ExtIEs } } OPTIONAL,
    ...
}

TDD-Info-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

TimeToWait ::= ENUMERATED {v1s, v2s, v5s, v10s, v20s, v60s, ...}

TNLAssociationUsage ::= ENUMERATED {
    ue,
    non-ue,
    both,
    ...
}

TransportLayerAddress ::= BIT STRING (SIZE(1..160, ...))
```

```

TransactionID ::= INTEGER (0..255, ...)

Transmission-Bandwidth ::= SEQUENCE {
    nRSCS NRSCS,
    nRNRB NRNRB,
    iE-Extensions ProtocolExtensionContainer { { Transmission-Bandwidth-ExtIEs } } OPTIONAL,
    ...
}

Transmission-Bandwidth-ExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

TransmissionStopIndicator ::= ENUMERATED {stop, ..., restart }

TypeOfError ::= ENUMERATED {
    not-understood,
    missing,
    ...
}

-- U

UE-associatedLogicalFl1-ConnectionItem ::= SEQUENCE {
    gNB-CU-UE-FlAP-ID GNB-CU-UE-FlAP-ID OPTIONAL,
    gNB-DU-UE-FlAP-ID GNB-DU-UE-FlAP-ID OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { UE-associatedLogicalFl1-ConnectionItemExtIEs } } OPTIONAL,
    ...
}

UE-associatedLogicalFl1-ConnectionItemExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

UE-CapabilityRAT-ContainerList ::= OCTET STRING

UEIdentityIndexValue ::= CHOICE {
    indexLength10 BIT STRING (SIZE (10)),
    choice-extension ProtocolIE-SingleContainer { { UEIdentityIndexValueChoice-ExtIEs } }
}

UEIdentityIndexValueChoice-ExtIEs FLAP-PROTOCOL-IES ::= {
    ...
}

ULConfiguration ::= SEQUENCE {
    uLUEConfiguration ULUEConfiguration,
    iE-Extensions ProtocolExtensionContainer { { ULConfigurationExtIEs } } OPTIONAL,
    ...
}

ULConfigurationExtIEs FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

```



```

ULUEConfiguration ::= ENUMERATED {no-data, shared, only, ...}

ULUPTNLInformation-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofULUPTNLInformation)) OF ULUPTNLInformation-ToBeSetup-Item

ULUPTNLInformation-ToBeSetup-Item ::=SEQUENCE {
    uLUPTNLInformation      UPTransportLayerInformation,
    iE-Extensions    ProtocolExtensionContainer { { ULUPTNLInformation-ToBeSetup-ItemExtIEs } } OPTIONAL,
    ...
}

ULUPTNLInformation-ToBeSetup-ItemExtIEs    FLAP-PROTOCOL-EXTENSION ::= {
    ...
}

UplinkTxDirectCurrentListInformation ::= OCTET STRING

UPTransportLayerInformation      ::= CHOICE {
    gTPTunnel      GTP Tunnel,
    choice-extension    ProtocolIE-SingleContainer { { UPTransportLayerInformation-ExtIEs } }
}

UPTransportLayerInformation-ExtIEs FLAP-PROTOCOL-IES ::= {
    ...
}
-- V
-- W
-- X
-- Y
-- Z
END

```

9.4.6 Common Definitions

```

-- *****
--
-- Common definitions
--
-- *****

Flap-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) flap (3) version1 (1) flap-CommonDataTypes (3) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

Criticality      ::= ENUMERATED { reject, ignore, notify }

```

```

Presence          ::= ENUMERATED { optional, conditional, mandatory }

PrivateIE-ID     ::= CHOICE {
  local          INTEGER (0..65535),
  global         OBJECT IDENTIFIER
}

ProcedureCode    ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..65535)

ProtocolIE-ID    ::= INTEGER (0..65535)

TriggeringMessage ::= ENUMERATED { initiating-message, successful-outcome, unsuccessful-outcome }

END

```

9.4.7 Constant Definitions

```

-- *****
--
-- Constant definitions
--
-- *****

FLAP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) flap (3) version1 (1) flap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- IE parameter types from other modules.
--
-- *****

