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NG-RAN

F1 application protocol (F1AP)
(Release 15)



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Foreword

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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".
 - [25] 3GPP TS 36.104: "Base Station (BS) radio transmission and reception".
 - [26] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone".
 - [27] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation".
-

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 F1AP ID* and *GNB-DU UE F1AP ID* according to the definition in TS 38.401 [4]. For a received UE associated F1AP message the gNB-CU identifies the associated UE based on the *GNB-CU UE F1AP ID* IE and the gNB-DU identifies the associated UE based on the *GNB-DU UE F1AP 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	UE CONTEXT MODIFICATION REFUSE
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
RRC Delivery Report	RRc DELIVERY REPORT

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

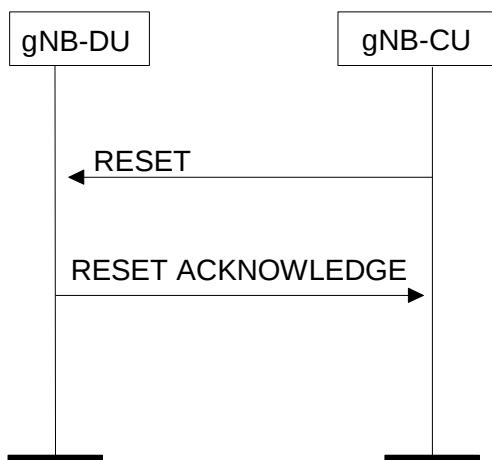


Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU. Successful operation

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

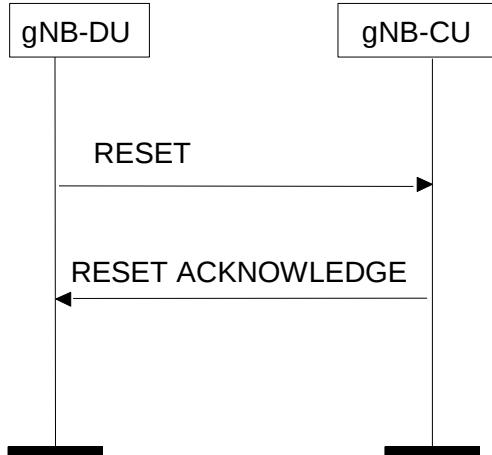


Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-DU. Successful operation

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

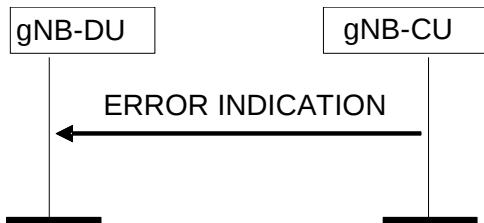


Figure 8.2.2.2-1: Error Indication procedure, gNB-CU originated. Successful operation

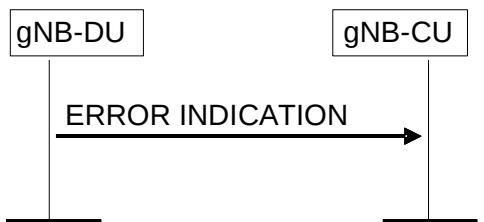


Figure 8.2.2.2-2: Error Indication procedure, gNB-DU originated. Successful operation

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

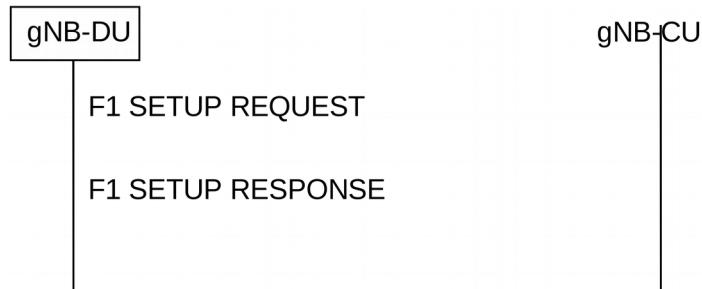


Figure 8.2.3.2-1: F1 Setup procedure: Successful Operation

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.

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.

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.

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, and optionally also *Extended 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 the received Available PLMN list(s).

The *Latest RRC Version Enhanced* IE shall be included in the F1 SETUP REQUEST message and in the F1 SETUP RESPONSE message.

If in F1 SETUP REQUEST message, the *Cell Direction* IE is present, the gNB-CU should use it to understand whether the cell is for UL or DL only. If in F1 SETUP REQUEST message, the *Cell Direction* IE is omitted in the *Served Cell Information* IE it shall be interpreted as that the Cell Direction is Bi-directional.

8.2.3.3 Unsuccessful Operation

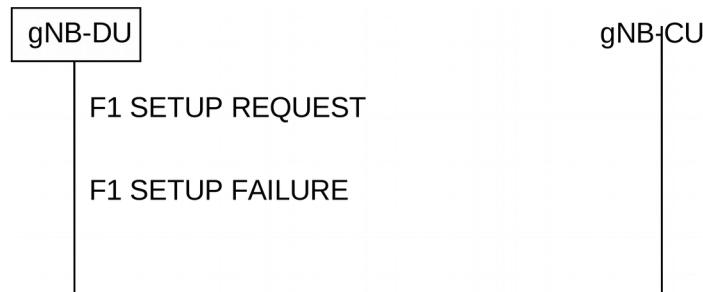


Figure 8.2.3.3-1: F1 Setup procedure: Unsuccessful Operation

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

Not applicable.

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

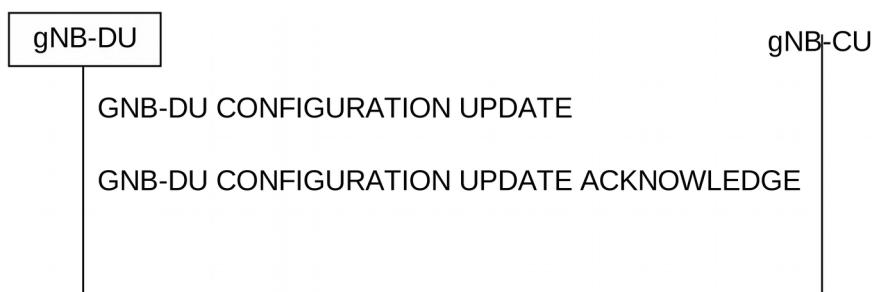


Figure 8.2.4.2-1: gNB-DU Configuration Update procedure: Successful Operation

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. If an information element is not included in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall interpret that the corresponding configuration data is not changed and shall continue to operate the F1-C interface with the existing related configuration data.

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

If *gNB-DU ID* IE is contained in the GNB-DU CONFIGURATION UPDATE message for a newly established SCTP association, the gNB-CU will associate this association with the related gNB-DU.

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 and overwrite the served cell information for the affected served cell. 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, as described in TS 38.401 [4].

If *Cells to be Activated List 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.

If *Cells to be Deactivated List Item* IE is contained in the GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-DU shall deactivate all the cells with NR CGI listed in the IE.

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

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

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

If in GNB-DU CONFIGURATION UPDATE message, the *Cell Direction* IE is present, the gNB-CU should use it to understand whether the cell is for UL or DL only. If in GNB-DU CONFIGURATION UPDATE message, the *Cell Direction* IE is omitted in the *Served Cell Information* IE it shall be interpreted as that the Cell Direction is Bi-directional.

8.2.4.3 Unsuccessful Operation

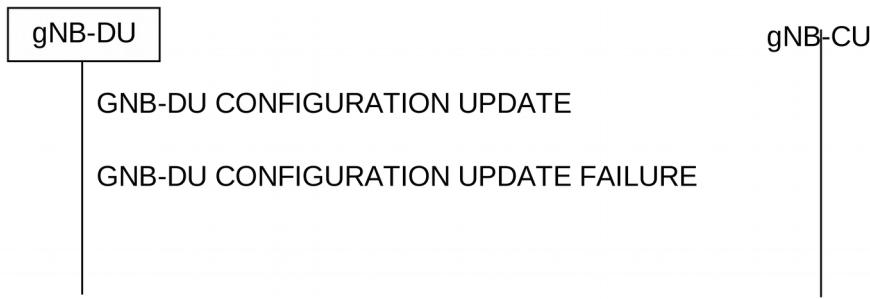


Figure 8.2.4.3-1: gNB-DU Configuration Update procedure: Unsuccessful Operation

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

Not applicable.

8.2.5 gNB-CU Configuration Update

8.2.5.1 General

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

8.2.5.2 Successful Operation

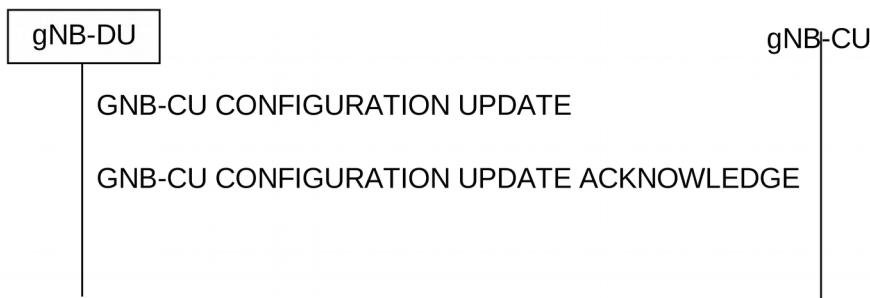


Figure 8.2.5.2-1: gNB-CU Configuration Update procedure: Successful Operation

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

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

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

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

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

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

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

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

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

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

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

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

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

8.2.5.3 Unsuccessful Operation

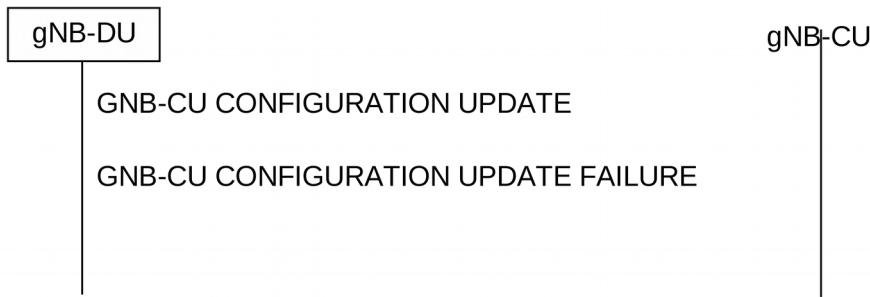


Figure 8.2.5.3-1: gNB-CU Configuration Update: Unsuccessful Operation

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

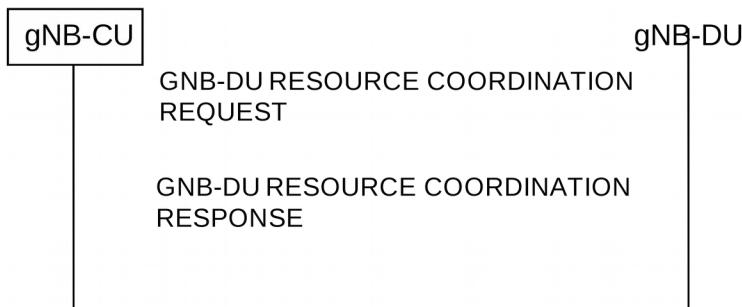


Figure 8.2.6.2-1: gNB-DU Resource Coordination, successful operation

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 NR-initiated gNB-DU Resource Coordination procedure, the *Ignore Coordination Request Container* IE shall be present and set to “yes” and the *E-UTRA – NR Cell Resource Coordination Request Container* IE in the GNB-DU RESOURCE COORDINATION REQUEST message shall be ignored.

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

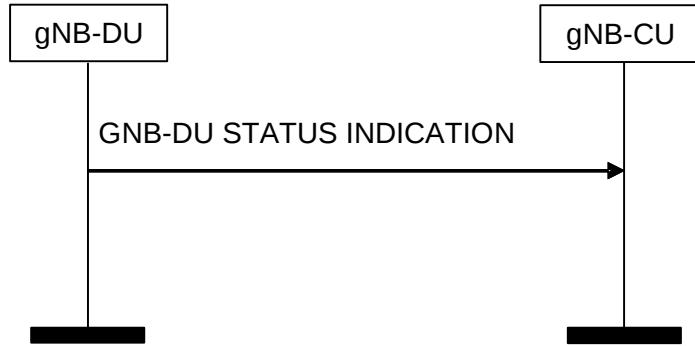


Figure 8.2.7.2-1: gNB-DU Status Indication procedure

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

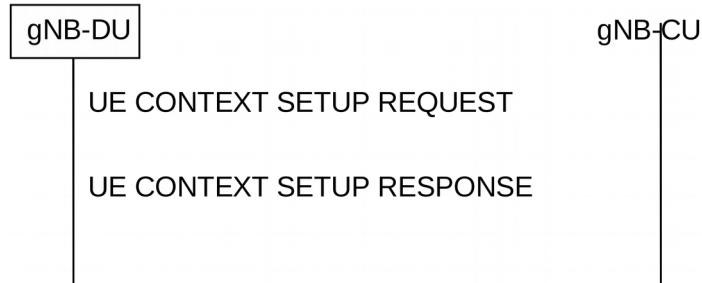


Figure 8.3.1.2-1: UE Context Setup Request procedure: Successful Operation

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

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 *servingCellMO* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall configure *servingCellMO* 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 the *QoS Flow Mapping Indication* IE is included in the *DRB To Be Setup List* IE for a QoS flow, the gNB-DU may take it into account that only the uplink or downlink QoS flow is mapped to the indicated DRB.

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 and setup two RLC entities for the indicated DRB. 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 if the value is set to be "true" 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.

If *UL PDCP SN length* IE is included in the UE CONTEXT SETUP REQUEST message for a DRB, gNB-DU shall, if supported, store this information and use it for lower layer configuration.

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.

- A list of successfully established SRBs with logical channel identities for primary path shall be included in the *SRB Setup List* IE only if CA based PDCP duplication is initiated for the concerned SRBs.

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 at the gNB acting as secondary node. If the CG-ConfigInfo IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall regard it as a reconfiguration with sync as defined in TS 38.331 [8].

If the *HandoverPreparationInformation* IE is included in the *CU to DU RRC Information* IE in the UE CONTEXT SETUP REQUEST message, the gNB-DU of the gNB acting as master node shall regard it as a reconfiguration with sync as defined in TS 38.331 [8]. The gNB-CU of the gNB acting as master node shall only initiate the UE Context Setup procedure for handover or secondary node addition when at least one DRB is setup for the UE.

If the gNB-CU includes the SMT 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 SMT 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.

For EN-DC operation, if the gNB-CU includes the *Resource Coordination Transfer Information* IE in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, use it for the purpose of resource coordination. 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 E-UTRA Cell Information* IE is included in the *Resource Coordination Information* IE, the gNB-DU shall store the information replacing previously received information for the same E-UTRA cell, and use the stored information for the purpose of resource coordination.

The *UEAssistanceInformation* IE shall be included in *CU to DU RRC Information* IE in the UE CONTEXT SETUP REQUEST message if the gNB-CU received this IE from the UE; if the *UEAssistanceInformation* IE is included in the *CU to DU RRC Information* IE in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, take it into account when configuring resources for the UE.

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 *CellGroupConfig* IE is included in the *DU to CU RRC Information* IE contained in the UE CONTEXT SETUP RESPONSE message, the gNB-CU shall perform RRC Reconfiguration or RRC connection resume as described in TS 38.331 [8]. The *CellGroupConfig* IE shall transparently be signaled to the UE as specified in TS 38.331 [8].

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 when enforcing uplink traffic policing for non-GBR Bearers for the concerned UE as specified in TS 23.501 [21].

The gNB-DU shall store the received gNB-DU UE Aggregate Maximum Bit Rate Uplink and use it for non-GBR Bearers for the concerned UE.

If the UE CONTEXT SETUP REQUEST message contains the *QoS Flow Mapping Indication* IE, the gNB-DU may take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

8.3.1.3 Unsuccessful Operation

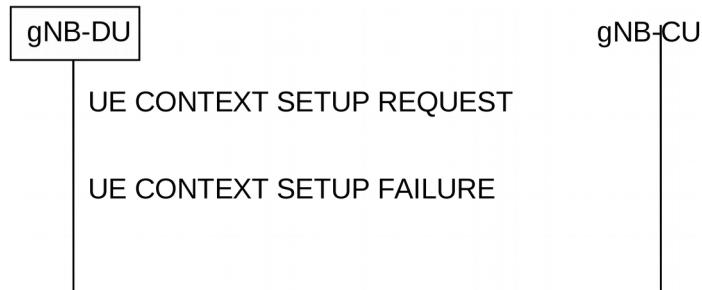


Figure 8.3.1.3-1: UE Context Setup Request procedure: unsuccessful Operation

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

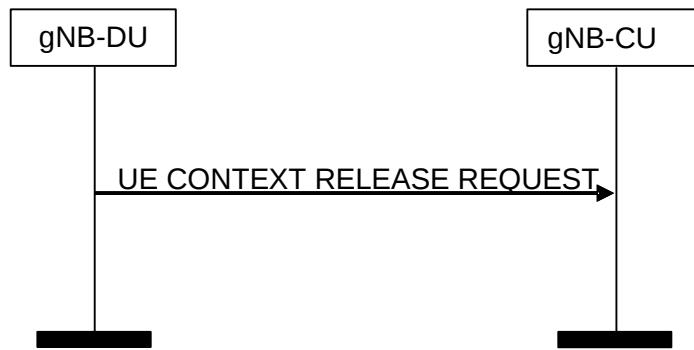


Figure 8.3.2.2-1: UE Context Release (gNB-DU initiated) procedure. Successful operation

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

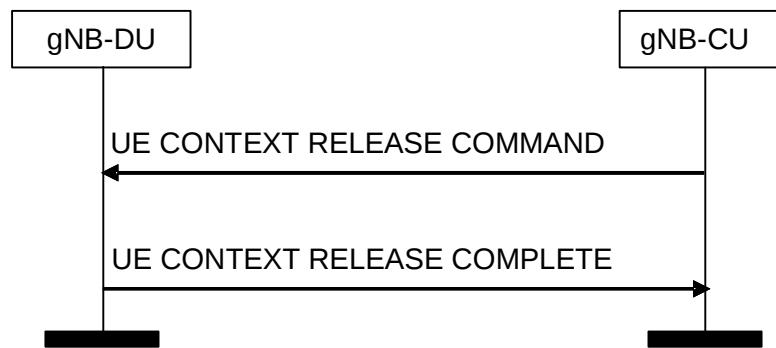


Figure 8.3.3.2-1: UE Context Release (gNB-CU initiated) procedure. Successful operation

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

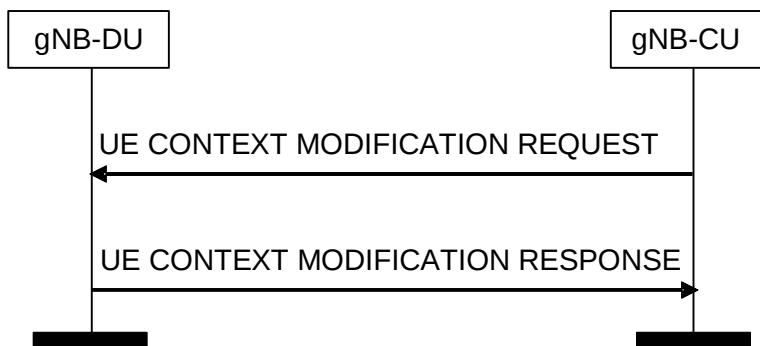


Figure 8.3.4.2-1: UE Context Modification procedure. Successful operation

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

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.

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 *servingCellMO IE* is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall configure servingCellMO 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 *servingCellMO IE* is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall configure servingCellMO 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 value is set to be "true", or delete the RLC entity of secondary path if the value is set to be "false".

