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TECHNICAL SPECIFICATION

**5G;
NG-RAN;
F1 Application Protocol (F1AP)
(3GPP TS 38.473 version 16.2.0 Release 16)**

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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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".

[28]   3GPP TS 38.423: "NG-RAN; Xn application protocol (XnAP)".

[29]   3GPP TS 32.422: "Trace control and configuration management".

[30]   3GPP TS 38.340: "NR; Backhaul Adaptation Protocol (BAP) specification".

[31]   3GPP TS 38.213: "NR; Physical layer procedures for control".

[32]   3GPP TS 38.314: "   NR; Layer 2 measurements".

[33]   3GPP TS 38.211: "NR; Physical channels and modulation".

[34]   3GPP TS 38.214: "NR; Physical layer procedures for data".

[35]   3GPP TS 37.320: "Radio measurement collection for Minimization of Drive Tests (MDT)".

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.

BH RLC channel: as defined in TS 38.300 [6].

Conditional handover: as defined in TS 38.300 [6].

Conditional PSCell Change: as defined in TS 37.340 [7].

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].

IAB-node: as defined in TS 38.300 [6].

IAB-donor: as defined in TS 38.300 [6].

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

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

Public network integrated NPN: as defined in TS 23.501 [21].

Stand-alone Non-Public Network: as defined in TS 23.501 [21].

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
ARPI	Additional RRM Policy Index
BH	Backhaul
CAG	Closed Access Group

CN	Core Network
CG	Cell Group
CGI	Cell Global Identifier
CHO	Conditional Handover
CP	Control Plane
CPC	Conditional PSCell Change
DL	Downlink
EN-DC	E-UTRA-NR Dual Connectivity
EPC	Evolved Packet Core
IAB	Integrated Access and Backhaul
IMEISV	International Mobile station Equipment Identity and Software Version number
NID	Network Identifier
NPN	Non-Public Network
NSSAI	Network Slice Selection Assistance Information
PNI-NPN	Public Network Integrated NPN
RANAC	RAN Area Code
RIM	Remote Interference Management
RIM-RS	RIM Reference Signal
RRC	Radio Resource Control
SNPN	Stand-alone Non-Public Network
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 *Information Element Name* 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. *E-RAB ID* 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.

All considerations of gNB-DU in this specification also apply to the IAB-DU and IAB-donor-DU, unless stated otherwise. All considerations of gNB-CU in this specification apply to the IAB-donor-CU as well, unless stated otherwise.

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 Response message	Unsuccessful Outcome 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	
F1 Removal	F1 REMOVAL REQUEST	F1 REMOVAL RESPONSE	F1 REMOVAL FAILURE
BAP Mapping Configuration	BAP MAPPING CONFIGURATION	BAP MAPPING CONFIGURATION ACKNOWLEDGE	
GNB-DU Resource Configuration	GNB-DU RESOURCE CONFIGURATION	GNB-DU RESOURCE CONFIGURATION ACKNOWLEDGE	
IAB TNL Address Allocation	IAB TNL ADDRESS REQUEST	IAB TNL ADDRESS RESPONSE	
IAB UP Configuration Update	IAB UP CONFIGURATION UPDATE REQUEST	IAB UP CONFIGURATION UPDATE RESPONSE	IAB UP CONFIGURATION UPDATE FAILURE
Resource Status Reporting Initiation	RESOURCE STATUS REQUEST	RESOURCE STATUS RESPONSE	RESOURCE STATUS FAILURE

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
Network Access Rate Reduction	NETWORK ACCESS RATE REDUCTION
Trace Start	TRACE START
Deactivate Trace	DEACTIVATE TRACE
DU-CU Radio Information Transfer	DU-CU RADIO INFORMATION TRANSFER
CU-DU Radio Information Transfer	CU-DU RADIO INFORMATION TRANSFER
Resource Status Reporting	RESOURCE STATUS UPDATE
Access And Mobility Indication	ACCESS AND MOBILITY INDICATION
Reference Time Information Reporting Control	REFERENCE TIME INFORMATION REPORTING CONTROL
Reference Time Information Report	REFERENCE TIME INFORMATION REPORT
Access Success	ACCESS SUCCESS
Cell Traffic Trace	CELL TRAFFIC TRACE