IMPORTS
  ProcedureCode,
  ProtocolIE-ID

FROM Flap-CommonDataTypes;

-- *****
--
-- Elementary Procedures
--
-- *****

id-Reset          ProcedureCode ::= 0

```

```

id-F1Setup ProcedureCode ::= 1
id-ErrorIndication ProcedureCode ::= 2
id-gNBDCUConfigurationUpdate ProcedureCode ::= 3
id-gNBCUCUConfigurationUpdate ProcedureCode ::= 4
id-UEContextSetup ProcedureCode ::= 5
id-UEContextRelease ProcedureCode ::= 6
id-UEContextModification ProcedureCode ::= 7
id-UEContextModificationRequired ProcedureCode ::= 8
id-UEMobilityCommand ProcedureCode ::= 9
id-UEContextReleaseRequest ProcedureCode ::= 10
id-InitialULRRCCMessageTransfer ProcedureCode ::= 11
id-DLRRCCMessageTransfer ProcedureCode ::= 12
id-ULRRCCMessageTransfer ProcedureCode ::= 13
id-privateMessage ProcedureCode ::= 14
id-UEInactivityNotification ProcedureCode ::= 15
id-GNBDUResourceCoordination ProcedureCode ::= 16
id-SystemInformationDeliveryCommand ProcedureCode ::= 17
id-Paging ProcedureCode ::= 18
id-Notify ProcedureCode ::= 19
id-WriteReplaceWarning ProcedureCode ::= 20
id-PWSCancel ProcedureCode ::= 21
id-PWSRestartIndication ProcedureCode ::= 22
id-PWSFailureIndication ProcedureCode ::= 23
id-GNBDUStatusIndication ProcedureCode ::= 24

```

```

-- *****
--
-- Extension constants
--
-- *****

```

```

maxPrivateIEs INTEGER ::= 65535
maxProtocolExtensions INTEGER ::= 65535
maxProtocolIEs INTEGER ::= 65535
-- *****
--
-- Lists
--
-- *****

```

```

maxNRARFCN INTEGER ::= 3279165
maxnoofErrors INTEGER ::= 256
maxnoofIndividualF1ConnectionsToReset INTEGER ::= 65536
maxCellingNBDU INTEGER ::= 512
maxnoofSCells INTEGER ::= 32
maxnoofSRBs INTEGER ::= 8
maxnoofDRBs INTEGER ::= 64
maxnoofULUPTNLInformation INTEGER ::= 2
maxnoofDLUPTNLInformation INTEGER ::= 2
maxnoofBPLMNs INTEGER ::= 6
maxnoofCandidateSpCells INTEGER ::= 64
maxnoofPotentialSpCells INTEGER ::= 64
maxnoofNrCellBands INTEGER ::= 32
maxnoofSIBTypes INTEGER ::= 32

```

```

maxnoofSITypes          INTEGER ::= 32
maxnoofPagingCells      INTEGER ::= 512
maxnoofTNLAssociations  INTEGER ::= 32
maxnoofQoSFlows         INTEGER ::= 64
maxnoofSliceItems       INTEGER ::= 1024
maxCellineNB            INTEGER ::= 256

```