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, the gNB-DU shall include two *DL UP TNL Information* IEs in UE CONTEXT MODIFICATION RESPONSE message and setup two RLC entities for the indicated DRB. 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, the 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, the gNB-DU shall regard that DC based PDCP duplication is configured for this DRB if the value is set to be "true" and it should take the responsibility of PDCP duplication activation/deactivation. Otherwise, the gNB-DU shall regard that DC based PDCP duplication is de-configured for this DRB if the value is set to be "false", and it should stop PDCP duplication activation/deactivation by MAC CE. If *DC Based Duplication Activation* IE is included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, the 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.

If the ongoing reconfiguration procedure involves changes of the L1/L2 configuration at the gNB-DU signalled to the gNB-CU via the *CellGroupConfig* IE, the gNB-CU shall include the *RRC Reconfiguration Complete Indicator* IE in the UE CONTEXT MODIFICATION REQUEST message to inform the gNB-DU that the ongoing reconfiguration procedure, including *CellGroupConfig* IE, has been successfully or unsuccessfully performed by the UE. In the case that the ongoing reconfiguration procedure has failed, the gNB-DU shall continue to use the old UE configuration.

If *DL PDCP SN length* IE is included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, gNB-DU shall, if supported, store this information and use it for lower layer configuration.

If *UL PDCP SN length* IE is included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, gNB-DU shall, if supported, store this information and use it for lower layer configuration.

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, and the gNB-DU may include the *Associated SCell List* IE in UE CONTEXT MODIFICATION RESPONSE by containing a list of SCell(s) associated with the RLC entity indicated by the *RLC Failure Indication* IE.

If the UE CONTEXT MODIFICATION REQUEST message contains the *RRC-Container* IE, the gNB-DU shall send the corresponding RRC message to the UE. 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 Action 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 includes the SMT 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 MODIFICATION REQUEST message, the gNB-DU shall generate the measurement gaps based on the received SMT 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 MODIFICATION RESPONSE message.

For EN-DC operation, if the gNB-CU includes the *Resource Coordination Transfer Information* IE in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, use it for the purpose of resource coordination. 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]. If the *Resource Coordination E-UTRA Cell Information* IE is included in the *Resource Coordination Transfer Information* IE, the gNB-DU shall store the information replacing previously received information for the same E-UTRA cell, and use the stored information for the purpose of resource coordination.

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.

The *UEAssistanceInformation* IE shall be included in *CU to DU RRC Information* IE in the UE CONTEXT MODIFICATION REQUEST message if the gNB-CU received this IE from the UE; if the *UEAssistanceInformation* IE is included in the *CU to DU RRC Information* IE in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take it into account when configuring resources for the UE.

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 be 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 be Setup List* IE.
- A list of successfully established SRBs with logical channel identities for primary path shall be included in the *SRB Setup List* IE only if CA based PDCP duplication is initiated for the concerned SRBs.
- A list of successfully modified SRBs with logical channel identities for primary path shall be included in the *SRB Modified List* IE only if CA based PDCP duplication is initiated for the concerned SRBs.

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 *CellGroupConfig* IE is included in the *DU to CU RRC Information* IE contained in the UE CONTEXT MODIFICATION RESPONSE message, the gNB-CU shall perform RRC Reconfiguration as described in TS 38.331 [8]. The *CellGroupConfig* IE shall transparently be signaled to the UE as specified in TS 38.331 [8].

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 Modify 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.

The *UL PDU Session Aggregate Maximum Bit Rate* IE shall be sent if *DRB to Be Setup List* IE is included and the gNB-CU has not previously sent it. The gNB-DU shall store and use the received gNB-DU UE Aggregate Maximum Bit Rate Uplink.

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.

If the *Bearer Type Change* IE is included in *DRB to Be Modified List* IE in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall either reset the lower layers or generate a new LCID for the affected bearer as specified in TS 37.340[7].

For NE-DC operation, if *NeedforGap* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall generate measurement gap for the SeNB.

If the *QoS Flow Mapping Indication* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, replace any previously received value and take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

8.3.4.3 Unsuccessful Operation

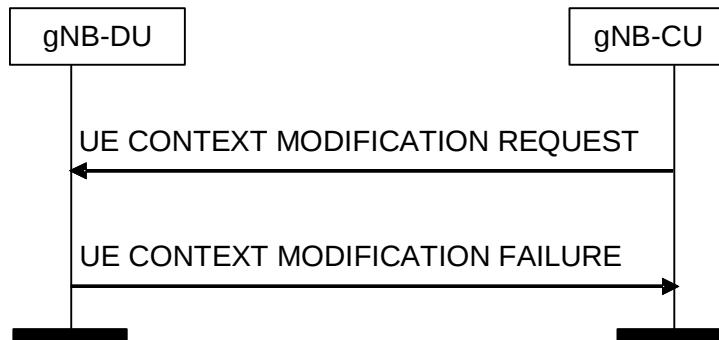


Figure 8.3.4.3-1: UE Context Modification procedure. Unsuccessful operation

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

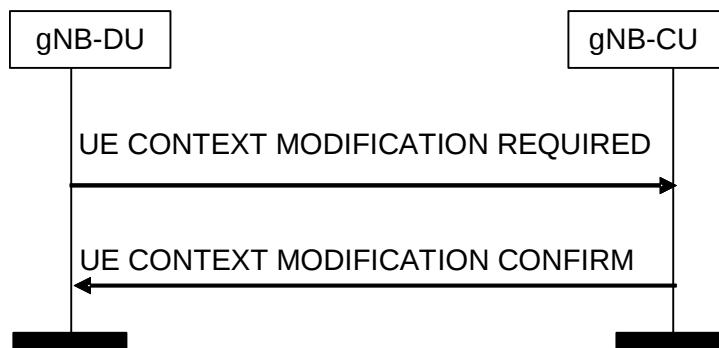


Figure 8.3.5.2-1: UE Context Modification Required procedure. Successful operation

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.

For a given bearer for which PDCP CA duplication was already configured, if two *DL UP TNL Information* IEs are included in UE CONTEXT MODIFICATION REQUIRED message for a DRB, the gNB-CU shall include two *UL UP TNL Information* IEs in UE CONTEXT MODIFICATION CONFIRM message. The 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].

For EN-DC operation, if the gNB-CU includes the *Resource Coordination Transfer Information* IE in the UE CONTEXT MODIFICATION CONFIRM message, the gNB-DU shall, if supported, use it for the purpose of resource coordination. 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 *Resource Coordination E-UTRA Cell Information* IE is included in the *Resource Coordination Transfer Information* IE, the gNB-DU shall store the information replacing previously received information for the same E-UTRA cell, and use the stored information for the purpose of resource coordination.

If the *CellGroupConfig* IE is included in the *DU to CU RRC Information* IE contained in the UE CONTEXT MODIFICATION REQUIRED message, the gNB-CU shall perform RRC Reconfiguration as described in TS 38.331 [8]. The *CellGroupConfig* IE shall transparently be signaled to the UE as specified in TS 38.331 [8].

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.

8.3.5.2A Unsuccessful Operation

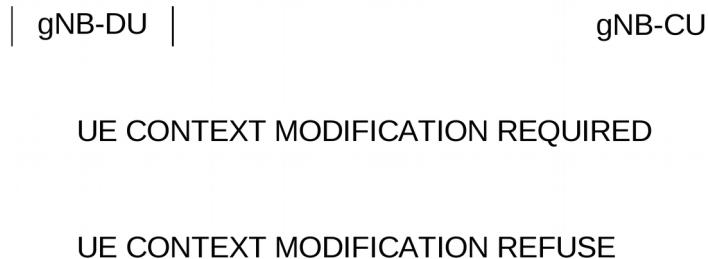


Figure 8.3.5.2A-1: UE Context Modification Required procedure. Unsuccessful operation.

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

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.

If the *DRB ID IE* is included in the *DRB Activity Item IE* in the UE INACTIVITY NOTIFICATION message, the *DRB Activity IE* shall also be included

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

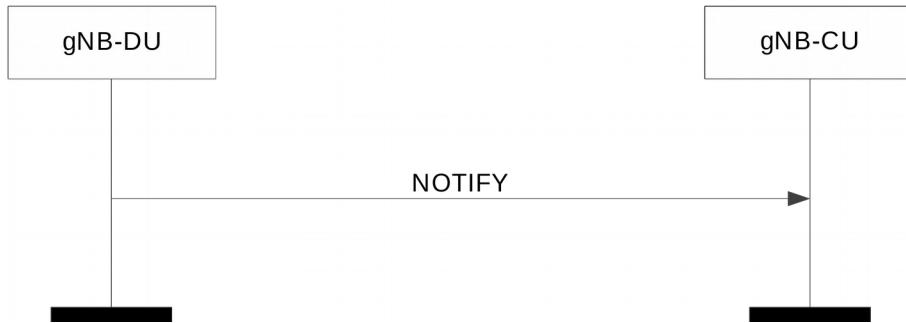


Figure 8.3.7.2-1: Notify procedure. Successful operation.

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. The procedure uses non-UE-associated signaling.

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 Container* 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 Container* IE and the gNB-CU shall configure the UE as specified in TS 38.331 [8] and transparently include the received *CellGroupConfig* IE. The gNB-DU shall not include the *ReconfigurationWithSync* field in the *CellGroupConfig* IE as defined in TS 38.331 [8] of the *DU to CU RRC Container* 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

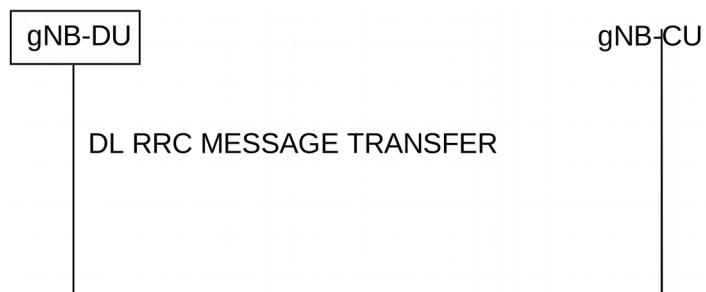


Figure 8.4.2.2-1: DL RRC Message Transfer procedure

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.

8.4.4 RRC Delivery Report

8.4.4.1 General

The purpose of the RRC Delivery Report procedure is to transfer to the gNB-CU information about successful delivery of DL PDCP-PDUs including RRC messages. The procedure uses UE-associated signalling.

8.4.4.2 Successful operation



Figure 8.4.4.2-1: RRC Delivery Report procedure.

When the gNB-DU has successfully delivered an RRC message to the UE for which the gNB-CU has requested a delivery report, the gNB-DU shall send the RRC CONTAINER DELIVERY REPORT message to the gNB-CU containing the *RRC Delivery Status* IE and the *SRB ID* IE.

8.4.4.3 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

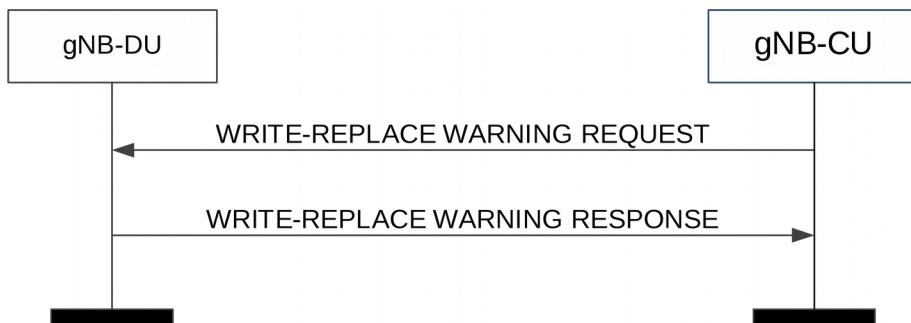


Figure 8.5.1.2-1: Write-Replace Warning procedure: successful operation

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.

Upon receipt of the WRITE-REPLACE WARNING REQUEST message, the gNB-DU shall include the *Dedicated SI Delivery Needed UE List* IE in the WRITE-REPLACE WARNING RESPONSE message for UEs that are unable to receive system information from broadcast.

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

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

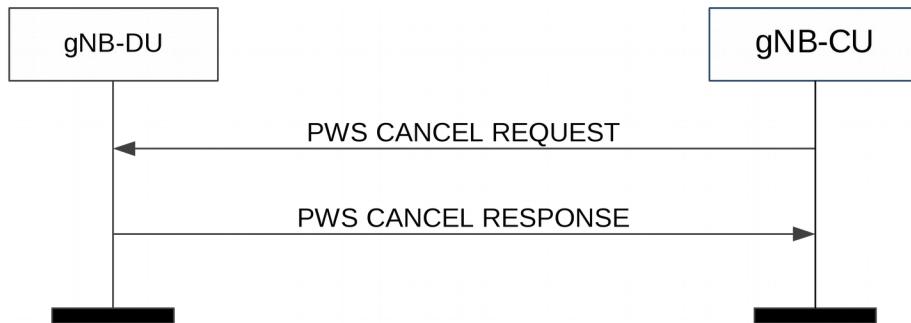


Figure 8.5.2.2-1: PWS Cancel procedure: successful operation

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

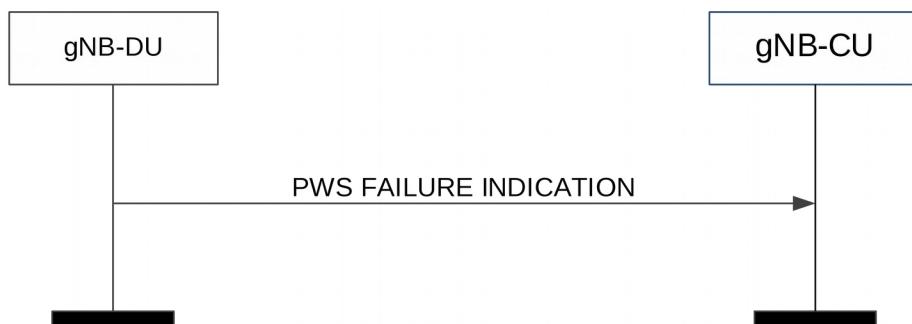


Figure 8.5.4.2-1: PWS failure indication

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.

Interactions with gNB-DU Configuration Update procedure:

Upon reception of SYSTEM INFORMATION DELIVERY COMMAND message, the gNB-DU Configuration Update procedure may be performed , and as part of such procedure the gNB-DU shall include the *Dedicated SI Delivery Needed UE List* IE in GNB-DU CONFIGURATION UPDATE message for UEs that are unable to receive system information from broadcast.

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 the gNB-DU to page a UE. The procedure uses non-UE associated signalling.

8.7.1.2 Successful Operation

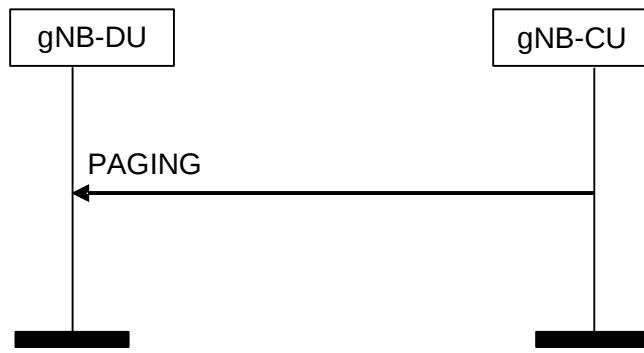


Figure 8.7.1.2-1: Paging procedure. Successful operation.

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

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

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

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

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

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 Reset Type	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	This IE shall be ignored if received in UE associated signalling message.	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.. <maxCellingNBD U>			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	YES	reject
>>Available PLMN List	O		9.3.1.65		YES	ignore
>>Extended Available PLMN List	O		9.3.1.76	This is included if Available PLMN List IE is included and if more than 6 Available PLMNs is to be signalled.	YES	ignore
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 .. <maxCellingNBD U>			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		NR CGI 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		NR CGI 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		-	
>>Service Status	M		9.3.1.68		-	
Dedicated SI Delivery		0..1		List of UEs	YES	ignore

Needed UE List				unable to receive system information from broadcast		
> Dedicated SI Delivery Needed UE Item		1 .. <maxnoofUEIDs>			EACH	ignore
>>gNB-CU UE F1AP ID	M		9.3.1.4		-	
>>NR CGI	M		9.3.1.12		-	
gNB-DU ID	O		9.3.1.9		YES	reject

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.
maxnoofUEIDs	Maximum no. of UEs that can be served by a gNB-DU. Value is 65536.

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	YES	reject
>>Available PLMN List	O		9.3.1.65		YES	ignore
>>Extended Available PLMN List	O		9.3.1.76	This is included if Available PLMN List IE is included and if more than 6 Available PLMNs is to be signalled.	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Cells to be Deactivated List		0.. 1		List of cells to be deactivated	YES	reject
>Cells to be Deactivated List Item		1.. <maxCellingNBDU>			EACH	reject
>> NR CGI	M		9.3.1.12		-	-

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	YES	reject
>>Available PLMN List	O		9.3.1.65		YES	ignore
>>Extended Available PLMN List	O		9.3.1.76	This is included if Available PLMN List IE is included and if more than 6 Available PLMNs is to be signalled.	YES	ignore
Cells to be Deactivated List		0..1		List of cells to be deactivated	YES	reject
>Cells to be Deactivated List Item		1.. <maxCellingNBD			EACH	reject

		<i>U></i>				
>> 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.	-	
>>TNL Association Usage	M		ENUMERATED (ue, non-ue, both, ...)	Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.472 [22].	-	
gNB-CU TNL Association To Remove List		0..1			YES	ignore
>gNB-CU TNL Association To Remove Item IEs		1..<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.	-	
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.	-	
>>TNL Association Usage	O		ENUMERATED (ue, non-ue, both, ...)	Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.472 [22].	-	

Cells to be barred List		0..1		List of cells to be barred.	YES	ignore
>Cells to be barred List Item		1.. <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 numbers of cells that can be served by a gNB-DU. Value is 512.
maxnoofTNLAssociations	Maximum numbers of TNL Associations between the gNB-CU and the gNB-CU. 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..<maxnoofTNLAssociations>			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU	-	
gNB-CU TNL Association Failed to Setup List		0..1			YES	ignore
>gNB-CU TNL Association Failed To Setup Item IEs		1..<maxnoofTNLAssociations>			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU	-	
>>Cause	M		9.3.1.2		-	
Dedicated SI Delivery Needed UE List		0..1		List of UEs unable to receive system information from broadcast	YES	ignore
>Dedicated SI Delivery Needed UE List		1 .. <maxnoofUEIDs>			EACH	ignore
>>gNB-CU UE F1AP ID	M		9.3.1.4		-	-
>>NR CGI	M		9.3.1.12		-	-

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

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	M		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
Ignore Coordination Request Container	O		ENUMERATED (yes, ...)		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	ignore
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)		YES	reject
SpCell UL Configured	O		Cell UL Configured 9.3.1.33		YES	ignore
CU to DU RRC Information	M		9.3.1.25		YES	reject
Candidate SpCell List		0..1			YES	ignore
>Candidate SpCell Item IEs		1 .. <maxnoofC andidateSp Cells>			EACH	ignore
>>Candidate SpCell ID	M		NR CGI 9.3.1.12	Special Cell as defined in TS 38.321 [16]	-	
DRX Cycle	O		DRX Cycle 9.3.1.24		YES	ignore
Resource Coordination Transfer Container	O		OCTET STRING	Includes the MeNB Resource Coordination Information 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.. <maxnoofS Cells>			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		-	
>>servingCellMO	O		INTEGER (1..64)		YES	ignore
SRB to Be Setup List		0..1			YES	reject
>SRB to Be Setup Item IEs		1 .. <maxnoofS RBs>			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 .. <maxnoofD RBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>CHOICE QoS Information	M				-	
>>>E-UTRAN QoS	M		9.3.1.19	Shall be used for EN-DC case to convey E-RAB Level QoS	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				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	YES	ignore
>>>>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 Identifier	M		9.3.1.63		-	
>>>>>QoS Flow Level QoS Parameters	M		9.3.1.45		-	
>>>>>QoS Flow Mapping Indication	O		9.3.1.72		YES	ignore
>>UL UP TNL Information to be setup List		1			-	
>>> UL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofULUPTNLInfo rmaton>			-	
>>>>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, ..., false)	Indication on whether DC based PDCP duplication is configured or not. If included, it should be set to true.	YES	reject
>>DC Based Duplication Activation	O		Duplication Activation 9.3.1.36	Information on the initial state of DC based UL PDCP duplication	YES	reject
>>DL PDCP SN length	M		ENUMERATED (12bits, 18bits, ...)		YES	ignore
>>UL PDCP SN length	O		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 DL-DCCH-Message 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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Serving PLMN	O		PLMN ID 9.3.1.14	Indicates the PLMN serving the UE.	YES	ignore
gNB-DU UE Aggregate Maximum Bit Rate Uplink	C-ifDRBSetup		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
RRC Delivery Status Request	O		ENUMERATED (true, ...)	Indicates whether RRC DELIVERY REPORT procedure is requested for the RRC message.	YES	ignore
Resource Coordination Transfer Information	O		9.3.1.73		YES	ignore
servingCellMO	O		INTEGER (1..64)		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.