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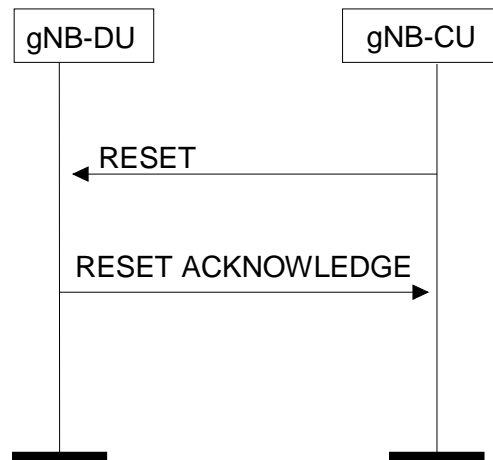
Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU. Successful operation

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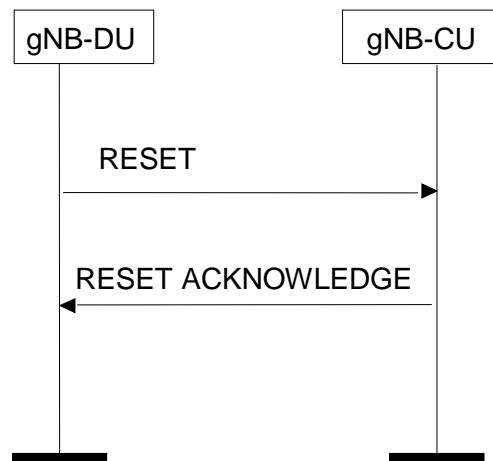
Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-DU. Successful operation

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
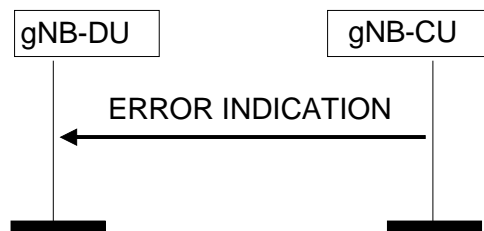
Figure 8.2.2.2-1: Error Indication procedure, gNB-CU originated. Successful operation
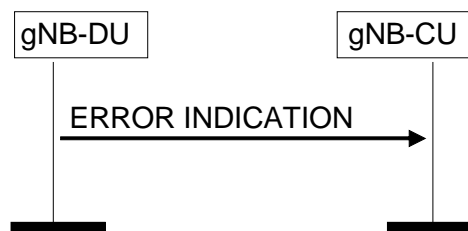
Figure 8.2.2.2-2: Error Indication procedure, gNB-DU originated. Successful operation

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 for the F1-C interface instance after a TNL association has become operational.

 NOTE: If F1-C signalling transport is shared among multiple F1-C interface instances, one F1 Setup procedure is issued per F1-C interface instance to be setup, i.e. several F1 Setup procedures may be issued via the same TNL association after that 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
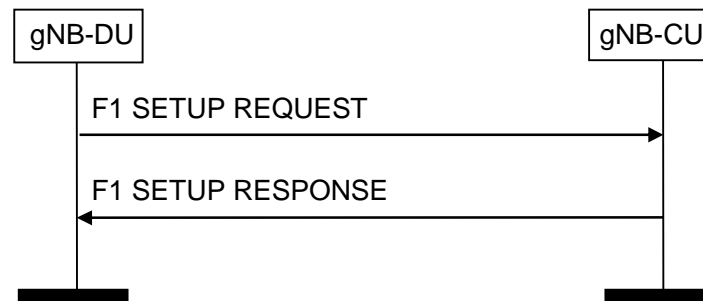
Figure 8.2.3.2-1: F1 Setup procedure: Successful Operation

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 in the F1 SETUP REQUEST message.

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.

If *Cells to be Activated List Item* IE is included in the F1 SETUP RESPONSE message, and the information for the cell indicated by the *NR CGI* IE includes the *IAB Info IAB-donor-CU* IE, the gNB-DU shall, if supported, apply the *IAB STC Info* IE therein to the indicated cell.