```

-- *****
--
-- IEs
--
-- *****

```

```

id-Cause                ProtocolIE-ID ::= 0
id-Cells-Failed-to-be-Activated-List  ProtocolIE-ID ::= 1
id-Cells-Failed-to-be-Activated-List-Item  ProtocolIE-ID ::= 2
id-Cells-to-be-Activated-List          ProtocolIE-ID ::= 3
id-Cells-to-be-Activated-List-Item     ProtocolIE-ID ::= 4
id-Cells-to-be-Deactivated-List        ProtocolIE-ID ::= 5
id-Cells-to-be-Deactivated-List-Item   ProtocolIE-ID ::= 6
id-CriticalityDiagnostics              ProtocolIE-ID ::= 7
id-CUtoDURRCInformation                ProtocolIE-ID ::= 9
id-DRBs-FailedToBeModified-Item        ProtocolIE-ID ::= 12
id-DRBs-FailedToBeModified-List        ProtocolIE-ID ::= 13
id-DRBs-FailedToBeSetup-Item           ProtocolIE-ID ::= 14
id-DRBs-FailedToBeSetup-List           ProtocolIE-ID ::= 15
id-DRBs-FailedToBeSetupMod-Item        ProtocolIE-ID ::= 16
id-DRBs-FailedToBeSetupMod-List        ProtocolIE-ID ::= 17
id-DRBs-ModifiedConf-Item              ProtocolIE-ID ::= 18
id-DRBs-ModifiedConf-List              ProtocolIE-ID ::= 19
id-DRBs-Modified-Item                  ProtocolIE-ID ::= 20
id-DRBs-Modified-List                  ProtocolIE-ID ::= 21
id-DRBs-Required-ToBeModified-Item     ProtocolIE-ID ::= 22
id-DRBs-Required-ToBeModified-List     ProtocolIE-ID ::= 23
id-DRBs-Required-ToBeReleased-Item     ProtocolIE-ID ::= 24
id-DRBs-Required-ToBeReleased-List     ProtocolIE-ID ::= 25
id-DRBs-Setup-Item                     ProtocolIE-ID ::= 26
id-DRBs-Setup-List                      ProtocolIE-ID ::= 27
id-DRBs-SetupMod-Item                   ProtocolIE-ID ::= 28
id-DRBs-SetupMod-List                   ProtocolIE-ID ::= 29
id-DRBs-ToBeModified-Item               ProtocolIE-ID ::= 30
id-DRBs-ToBeModified-List               ProtocolIE-ID ::= 31
id-DRBs-ToBeReleased-Item               ProtocolIE-ID ::= 32
id-DRBs-ToBeReleased-List               ProtocolIE-ID ::= 33
id-DRBs-ToBeSetup-Item                  ProtocolIE-ID ::= 34
id-DRBs-ToBeSetup-List                  ProtocolIE-ID ::= 35
id-DRBs-ToBeSetupMod-Item               ProtocolIE-ID ::= 36
id-DRBs-ToBeSetupMod-List               ProtocolIE-ID ::= 37
id-DRXCycle                             ProtocolIE-ID ::= 38
id-DUtoCURRCInformation                 ProtocolIE-ID ::= 39
id-gNB-CU-UE-FLAP-ID                   ProtocolIE-ID ::= 40
id-gNB-DU-UE-FLAP-ID                   ProtocolIE-ID ::= 41
id-gNB-DU-ID                             ProtocolIE-ID ::= 42

```

id-GNB-DU-Served-Cells-Item	ProtocolIE-ID ::= 43
id-gNB-DU-Served-Cells-List	ProtocolIE-ID ::= 44
id-gNB-DU-Name	ProtocolIE-ID ::= 45