Condition	Explanation
ifDRBSetup	This IE shall be present only if the DRB to Be Setup List IE is present.

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 IE</i> 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		-	
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		-	
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	O		ENUMERATED		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Response			ED (not-supported, ..)			
Criticality Diagnostics	O		9.3.1.3		YES	ignore
SRB Setup List		0..1			YES	ignore
>SRB Setup Item		1 .. <maxnoofSRBs>			EACH	ignore
>>SRB ID	M		9.3.1.7		-	
>>LCID	M		9.3.1.35	LCID for the primary path if PDCP duplication is applied	-	

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.
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	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
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 IE</i> as defined in subclause 6.2 of TS 38.331 [8] encapsulated in a PDCP PDU, or the <i>DL-CCCH-Message IE</i> 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 IE</i> 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
RRC Delivery Status Request	O		ENUMERATED (true, ...)	Indicates whether RRC DELIVERY REPORT procedure is requested for the RRC message.	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)		YES	reject
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 Action Indicator	O		9.3.1.11		YES	ignore
Resource Coordination Transfer Container	O		OCTET STRING	Includes the MeNB Resource Coordination Information 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 RRCConnectionRe configuration message as defined in TS 38.331 [8], encapsulated in a PDCP PDU.	YES	reject
SCell To Be Setup List		0..1			YES	ignore
>SCell to Be Setup Item IEs		1.. <maxnoofS Cells>			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		-	
>>servingCellMO	O		INTEGER (1..64)		YES	ignore
SCell To Be Removed List		0..1			YES	ignore
>SCell to Be Removed Item IEs		1 .. <maxnoofS Cells>			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB	-	
SRB to Be Setup List		0..1			YES	reject
>SRB to Be Setup Item IEs		1..<maxnoof SRBs>			EACH	reject
>>SRB ID	M		9.3.1.7		-	
>>Duplication Indication	O		ENUMERATED (true, ..., false)		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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				-	
>>>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	YES	ignore
>>>>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 Identifier	M		9.3.1.63		-	
>>>>>QoS Flow Level QoS Parameters	M		9.3.1.45		-	
>>>>>QoS Flow Mapping Indication	O		9.3.1.72		YES	ignore
>>UL UP TNL Information to be setup List		1			-	
>>UL UP TNL Information to Be Setup Item IEs		1 .. <maxnoofULUPTNLIformation>			-	
>>>>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, ..., false)	Indication on whether DC based PDCP duplication is configured or not. If included, it should be set to true.	YES	reject
>>DC Based Duplication Activation	O		Duplication Activation 9.3.1.36	Information on the initial state of DC based UL PDCP duplication	YES	reject
>>DL PDCP SN length	O		ENUMERATED (12bits, 18bits, ...)		YES	ignore
>>UL PDCP SN length	O		ENUMERATED (12bits,		YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			18bits, ...)			

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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		-	
>>CHOICE QoS Information	O				-	
>>>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	YES	ignore
>>>>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 Identifier	M		9.3.1.63		-	
>>>>>QoS Flow Level QoS Parameters	M		9.3.1.45		-	
>>>>>QoS Flow Mapping Indication	O		9.3.1.72		YES	ignore
>> 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.	-	
>>DL PDCP SN length	O		ENUMERATED(12bits,18 bits, ...)		YES	ignore
>>UL PDCP SN length	O		ENUMERATED (12bits, 18bits, ...)		YES	ignore
>>Bearer Type Change	O		ENUMERATED (true, ...)		YES	ignore
>> RLC Mode	O		9.3.1.27		YES	ignore
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication	YES	reject
>> DC Based Duplication Configured	O		ENUMERATED (true, ..., false)	Indication on whether DC based PDCP duplication is configured or not.	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>DC Based Duplication Activation	O		9.3.1.36	Information on the initial state of DC based UL PDCP duplication	YES	reject
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
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
RRC Delivery Status Request	O		ENUMERATED (true, ...)	Indicates whether RRC DELIVERY REPORT procedure is requested for the RRC message.	YES	ignore
Resource Coordination Transfer Information	O		9.3.1.73		YES	ignore
servingCellMO	O		INTEGER (1..64)		YES	ignore
Need for Gap	O		ENUMERATED (true, ...)	Indicate gap for SeNB configured measurement is requested. It only applied to NE DC scenario.	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.
maxnoofQoSFlows	Maximum no. of flows allowed to be mapped to one DRB, the maximum value is 64.

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 IE</i> 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>			-	
>>>DL UP TNL Information	M		UP Transport Layer Information	gNB-DU endpoint of the F1 transport	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			9.3.2.1	bearer. For delivery of DL PDUs.		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>RLC Status	O		9.3.1.69	Indicates the RLC has been re-established at the gNB-DU.	YES	ignore
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		9.3.1.7		-	
>>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		-	
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		-	
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		-	
Inactivity Monitoring Response	O		ENUMERATE D (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
Associated SCell List	O		9.3.1.77		YES	ignore
SRB Setup List		0..1			YES	ignore
>SRB Setup Item		1 .. <maxnoofSRBs>			EACH	ignore
>>SRB ID	M		9.3.1.7		-	
>>LCID	M		9.3.1.35	LCID for the primary path if PDCP duplication is applied	-	
SRB Modified List		0..1			YES	ignore
>SRB Modified Item		1 .. <maxnoofSRBs>			EACH	ignore
>>SRB ID	M		9.3.1.7		-	
>>LCID	M		9.3.1.35	LCID for the primary path if	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				PDCP duplication is applied		

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.
maxnoofSCells	Maximum no. of SCells allowed towards one UE, the maximum value is 32.

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 SgNB Resource Coordination Information 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 .. <maxnoofDLUPTNLInformation>			-	
>>>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.	YES	ignore
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 MeNB Resource Coordination Information IE as defined in subclause 9.2.116 of TS 36.423 [9].	YES	ignore
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		-	
>>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-DU endpoint of the F1 transport bearer. For delivery of UL PDUs.	-	
RRC-Container	O		9.3.1.6	Includes the RRCConnectionRe configuration 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
Resource Coordination Transfer Information	O		9.3.1.73		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.

9.2.2.11A UE CONTEXT MODIFICATION REFUSE

This message is sent by the gNB-CU to indicate the UE context modification was unsuccessful.

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
Criticality Diagnostics	O		9.3.1.3		YES	ignore

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	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 Activity List		1			YES	reject
>DRB Activity Item		1 .. <maxnoofDRBs>			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>DRB Activity	O		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, ...)		-	

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

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 IE</i> as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
DU to CU RRC Container	O		OCTET STRING	<i>CellGroupConfig IE</i> as defined in subclause 6.3.2 in TS 38.331 [8]. Required at least to carry SRB1 configuration. The ReconfigurationWithSync field shall not be included in the <i>CellGroupConfig IE</i> .	YES	reject
SUL Access Indication	O		ENUMERATE D (true, ...)		YES	ignore
Transaction ID	M		9.3.1.23		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 RRConnectionEstablishment is included in RRC-Container	YES	reject
SRB ID	M		9.3.1.7		YES	reject
Execute Duplication	O		ENUMERATE D (true, ...)		YES	ignore
RRC-Container	M		9.3.1.6	Includes the <i>DL-DCCH-Message IE</i> as defined in subclause 6.2 of TS 38.331 [8] encapsulated in a PDCP PDU, or the <i>DL-CCCH-Message IE</i> as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject
RRC Delivery Status Request	O		ENUMERATE D (true, ...)	Indicates whether RRC DELIVERY REPORT procedure is requested for the RRC message.	YES	ignore

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 IE</i> as defined in subclause 6.2 of TS 38.331 [8], encapsulated in a PDCP PDU.	YES	reject

9.2.3.4 RRC DELIVERY REPORT

This message is sent by the gNB-DU to inform the gNB-CU about the delivery status of DL RRC messages.

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
RRC Delivery Status	M		9.3.1.71		YES	ignore
SRB ID	M		9.3.1.7		YES	ignore

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
Repetition Period	M		9.3.1.59		YES	reject
Number of Broadcasts Requested	M		9.3.1.60		YES	reject
Cell To Be Broadcast List		0..1			YES	reject
>Cell to Be Broadcast Item IEs		1.. <maxCelli ngNBDU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	

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.. <maxCellingNBDU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Dedicated SI Delivery Needed UE List		0..1		List of UEs unable to receive system information from broadcast	YES	ignore
>Dedicated SI Delivery Needed UE Item		1 .. <maxno ofUEIDs >			EACH	ignore
>>gNB-CU UE F1AP ID	M		9.3.1.4		-	
>>NR CGI	M		9.3.1.12		-	

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.
maxnoofUEIDs	Maximum no. of UEs that can be served by a gNB-DU. Value is 65536.

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
Number of Broadcasts Requested	M		9.3.1.60	This IE is not used in this version of the specification	YES	reject
Cell Broadcast To Be Cancelled List		0..1			YES	reject
>Cell Broadcast to Be Cancelled Item IEs		1.. <maxCellingNBDU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	
Cancel-all Warning Messages Indicator	O			ENUMERATED (true, ...)	YES	reject

Range bound	Explanation
maxCellingNBDU	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.. <maxCellingNBDU>			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

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

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
Transaction ID	M		9.3.1.23		YES	reject
NR CGI List for Restart List		1			YES	reject
>NR CGI List for Restart Item IEs		1..<maxCellingNB DU>			EACH	reject
>>NR CGI	M		9.3.1.12		-	

Range bound	Explanation
maxCellingNBDU	Maximum no. of cells that can be served by a 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
Transaction ID	M		9.3.1.23		YES	reject
PWS failed NR CGI List		0..1			YES	reject
>PWS failed NR CGI Item IEs		1..<maxCellingNB DU>			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.	-	

Range bound	Explanation
maxCellingNBDU	Maximum no. of cells that can be served by a 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	ignore
Transaction ID	M		9.3.1.23		YES	reject
NR CGI	M		9.3.1.12	NR cell identifier	YES	reject
SIType List	M		9.3.1.62		YES	reject
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	ignore
UE Identity Index value	M		9.3.1.39		YES	reject
CHOICE Paging Identity	M				YES	reject
>RAN UE Paging identity	M		9.3.1.43		-	
>CN UE paging identity	M		9.3.1.44		-	
Paging DRX	O		9.3.1.40	It is defined as the minimum between the RAN UE Paging DRX and CN UE Paging DRX	YES	ignore
Paging Priority	O		9.3.1.41		YES	ignore
Paging Cell List		1			YES	ignore
>Paging Cell Item IEs		1 .. <maxnoof PagingCells>			EACH	ignore
>>NR CGI	M		9.3.1.12		-	
Paging Origin	O		9.3.1.79		YES	ignore

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 F1AP 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, AMF initiated abnormal release, Release due to Pre-Emption)	
>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 (Falsey 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.
AMF initiated abnormal release	The release is triggered by an error in the AMF or in the NAS layer.
Release due to Pre-Emption	Release is initiated due to pre-emption.

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 (Falsey 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 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		0 .. <maxnoof Errors>		
>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		1..<maxnoofBPLMNs>		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.	YES	ignore
CHOICE NR-Mode-Info	M				-	
>FDD					-	
>>FDD Info		1			-	
>>>UL FreqInfo	M		NR Frequency Info 9.3.1.17		-	
>>>DL FreqInfo	M		NR Frequency Info 9.3.1.17		-	
>>>UL Transmission Bandwidth	M		Transmission Bandwidth 9.3.1.15		-	
>>>DL Transmission Bandwidth	M		Transmission Bandwidth 9.3.1.15		-	
>TDD					-	
>>TDD Info		1			-	
>>> NR FreqInfo	M		NR Frequency Info 9.3.1.17		-	
>>> Transmission Bandwidth	M		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		RAN Area Code 9.3.1.57		YES	ignore
Extended Served PLMNs List		0..1		This is included if more than 6 Served PLMNs is to be signalled.	YES	ignore
>Extended Served PLMNs Item		1 ..<maxnoofExtendedBPLMNs>			-	
>>PLMN Identity	M		9.3.1.14		-	
>>TAI Slice Support List	O		Slice Support List 9.3.1.37	Supported S-NSSAIs per TA.	-	
Cell Direction	O		9.3.1.78		YES	ignore

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

9.3.1.11 Transmission Action Indicator

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transmission Action 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 " N_{RB} " (TS 38.104 [17]). The values nrb11, nrb18, etc. correspond to the number of resource blocks " N_{RB} " 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 [26] 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
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
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	Criticality	Assigned Criticality
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 [8] (without MeasGapConfig). For EN-DC/NGEN-DC operation, includes the list of FR2 frequencies for which the gNB-CU requests the gNB-DU to generate gaps. For NG-RAN, NE-DC and MN for NR-NR DC, 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].	YES	ignore
CellGroupConfig	O		OCTET STRING	CellGroupConfig, as defined in TS 38.331 [8].	YES	ignore
Measurement Timing Configuration	O		OCTET STRING	Contains the <i>MeasurementTimingConfiguration</i> inter-node message defined in TS 38.331 [8]. In EN-DC/NGEN-DC, it is included when the gaps for FR2 are requested to be configured by the MeNB. For MN in NR-NR DC, it is included when the gaps for FR2 and/or FR1 are requested by the SgNB	YES	ignore
UEAssistanceInformation	O		OCTET STRING	UEAssistanceInformation, as defined in TS 38.331 [8].	YES	ignore

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	Criticality	Assigned Criticality
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/NGEN-DC operation, includes the gap for FR2, as requested by the gNB-CU via MeasConfig IE. For NG-RAN, NE-DC and MN for NR-NR DC, 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.		
DRX Long Cycle Start Offset	O		INTEGER (0..10239)	Identical to the value of the drx-LongCycleStartOffset IE within the DRX-Config as defined in TS 38.331.		
Selected BandCombinationIndex	O		OCTET STRING	BandCombinationIndex, as defined in TS 38.331 [8]. For EN-DC operation, this IE should be included so that gNB-CU is informed of the selected Band Combination.	YES	ignore
Selected FeatureSetEntryIndex	O		OCTET STRING	FeatureSetEntryIndex, as defined in TS 38.331 [8]. For EN-DC operation, this IE should be included so that gNB-CU is informed of the selected FeatureSet.	YES	ignore
Ph-InfoSCG	O		OCTET STRING	PH-TypeListSCG, as defined in TS 38.331[8]. For MR-DC, this IE should be included so that gNB-CU is informed of the Power Headroom type for each serving cell in SN.	Yes	ignore
Requested BandCombinationIndex	O		OCTET STRING	BandCombinationIndex, as defined in TS 38.331 [8]. This IE is used for the gNB-DU to request a new Band Combination.	YES	ignore
Requested FeatureSetEntryIndex	O		OCTET STRING	FeatureSetEntryIndex, as defined in TS 38.331 [8]. This IE is used for the gNB-DU to request a new Feature Set.	YES	ignore
Requested P-MaxFR2	O		OCTET STRING	requestedP-MaxFR2, as defined in TS 38.331 [8]. For NR-DC operation, this IE should be included.	YES	ignore
DRX Config	O		OCTET STRING	DRX-Config, as defined in TS 38.331 [8].	YES	ignore

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- Unidirectionall-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		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 result of the reconfiguration performed towards the UE.

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

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				
>> Index to RAT/Frequency Selection Priority	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
Slice Support Item IEs		1..<maxno ofSliceItems>		
>S-NSSAI	M		9.3.1.38	

Range bound	Explanation
maxnoofSliceItems	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 UE Identity Index Value	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 CN UE paging identity	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 QoS Characteristics	M				-	
>Non-dynamic 5QI					-	
>>Non Dynamic 5QI Descriptor	M		9.3.1.49		-	
>Dynamic 5QI					-	
>>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].	YES	ignore
UL PDU Session Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.22	The PDU session Aggregate Maximum Bit Rate Uplink which is associated with the involved PDU session.	YES	ignore

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
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)	<p>Desc.: This IE defines the relative importance of a resource request (see TS 23.501 [21]).</p> <p>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].</p>
>Pre-emption Capability	M		ENUMERATED (shall not trigger pre-emption, may trigger pre-emption)	<p>Desc.: This IE indicates the pre-emption capability of the request on other QoS flows.</p> <p>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.</p>
>Pre-emption Vulnerability	M		ENUMERATED (not pre-emptable, pre-emptable)	<p>Desc.: This IE indicates the vulnerability of the QoS flow to pre-emption of other QoS flows.</p> <p>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.</p>

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
SIB type	M		INTEGER (6..8, ...)	Indicates a certain SIB block for public warning message, e.g. 6 means sibType6, 7 for sibType7, etc.
SIB message	M		OCTET STRING	SIB message for public warning, as defined in TS 38.331 [8].

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.. <maxnoofSITypes>		
>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 Identifier

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Identifier	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
CHOICE EUTRA-Mode-Info	M			
>FDD				
>>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.
>TDD				
>>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].

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
Available PLMN Item IEs		1..< maxnoofBPLM Ns >		
>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		LCID 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	UplinkTxDirectCurrentList as defined in TS 38.331 [8].

9.3.1.68 Service Status

This IE is used to indicate the service status of a cell by the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Service State	M		ENUMERATED (In-Service, Out-Of-Service, ...)	Indicates the Service State of the cell. In-Service and Out-of-Service Service States are defined in TS 38.401 [4].
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 Service State IE shall be set to "In-Service".

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	Criticality	Assigned Criticality
Latest RRC Version	M		BIT STRING (SIZE (3))	This IE is not used in this release.	-	
Latest RRC Version Enhanced	O		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.	YES	ignore

9.3.1.71 RRC Delivery Status

This IE provides information about the delivery status of RRC messages to the UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Delivery Status	M		INTEGER (0..2 ¹² -1)	Highest NR PDCP SN successfully delivered in sequence to the UE.
Triggering Message	M		INTEGER (0..2 ¹² -1)	NR PDCP SN for the RRC message that triggered the report.