id-NRCellID	ProtocolIE-ID ::= 46
id-oldgNB-DU-UE-FlAP-ID	ProtocolIE-ID ::= 47
id-ResetType	ProtocolIE-ID ::= 48
id-ResourceCoordinationTransferContainer	ProtocolIE-ID ::= 49
id-RRCContainer	ProtocolIE-ID ::= 50
id-SCell-ToBeRemoved-Item	ProtocolIE-ID ::= 51
id-SCell-ToBeRemoved-List	ProtocolIE-ID ::= 52
id-SCell-ToBeSetup-Item	ProtocolIE-ID ::= 53
id-SCell-ToBeSetup-List	ProtocolIE-ID ::= 54
id-SCell-ToBeSetupMod-Item	ProtocolIE-ID ::= 55
id-SCell-ToBeSetupMod-List	ProtocolIE-ID ::= 56
id-Served-Cells-To-Add-Item	ProtocolIE-ID ::= 57
id-Served-Cells-To-Add-List	ProtocolIE-ID ::= 58
id-Served-Cells-To-Delete-Item	ProtocolIE-ID ::= 59
id-Served-Cells-To-Delete-List	ProtocolIE-ID ::= 60
id-Served-Cells-To-Modify-Item	ProtocolIE-ID ::= 61
id-Served-Cells-To-Modify-List	ProtocolIE-ID ::= 62
id-SpCell-ID	ProtocolIE-ID ::= 63
id-SRBID	ProtocolIE-ID ::= 64
id-SRBs-FailedToBeSetup-Item	ProtocolIE-ID ::= 65
id-SRBs-FailedToBeSetup-List	ProtocolIE-ID ::= 66
id-SRBs-FailedToBeSetupMod-Item	ProtocolIE-ID ::= 67
id-SRBs-FailedToBeSetupMod-List	ProtocolIE-ID ::= 68
id-SRBs-Required-ToBeReleased-Item	ProtocolIE-ID ::= 69
id-SRBs-Required-ToBeReleased-List	ProtocolIE-ID ::= 70
id-SRBs-ToBeReleased-Item	ProtocolIE-ID ::= 71
id-SRBs-ToBeReleased-List	ProtocolIE-ID ::= 72
id-SRBs-ToBeSetup-Item	ProtocolIE-ID ::= 73
id-SRBs-ToBeSetup-List	ProtocolIE-ID ::= 74
id-SRBs-ToBeSetupMod-Item	ProtocolIE-ID ::= 75
id-SRBs-ToBeSetupMod-List	ProtocolIE-ID ::= 76
id-TimeToWait	ProtocolIE-ID ::= 77
id-TransactionID	ProtocolIE-ID ::= 78
id-TransmissionStopIndicator	ProtocolIE-ID ::= 79
id-UE-associatedLogicalFl-ConnectionItem	ProtocolIE-ID ::= 80
id-UE-associatedLogicalFl-ConnectionListResAck	ProtocolIE-ID ::= 81
id-gNB-CU-Name	ProtocolIE-ID ::= 82
id-SCell-FailedtoSetup-List	ProtocolIE-ID ::= 83
id-SCell-FailedtoSetup-Item	ProtocolIE-ID ::= 84
id-SCell-FailedtoSetupMod-List	ProtocolIE-ID ::= 85
id-SCell-FailedtoSetupMod-Item	ProtocolIE-ID ::= 86
id-RRCRconfigurationCompleteIndicator	ProtocolIE-ID ::= 87
id-Cells-Status-Item	ProtocolIE-ID ::= 88
id-Cells-Status-List	ProtocolIE-ID ::= 89
id-Candidate-SpCell-List	ProtocolIE-ID ::= 90
id-Candidate-SpCell-Item	ProtocolIE-ID ::= 91
id-Potential-SpCell-List	ProtocolIE-ID ::= 92
id-Potential-SpCell-Item	ProtocolIE-ID ::= 93
id-FullConfiguration	ProtocolIE-ID ::= 94
id-C-RNTI	ProtocolIE-ID ::= 95
id-SpCellULConfigured	ProtocolIE-ID ::= 96

id-InactivityMonitoringRequest	ProtocolIE-ID ::= 97
id-InactivityMonitoringResponse	ProtocolIE-ID ::= 98
id-DRB-Activity-Item	ProtocolIE-ID ::= 99
id-DRB-Activity-List	ProtocolIE-ID ::= 100
id-EUTRA-NR-CellResourceCoordinationReq-Container	ProtocolIE-ID ::= 101
id-EUTRA-NR-CellResourceCoordinationReqAck-Container	ProtocolIE-ID ::= 102
id-Protected-EUTRA-Resources-List	ProtocolIE-ID ::= 105
id-RequestType	ProtocolIE-ID ::= 106
id-ServCellIndex	ProtocolIE-ID ::= 107
id-RAT-FrequencyPriorityInformation	ProtocolIE-ID ::= 108
id-ExecuteDuplication	ProtocolIE-ID ::= 109
id-NRCGI	ProtocolIE-ID ::= 111
id-PagingCell-Item	ProtocolIE-ID ::= 112
id-PagingCell-List	ProtocolIE-ID ::= 113
id-PagingDRX	ProtocolIE-ID ::= 114
id-PagingPriority	ProtocolIE-ID ::= 115
id-SItype-List	ProtocolIE-ID ::= 116
id-UEIdentityIndexValue	ProtocolIE-ID ::= 117
id-gNB-CU-SystemInformation	ProtocolIE-ID ::= 118
id-HandoverPreparationInformation	ProtocolIE-ID ::= 119
id-GNB-CU-TNL-Association-To-Add-Item	ProtocolIE-ID ::= 120
id-GNB-CU-TNL-Association-To-Add-List	ProtocolIE-ID ::= 121
id-GNB-CU-TNL-Association-To-Remove-Item	ProtocolIE-ID ::= 122
id-GNB-CU-TNL-Association-To-Remove-List	ProtocolIE-ID ::= 123
id-GNB-CU-TNL-Association-To-Update-Item	ProtocolIE-ID ::= 124
id-GNB-CU-TNL-Association-To-Update-List	ProtocolIE-ID ::= 125
id-MaskedIMEISV	ProtocolIE-ID ::= 126
id-PagingIdentity	ProtocolIE-ID ::= 127
id-DUtoCURRCContainer	ProtocolIE-ID ::= 128
id-Cells-to-be-Barred-List	ProtocolIE-ID ::= 129
id-Cells-to-be-Barred-Item	ProtocolIE-ID ::= 130
id-TAISliceSupportList	ProtocolIE-ID ::= 131
id-GNB-CU-TNL-Association-Setup-List	ProtocolIE-ID ::= 132
id-GNB-CU-TNL-Association-Setup-Item	ProtocolIE-ID ::= 133
id-GNB-CU-TNL-Association-Failed-To-Setup-List	ProtocolIE-ID ::= 134
id-GNB-CU-TNL-Association-Failed-To-Setup-Item	ProtocolIE-ID ::= 135
id-DRB-Notify-Item	ProtocolIE-ID ::= 136
id-DRB-Notify-List	ProtocolIE-ID ::= 137
id-NotificationControl	ProtocolIE-ID ::= 138
id-RANAC	ProtocolIE-ID ::= 139
id-PWSSystemInformation	ProtocolIE-ID ::= 140
id-RepetitionPeriod	ProtocolIE-ID ::= 141
id-NumberOfBroadcastRequest	ProtocolIE-ID ::= 142
id-Cells-To-Be-Broadcast-List	ProtocolIE-ID ::= 144
id-Cells-To-Be-Broadcast-Item	ProtocolIE-ID ::= 145
id-Cells-Broadcast-Completed-List	ProtocolIE-ID ::= 146
id-Cells-Broadcast-Completed-Item	ProtocolIE-ID ::= 147
id-Broadcast-To-Be-Cancelled-List	ProtocolIE-ID ::= 148
id-Broadcast-To-Be-Cancelled-Item	ProtocolIE-ID ::= 149
id-Cells-Broadcast-Cancelled-List	ProtocolIE-ID ::= 150
id-Cells-Broadcast-Cancelled-Item	ProtocolIE-ID ::= 151
id-NR-CGI-List-For-Restart-List	ProtocolIE-ID ::= 152
id-NR-CGI-List-For-Restart-Item	ProtocolIE-ID ::= 153
id-PWS-Failed-NR-CGI-List	ProtocolIE-ID ::= 154