9.3.1.72 QoS Flow Mapping Indication

This IE is used to indicate only the uplink or downlink QoS flow is mapped to the DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Mapping Indication	O		ENUMERATED(ul, dl,...)	Indicates that only the uplink or downlink QoS flow is mapped to the DRB

9.3.1.73 Resource Coordination Transfer Information

This IE contains information for UE-associated E-UTRA – NR resource coordination.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MeNB Cell ID	M		BIT STRING (SIZE(28))	E-UTRAN Cell Global Identifier defined in TS 36.423 [9] clause 9.2.14
Resource Coordination E-UTRA Cell Information	O		9.3.1.75	

9.3.1.74 E-UTRA PRACH Configuration

This IE indicates the PRACH resources used in E-UTRA cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RootSequenceIndex	M		INTEGER (0..837)	See section 5.7.2. in TS 36.211 [27]
ZeroCorrelationZoneConfiguration	M		INTEGER (0..15)	See section 5.7.2. in TS 36.211 [27]
HighSpeedFlag	M		BOOLEAN	TRUE corresponds to Restricted set and FALSE to Unrestricted set. See section 5.7.2 in TS 36.211 [27]
PRACH-FrequencyOffset	M		INTEGER (0..94)	See section 5.7.1 of TS 36.211 [27]
PRACH-ConfigurationIndex	O		INTEGER (0..63)	Mandatory for TDD, shall not be present for FDD. See section 5.7.1. in TS 36.211 [27]

9.3.1.75 Resource Coordination E-UTRA Cell Information

This IE contains E-UTRA cell information for UE-associated E-UTRA – NR resource coordination.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE EUTRA-Mode-Info	M			
>FDD				
>>FDD Info		1		
>>>UL EARFCN	O		INTEGER (0 .. maxExtendedEARFCN, ...)	The relation between EARFCN and carrier frequency (in MHz) is defined in TS 36.104 [25].
>>>DL EARFCN	M		INTEGER (0 .. maxExtendedEARFCN, ...)	The relation between EARFCN and carrier frequency (in MHz) is defined in TS 36.104 [25].
>>>UL Transmission Bandwidth	O		Transmission Bandwidth 9.2.27	Present if UL EARFCN IE is present.
>>>DL Transmission Bandwidth	M		Transmission Bandwidth 9.2.27	
>TDD				
>>TDD Info		1		
>>>EARFCN	M		INTEGER (0 .. maxExtendedEARFCN, ...)	The relation between EARFCN and carrier frequency (in MHz) is defined in TS 36.104 [25].
>>>Transmission Bandwidth	M		Transmission Bandwidth 9.2.27	
>>>Subframe Assignment	M		ENUMERATED(sa0, sa1, sa2, sa3, sa4, sa5, sa6,...)	Uplink-downlink subframe configuration information defined in TS 36.211 [27]. In NB-IOT, sa0 and sa6 are not applicable.
>>>Special Subframe Info		1		Special subframe configuration information defined in TS 36.211 [27]
>>>>Special Subframe Patterns	M		ENUMERATED(ssp0, ssp1, ssp2, ssp3, ssp4, ssp5, ssp6, ssp7, ssp8, ssp9, ssp10, ...)	
>>>>Cyclic Prefix DL	M		ENUMERATED(Normal, Extended,...)	
>>>>Cyclic Prefix UL	M		ENUMERATED(Normal, Extended,...)	
E-UTRA PRACH Configuration	O		9.3.1.74	

Range bound	Explanation
maxExtendedEARFCN	Maximum value of extended EARFCN. Value is 262143.

9.3.1.76 Extended Available PLMN List

This IE indicates the list of available PLMN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Extended Available PLMN Item IEs		1..< maxnoofExtendedBPLMNs >		
>PLMN Identity	M		9.3.1.14	

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

9.3.1.77 Associated SCell List

This IE indicates the list of SCells associated with the RLC entity indicated by the *RLC Failure Indication* IE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Associated SCell Item IEs		1..< maxnoofSCells >			-	-
>SCell ID	M		NR CGI 9.3.1.12		-	

Range bound	Explanation
maxnoofSCells	Maximum no. of SCells allowed towards one UE, the maximum value is 32.

9.3.1.78 Cell Direction

This IE indicates if the cell is either bidirectional or only DL or only UL.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Direction	M		ENUMERATED (dl-only, ul-only)	

9.3.1.79 Paging Origin

This IE indicates whether Paging is originated due to the PDU sessions from the non-3GPP access.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Paging Origin	M		ENUMERATED (non-3GPP, ...)	

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 Transport Layer Information	M			
>GTP Tunnel				
>>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 F1 control plane transport layer information associated with a gNB-CU – gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE CP Transport Layer Information				
>Endpoint-IP-address				
>> Endpoint IP address	M		Transport Layer Address 9.3.2.3	
>Endpoint-IP-address-and-port				
>> Endpoint IP address and port	M		Transport Layer Address 9.3.2.3	This IE is not used in this version of the specification

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

```
-- ASN1START
-- ****
-- Elementary Procedure definitions
-- ****

F1AP-PDU-Descriptions {
    itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
    ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-PDU-Descriptions (0)}

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    Criticality,
    ProcedureCode

FROM F1AP-CommonDataTypes
    Reset,
    ResetAcknowledge,
    F1SetupRequest,
    F1SetupResponse,
    F1SetupFailure,
    GNBDUConfigurationUpdate,
    GNBDUConfigurationUpdateAcknowledge,
    GNBDUConfigurationUpdateFailure,
    GNBCUConfigurationUpdate,
    GNBCUConfigurationUpdateAcknowledge,
    GNBCUConfigurationUpdateFailure,
    UEContextSetupRequest,
    UEContextSetupResponse,
    UEContextSetupFailure,
    UEContextReleaseCommand,
    UEContextReleaseComplete,
    UEContextModificationRequest,
    UEContextModificationResponse,
    UEContextModificationFailure,
    UEContextModificationRequired,
    UEContextModificationConfirm,
    ErrorIndication,
    UEContextReleaseRequest,
    DLRRCMessageTransfer,
    ULRRCMessageTransfer,
```

```
GNBDDUResourceCoordinationRequest,  
GNBDDUResourceCoordinationResponse,  
PrivateMessage,  
UEInactivityNotification,  
InitialULRRCMessageTransfer,  
SystemInformationDeliveryCommand,  
Paging,  
Notify,  
WriteReplaceWarningRequest,  
WriteReplaceWarningResponse,  
PWSCancelRequest,  
PWSCancelResponse,  
PWSRestartIndication,  
PWSFailureIndication,  
GNBDDUStatusIndication,  
RRCDeliveryReport,  
UEContextModificationRefuse
```

```
FROM F1AP-PDU-Contents  
    id-Reset,  
    id-F1Setup,  
    id-gNBDUConfigurationUpdate,  
    id-gNBCUConfigurationUpdate,  
    id-UEContextSetup,  
    id-UEContextRelease,  
    id-UEContextModification,  
    id-UEContextModificationRequired,  
    id-ErrorIndication,  
    id-UEContextReleaseRequest,  
    id-DLRRCMessageTransfer,  
    id-ULRRCMessageTransfer,  
    id-GNBDDUResourceCoordination,  
    id-privateMessage,  
    id-UEInactivityNotification,  
    id-InitialULRRCMessageTransfer,  
    id-SystemInformationDeliveryCommand,  
    id-Paging,  
    id-Notify,  
    id-WriteReplaceWarning,  
    id-PWSCancel,  
    id-PWSRestartIndication,  
    id-PWSFailureIndication,  
    id-GNBDDUStatusIndication,  
    id-RRCDeliveryReport
```

```
FROM F1AP-Constants
```

```
ProtocolIE-SingleContainer{},  
F1AP-PROTOCOL-IES
```

```
FROM F1AP-Containers;
```

```

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

F1AP-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
-- ****

F1AP-PDU ::= CHOICE {
    initiatingMessage  InitiatingMessage,
    successfulOutcome  SuccessfulOutcome,
    unsuccessfulOutcome UnsuccessfulOutcome,
    choice-extension    ProtocolIE-SingleContainer { { F1AP-PDU-ExtIEs} }
}

F1AP-PDU-ExtIEs F1AP-PROTOCOL-IES ::= { -- this extension is not used
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode  F1AP-ELEMENTARY-PROCEDURE.&procedureCode      ({F1AP-ELEMENTARY-PROCEDURES}),
    criticality    F1AP-ELEMENTARY-PROCEDURE.&criticality        ({F1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value          F1AP-ELEMENTARY-PROCEDURE.&InitiatingMessage   ({F1AP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode  F1AP-ELEMENTARY-PROCEDURE.&procedureCode      ({F1AP-ELEMENTARY-PROCEDURES}),
    criticality    F1AP-ELEMENTARY-PROCEDURE.&criticality        ({F1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value          F1AP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome   ({F1AP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode  F1AP-ELEMENTARY-PROCEDURE.&procedureCode      ({F1AP-ELEMENTARY-PROCEDURES}),
    criticality    F1AP-ELEMENTARY-PROCEDURE.&criticality        ({F1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value          F1AP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome ({F1AP-ELEMENTARY-PROCEDURES}{@procedureCode})}

```

```
}

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

F1AP-ELEMENTARY-PROCEDURES F1AP-ELEMENTARY-PROCEDURE ::= {
    F1AP-ELEMENTARY-PROCEDURES-CLASS-1
    |
    F1AP-ELEMENTARY-PROCEDURES-CLASS-2,
    ...
}

F1AP-ELEMENTARY-PROCEDURES-CLASS-1 F1AP-ELEMENTARY-PROCEDURE ::= {
    reset
    f1Setup
    gNBDUConfigurationUpdate
    gNBCUConfigurationUpdate
    uEContextSetup
    uEContextRelease
    uEContextModification
    uEContextModificationRequired
    writeReplaceWarning
    pWSCancel
    gNBDUResourceCoordination
    ...
}

F1AP-ELEMENTARY-PROCEDURES-CLASS-2 F1AP-ELEMENTARY-PROCEDURE ::= {
    errorIndication
    uEContextReleaseRequest
    dLRRCMessageTransfer
    uLRRCMessageTransfer
    uEIInactivityNotification
    privateMessage
    initialULRRCMessageTransfer
    systemInformationDelivery
    paging
    notify
    pWSRestartIndication
    pWSFailureIndication
    gNBDUStatusIndication
    rRCDeliveryReport
    ...
}

-- ****
-- Interface Elementary Procedures
-- ****

reset F1AP-ELEMENTARY-PROCEDURE ::= {
```

```
INITIATING MESSAGE      Reset
SUCCESSFUL OUTCOME    ResetAcknowledge
PROCEDURE CODE         id-Reset
CRITICALITY            reject
}

f1Setup F1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE    F1SetupRequest
  SUCCESSFUL OUTCOME   F1SetupResponse
  UNSUCCESSFUL OUTCOME F1SetupFailure
  PROCEDURE CODE        id-F1Setup
  CRITICALITY           reject
}

gNBDUConfigurationUpdate F1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE    GNBDUConfigurationUpdate
  SUCCESSFUL OUTCOME   GNBDUConfigurationUpdateAcknowledge
  UNSUCCESSFUL OUTCOME GNBDUConfigurationUpdateFailure
  PROCEDURE CODE        id-gNBDUConfigurationUpdate
  CRITICALITY           reject
}

gNBCUConfigurationUpdate F1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE    GNBCUConfigurationUpdate
  SUCCESSFUL OUTCOME   GNBCUConfigurationUpdateAcknowledge
  UNSUCCESSFUL OUTCOME GNBCUConfigurationUpdateFailure
  PROCEDURE CODE        id-gNBCUConfigurationUpdate
  CRITICALITY           reject
}

uEContextSetup F1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE    UEContextSetupRequest
  SUCCESSFUL OUTCOME   UEContextSetupResponse
  UNSUCCESSFUL OUTCOME UEContextSetupFailure
  PROCEDURE CODE        id-UEContextSetup
  CRITICALITY           reject
}

uEContextRelease F1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE    UEContextReleaseCommand
  SUCCESSFUL OUTCOME   UEContextReleaseComplete
  PROCEDURE CODE        id-UEContextRelease
  CRITICALITY           reject
}

uEContextModification F1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE    UEContextModificationRequest
  SUCCESSFUL OUTCOME   UEContextModificationResponse
  UNSUCCESSFUL OUTCOME UEContextModificationFailure
  PROCEDURE CODE        id-UEContextModification
  CRITICALITY           reject
}

uEContextModificationRequired F1AP-ELEMENTARY-PROCEDURE ::= {
```

```
INITIATING MESSAGE      UEContextModificationRequired
SUCCESSFUL OUTCOME     UEContextModificationConfirm
UNSUCCESSFUL OUTCOME   UEContextModificationRefuse
PROCEDURE CODE          id-UEContextModificationRequired
CRITICALITY             reject
}

writeReplaceWarning F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      WriteReplaceWarningRequest
    SUCCESSFUL OUTCOME     WriteReplaceWarningResponse
    PROCEDURE CODE          id-WriteReplaceWarning
    CRITICALITY             reject
}

pWSCancel F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PWS CancelRequest
    SUCCESSFUL OUTCOME     PWS CancelResponse
    PROCEDURE CODE          id-PWS Cancel
    CRITICALITY             reject
}

errorIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ErrorIndication
    PROCEDURE CODE          id-ErrorIndication
    CRITICALITY             ignore
}

uEContextReleaseRequest F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      UEContextReleaseRequest
    PROCEDURE CODE          id-UEContextReleaseRequest
    CRITICALITY             ignore
}

initialULRRCMessageTransfer F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      InitialULRRCMessageTransfer
    PROCEDURE CODE          id-InitialULRRCMessageTransfer
    CRITICALITY             ignore
}

dLRRRCMessageTransfer F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      DLRRRCMessageTransfer
    PROCEDURE CODE          id-DLRRRCMessageTransfer
    CRITICALITY             ignore
}

uLRRRCMessageTransfer F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ULRRCMessageTransfer
    PROCEDURE CODE          id-ULRRCMessageTransfer
    CRITICALITY             ignore
}

uEIactivityNotification F1AP-ELEMENTARY-PROCEDURE ::= {
```

```

INITIATING MESSAGE      UEInactivityNotification
PROCEDURE CODE          id-UEInactivityNotification
CRITICALITY             ignore
}

gNBDUResourceCoordination F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNBDRResourceCoordinationRequest
    SUCCESSFUL OUTCOME      GNBDRResourceCoordinationResponse
    PROCEDURE CODE          id-GNBDRResourceCoordination
    CRITICALITY             reject
}

privateMessage F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PrivateMessage
    PROCEDURE CODE          id-privateMessage
    CRITICALITY             ignore
}

systemInformationDelivery F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      SystemInformationDeliveryCommand
    PROCEDURE CODE          id-SystemInformationDeliveryCommand
    CRITICALITY             ignore
}

paging F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      Paging
    PROCEDURE CODE          id-Paging
    CRITICALITY             ignore
}

notify F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      Notify
    PROCEDURE CODE          id-Notify
    CRITICALITY             ignore
}

pWSRestartIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PWSRestartIndication
    PROCEDURE CODE          id-PWSRestartIndication
    CRITICALITY             ignore
}

pWSFailureIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PWSFailureIndication
    PROCEDURE CODE          id-PWSFailureIndication
    CRITICALITY             ignore
}

gNBDUStatusIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNBDUStatusIndication
    PROCEDURE CODE          id-GNBDUStatusIndication
    CRITICALITY             ignore
}

```

```
rRCDeliveryReport F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      RRCDeliveryReport
    PROCEDURE CODE          id-RRCDeliveryReport
    CRITICALITY             ignore
}
```

```
END
-- ASN1STOP
```

9.4.4 PDU Definitions

```
-- ASN1START
-- ****
-- PDU definitions for F1AP.
-- ****
F1AP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS :=

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

IMPORTS
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-F1AP-ID,
GNB-DU-UE-F1AP-ID,
GNB-DU-ID,
GNB-DU-Served-Cells-Item,
GNB-DU-System-Information,
GNB-CU-Name,
GNB-DU-Name,
InactivityMonitoringRequest,
InactivityMonitoringResponse,
NotificationControl,
NRCGI,
NRPCI,
Potential-SpCell-Item,
RAT-FrequencyPriorityInformation,
ResourceCoordinationTransferContainer,
RRCCContainer,
RRCReconfigurationCompleteIndicator,
SCellIndex,
SCell-ToBeRemoved-Item,
SCell-ToBeSetup-Item,
SCell-ToBeSetupMod-Item,
SCell-FailedtoSetup-Item,
SCell-FailedtoSetupMod-Item,
ServedCellIndex,
Served-Cell-Information,
Served-Cells-To-Add-Item,
Served-Cells-To-Delete-Item,
Served-Cells-To-Modify-Item,
ServingCellMO,
SRBID,
SRBs-FailedToBeSetup-Item,
SRBs-FailedToBeSetupMod-Item,
SRBs-Required-ToBeReleased-Item,
SRBs-ToBeReleased-Item,
SRBs-ToBeSetup-Item,
SRBs-ToBeSetupMod-Item,
SRBs-Modified-Item,
SRBs-Setup-Item,

```
SRBs-SetupMod-Item,  
TimeToWait,  
TransactionID,  
TransmissionActionIndicator,  
UE-associatedLogicalF1-ConnectionItem,  
DUtoCURRCContainer,  
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,  
RRCDeliveryStatusRequest,  
NeedforGap,  
RRCDeliveryStatus,  
ResourceCoordinationTransferInformation,  
Dedicated-SIDelivery-NeededUE-Item,  
Associated-SCell-Item,  
IgnoreResourceCoordinationContainer,  
PagingOrigin
```

FROM F1AP-IEs

```
PrivateIE-Container{},  
ProtocolExtensionContainer{},
```

```
ProtocolIE-Container{},
ProtocolIE-ContainerPair{},
ProtocolIE-SingleContainer{},
F1AP-PRIVATE-IES,
F1AP-PROTOCOL-EXTENSION,
F1AP-PROTOCOL-IES,
F1AP-PROTOCOL-IES-PAIR

FROM F1AP-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-F1AP-ID,  
id-gNB-DU-UE-F1AP-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-F1AP-ID,  
id-Potential-SpCell-Item,  
id-Potential-SpCell-List,  
id-RAT-FrequencyPriorityInformation,  
id-ResetType,  
id-ResourceCoordinationTransferContainer,  
id-RCCContainer,  
id-RRCReconfigurationCompleteIndicator,  
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-ServingCellMO,  
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-SRBs-Modified-Item,
id-SRBs-Modified-List,
id-SRBs-Setup-Item,
id-SRBs-Setup-List,
id-SRBs-SetupMod-Item,
id-SRBs-SetupMod-List,
id-TimeToWait,
id-TransactionID,
id-TransmissionActionIndicator,
id-UE-associatedLogicalF1-ConnectionItem,
id-UE-associatedLogicalF1-ConnectionListResAck,
id-DUtoCURRCContainer,
id-NRCGI,
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,
id-NeedforGap,
id-RRCDeliveryStatusRequest,
id-RRCDeliveryStatus,
id-Dedicated-SIDelivery-NeededUE-List,
id-Dedicated-SIDelivery-NeededUE-Item,
id-ResourceCoordinationTransferInformation,
id-Associated-SCell-List,
id-Associated-SCell-Item,
id-IgnoreResourceCoordinationContainer,
id-PagingOrigin,
maxCellingNBDU,
maxnoofCandidateSpCells,
maxnoofDRBs,
maxnoofErrors,
maxnoofIndividualF1ConnectionsToReset,
maxnoofPotentialSpCells,
maxnoofSCells,
maxnoofSRBs,
maxnoofPagingCells,
maxnoofTNLAssociations,
maxCellineNB,
maxnoofUEIDs
```

```
FROM F1AP-Constants;
```

```
-- ****
-- 
-- RESET ELEMENTARY PROCEDURE
-- 
-- ****
-- 
-- ****
-- 
-- Reset
-- 
-- ****
Reset ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ResetIEs} },
    ...
}
```

```

ResetIEs F1AP-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 {
  f1-Interface
  partOfF1-Interface
  choice-extension
}
ResetAll,
UE-associatedLogicalF1-ConnectionListRes,
ProtocolIE-SingleContainer { { ResetType-ExtIEs} }

ResetType-ExtIEs F1AP-PROTOCOL-IES ::= {
  ...
}

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

UE-associatedLogicalF1-ConnectionListRes ::= SEQUENCE (SIZE(1.. maxnoofIndividualF1ConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-associatedLogicalF1-ConnectionItemRes } }

UE-associatedLogicalF1-ConnectionItemRes F1AP-PROTOCOL-IES ::= {
  { ID id-UE-associatedLogicalF1-ConnectionItem  CRITICALITY reject  TYPE UE-associatedLogicalF1-ConnectionItem  PRESENCE mandatory},
  ...
}