```

id-PWS-Failed-NR-CGI-Item          ProtocolIE-ID ::= 155
id-ConfirmedUEID                   ProtocolIE-ID ::= 156
id-Cancel-all-Warning-Messages-Indicator ProtocolIE-ID ::= 157
id-GNB-DU-UE-AMBR-UL               ProtocolIE-ID ::= 158
id-DRXConfigurationIndicator       ProtocolIE-ID ::= 159
id-RLC-Status                      ProtocolIE-ID ::= 160
id-PDCPSNLength                   ProtocolIE-ID ::= 161
id-GNB-DUConfigurationQuery        ProtocolIE-ID ::= 162
id-MeasurementTimingConfiguration ProtocolIE-ID ::= 163
id-DRB-Information                 ProtocolIE-ID ::= 164
id-ServingPLMN                    ProtocolIE-ID ::= 165
id-Protected-EUTRA-Resources-Item  ProtocolIE-ID ::= 168
id-GNB-CU-RRC-Version              ProtocolIE-ID ::= 170
id-GNB-DU-RRC-Version              ProtocolIE-ID ::= 171
id-GNBDUOverloadInformation        ProtocolIE-ID ::= 172
id-CellGroupConfig                ProtocolIE-ID ::= 173
id-RLCFailureIndication            ProtocolIE-ID ::= 174
id-UplinkTxDirectCurrentListInformation ProtocolIE-ID ::= 175
id-DC-Based-Duplication-Configured ProtocolIE-ID ::= 176
id-DC-Based-Duplication-Activation ProtocolIE-ID ::= 177
id-SULAccessIndication             ProtocolIE-ID ::= 178
id-AvailablePLMNList              ProtocolIE-ID ::= 179
id-PDUSessionID                   ProtocolIE-ID ::= 180
id-ULPDUSessionAggregateMaximumBitRate ProtocolIE-ID ::= 181

```

END

9.4.8 Container Definitions

```

-- *****
--
-- Container definitions
--
-- *****

FLAP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) flap (3) version1 (1) flap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *****
--
-- IE parameter types from other modules.
--
-- *****

IMPORTS
    Criticality,
    Presence,
    PrivateIE-ID,
    ProtocolExtensionID,

```

```

ProtocolIE-ID

FROM FlAP-CommonDataTypes
  maxPrivateIEs,
  maxProtocolExtensions,
  maxProtocolIEs

FROM FlAP-Constants;

-- *****
--
-- Class Definition for Protocol IEs
--
-- *****

FlAP-PROTOCOL-IES ::= CLASS {
  &id          ProtocolIE-ID          UNIQUE,
  &criticality Criticality,
  &Value,
  &presence    Presence
}
WITH SYNTAX {
  ID          &id
  CRITICALITY &criticality
  TYPE        &Value
  PRESENCE    &presence
}

-- *****
--
-- Class Definition for Protocol IEs
--
-- *****

FlAP-PROTOCOL-IES-PAIR ::= CLASS {
  &id          ProtocolIE-ID          UNIQUE,
  &firstCriticality Criticality,
  &FirstValue,
  &secondCriticality Criticality,
  &SecondValue,
  &presence    Presence
}
WITH SYNTAX {
  ID          &id
  FIRST CRITICALITY &firstCriticality
  FIRST TYPE      &FirstValue
  SECOND CRITICALITY &secondCriticality
  SECOND TYPE     &SecondValue
  PRESENCE        &presence
}

-- *****
--
-- Class Definition for Protocol Extensions

```



```

--
-- *****
FlAP-PROTOCOL-EXTENSION ::= CLASS {
    &id          ProtocolExtensionID          UNIQUE,
    &criticality Criticality,
    &Extension,
    &presence    Presence
}
WITH SYNTAX {
    ID          &id
    CRITICALITY &criticality
    EXTENSION   &Extension
    PRESENCE    &presence
}
-- *****
--
-- Class Definition for Private IEs
--
-- *****

FlAP-PRIVATE-IES ::= CLASS {
    &id          PrivateIE-ID,
    &criticality Criticality,
    &Value,
    &presence    Presence
}
WITH SYNTAX {
    ID          &id
    CRITICALITY &criticality
    TYPE        &Value
    PRESENCE    &presence
}
-- *****
--
-- Container for Protocol IEs
--
-- *****

ProtocolIE-Container {FlAP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-Field {{IEsSetParam}}

ProtocolIE-SingleContainer {FlAP-PROTOCOL-IES : IEsSetParam} ::=
    ProtocolIE-Field {{IEsSetParam}}

ProtocolIE-Field {FlAP-PROTOCOL-IES : IEsSetParam} ::= SEQUENCE {
    id          FlAP-PROTOCOL-IES.&id          ({IEsSetParam}),
    criticality FlAP-PROTOCOL-IES.&criticality ({IEsSetParam}@id),
    value       FlAP-PROTOCOL-IES.&Value      ({IEsSetParam}@id)
}

```