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

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

ResetAcknowledgeIEs F1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID           CRITICALITY reject  TYPE TransactionID          PRESENCE
  mandatory  }|
  { ID id-UE-associatedLogicalF1-ConnectionListResAck    CRITICALITY ignore   TYPE UE-associatedLogicalF1-ConnectionListResAck  PRESENCE
  optional  }|
  { ID id-CriticalityDiagnostics  CRITICALITY ignore   TYPE CriticalityDiagnostics  PRESENCE optional  },
  ...
}

```

```

UE-associatedLogicalF1-ConnectionListResAck ::= SEQUENCE (SIZE(1.. maxnoofIndividualF1ConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-
associatedLogicalF1-ConnectionItemResAck } }

UE-associatedLogicalF1-ConnectionItemResAck      F1AP-PROTOCOL-IES ::= {
    { ID id-UE-associatedLogicalF1-ConnectionItem   CRITICALITY ignore      TYPE UE-associatedLogicalF1-ConnectionItem   PRESENCE mandatory },
    ...
}

-- *****
-- 
-- ERROR INDICATION ELEMENTARY PROCEDURE
-- 
-- *****

-- *****
-- 
-- Error Indication
-- 
-- *****

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

ErrorIndicationIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID           CRITICALITY reject    TYPE TransactionID           PRESENCE mandatory } |
    { ID id-gNB-CU-UE-F1AP-ID       CRITICALITY ignore   TYPE GNB-CU-UE-F1AP-ID       PRESENCE optional } |
    { ID id-gNB-DU-UE-F1AP-ID       CRITICALITY ignore   TYPE GNB-DU-UE-F1AP-ID       PRESENCE optional } |
    { ID id-Cause                  CRITICALITY ignore   TYPE Cause                  PRESENCE optional } |
    { ID id-CriticalityDiagnostics CRITICALITY ignore   TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

-- *****
-- 
-- F1 SETUP ELEMENTARY PROCEDURE
-- 
-- *****

-- *****
-- 
-- F1 Setup Request
-- 
-- *****

F1SetupRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container     { {F1SetupRequestIEs} },
    ...
}

F1SetupRequestIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
  { ID id-GNB-DU-Served-Cells-Item      CRITICALITY reject   TYPE GNB-DU-Served-Cells-Item PRESENCE mandatory },
  ...
}

-- *****
-- 
-- F1 Setup Response
-- 
-- *****

F1SetupResponse ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container     { {F1SetupResponseIEs} },
  ...
}

F1SetupResponseIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
  { ID id-Cells-to-be-Activated-List-Item      CRITICALITY reject   TYPE Cells-to-be-Activated-List-Item      PRESENCE mandatory },
  ...
}

-- *****
-- 
-- F1 Setup Failure
-- 
-- *****

F1SetupFailure ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container     { {F1SetupFailureIEs} },
  ...
}

```

```

}

F1SetupFailureIEs F1AP-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 F1AP-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 }|
{ ID id-Dedicated-SIDelivery-NeededUE-List  CRITICALITY ignore   TYPE Dedicated-SIDelivery-NeededUE-List  PRESENCE optional }|
{ ID id-gNB-DU-ID               CRITICALITY reject  TYPE GNB-DU-ID                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 } }

Dedicated-SIDelivery-NeededUE-List ::= SEQUENCE (SIZE(1.. maxnoofUEIDs)) OF ProtocolIE-SingleContainer { { Dedicated-SIDelivery-NeededUE-ItemIEs } }

Served-Cells-To-Add-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-Served-Cells-To-Add-Item    CRITICALITY reject  TYPE Served-Cells-To-Add-Item      PRESENCE mandatory  },
  ...
}

Served-Cells-To-Modify-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-Served-Cells-To-Modify-Item CRITICALITY reject  TYPE Served-Cells-To-Modify-Item      PRESENCE mandatory  },
}

```

```

}

Served-Cells-To-Delete-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-Served-Cells-To-Delete-Item           CRITICALITY reject   TYPE      Served-Cells-To-Delete-Item          PRESENCE mandatory  },
    ...
}

Cells-Status-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-Cells-Status-Item           CRITICALITY reject   TYPE      Cells-Status-Item          PRESENCE mandatory  },
    ...
}

Dedicated-SIDelivery-NeededUE-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-Dedicated-SIDelivery-NeededUE-Item   CRITICALITY ignore   TYPE      Dedicated-SIDelivery-NeededUE-Item          PRESENCE mandatory  },
    ...
}

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

GNBDUConfigurationUpdateAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container     { {GNBDUConfigurationUpdateAcknowledgeIEs} },
    ...
}

GNBDUConfigurationUpdateAcknowledgeIEs F1AP-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 }|
    { ID id-Cells-to-be-Deactivated-List   CRITICALITY reject   TYPE Cells-to-be-Deactivated-List      PRESENCE optional },
    ...
}

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

GNBDUConfigurationUpdateFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container     { {GNBDUConfigurationUpdateFailureIEs} },
    ...
}

GNBDUConfigurationUpdateFailureIEs F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-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.. maxCelllineNB))  OF ProtocolIE-SingleContainer { { Protected-EUTRA-Resources-ItemIEs } }
Protected-EUTRA-Resources-ItemIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID      CRITICALITY reject  TYPE TransactionID      PRESENCE mandatory  }|
  { ID id-Cells-Failed-to-be-Activated-List      CRITICALITY reject  TYPE Cells-Failed-to-be-Activated-List      PRESENCE optional }|
  { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional }|
  { ID id-GNB-CU-TNL-Association-Setup-List      CRITICALITY ignore  TYPE GNB-CU-TNL-Association-Setup-List      PRESENCE optional }|
  { ID id-GNB-CU-TNL-Association-Failed-To-Setup-List      CRITICALITY ignore  TYPE GNB-CU-TNL-Association-Failed-To-Setup-List
PRESENCE optional  }|
  { ID id-Dedicated-SIDelivery-NeededUE-List      CRITICALITY ignore  TYPE Dedicated-SIDelivery-NeededUE-List      PRESENCE optional },
  ...
}

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

```

```

Cells-Failed-to-be-Activated-List-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-Cells-Failed-to-be-Activated-List-Item   CRITICALITY reject  TYPE Cells-Failed-to-be-Activated-List-Item   PRESENCE mandatory  },
  ...
}

GNB-CU-TNL-Association-Setup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-TNL-Association-Setup-Item   CRITICALITY ignore   TYPE   GNB-CU-TNL-Association-Setup-Item   PRESENCE mandatory  },
  ...
}

GNB-CU-TNL-Association-Failed-To-Setup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-TNL-Association-Failed-To-Setup-Item   CRITICALITY ignore   TYPE   GNB-CU-TNL-Association-Failed-To-Setup-Item   PRESENCE mandatory  },
  ...
}

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

GNBCUConfigurationUpdateFailure ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container    { { GNBCUConfigurationUpdateFailureIEs} },
  ...
}

GNBCUConfigurationUpdateFailureIEs F1AP-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 F1AP-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 } |
}

```

```

{ ID id-IgnoreResourceCoordinationContainer CRITICALITY reject TYPE IgnoreResourceCoordinationContainer PRESENCE optional },
...
}

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

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

GNBDUResourceCoordinationResponse-IEs F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject TYPE GNB-CU-UE-F1AP-ID        PRESENCE mandatory }|
    { ID id-gNB-DU-UE-F1AP-ID         CRITICALITY ignore TYPE GNB-DU-UE-F1AP-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 conditional }|
{ ID id-RRCDeliveryStatusRequest             CRITICALITY ignore    TYPE RRCDeliveryStatusRequest  PRESENCE optional }|
{ ID id-ResourceCoordinationTransferInformation CRITICALITY ignore    TYPE ResourceCoordinationTransferInformation  PRESENCE optional }|
{ ID id-ServingCellMO                         CRITICALITY ignore    TYPE ServingCellMO        PRESENCE optional },
}

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 F1AP-PROTOCOL-IES ::= {
  { ID id-Candidate-SpCell-Item           CRITICALITY ignore   TYPE Candidate-SpCell-Item          PRESENCE mandatory }|,
  ...
}

SCell-ToBeSetup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SCell-ToBeSetup-Item           CRITICALITY ignore   TYPE SCell-ToBeSetup-Item          PRESENCE mandatory }|,
  ...
}

SRBs-ToBeSetup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-ToBeSetup-Item           CRITICALITY reject    TYPE SRBs-ToBeSetup-Item          PRESENCE mandatory },
  ...
}

DRBs-ToBeSetup-ItemIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-F1AP-ID           CRITICALITY reject    TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory }|
}

```

```

{ ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID           PRESENCE mandatory  }|
{ ID id-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 }|
{ ID id-SRBs-Setup-List          CRITICALITY ignore    TYPE SRBs-Setup-List           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} }
SRBs-Setup-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-Setup-ItemIEs} }

DRBs-Setup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-Setup-Item          CRITICALITY ignore    TYPE DRBs-Setup-Item           PRESENCE mandatory},
  ...
}

SRBs-Setup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-Setup-Item          CRITICALITY ignore    TYPE SRBs-Setup-Item           PRESENCE mandatory},
  ...
}

SRBs-FailedToBeSetup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-FailedToBeSetup-Item CRITICALITY ignore    TYPE SRBs-FailedToBeSetup-Item  PRESENCE mandatory},
  ...
}

DRBs-FailedToBeSetup-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-FailedToBeSetup-Item CRITICALITY ignore    TYPE DRBs-FailedToBeSetup-Item  PRESENCE mandatory},
  ...
}

SCell-FailedtoSetup-ItemIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID      CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID      PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID      CRITICALITY ignore   TYPE GNB-DU-UE-F1AP-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 F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID      CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID      PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID      CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID      PRESENCE mandatory  }|
    { ID id-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 F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-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-F1AP-ID      CRITICALITY ignore   TYPE GNB-DU-UE-F1AP-ID          PRESENCE optional }|
    { ID id-ExecuteDuplication        CRITICALITY ignore   TYPE ExecuteDuplication       PRESENCE optional }|
    { ID id-RRCDeliveryStatusRequest CRITICALITY ignore   TYPE RRCDeliveryStatusRequest PRESENCE optional },
    ...
}

-- ****
-- UE CONTEXT RELEASE COMPLETE
--

UEContextReleaseComplete ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container     { { UEContextReleaseCompleteIEs } },
    ...
}

UEContextReleaseCompleteIEs F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-CriticalityDiagnostics   CRITICALITY ignore   TYPE CriticalityDiagnostics  PRESENCE optional },
    ...
}

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

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

UEContextModificationRequest ::= SEQUENCE {

```

```

protocolIEs      ProtocolIE-Container    { { UEContextModificationRequestIEs} },
...
}

UEContextModificationRequestIEs F1AP-PROTOCOL-IES ::= {
{ ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID           PRESENCE mandatory  }|
{ ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID           PRESENCE mandatory  }|
{ ID id-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-TransmissionActionIndicator CRITICALITY ignore   TYPE TransmissionActionIndicator      PRESENCE optional  }|
{ ID id-ResourceCoordinationTransferContainer CRITICALITY ignore   TYPE ResourceCoordinationTransferContainer  PRESENCE optional  }|
{ ID id-RRCReconfigurationCompleteIndicator CRITICALITY ignore   TYPE RRCReconfigurationCompleteIndicator  PRESENCE optional  }|
{ ID id-RRCContainer              CRITICALITY reject    TYPE RRCContainer                   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  }|
{ ID id-RRCDeliveryStatusRequest CRITICALITY ignore    TYPE RRCDeliveryStatusRequest        PRESENCE optional  }|
{ ID id-ResourceCoordinationTransferInformation CRITICALITY ignore   TYPE ResourceCoordinationTransferInformation  PRESENCE optional  }|
{ ID id-ServingCellMO            CRITICALITY ignore    TYPE ServingCellMO                 PRESENCE optional  }|
{ ID id-NeedforGap               CRITICALITY ignore    TYPE NeedforGap                  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 F1AP-PROTOCOL-IES ::= {
{ ID id-SCell-ToBeSetupMod-Item      CRITICALITY ignore   TYPE SCell-ToBeSetupMod-Item          PRESENCE mandatory  },
...
}

SCell-ToBeRemoved-ItemIEs F1AP-PROTOCOL-IES ::= {
{ ID id-SCell-ToBeRemoved-Item      CRITICALITY ignore   TYPE SCell-ToBeRemoved-Item          PRESENCE mandatory  },

```

```

}

SRBs-ToBeSetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-ToBeSetupMod-Item      CRITICALITY reject   TYPE SRBs-ToBeSetupMod-Item      PRESENCE mandatory},
  ...
}

DRBs-ToBeSetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-ToBeSetupMod-Item      CRITICALITY reject   TYPE DRBs-ToBeSetupMod-Item      PRESENCE mandatory},
  ...
}

DRBs-ToBeModified-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-ToBeModified-Item      CRITICALITY reject   TYPE DRBs-ToBeModified-Item      PRESENCE mandatory},
  ...
}

SRBs-ToBeReleased-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-ToBeReleased-Item      CRITICALITY reject   TYPE SRBs-ToBeReleased-Item      PRESENCE mandatory},
  ...
}

DRBs-ToBeReleased-ItemIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-F1AP-ID           CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID           PRESENCE mandatory }|,
  { ID id-gNB-DU-UE-F1AP-ID           CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID           PRESENCE mandatory }|,
  { ID id-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 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 }|
{ ID id-Associated-SCell-List              CRITICALITY ignore    TYPE Associated-SCell-List      PRESENCE optional }|
{ ID id-SRBs-SetupMod-List                CRITICALITY ignore    TYPE SRBs-SetupMod-List       PRESENCE optional }|
{ ID id-SRBs-Modified-List               CRITICALITY ignore    TYPE SRBs-Modified-List      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 } }
SRBs-SetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-SetupMod-ItemIEs} }
SRBs-Modified-List ::= SEQUENCE (SIZE(1..maxnoofSRBs)) OF ProtocolIE-SingleContainer { { SRBs-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} }

Associated-SCell-List ::= SEQUENCE (SIZE(1.. maxnoofSCells)) OF ProtocolIE-SingleContainer { { Associated-SCell-ItemIEs} }

DRBs-SetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-SetupMod-Item      CRITICALITY ignore      TYPE DRBs-SetupMod-Item      PRESENCE mandatory},
  ...
}

DRBs-Modified-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-Modified-Item      CRITICALITY ignore      TYPE DRBs-Modified-Item      PRESENCE mandatory},
  ...
}

SRBs-SetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-SetupMod-Item      CRITICALITY ignore      TYPE SRBs-SetupMod-Item      PRESENCE mandatory},
  ...
}

SRBs-Modified-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-Modified-Item      CRITICALITY ignore      TYPE SRBs-Modified-Item      PRESENCE mandatory},
  ...
}

SRBs-FailedToBeSetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SRBs-FailedToBeSetupMod-Item      CRITICALITY ignore      TYPE SRBs-FailedToBeSetupMod-Item      PRESENCE mandatory},
  ...
}

DRBs-FailedToBeSetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-FailedToBeSetupMod-Item      CRITICALITY ignore      TYPE DRBs-FailedToBeSetupMod-Item      PRESENCE mandatory},
  ...
}

}

```

```

DRBs-FailedToBeModified-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-FailedToBeModified-Item          CRITICALITY ignore   TYPE DRBs-FailedToBeModified-Item      PRESENCE mandatory},
  ...
}

SCell-FailedtoSetupMod-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-SCell-FailedtoSetupMod-Item          CRITICALITY ignore   TYPE SCell-FailedtoSetupMod-Item      PRESENCE mandatory},
  ...
}

Associated-SCell-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-Associated-SCell-Item          CRITICALITY ignore   TYPE Associated-SCell-Item      PRESENCE mandatory},
  ...
}

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

UEContextModificationFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container    { { UEContextModificationFailureIEs} },
  ...
}

UEContextModificationFailureIEs F1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID      PRESENCE mandatory  }|,
  { ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID      PRESENCE mandatory  }|,
  { ID id-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 F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID           CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID           CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-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 F1AP-PROTOCOL-IES ::= {
    { ID id-DRBs-Required-ToBeModified-Item      CRITICALITY reject   TYPE DRBs-Required-ToBeModified-Item      PRESENCE mandatory},
    ...
}

DRBs-Required-ToBeReleased-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-DRBs-Required-ToBeReleased-Item      CRITICALITY reject   TYPE DRBs-Required-ToBeReleased-Item      PRESENCE mandatory},
    ...
}

SRBs-Required-ToBeReleased-ItemIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID           CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID           CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE mandatory  }|
    { ID id-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 }|
    { ID id-ResourceCoordinationTransferInformation CRITICALITY ignore    TYPE ResourceCoordinationTransferInformation  PRESENCE optional },
    ...
}

```

```

}

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

DRBs-ModifiedConf-ItemIEs F1AP-PROTOCOL-IES ::= {
  { ID id-DRBs-ModifiedConf-Item      CRITICALITY ignore   TYPE DRBs-ModifiedConf-Item      PRESENCE mandatory },
  ...
}

-- *****
-- 
-- UE CONTEXT MODIFICATION REFUSE
-- 
-- *****

UEContextModificationRefuse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container     { { UEContextModificationRefuseIEs } },
  ...
}

UEContextModificationRefuseIEs F1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-UE-F1AP-ID           CRITICALITY reject    TYPE GNB-CU-UE-F1AP-ID      PRESENCE mandatory },
  { ID id-gNB-DU-UE-F1AP-ID           CRITICALITY reject    TYPE GNB-DU-UE-F1AP-ID      PRESENCE mandatory },
  { ID id-Cause                      CRITICALITY ignore    TYPE Cause                  PRESENCE mandatory },
  { ID id-CriticalityDiagnostics    CRITICALITY ignore    TYPE CriticalityDiagnostics  PRESENCE optional },
  ...
}

-- *****
-- 
-- WRITE-REPLACE WARNING ELEMENTARY PROCEDURE
-- 
-- *****

-- *****
-- 
-- Write-Replace Warning Request
-- 
-- *****

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

WriteReplaceWarningRequestIEs F1AP-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 F1AP-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 F1AP-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 }|
    { ID id-Dedicated-SIDelivery-NeededUE-List   CRITICALITY ignore    TYPE Dedicated-SIDelivery-NeededUE-List  PRESENCE optional },
    ...
}

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

Cells-Broadcast-Completed-List-ItemIEs F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-PROTOCOL-IES ::= {  

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

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

    { ID id-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 F1AP-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  

--  

-- *****  

--  

InitialULRRCMessageTransfer ::= SEQUENCE {  

    protocolIEs          ProtocolIE-Container     {{ InitialULRRCMessageTransferIEs }},  

    ...
}  

InitialULRRCMessageTransferIEs F1AP-PROTOCOL-IES ::= {  

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

    { ID id-DUtoCURRCContainer        CRITICALITY reject  TYPE DUtoCURRCContainer      PRESENCE optional }|  

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

    { ID id-TransactionID             CRITICALITY ignore   TYPE TransactionID            PRESENCE mandatory },  

    ...
}  

-- *****  

--  

-- DL RRC Message Transfer ELEMENTARY PROCEDURE  

--  

-- *****

```

```

-- ****
-- DL RRC Message Transfer
-- ****
DLRRCMessageTransfer ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container    {{ DLRRCMessageTransferIEs }},
    ...
}

DLRRCMessageTransferIEs F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory },
    { ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE mandatory },
    { ID id-oldgNB-DU-UE-F1AP-ID       CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE optional },
    { ID id-SRBID                     CRITICALITY reject   TYPE SRBID                      PRESENCE mandatory },
    { ID id-ExecuteDuplication        CRITICALITY ignore   TYPE ExecuteDuplication          PRESENCE optional },
    { ID id-RRCContainer              CRITICALITY reject   TYPE RRCContainer                PRESENCE mandatory },
    { ID id-RAT-FrequencyPriorityInformation CRITICALITY reject   TYPE RAT-FrequencyPriorityInformation PRESENCE optional },
    { ID id-RRCDeliveryStatusRequest  CRITICALITY ignore   TYPE RRCDeliveryStatusRequest     PRESENCE optional },
    ...
}
-- ****
-- UL RRC Message Transfer ELEMENTARY PROCEDURE
-- ****
-- ****
-- UL RRC Message Transfer
-- ****
ULRRCMessageTransfer ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container    {{ ULRRCMessageTransferIEs }},
    ...
}