```

-- *****
--
-- Container for Protocol IE Pairs
--
-- *****

ProtocolIE-ContainerPair {FlAP-PROTOCOL-IES-PAIR : IEsSetParam} ::=
  SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-FieldPair {{IEsSetParam}}

ProtocolIE-FieldPair {FlAP-PROTOCOL-IES-PAIR : IEsSetParam} ::= SEQUENCE {
  id                FlAP-PROTOCOL-IES-PAIR.&id                ({IEsSetParam}),
  firstCriticality  FlAP-PROTOCOL-IES-PAIR.&firstCriticality  ({IEsSetParam}{@id}),
  firstValue        FlAP-PROTOCOL-IES-PAIR.&firstValue        ({IEsSetParam}{@id}),
  secondCriticality FlAP-PROTOCOL-IES-PAIR.&secondCriticality ({IEsSetParam}{@id}),
  secondValue       FlAP-PROTOCOL-IES-PAIR.&secondValue       ({IEsSetParam}{@id})
}

-- *****
--
-- Container for Protocol Extensions
--
-- *****

ProtocolExtensionContainer {FlAP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
  SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
    ProtocolExtensionField {{ExtensionSetParam}}

ProtocolExtensionField {FlAP-PROTOCOL-EXTENSION : ExtensionSetParam} ::= SEQUENCE {
  id                FlAP-PROTOCOL-EXTENSION.&id                ({ExtensionSetParam}),
  criticality       FlAP-PROTOCOL-EXTENSION.&criticality       ({ExtensionSetParam}{@id}),
  extensionValue    FlAP-PROTOCOL-EXTENSION.&Extension         ({ExtensionSetParam}{@id})
}

-- *****
--
-- Container for Private IEs
--
-- *****

PrivateIE-Container {FlAP-PRIVATE-IES : IEsSetParam} ::=
  SEQUENCE (SIZE (1.. maxPrivateIEs)) OF
    PrivateIE-Field {{IEsSetParam}}

PrivateIE-Field {FlAP-PRIVATE-IES : IEsSetParam} ::= SEQUENCE {
  id                FlAP-PRIVATE-IES.&id                ({IEsSetParam}),
  criticality       FlAP-PRIVATE-IES.&criticality       ({IEsSetParam}{@id}),
  value            FlAP-PRIVATE-IES.&Value            ({IEsSetParam}{@id})
}