ULRRCMessageTransferIEs F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID          PRESENCE mandatory },
    { ID id-gNB-DU-UE-F1AP-ID          CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID          PRESENCE mandatory },
    { ID id-SRBID                     CRITICALITY reject   TYPE SRBID                      PRESENCE mandatory },
    { ID id-RRCContainer              CRITICALITY reject   TYPE RRCContainer                PRESENCE mandatory },
    ...
}
-- ****
-- PRIVATE MESSAGE
-- ****
PrivateMessage ::= SEQUENCE {

```

```

privateIEs      PrivateIE-Container {{PrivateMessage-IEs}},
...
}

PrivateMessage-IEs F1AP-PRIVATE-IES ::= {
...
}

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

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

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

SystemInformationDeliveryCommandIEs F1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject   TYPE TransactionID          PRESENCE mandatory }|,
  { 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-F1AP-ID        PRESENCE mandatory },
...
}

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

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

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

PagingIEs F1AP-PROTOCOL-IES ::= {
  { ID id-UEIdentityIndexValue    CRITICALITY reject   TYPE UEIdentityIndexValue  PRESENCE mandatory }|
}

```

```

{ ID id-PagingIdentity      CRITICALITY reject  TYPE PagingIdentity      PRESENCE mandatory }|
{ 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 mandatory }|
{ ID id-PagingOrigin        CRITICALITY ignore   TYPE PagingOrigin        PRESENCE optional  },
...
}

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

PagingCell-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-PagingCell-Item      CRITICALITY ignore   TYPE PagingCell-Item      PRESENCE mandatory} ,
    ...
}

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

NotifyIEs F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID      CRITICALITY reject  TYPE GNB-CU-UE-F1AP-ID      PRESENCE mandatory }|
    { ID id-gNB-DU-UE-F1AP-ID      CRITICALITY reject  TYPE GNB-DU-UE-F1AP-ID      PRESENCE mandatory }|
    { ID id-DRB-Notify-List        CRITICALITY reject  TYPE DRB-Notify-List        PRESENCE mandatory }|,
    ...
}

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

DRB-Notify-ItemIEs F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID           CRITICALITY reject   TYPE TransactionID           PRESENCE mandatory }|,
    { ID id-NR-CGI-List-For-Restart-List   CRITICALITY reject   TYPE NR-CGI-List-For-Restart-List PRESENCE mandatory },
    ...
}

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 F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID           CRITICALITY reject   TYPE TransactionID           PRESENCE mandatory }|,
    { 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 F1AP-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 F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject   TYPE TransactionID           PRESENCE mandatory  }|
    { ID id-GNBDUOverloadInformation CRITICALITY reject   TYPE GNBDUOverloadInformation  PRESENCE mandatory  },
    ...
}

-- ****
-- RRC Delivery Report ELEMENTARY PROCEDURE
-- ****
-- RRC Delivery Report
-- ****

RRCDeliveryReport ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container     {{ RRCDeliveryReportIEs}},
    ...
}

RRCDeliveryReportIEs F1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-UE-F1AP-ID    CRITICALITY reject   TYPE GNB-CU-UE-F1AP-ID    PRESENCE mandatory  }|
    { ID id-gNB-DU-UE-F1AP-ID    CRITICALITY reject   TYPE GNB-DU-UE-F1AP-ID    PRESENCE mandatory  }|
    { ID id-RRCDeliveryStatus   CRITICALITY ignore    TYPE RRCDeliveryStatus   PRESENCE mandatory  }|
    { ID id-SRBID               CRITICALITY ignore    TYPE SRBID                PRESENCE mandatory  },
    ...
}

END
-- ASN1STOP
```

9.4.5 Information Element Definitions

```
-- ASN1START
-- ****
-- Information Element Definitions
-- ****

F1AP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
  id-gNB-CUSystemInformation,
  id-HandoverPreparationInformation,
  id-TAISliceSupportList,
  id-RANAC,
  id-BearerTypeChange,
  id-Cell-Direction,
  id-CellGroupConfig,
  id-AvailablePLMNList,
  id-PDUSessionID,
  id-ULPDUSessionAggregateMaximumBitRate,
  id-DC-Based-Duplication-Configured,
  id-DC-Based-Duplication-Activation,
  id-Duplication-Activation,
  id-DLPDCPSNLength,
  id-ULPDCPSNLength,
  id-RLC-Status,
  id-MeasurementTimingConfiguration,
  id-DRB-Information,
  id-QoSFlowMappingIndication,
  id-ServingCellMO,
  id-RLCMode,
  id-ExtendedServedPLMNS-List,
  id-ExtendedAvailablePLMN-List,
  id-DRX-LongCycleStartOffset,
  id-SelectedBandCombinationIndex,
  id-SelectedFeatureSetEntryIndex,
  id-Ph-InfoSCG,
  id-latest-RRC-Version-Enhanced,
  id-RequestedBandCombinationIndex,
  id-RequestedFeatureSetEntryIndex,
  id-RequestedP-MaxFR2,
  id-DRX-Config,
  id-UEAssistanceInformation,
  maxNRARFCN,
  maxnoofErrors,
  maxnoofBPLMNS,
```

```
maxnofDLUPTNLInformation,
maxnofNrCellBands,
maxnofULUPTNLInformation,
maxnofQoSFlows,
maxnofSliceItems,
maxnofSIBTypes,
maxnofSITypes,
maxCellineNB,
maxnofExtendedBPLMNs

FROM F1AP-Constants

Criticality,
ProcedureCode,
ProtocolIE-ID,
TriggeringMessage

FROM F1AP-CommonDataTypes

ProtocolExtensionContainer{},
F1AP-PROTOCOL-EXTENSION,
ProtocolIE-SingleContainer{},
F1AP-PROTOCOL-IES

FROM F1AP-Containers;

-- A

AllocationAndRetentionPriority ::= SEQUENCE {
    priorityLevel          PriorityLevel,
    pre-emptionCapability Pre-emptionCapability,
    pre-emptionVulnerability Pre-emptionVulnerability,
    iE-Extensions          ProtocolExtensionContainer { {AllocationAndRetentionPriority-ExtIEs} } OPTIONAL,
    ...
}

AllocationAndRetentionPriority-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Associated-SCell-Item ::= SEQUENCE {
    sCell-ID            NRCGI,
    iE-Extensions      ProtocolExtensionContainer { { Associated-SCell-ItemExtIEs } } OPTIONAL
}

Associated-SCell-ItemExtIEs     F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

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

```
}

AvailablePLMNList-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

-- B

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

BearerTypeChange ::= ENUMERATED {true, ...}

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

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

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

}

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

Cause-ExtIEs F1AP-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-f1ap-id,
    unknown-or-already-allocated-gnd-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,
    amf-initiated-abnormal-release,
    release-due-to-pre-emption
}

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

CellGroupConfig ::= OCTET STRING

Cell-Direction ::= ENUMERATED {dl-only, ul-only}

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    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

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

Cells-Status-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

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

Cells-To-Be-Broadcast-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

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

Cells-Broadcast-Completed-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

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

Broadcast-To-Be-Cancelled-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

Cells-Broadcast-Cancelled-Item ::= SEQUENCE {
  nRCGI          NRCGI,
  numberofBroadcasts  NumberofBroadcasts,
  iE-Extensions    ProtocolExtensionContainer { { Cells-Broadcast-Cancelled-ItemExtIEs } } OPTIONAL,
```

```
}

Cells-Broadcast-Cancelled-ItemExtIEs    F1AP-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    F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-gNB-CUSystemInformation      CRITICALITY reject   EXTENSION GNB-CUSystemInformation      PRESENCE optional }|
    { ID id-AvailablePLMNList           CRITICALITY ignore  EXTENSION AvailablePLMNList           PRESENCE optional }|
    { ID id-ExtendedAvailablePLMN-List  CRITICALITY ignore  EXTENSION ExtendedAvailablePLMN-List  PRESENCE optional },
    ...
}

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    F1AP-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    F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-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 {{ CUTO-DURRCInformation-ExtIEs }}  OPTIONAL,
    ...
}

CUToDURRCInformation-ExtIEs F1AP-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 }|
    { ID id-UEAssistanceInformation CRITICALITY ignore EXTENSION UEAssistanceInformation       PRESENCE optional },
}

```

```
}

-- D

DCBasedDuplicationConfigured ::= ENUMERATED{true,..., false}

Dedicated-SIDelivery-NeededUE-Item ::= SEQUENCE {
    gNB-CU-UE-F1AP-ID          GNB-CU-UE-F1AP-ID,
    nRCGI                      NRCGI,
    iE-Extensions               ProtocolExtensionContainer { { DedicatedSIDeliveryNeededUE-Item-ExtIEs } } OPTIONAL,
    ...
}

DedicatedSIDeliveryNeededUE-Item-ExtIEs F1AP-PROTOCOL-EXTENSION:={  
    ...  
}

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     F1AP-PROTOCOL-EXTENSION := {  
    ...  
}

DRB-Activity-Item ::= SEQUENCE {
    dRBID           DRBID,
    dRB-Activity    DRB-Activity      OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { DRB-Activity-ItemExtIEs } } OPTIONAL,
    ...
}

DRB-Activity-ItemExtIEs     F1AP-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 F1AP-PROTOCOL-EXTENSION := {  
    ...  
}
```

```
}

DRBs-FailedToBeSetup-Item ::= SEQUENCE {
    dRBID      DRBID,
    cause      Cause   OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { DRBs-FailedToBeSetup-ItemExtIEs } }  OPTIONAL,
    ...
}

DRBs-FailedToBeSetup-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-FailedToBeSetupMod-Item ::= SEQUENCE {
    dRBID      DRBID ,
    cause      Cause   OPTIONAL ,
    iE-Extensions  ProtocolExtensionContainer { { DRBs-FailedToBeSetupMod-ItemExtIEs } }  OPTIONAL,
    ...
}

DRBs-FailedToBeSetupMod-ItemExtIEs   F1AP-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   F1AP-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   F1AP-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    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

DRB-Notify-Item ::= SEQUENCE {
  dRBID          DRBID,
  notification-Cause  Notification-Cause,
  iE-Extensions  ProtocolExtensionContainer { { DRB-Notify-ItemExtIEs } }   OPTIONAL,
  ...
}

DRB-Notify-ItemExtIEs    F1AP-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    F1AP-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    F1AP-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    F1AP-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   F1AP-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   F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-DLDCPSNLength           CRITICALITY ignore EXTENSION PDCPSNLength           PRESENCE optional }|
  { ID id-ULDCPSNLength           CRITICALITY ignore EXTENSION PDCPSNLength           PRESENCE optional }|
  { ID id-BearerTypeChange        CRITICALITY ignore EXTENSION BearerTypeChange        PRESENCE optional }|
  { ID id-RLCMode                CRITICALITY ignore EXTENSION RLCMode                PRESENCE optional }|
  { ID id-Duplication-Activation CRITICALITY reject EXTENSION DuplicationActivation    PRESENCE optional }|
  { ID id-DC-Based-Duplication-Configured CRITICALITY reject EXTENSION DCBasedDuplicationConfigured PRESENCE optional }|
  { ID id-DC-Based-Duplication-Activation CRITICALITY reject EXTENSION DuplicationActivation    PRESENCE optional },
  ...
}

DRBs-ToBeReleased-Item ::= SEQUENCE {
  dRBID          DRBID,
  iE-Extensions  ProtocolExtensionContainer { { DRBs-ToBeReleased-ItemExtIEs } } OPTIONAL,
  ...
}

DRBs-ToBeReleased-ItemExtIEs   F1AP-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   F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-DC-Based-Duplication-Configured   CRITICALITY reject EXTENSION DCBasedDuplicationConfigured   PRESENCE optional }|

```

```

{ ID id-DC-Based-Duplication-Activation   CRITICALITY reject  EXTENSION DuplicationActivation
{ ID id-DLPCPSNLength                      CRITICALITY ignore   EXTENSION PDCPSNLength
{ ID id-ULPDCPSNLength                     CRITICALITY ignore   EXTENSION PDCPSNLength
                                         PRESENCE optional }|
                                         PRESENCE mandatory }|
                                         PRESENCE optional },
}

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 F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-DC-Based-Duplication-Configured   CRITICALITY reject  EXTENSION DCBasedDuplicationConfigured
  { ID id-DC-Based-Duplication-Activation    CRITICALITY reject  EXTENSION DuplicationActivation
  { ID id-DLPCPSNLength                      CRITICALITY ignore   EXTENSION PDCPSNLength
  { ID id-ULPDCPSNLength                     CRITICALITY ignore   EXTENSION PDCPSNLength
                                         PRESENCE optional }|
                                         PRESENCE optional }|
                                         PRESENCE optional }|
                                         PRESENCE optional },
}

DRXCycle ::= SEQUENCE {
  longDRXCycleLength  LongDRXCycleLength,
  shortDRXCycleLength ShortDRXCycleLength OPTIONAL,
  shortDRXCycleTimer  ShortDRXCycleTimer OPTIONAL,
  iE-Extensions        ProtocolExtensionContainer { { DRXCycle-ExtIEs } } OPTIONAL,
  ...
}

DRXCycle-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

DRX-Config ::= OCTET STRING

DRXConfigurationIndicator ::= ENUMERATED{ release, ... }

DRX-LongCycleStartOffset ::= INTEGER (0..10239)

DUToCURRCContainer ::= OCTET STRING

DUToCURRCInformation ::= SEQUENCE {
  cellGroupConfig      CellGroupConfig,
  measGapConfig        MeasGapConfig OPTIONAL,
  requestedP-MaxFR1    OCTET STRING          OPTIONAL,
  iE-Extensions        ProtocolExtensionContainer { { DUToCURRCInformation-ExtIEs } } OPTIONAL,
  ...
}

```

```

DUtoCURRCInformation-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-DRX-LongCycleStartOffset           CRITICALITY ignore EXTENSION DRX-LongCycleStartOffset
    { ID id-SelectedBandCombinationIndex       CRITICALITY ignore EXTENSION SelectedBandCombinationIndex
    { ID id-SelectedFeatureSetEntryIndex        CRITICALITY ignore EXTENSION SelectedFeatureSetEntryIndex
    { ID id-Ph-InfoSCG                          CRITICALITY ignore EXTENSION Ph-InfoSCG
    { ID id-RequestedBandCombinationIndex      CRITICALITY ignore EXTENSION RequestedBandCombinationIndex
    { ID id-RequestedFeatureSetEntryIndex       CRITICALITY ignore EXTENSION RequestedFeatureSetEntryIndex
    { ID id-RequestedP-MaxFR2                   CRITICALITY ignore EXTENSION RequestedP-MaxFR2
    { ID id-DRX-Config                         CRITICALITY ignore EXTENSION DRX-Config
                                                PRESENCE optional }|
    ...
}

DuplicationActivation ::= ENUMERATED{active,inactive,... }

DuplicationIndication ::= ENUMERATED {true, ... , false }

Dynamic5QIDescriptor ::= SEQUENCE {
    qosPriorityLevel          INTEGER (1..127),
    packetDelayBudget          PacketDelayBudget,
    packetErrorRate            PacketErrorRate,
    fiveQI                     INTEGER (0..255, ...)
    delayCritical              ENUMERATED {delay-critical, non-delay-critical} OPTIONAL,
    averagingWindow            AveragingWindow OPTIONAL,
    maxDataBurstVolume         MaxDataBurstVolume OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { Dynamic5QIDescriptor-ExtIEs } } OPTIONAL
}
}

Dynamic5QIDescriptor-ExtIEs F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ExtendedAvailablePLMN-List ::= SEQUENCE (SIZE(1..maxnoofExtendedBPLMNs)) OF ExtendedAvailablePLMN-Item

ExtendedAvailablePLMN-Item ::= SEQUENCE {
    pLMNIIdentity             PLMN-Identity,
    iE-Extensions               ProtocolExtensionContainer { { ExtendedAvailablePLMN-Item-ExtIEs} } OPTIONAL
}
}

ExtendedAvailablePLMN-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ExtendedServedPLMNs-List ::= SEQUENCE (SIZE(1.. maxnoofExtendedBPLMNs)) OF ExtendedServedPLMNs-Item

```

```
ExtendedServedPLMNs-Item ::= SEQUENCE {
    pLMN-Identity          PLMN-Identity,
    tAISliceSupportList    SliceSupportList    OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { ExtendedServedPLMNs-ItemExtIEs} } OPTIONAL,
    ...
}

ExtendedServedPLMNs-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRACells-List ::= SEQUENCE (SIZE (1.. maxCelllineNB)) OF EUTRACells-List-item

EUTRACells-List-item ::= SEQUENCE {
    eUTRA-Cell-ID           EUTRA-Cell-ID,
    served-EUTRA-Cells-Information Served-EUTRA-Cells-Information,
    iE-Extensions            ProtocolExtensionContainer { { EUTRACells-List-itemExtIEs } }    OPTIONAL
}

EUTRACells-List-itemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRA-Cell-ID ::= BIT STRING (SIZE(28))

EUTRA-Coex-FDD-Info ::= SEQUENCE {
    uL-EARFCN                ExtendedEARFCN           OPTIONAL,
    dL-EARFCN                ExtendedEARFCN           OPTIONAL,
    uL-Transmission-Bandwidth EUTRA-Transmission-Bandwidth   OPTIONAL,
    dL-Transmission-Bandwidth EUTRA-Transmission-Bandwidth   OPTIONAL,
    iE-Extensions             ProtocolExtensionContainer { {EUTRA-Coex-FDD-Info-ExtIEs} } OPTIONAL,
    ...
}

EUTRA-Coex-FDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRA-Coex-Mode-Info ::= CHOICE {
    fDD          EUTRA-Coex-FDD-Info,
    tDD          EUTRA-Coex-TDD-Info,
    ...
}

EUTRA-Coex-TDD-Info ::= SEQUENCE {
    eARFCN                  ExtendedEARFCN,
    transmission-Bandwidth  EUTRA-Transmission-Bandwidth,
    subframeAssignment       EUTRA-SubframeAssignment,
    specialSubframe-Info    EUTRA-SpecialSubframe-Info,
    iE-Extensions            ProtocolExtensionContainer { {EUTRA-Coex-TDD-Info-ExtIEs} } OPTIONAL,
    ...
}
```

```
EUTRA-Coex-TDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRA-CyclicPrefixDL ::= ENUMERATED {
    normal,
    extended,
    ...
}

EUTRA-CyclicPrefixUL ::= ENUMERATED {
    normal,
    extended,
    ...
}

EUTRA-PRACH-Configuration ::= SEQUENCE {
    rootSequenceIndex           INTEGER (0..837),
    zeroCorrelationIndex        INTEGER (0..15),
    highSpeedFlag               BOOLEAN,
    prach-FreqOffset             INTEGER (0..94),
    prach-ConfigIndex            INTEGER (0..63)      OPTIONAL, -- present for TDD --
    iE-Extensions                ProtocolExtensionContainer { {EUTRA-PRACH-Configuration-ExtIEs} } OPTIONAL,
    ...
}

EUTRA-PRACH-Configuration-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRA-SpecialSubframe-Info ::= SEQUENCE {
    specialSubframePatterns     EUTRA-SpecialSubframePatterns,
    cyclicPrefixDL               EUTRA-CyclicPrefixDL,
    cyclicPrefixUL               EUTRA-CyclicPrefixUL,
    iE-Extensions                ProtocolExtensionContainer { { EUTRA-SpecialSubframe-Info-ExtIEs} } OPTIONAL,
    ...
}

EUTRA-SpecialSubframe-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRA-SpecialSubframePatterns ::= ENUMERATED {
    ssp0,
    ssp1,
    ssp2,
    ssp3,
    ssp4,
    ssp5,
    ssp6,
    ssp7,
    ssp8,
    ssp9,
    ssp10,
```

```
}

EUTRA-SubframeAssignment ::= ENUMERATED {
    sa0,
    sa1,
    sa2,
    sa3,
    sa4,
    sa5,
    sa6,
    ...
}

EUTRA-Transmission-Bandwidth ::= ENUMERATED {
    bw6,
    bw15,
    bw25,
    bw50,
    bw75,
    bw100,
    ...
}

EUTRANQoS ::= SEQUENCE {
    qCI                               QCI,
    allocationAndRetentionPriority   AllocationAndRetentionPriority,
    gbrQosInformation                GBR-QosInformation
                                         OPTIONAL,
    iE-Extensions                     ProtocolExtensionContainer { { EUTRANQoS-ExtIEs} } OPTIONAL,
    ...
}

EUTRANQoS-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ExecuteDuplication ::= ENUMERATED{true,...}

ExtendedEARFCN ::= INTEGER (0..262143)

EUTRA-Mode-Info ::= CHOICE {
    eUTRAFDD      EUTRA-FDD-Info,
    eUTRATDD      EUTRA-TDD-Info,
    choice-extension ProtocolIE-SingleContainer { { EUTRA-Mode-Info-ExtIEs} }
}

EUTRA-Mode-Info-ExtIEs F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRA-TDD-Info ::= SEQUENCE {
    offsetToPointA             OffsetToPointA,
    iE-Extensions               ProtocolExtensionContainer { {EUTRA-TDD-Info-ExtIEs} } OPTIONAL,
    ...
}

EUTRA-TDD-Info-ExtIEs F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Flows-Mapped-To-DRB-List     ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF Flows-Mapped-To-DRB-Item

Flows-Mapped-To-DRB-Item     ::= SEQUENCE {
    qosFlowIdentifier           QoSFlowIdentifier,
    qosFlowLevelQoSParameters   QoSFlowLevelQoSParameters,
    iE-Extensions                 ProtocolExtensionContainer { { Flows-Mapped-To-DRB-ItemExtIEs} } OPTIONAL
}

Flows-Mapped-To-DRB-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    {ID id-QoSFlowMappingIndication      CRITICALITY ignore EXTENSION QoSFlowMappingIndication      PRESENCE optional},
    ...
}

FreqBandNrItem ::= SEQUENCE {
    freqBandIndicatorNr           INTEGER (1..1024,...),
    supportedSULBandList          SEQUENCE (SIZE(0..maxnoofNrCellBands)) OF SupportedSULFreqBandItem,
    iE-Extensions                 ProtocolExtensionContainer { {FreqBandNrItem-ExtIEs} } OPTIONAL,
}

```

```
}

FREQBANDNRITEM-EXTIES F1AP-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 F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

GNB-CUSystemInformation ::= SEQUENCE {
  sibtypetobeupdatedlist    SEQUENCE (SIZE(1.. maxnoofSIBTypes)) OF SibtypetobeupdatedListItem,
  iE-Extensions              ProtocolExtensionContainer { { GNB-CUSystemInformation-ExtIES} } OPTIONAL,
  ...
}

GNB-CUSystemInformation-ExtIES F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

GNB-CU-UE-F1AP-ID      ::= INTEGER (0..4294967295)
GNB-DU-UE-F1AP-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 F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-DUConfigurationQuery ::= ENUMERATED {true, ...}

GNBDUOverloadInformation ::= ENUMERATED {overloaded, not-overloaded}

GTP-TEID          ::= OCTET STRING (SIZE (4))

GTPTunnel         ::= SEQUENCE {
    transportLayerAddress   TransportLayerAddress,
    gTP-TEID               GTP-TEID,
    iE-Extensions           ProtocolExtensionContainer { { GTPTunnel-ExtIEs } } OPTIONAL,
    ...
}

GTPTunnel-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- H

HandoverPreparationInformation ::= OCTET STRING

-- I
IgnoreResourceCoordinationContainer ::= ENUMERATED { true,... }
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

NeedforGap ::= ENUMERATED {true, ...}

NGRANAllocationAndRetentionPriority ::= SEQUENCE {
    priorityLevel          PriorityLevel,
    pre-emptionCapability Pre-emptionCapability,
    pre-emptionVulnerability Pre-emptionVulnerability,
    iE-Extensions          ProtocolExtensionContainer { {NGRANAllocationAndRetentionPriority-ExtIEs} } OPTIONAL
}
NGRANAllocationAndRetentionPriority-ExtIEs F1AP-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 F1AP-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 F1AP-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      F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

NRCGI ::= SEQUENCE {
    pLMN-Identity      PLMN-Identity,
    nRCellIdentity     NRCellIdentity,
    iE-Extensions       ProtocolExtensionContainer { { NRCGI-ExtIEs} } OPTIONAL,
    ...
}

NRCGI-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

NR-Mode-Info ::= CHOICE {
    fDD        FDD-Info,
    tDD        TDD-Info,
    choice-extension  ProtocolIE-SingleContainer { { NR-Mode-Info-ExtIEs} }
}

NR-Mode-Info-ExtIEs F1AP-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)
-- 0
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 F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

PagingCell-Item ::= SEQUENCE {
    nRCGI      NRCGI,
    iE-Extensions  ProtocolExtensionContainer { { PagingCell-ItemExtIEs } }   OPTIONAL
}

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

PagingDRX ::= ENUMERATED {
    v32,
    v64,
    v128,
    v256,
    ...
}

PagingIdentity ::= CHOICE {
    rANUEPagingIdentity RANUEPagingIdentity,
    cNUEPagingIdentity  CNUEPagingIdentity,
    choice-extension     ProtocolIE-SingleContainer { { PagingIdentity-ExtIEs } }
}

PagingIdentity-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}
```

```
PagingOrigin ::= ENUMERATED { non-3gpp, ...}

PagingPriority ::= ENUMERATED { priolevel1, priolevel2, priolevel3, priolevel4, priolevel5, priolevel6, priolevel7, priolevel8, ...}

PDCP-SN ::= INTEGER (0..4095)

PDCPSNLength ::= ENUMERATED { twelve-bits,eighteen-bits,...}

PDUSESSIONID ::= INTEGER (0..255)

Ph-InfoSCG ::= OCTET STRING

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,
    eUTRACells-List                 EUTRACells-List,
    iE-Extensions                  ProtocolExtensionContainer { { Protected-EUTRA-Resources-ItemExtIEs } } OPTIONAL
}

Protected-EUTRA-Resources-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Potential-SpCell-Item ::= SEQUENCE {
    potential-SpCell-ID            NRCGI,
    iE-Extensions                 ProtocolExtensionContainer { { Potential-SpCell-ItemExtIEs } } OPTIONAL,
    ...
}

Potential-SpCell-ItemExtIEs   F1AP-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    F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

PWSSystemInformation ::= SEQUENCE {
  SIBtype          SIBtype-PWS,
  SIBmessage       OCTET STRING,
  iE-Extensions    ProtocolExtensionContainer { { PWSSystemInformationExtIEs } }   OPTIONAL,
  ...
}

PWSSystemInformationExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

-- 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 F1AP-PROTOCOL-IES ::= {
  ...
}

QoSFlowIdentifier ::= 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  F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-PDUSessionID           CRITICALITY ignore EXTENSION PDUSessionID      PRESENCE optional}| 
  { ID id-ULPDUSessionAggregateMaximumBitRate CRITICALITY ignore EXTENSION BitRate      PRESENCE optional},
  ...
}

QoSFlowMappingIndication ::= ENUMERATED {ul,dl,...}

QoSInformation ::= CHOICE {
  eUTRANQoS            EUTRANQoS,
  choice-extension      ProtocolIE-SingleContainer { { QoSInformation-ExtIEs } }
}

```

```
QoSInformation-ExtIEs F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

RAT-FrequencyPriorityInformation ::= CHOICE {
    subscriberProfileIDforRFP      SubscriberProfileIDforRFP,
    rAT-FrequencySelectionPriority   RAT-FrequencySelectionPriority,
    choice-extension                ProtocolIE-SingleContainer { { RAT-FrequencyPriorityInformation-ExtIEs} }
}
RAT-FrequencyPriorityInformation-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

RAT-FrequencySelectionPriority ::= INTEGER (1.. 256, ...)

Reestablishment-Indication ::= ENUMERATED {
    reestablished,
    ...
}

RequestedBandCombinationIndex ::= OCTET STRING

RequestedFeatureSetEntryIndex ::= OCTET STRING

RequestedP-MaxFR2 ::= OCTET STRING

RequestType ::= ENUMERATED {offer, execution, ...}

ResourceCoordinationEUTRACellInfo ::= SEQUENCE {
    eUTRA-Mode-Info              EUTRA-Coex-Mode-Info,
    eUTRA-PRACH-Configuration     EUTRA-PRACH-Configuration,
    iE-Extensions                 ProtocolExtensionContainer { { ResourceCoordinationEUTRACellInfo-ExtIEs } } OPTIONAL,
    ...
}

ResourceCoordinationEUTRACellInfo-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ResourceCoordinationTransferInformation ::= SEQUENCE {
```

```
meNB-Cell-ID                      EUTRA-Cell-ID,
resourceCoordinationEUTRACellInfo   ResourceCoordinationEUTRACellInfo  OPTIONAL,
iE-Extensions          ProtocolExtensionContainer { { ResourceCoordinationTransferInformation-ExtIEs } }  OPTIONAL,
...
}

ResourceCoordinationTransferInformation-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

ResourceCoordinationTransferContainer ::= OCTET STRING

RepetitionPeriod ::= INTEGER (0..131071, ...)

RLCFailureIndication ::= SEQUENCE {
  associatedLCID      LCID,
  iE-Extensions       ProtocolExtensionContainer { { RLCFailureIndication-ExtIEs } } OPTIONAL
}

RLCFailureIndication-ExtIEs F1AP-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 F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

RRCCContainer ::= OCTET STRING

RRCDeliveryStatus ::= SEQUENCE {
  delivery-status        PDCP-SN,
  triggering-message     PDCP-SN,
  iE-Extensions          ProtocolExtensionContainer { { RRCDeliveryStatus-ExtIEs } } OPTIONAL
}

RRCDeliveryStatus-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

RRCDeliveryStatusRequest ::= ENUMERATED {true, ...}
```

```
RRCReconfigurationCompleteIndicator ::= ENUMERATED {
    true,
    ...,
    failure
}

RRC-Version ::= SEQUENCE {
    latest-RRC-Version      BIT STRING (SIZE(3)),
    iE-Extensions           ProtocolExtensionContainer { { RRC-Version-ExtIEs } } OPTIONAL}

RRC-Version-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    {ID id-latest-RRC-Version-Enhanced} CRITICALITY ignore EXTENSION OCTET STRING (SIZE(3)) PRESENCE optional },
    ...
}

-- S

SCell-FailedtoSetup-Item ::= SEQUENCE {
    sCell-ID          NRCGI ,
    cause             Cause   OPTIONAL ,
    iE-Extensions     ProtocolExtensionContainer { { SCell-FailedtoSetup-ItemExtIEs } } OPTIONAL,
    ...
}

SCell-FailedtoSetup-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SCell-FailedtoSetupMod-Item ::= SEQUENCE {
    sCell-ID          NRCGI ,
    cause             Cause   OPTIONAL ,
    iE-Extensions     ProtocolExtensionContainer { { SCell-FailedtoSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

SCell-FailedtoSetupMod-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SCell-ToBeRemoved-Item ::= SEQUENCE {
    sCell-ID          NRCGI ,
    iE-Extensions     ProtocolExtensionContainer { { SCell-ToBeRemoved-ItemExtIEs } } OPTIONAL,
    ...
}

SCell-ToBeRemoved-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SCell-ToBeSetup-Item ::= SEQUENCE {
    sCell-ID          NRCGI ,
    sCellIndex        SCellIndex,
    sCellULConfigured CellULConfigured   OPTIONAL,
```

```

iE-Extensions  ProtocolExtensionContainer { { SCell-ToBeSetup-ItemExtIEs } }  OPTIONAL,
...
}

SCell-ToBeSetup-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-ServingCellMO      CRITICALITY ignore EXTENSION ServingCellMO      PRESENCE optional },
  ...
}

SCell-ToBeSetupMod-Item ::= SEQUENCE {
  sCell-ID          NRCGI ,
  sCellIndex        SCellIndex,
  sCellULConfigured CellULConfigured  OPTIONAL,
  iE-Extensions    ProtocolExtensionContainer { { SCell-ToBeSetupMod-ItemExtIEs } }  OPTIONAL,
  ...
}

SCell-ToBeSetupMod-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-ServingCellMO      CRITICALITY ignore EXTENSION ServingCellMO      PRESENCE optional },
  ...
}

SCellIndex ::=INTEGER (1..31, ...)

SIBType-PWS ::=INTEGER (6..8, ...)

SelectedBandCombinationIndex ::= OCTET STRING

SelectedFeatureSetEntryIndex ::= OCTET STRING

CG-ConfigInfo ::= OCTET STRING

ServCellIndex ::= INTEGER (0..31, ...)

ServingCellMO ::= INTEGER (1..64, ...)

Served-Cell-Information ::= SEQUENCE {
  nRCGI           NRCGI,
  nRPCI           NRPCI,
  fiveGS-TAC      FiveGS-TAC      OPTIONAL,
  configured-EPS-TAC Configured-EPS-TAC  OPTIONAL,
  servedPLMNs     ServedPLMNs-List,
  nR-Mode-Info    NR-Mode-Info,
  measurementTimingConfiguration OCTET STRING,
  iE-Extensions   ProtocolExtensionContainer { {Served-Cell-Information-ExtIEs} } OPTIONAL,
  ...
}

Served-Cell-Information-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
  { ID id-RANAC          CRITICALITY ignore EXTENSION RANAC          PRESENCE optional }|
  { ID id-ExtendedServedPLMNs-List  CRITICALITY ignore EXTENSION ExtendedServedPLMNs-List  PRESENCE optional }|
  { ID id-Cell-Direction    CRITICALITY ignore EXTENSION Cell-Direction  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   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Served-Cells-To-Delete-Item ::= SEQUENCE {
    oldNRCGI                    NRCGI',
    iE-Extensions                 ProtocolExtensionContainer { { Served-Cells-To-Delete-ItemExtIEs } } OPTIONAL,
    ...
}

Served-Cells-To-Delete-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Served-Cells-To-Modify-Item ::= SEQUENCE {
    oldNRCGI                    NRCGI',
    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   F1AP-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   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Service-State ::= ENUMERATED {
    in-service,
    out-of-service,
    ...
}

Service-Status ::= SEQUENCE {
    service-state                Service-State,
    switchingOffOngoing          ENUMERATED {true, ...}  OPTIONAL,
```

```
iE-Extensions          ProtocolExtensionContainer { { Service-Status-ExtIEs } }      OPTIONAL,
...
}

Service-Status-ExtIEs  F1AP-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

SItype ::= INTEGER (1..32, ...)

SItype-List ::= SEQUENCE (SIZE(1.. maxnoofSITypes)) OF SItype-Item

SItype-Item ::= SEQUENCE {
  SItype      SItype,
  iE-Extensions  ProtocolExtensionContainer { { SItype-ItemExtIEs } }      OPTIONAL
}
SItype-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

SibtypetobeupdatedListItem ::= SEQUENCE {
  SIBtype        INTEGER (2..32,...),
  SIBmessage     OCTET STRING,
  valueTag       INTEGER (0..31,...),
  iE-Extensions  ProtocolExtensionContainer { { SibtypetobeupdatedListItem-ExtIEs } }      OPTIONAL,
  ...
}
SibtypetobeupdatedListItem-ExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

SliceSupportList ::= SEQUENCE (SIZE(1.. maxnoofSliceItems)) OF SliceSupportItem

SliceSupportItem ::= SEQUENCE {
  SNSSAI   SNSSAI,
  iE-Extensions  ProtocolExtensionContainer { { SliceSupportItem-ExtIEs } }      OPTIONAL
}
SliceSupportItem-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

SNSSAI ::= SEQUENCE {
  SST        OCTET STRING (SIZE(1)),
  SD         OCTET STRING (SIZE(3))  OPTIONAL      ,
}
```

```
iE-Extensions          ProtocolExtensionContainer { { SNSSAI-ExtIEs } }    OPTIONAL
}

SNSSAI-ExtIEs   F1AP-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   F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

SRBs-FailedToBeSetupMod-Item ::= SEQUENCE {
  SRBID      SRBID      ,
  cause      Cause      OPTIONAL,
  iE-Extensions  ProtocolExtensionContainer { { SRBs-FailedToBeSetupMod-ItemExtIEs } }  OPTIONAL,
  ...
}

SRBs-FailedToBeSetupMod-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

SRBs-Modified-Item ::= SEQUENCE {
  SRBID      SRBID,
  LCID      LCID,
  iE-Extensions  ProtocolExtensionContainer { { SRBs-Modified-ItemExtIEs } } OPTIONAL,
  ...
}

SRBs-Modified-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
  ...
}

SRBs-Required-ToBeReleased-Item ::= SEQUENCE {
  SRBID      SRBID,
  iE-Extensions  ProtocolExtensionContainer { { SRBs-Required-ToBeReleased-ItemExtIEs } }  OPTIONAL,
  ...
}

SRBs-Required-ToBeReleased-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
  ...
}
```

```
SRBs-Setup-Item ::= SEQUENCE {
    SRBID                  SRBID,
    LCID                   LCID,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-Setup-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-Setup-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-SetupMod-Item ::= SEQUENCE {
    SRBID                  SRBID,
    LCID                   LCID,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-SetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-SetupMod-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-ToBeReleased-Item  ::= SEQUENCE {
    SRBID      SRBID,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-ToBeReleased-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-ToBeReleased-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-ToBeSetup-Item ::= SEQUENCE {
    SRBID      SRBID ,
    duplicationIndication  DuplicationIndication  OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-ToBeSetup-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-ToBeSetup-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SRBs-ToBeSetupMod-Item  ::= SEQUENCE {
    SRBID      SRBID,
    duplicationIndication  DuplicationIndication  OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { SRBs-ToBeSetupMod-ItemExtIEs } } OPTIONAL,
    ...
}

SRBs-ToBeSetupMod-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
SUL-Information ::= SEQUENCE {
    SUL-NRARFCN                  INTEGER (0..maxNRARFCN),
    SUL-transmission-Bandwidth    Transmission-Bandwidth,
    iE-Extensions                 ProtocolExtensionContainer { { SUL-InformationExtIEs} } OPTIONAL,
    ...
}

SUL-InformationExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SubscriberProfileIDforRFP ::= INTEGER (1..256, ...)

SULAccessIndication ::= ENUMERATED {true,...}

SupportedSULFreqBandItem ::= SEQUENCE {
    freqBandIndicatorNr          INTEGER (1..1024,...),
    iE-Extensions                 ProtocolExtensionContainer { { SupportedSULFreqBandItem-ExtIEs} } OPTIONAL,
    ...
}

SupportedSULFreqBandItem-ExtIEs F1AP-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 F1AP-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    NNRNB,
    iE-Extensions    ProtocolExtensionContainer { { Transmission-Bandwidth-ExtIEs} } OPTIONAL,
    ...
}

Transmission-Bandwidth-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

TransmissionActionIndicator ::= ENUMERATED {stop, ..., restart }

TypeOfError ::= ENUMERATED {
    not-understood,
    missing,
    ...
}
-- U

UE-associatedLogicalF1-ConnectionItem ::= SEQUENCE {
    gNB-CU-UE-F1AP-ID      GNB-CU-UE-F1AP-ID      OPTIONAL,
    gNB-DU-UE-F1AP-ID      GNB-DU-UE-F1AP-ID      OPTIONAL,
    iE-Extensions    ProtocolExtensionContainer { { UE-associatedLogicalF1-ConnectionItemExtIEs} } OPTIONAL,
    ...
}

UEAssistanceInformation ::= OCTET STRING

UE-associatedLogicalF1-ConnectionItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UE-CapabilityRAT-ContainerList ::= OCTET STRING

UEIdentityIndexValue ::= CHOICE {
    indexLength10      BIT STRING (SIZE (10)),
    choice-extension  ProtocolIE-SingleContainer { {UEIdentityIndexValueChoice-ExtIEs} }
}

UEIdentityIndexValueChoice-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

ULConfiguration ::= SEQUENCE {
    uLUEConfiguration      ULUEConfiguration,
    iE-Extensions    ProtocolExtensionContainer { { ULConfigurationExtIEs} }      OPTIONAL,
    ...
}

ULConfigurationExtIEs F1AP-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      F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UplinkTxDirectCurrentListInformation ::= OCTET STRING

UPTransportLayerInformation      ::= CHOICE {
    gPTTunnel      GPTTunnel,
    choice-extension      ProtocolIE-SingleContainer { { UPTransportLayerInformation-ExtIEs} }
}
}

UPTransportLayerInformation-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}
-- V
-- W
-- X
-- Y
-- Z

END
-- ASN1STOP