END

```

9.5 Message Transfer Syntax

F1AP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax, as specified in ITU-T Recommendation X.691 [5].

9.6 Timers

10 Handling of unknown, unforeseen and erroneous protocol data

Clause 10 of TS 38.413 [3] is applicable for the purposes of the present document, with the following additions for non-UE-associated procedures:

- In case of Abstract Syntax Error, when reporting the *Criticality Diagnostics* IE for not comprehended IE/IEgroups or missing IE/IE groups, the *Transaction ID* IE shall also be included;
- In case of Logical Error, when reporting the *Criticality Diagnostics* IE, the *Transaction ID* IE shall also be included;
- In case of Logical Error in a response message of a Class 1 procedure, or failure to comprehend *Transaction ID* IE from a received message, the procedure shall be considered as unsuccessfully terminated or not terminated (e.g., transaction ID unknown in response message), and local error handling shall be initiated.

Annex A (informative): Change History

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-06	R3 NR#2	R3-172493	-	-	-	First version	0.1.0
2017-07	R3 NR#2	R3-172640	-	-	-	Incorporated agreed TPs from R3 NR#2 Adhoc	0.2.0
2017-08	R3#97	R3-173451	-	-	-	Incorporated agreed TPs from R3#97	0.3.0
2017-10	R3#97b	R3-174247	-	-	-	Incorporated agreed TPs from R3#97b	0.4.0
2017-12	R3#98	R3-175062	-	-	-	Incorporated agreed TPs from R3#98	0.5.0
2017-12	RAN#78	RP-172287				Submitted for approval to RAN	1.0.0
2017-12	RAN#78					TR approved by RAN plenary	15.0.0
2018-03	RP-79	RP-180468	000 1	2	B	Baseline CR for March version of TS 38.473 covering agreements of RAN3#99	15.1.0
2018-04						Editorial correction to ASN.1 (correction to id-TimeToWait ProtocolE-ID)	15.1.1
2018-06	RP-80	RP-181237	001 1	6	B	Introduction of SA NR (38.473 Baseline CR covering RAN3 agreements)	15.2.0
2018-06	RP-80	RP-181239	004 3	3	F	Essential corrections of EN-DC for NSA NR (38.473 Baseline CR covering RAN3 agreements)	15.2.0
2018-06	RP-80	RP-181237	004 5	-	B	F1 support for LTE - NR coexistence	15.2.0
2018-06	RP-80					Correction to ASN.1 and to Change History table	15.2.1
2018-09	RP-81	RP-181920	005 5	2	F	Introduction of DU Configuration Query	15.3.0
2018-09	RP-81	RP-181921	005 6	4	F	CR to 38.473 on further clarifications on System information transfer over F1	15.3.0
2018-09	RP-81	RP-181921	005 8	4	F	CR to 38.473 on corrections to System information delivery	15.3.0
2018-09	RP-81	RP-181920	005 9	1	F	CR to 38.473 on corrections to PWS transfer over F1	15.3.0
2018-09	RP-81	RP-181921	006 3	3	F	CR to 38.473 on PDCCP SN over F1 interface	15.3.0
2018-09	RP-81	RP-181922	006 4	3	F	NR Corrections (38.473 Baseline CR covering RAN3-101 agreements)	15.3.0
2018-09	RP-81	RP-181997	006 8	-	F	Introduction of UL AMBR on F1	15.3.0
2018-09	RP-81	RP-181921	007 2	3	F	Correction on cell management	15.3.0
2018-09	RP-81	RP-181921	007 3	2	F	RLC Mode Indication over F1	15.3.0
2018-09	RP-81	RP-181921	007 6	3	F	CR to 38.473 on UE Identity Index value	15.3.0
2018-09	RP-81	RP-181920	007 7	1	F	Correction for UE Context Modification on presence of ServCellIndex IE	15.3.0
2018-09	RP-81	RP-181920	007 8	-	F	Executing duplication for RRC-container	15.3.0
2018-09	RP-81	RP-181921	007 9	1	F	Indication of RLC re-establishment at the gNB-DU	15.3.0
2018-09	RP-81	RP-181920	008 0	-	F	Exchange of SMTc over F1	15.3.0
2018-09	RP-81	RP-181920	008 1	-	F	Solving remaining issues with QoS parameters – TS 38.473	15.3.0
2018-09	RP-81	RP-181921	009 0		F	Correction of 5GS TAC	15.3.0
2018-09	RP-81	RP-181921	009 5	1	F	Extend the RANAC size to 8bits	15.3.0
2018-09	RP-81	RP-181921	009 7	-	F	Corrections of Choice	15.3.0
2018-09	RP-81	RP-181921	009 8	1	F	Correction of TNL criticality	15.3.0
2018-09	RP-81	RP-181921	009 9	1	F	Corrections of usage of single container	15.3.0
2018-09	RP-81	RP-181921	010 5	2	B	RRC version handling	15.3.0
2018-09	RP-81	RP-181921	010 6	1	B	Introduction of Overload Handling in F1-C	15.3.0
2018-09	RP-81	RP-181921	011 3	-	F	CR to 38.473 on presence of QoS information	15.3.0
2018-09	RP-81	RP-181921	011 4	1	F	Correction C-RNTI format	15.3.0
2018-09	RP-81	RP-181921	011 5	-	F	Correction of QoS Parameters	15.3.0
2018-09	RP-81	RP-181921	011 6	1	F	Correction on F1 Setup Request	15.3.0

History

Document history		
V15.2.1	July 2018	Publication
V15.3.0	October 2018	Publication