```

9.4.6 Common Definitions

```

-- ASN1START
-- ****
-- 
-- Common definitions
-- 
-- ****
F1AP-CommonDataTypes {
    itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
    ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-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
-- ASN1STOP

```

9.4.7 Constant Definitions

```

-- ASN1START
-- ****
-- 
-- Constant definitions
-- 
-- ****

F1AP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-Constants (4) }

```

```

DEFINITIONS AUTOMATIC TAGS ::=

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

IMPORTS
    ProcedureCode,
    ProtocolIE-ID

FROM F1AP-CommonDataTypes;

```

```

-- ****
-- Elementary Procedures
-- ****

id-Reset ProcedureCode ::= 0
id-F1Setup ProcedureCode ::= 1
id-ErrorIndication ProcedureCode ::= 2
id-gNBDUConfigurationUpdate ProcedureCode ::= 3
id-gNBCUConfigurationUpdate 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-InitialULRRCMessageTransfer ProcedureCode ::= 11
id-DLRRCMassageTransfer ProcedureCode ::= 12
id-ULRRCMessageTransfer 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
id-RRCDeliveryReport ProcedureCode ::= 25

-- ****
-- Extension constants
-- ****

maxPrivateIEs INTEGER ::= 65535
maxProtocolExtensions INTEGER ::= 65535
maxProtocolIEs INTEGER ::= 65535
-- ****
-- Lists
-- ****

maxNRARFCN INTEGER ::= 3279165
maxnofErrors INTEGER ::= 256
maxnofIndividualF1ConnectionsToReset INTEGER ::= 65536
maxCellingNBDU INTEGER ::= 512

```

```

maxnofSCells           INTEGER ::= 32
maxnofSRBs            INTEGER ::= 8
maxnofDRBs            INTEGER ::= 64
maxnofULUPTNLInformation INTEGER ::= 2
maxnofDLUPTNLInformation INTEGER ::= 2
maxnofBPLMNs           INTEGER ::= 6
maxnofCandidateSpCells INTEGER ::= 64
maxnofPotentialSpCells INTEGER ::= 64
maxnofNrCellBands      INTEGER ::= 32
maxnofSIBTypes          INTEGER ::= 32
maxnofSITypes           INTEGER ::= 32
maxnofPagingCells       INTEGER ::= 512
maxnofTNLAssociations   INTEGER ::= 32
maxnofQoSFlows          INTEGER ::= 64
maxnofSliceItems         INTEGER ::= 1024
maxCelllineNB            INTEGER ::= 256
maxnofExtendedBPLMNs     INTEGER ::= 6
maxnofUEIDs              INTEGER ::= 65536

-- ****
-- 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-CUtoDURCInformation                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-F1AP-ID	ProtocolIE-ID ::= 40
id-gNB-DU-UE-F1AP-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-F1AP-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-TransmissionActionIndicator	ProtocolIE-ID ::= 79
id-UE-associatedLogicalF1-ConnectionItem	ProtocolIE-ID ::= 80
id-UE-associatedLogicalF1-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-RRCReconfigurationCompleteIndicator	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-CUSystemInformation	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-ULPDCPSNLength	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-AvailablePLMNLlist	ProtocolIE-ID ::= 179
id-PDUSessionID	ProtocolIE-ID ::= 180
id-ULPDUSessionAggregateMaximumBitRate	ProtocolIE-ID ::= 181
id-ServingCellMO	ProtocolIE-ID ::= 182
id-QoSFlowMappingIndication	ProtocolIE-ID ::= 183
id-RRCDeliveryStatusRequest	ProtocolIE-ID ::= 184
id-RRCDeliveryStatus	ProtocolIE-ID ::= 185
id-BearerTypeChange	ProtocolIE-ID ::= 186
id-RLCMode	ProtocolIE-ID ::= 187
id-Duplication-Activation	ProtocolIE-ID ::= 188
id-Dedicated-SIDelivery-NeededUE-List	ProtocolIE-ID ::= 189
id-Dedicated-SIDelivery-NeededUE-Item	ProtocolIE-ID ::= 190
id-DRX-LongCycleStartOffset	ProtocolIE-ID ::= 191
id-ULPDCPSNLength	ProtocolIE-ID ::= 192
id-SelectedBandCombinationIndex	ProtocolIE-ID ::= 193
id-SelectedFeatureSetEntryIndex	ProtocolIE-ID ::= 194
id-ResourceCoordinationTransferInformation	ProtocolIE-ID ::= 195
id-ExtendedServedPLMNs-List	ProtocolIE-ID ::= 196
id-ExtendedAvailablePLMN-List	ProtocolIE-ID ::= 197
id-Associated-SCell-List	ProtocolIE-ID ::= 198
id-latest-RRC-Version-Enhanced	ProtocolIE-ID ::= 199
id-Associated-SCell-Item	ProtocolIE-ID ::= 200

```

id-Cell-Direction           ProtocolIE-ID ::= 201
id-SRBs-Setup-List          ProtocolIE-ID ::= 202
id-SRBs-Setup-Item          ProtocolIE-ID ::= 203
id-SRBs-SetupMod-List       ProtocolIE-ID ::= 204
id-SRBs-SetupMod-Item       ProtocolIE-ID ::= 205
id-SRBs-Modified-List       ProtocolIE-ID ::= 206
id-SRBs-Modified-Item       ProtocolIE-ID ::= 207
id-Ph-InfoSCG                ProtocolIE-ID ::= 208
id-RequestedBandCombinationIndex ProtocolIE-ID ::= 209
id-RequestedFeatureSetEntryIndex ProtocolIE-ID ::= 210
id-RequestedP-MaxFR2          ProtocolIE-ID ::= 211
id-DRX-Config                 ProtocolIE-ID ::= 212
id-IgnoreResourceCoordinationContainer ProtocolIE-ID ::= 213
id-UEAssistanceInformation   ProtocolIE-ID ::= 214
id-NeedforGap                  ProtocolIE-ID ::= 215
id-PagingOrigin                 ProtocolIE-ID ::= 216

```

```

END
-- ASN1STOP

```

9.4.8 Container Definitions

```

-- ASN1START
-- ****
-- Container definitions
-- ****
F1AP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS :=

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

IMPORTS
  Criticality,
  Presence,
  PrivateIE-ID,
  ProtocolExtensionID,
  ProtocolIE-ID

FROM F1AP-CommonDataTypes
  maxPrivateIEs,
  maxProtocolExtensions,

```

```
maxProtocolIEs

FROM F1AP-Constants;

-- *****
-- Class Definition for Protocol IEs
--
-- *****

F1AP-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
--
-- *****

F1AP-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
--
-- *****

F1AP-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
--
-- ****

F1AP-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 {F1AP-PROTOCOL-IES : IEsSetParam} ::=
SEQUENCE (SIZE (0..maxProtocolIEs)) OF
ProtocolIE-Field {{IEsSetParam}}


ProtocolIE-SingleContainer {F1AP-PROTOCOL-IES : IEsSetParam} ::=
ProtocolIE-Field {{IEsSetParam}}


ProtocolIE-Field {F1AP-PROTOCOL-IES : IEsSetParam} ::= SEQUENCE {
    id           F1AP-PROTOCOL-IES.&id          {{IEsSetParam}},
    criticality F1AP-PROTOCOL-IES.&criticality {{IEsSetParam}{@id}},
    value        F1AP-PROTOCOL-IES.&Value       {{IEsSetParam}{@id}}
}

-- ****
-- Container for Protocol IE Pairs
--
-- ****

```

```

ProtocolIE-ContainerPair {F1AP-PROTOCOL-IES-PAIR : IEsSetParam} ::=

SEQUENCE (SIZE (0..maxProtocolIEs)) OF
ProtocolIE-FieldPair {{IEsSetParam}}


ProtocolIE-FieldPair {F1AP-PROTOCOL-IES-PAIR : IEsSetParam} ::= SEQUENCE {
  id          F1AP-PROTOCOL-IES-PAIR.&id           {{IEsSetParam}},
  firstCriticality F1AP-PROTOCOL-IES-PAIR.&firstCriticality {{IEsSetParam}{@id}},
  firstValue   F1AP-PROTOCOL-IES-PAIR.&FirstValue    {{IEsSetParam}{@id}},
  secondCriticality F1AP-PROTOCOL-IES-PAIR.&secondCriticality {{IEsSetParam}{@id}},
  secondValue   F1AP-PROTOCOL-IES-PAIR.&SecondValue   {{IEsSetParam}{@id}}
}

-- ****
-- Container for Protocol Extensions
-- ****

ProtocolExtensionContainer {F1AP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=

SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
ProtocolExtensionField {{ExtensionSetParam}}


ProtocolExtensionField {F1AP-PROTOCOL-EXTENSION : ExtensionSetParam} ::= SEQUENCE {
  id          F1AP-PROTOCOL-EXTENSION.&id           {{ExtensionSetParam}},
  criticality F1AP-PROTOCOL-EXTENSION.&criticality {{ExtensionSetParam}{@id}},
  extensionValue F1AP-PROTOCOL-EXTENSION.&Extension {{ExtensionSetParam}{@id}}
}

-- ****
-- Container for Private IEs
-- ****

PrivateIE-Container {F1AP-PRIVATE-IES : IEsSetParam} ::=

SEQUENCE (SIZE (1.. maxPrivateIEs)) OF
PrivateIE-Field {{IEsSetParam}}


PrivateIE-Field {F1AP-PRIVATE-IES : IEsSetParam} ::= SEQUENCE {
  id          F1AP-PRIVATE-IES.&id           {{IEsSetParam}},
  criticality F1AP-PRIVATE-IES.&criticality {{IEsSetParam}{@id}},
  value       F1AP-PRIVATE-IES.&Value        {{IEsSetParam}{@id}}
}

END
-- ASN1STOP

```

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	0001	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 ProtocolIE-ID)	15.1.1
2018-06	RP-80	RP-181237	0011	6	B	Introduction of SA NR (38.473 Baseline CR covering RAN3 agreements)	15.2.0
2018-06	RP-80	RP-181239	0043	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	0045	-	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	0055	2	F	Introduction of DU Configuration Query	15.3.0
2018-09	RP-81	RP-181921	0056	4	F	CR to 38.473 on further clarifications on System information transfer over F1	15.3.0
2018-09	RP-81	RP-181921	0058	4	F	CR to 38.473 on corrections to System information delivery	15.3.0
2018-09	RP-81	RP-181920	0059	1	F	CR to 38.473 on corrections to PWS transfer over F1	15.3.0
2018-09	RP-81	RP-181921	0063	3	F	CR to 38.473 on PDCP SN over F1 interface	15.3.0
2018-09	RP-81	RP-181922	0064	3	F	NR Corrections (38.473 Baseline CR covering RAN3-101 agreements)	15.3.0
2018-09	RP-81	RP-181997	0068	-	F	Introduction of UL AMBR on F1	15.3.0
2018-09	RP-81	RP-181921	0072	3	F	Correction on cell management	15.3.0
2018-09	RP-81	RP-181921	0073	2	F	RLC Mode Indication over F1	15.3.0
2018-09	RP-81	RP-181921	0076	3	F	CR to 38.473 on UE Identity Index value	15.3.0
2018-09	RP-81	RP-181920	0077	1	F	Correction for UE Context Modification on presence of ServCellIndex IE	15.3.0
2018-09	RP-81	RP-181920	0078	-	F	Executing duplication for RRC-container	15.3.0
2018-09	RP-81	RP-181921	0079	1	F	Indication of RLC re-establishment at the gNB-DU	15.3.0
2018-09	RP-81	RP-181920	0080	-	F	Exchange of SMTC over F1	15.3.0
2018-09	RP-81	RP-181920	0081	-	F	Solving remaining issues with QoS parameters – TS 38.473	15.3.0
2018-09	RP-81	RP-181921	0090		F	Correction of 5GS TAC	15.3.0
2018-09	RP-81	RP-181921	0095	1	F	Extend the RANAC size to 8bits	15.3.0
2018-09	RP-81	RP-181921	0097	-	F	Corrections of Choice	15.3.0
2018-09	RP-81	RP-181921	0098	1	F	Correction of TNL criticality	15.3.0
2018-09	RP-81	RP-181921	0099	1	F	Corrections of usage of single container	15.3.0
2018-09	RP-81	RP-181921	0105	2	B	RRC version handling	15.3.0
2018-09	RP-81	RP-181921	0106	1	B	Introduction of Overload Handling in F1-C	15.3.0
2018-09	RP-81	RP-181921	0113	-	F	CR to 38.473 on presence of QoS information	15.3.0
2018-09	RP-81	RP-181921	0114	1	F	Correction C-RNTI format	15.3.0
2018-09	RP-81	RP-181921	0115	-	F	Correction of QoS Parameters	15.3.0
2018-09	RP-81	RP-181921	0116	1	F	Correction on F1 Setup Request	15.3.0
2018-12	RP-82	RP-182446	0070	3	F	RRC Delivery Indication	15.4.0
2018-12	RP-82	RP-182446	0117	1	F	Correction of AMBR Enforcement	15.4.0
2018-12	RP-82	RP-182446	0138	-	F	CR for correction on Initial UL RRC message transfer	15.4.0
2018-12	RP-82	RP-182446	0140	1	F	CR to 38.473 on bearer type change indication	15.4.0
2018-12	RP-82	RP-182446	0142	1	F	CR to 38.473 on correction to PWS System Information	15.4.0
2018-12	RP-82	RP-182446	0144	2	F	CR to 38.473 on asymmetric mapping for UL and DL QoS flow	15.4.0
2018-12	RP-82	RP-182447	0145	4	F	Corrections on UE-associated LTE/NR resource coordination	15.4.0
2018-12	RP-82	RP-182446	0147	2	F	CR for F1 Cell Management	15.4.0
2018-12	RP-82	RP-182447	0150	1	F	Missing Transaction ID in non-UE-associated procedures	15.4.0
2018-12	RP-82	RP-182446	0157	1	F	CR to 38.473 on mapping of servingCellMO and Serving Cell	15.4.0
2018-12	RP-82	RP-182446	0160	1	F	CR to 38.473 on UE context modification required procedure	15.4.0
2018-12	RP-82	RP-182447	0165	1	F	Addition of the RLC Mode information for bearer modification	15.4.0
2018-12	RP-82	RP-182448	0167	2	F	Rapporteur CR to align tabular	15.4.0
2018-12	RP-82	RP-182448	0168	2	F	Rapporteur CR to align ASN.1	15.4.0
2018-12	RP-82	RP-182447	0169	2	F	Correction of MaxnoofBPLMNs	15.4.0
2018-12	RP-82	RP-182351	0174	2	F	Correction on PDCP SN length on F1	15.4.0
2018-12	RP-82	RP-182447	0178	2	F	CR for TS 38.473 for MR-DC coordination	15.4.0
2018-12	RP-82	RP-182447	0179	2	F	Support of system information update for active UE without CSS	15.4.0
2018-12	RP-82	RP-182447	0187	1	F	CR to 38.473 on clarification to the presence of UE AMBR	15.4.0
2018-12	RP-82	RP-182506	0195	2	F	CR on Scell release for RLC failure	15.4.0
2018-12	RP-82	RP-182447	0205	1	F	About bandcombinationindex and featureSetEntryIndex	15.4.0
2018-12	RP-82	RP-182447	0211	1	F	CR to 38.473 on DRB PDCP duplication	15.4.0
2018-12	RP-82	RP-182447	0216	1	F	CR to 38.473 on clarifications on system information update over F1	15.4.0

2018-12	RP-82	RP-182448	0219	-	F	Correction of RRC version handling and UE inactivity notification	15.4.0
2019-01	RP-82					- correction to ASN.1: addiming a missing change to "WriteReplaceWarningResponseEs F1AP-PROTOCOL-IES ::= {"	15.4.1
2019-03	RP-83	RP-190555	0202	2	F	Indication that cells are only UL or DL on F1	15.5.0
2019-03	RP-83	RP-190554	0204	1	F	AMF initiated UE Context Release failure cause	15.5.0
2019-03	RP-83	RP-190554	0220	1	F	Correction to reconfiguration with sync for gNB-DU	15.5.0
2019-03	RP-83	RP-190554	0225	1	F	Introduction of PH-InforSCG in DU to CU RRC Information	15.5.0
2019-03	RP-83	RP-190554	0226	1	F	CR to 38.473 on Measurement gap coordination	15.5.0
2019-03	RP-83	RP-190554	0228	1	F	CR for TS 38.473 for MR-DC coordination	15.5.0
2019-03	RP-83	RP-190554	0229	2	F	Condition for inclusion of the Dedicated SI Delivery Needed UE List IE	15.5.0
2019-03	RP-83	RP-190554	0230	1	F	Correction of the Transmission stop/restart indication	15.5.0
2019-03	RP-83	RP-190554	0231	-	F	Corrections on gNB-CU/gNB-DU Configuration Update	15.5.0
2019-03	RP-83	RP-190556	0236	2	F	Correction of QoS Flow Mapping Indication	15.5.0
2019-03	RP-83	RP-190554	0244	-	F	Release due to pre-emption	15.5.0
2019-03	RP-83	RP-190554	0245	2	F	CR on RRC container in UE context modification request message	15.5.0
2019-03	RP-83	RP-190554	0246	2	F	CR on UE context modification refuse	15.5.0
2019-03	RP-83	RP-190554	0247	-	F	Transaction ID in Error Indication procedure	15.5.0
2019-03	RP-83	RP-190554	0249	2	F	Cells to be deactivated over F1	15.5.0
2019-03	RP-83	RP-190554	0251	1	F	CR to 38.473 on SRB duplication and LCID	15.5.0
2019-03	RP-83	RP-190554	0258	-	F	CR to 38.473 on corrections for removal of PDCP duplication for SRB	15.5.0
2019-03	RP-83	RP-190554	0263	1	F	CR to 38.473 on transferring UEAssistanceInformation over F1	15.5.0
2019-03	RP-83	RP-190554	0265	-	F	Rapporteur updates	15.5.0
2019-03	RP-83	RP-190554	0266	1	F	Correction on gNB-DU Resource Coordination	15.5.0
2019-03	RP-83	RP-190554	0267	1	F	Endpoint IP address and port	15.5.0
2019-03	RP-83	RP-190554	0268	1	F	Correction to add paging origin IE	15.5.0
2019-03	RP-83	RP-190555	0269	2	F	Multiple SCTP associations over F1AP	15.5.0
2019-03	RP-83	RP-190554	0272	1	F	About Cells Failed to be Activated IE in gNB-CU Configuration Update Ack	15.5.0
2019-03	RP-83	RP-190556	0273	1	F	gNB-DU UE Aggregate Maximum Bit Rate Uplink correction	15.5.0
2019-03	RP-83	RP-190554	0276	1	F	RRC Reconfiguration failure	15.5.0
2019-03	RP-83	RP-190554	0278	1	F	Node behaviour at reception of DU to CU RRC Information	15.5.0
2019-03	RP-83	RP-190554	0281	-	F	Addition of Transaction ID to Initial UL RRC Message Transfer	15.5.0