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 in the F1 SETUP RESPONSE message, 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).

For NG-RAN, the gNB-CU may include *Available SNPN ID List* IE in the F1 SETUP RESPONSE message. If the available SNPN(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 SNPN(s) included in the received Available SNPN ID list.

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.

If the *Intended TDD DL-UL Configuration IE* is present in the F1 SETUP REQUEST message, the receiving gNB-CU shall use the received information for Cross Link Interference management and/or NR-DC power coordination. The gNB-CU may merge the Intended TDD DL-UL Configuration information received from two or more gNB-DUs. The gNB-CU shall consider the received *Intended TDD DL-UL Configuration* content valid until reception of an update of the IE for the same cell(s).

If the *Aggressor gNB Set* ID IE is included in the *Served Cell Information* IE in the F1 SETUP REQUEST message, the gNB-CU shall, if supported, take it into account.

If the *Victim gNB Set* ID IE is included in the *Served Cell Information* IE in the F1 SETUP REQUEST message, the gNB-CU shall, if supported, take it into account.

If the F1 SETUP REQUEST message contains the *Transport Layer Address Info* IE, the gNB-CU shall, if supported, take into account for IPSec tunnel establishment.

If the F1 SETUP RESPONSE message contains the *Transport Layer Address Info* IE, the gNB-DU shall, if supported, take into account for IPSec tunnel establishment.

If the F1 SETUP RESPONSE message contains the *Uplink BH Non-UP Traffic Mapping* IE, the gNB-DU shall, if supported, consider the information therein for mapping of non-UP uplink traffic.

If the *BAP Address* IE is included in the F1 SETUP REQUEST, the receiving gNB-CU shall, if supported, consider the information therein for discovering the collocation of an IAB-DU and an IAB-MT.

If the F1 SETUP REQUEST message is received from an IAB-donor-DU, the gNB-CU shall, if supported, include the *BAP Address* IE in the F1 SETUP RESPONSE message.

If the F1 SETUP RESPONSE message contains the *BAP Address* IE, the gNB-DU shall, if supported, store the received BAP address and use it as specified in TS 38.340 [30].

8.2.3.3   Unsuccessful Operation
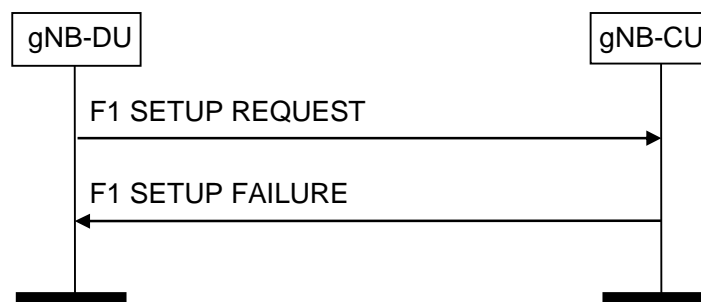
Figure 8.2.3.3-1: F1 Setup procedure: Unsuccessful Operation

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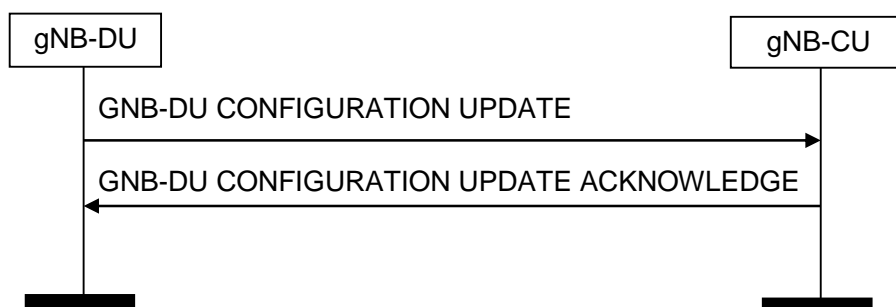
Figure 8.2.4.2-1: gNB-DU Configuration Update procedure: Successful Operation

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 g*NB-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 if the *Switching Off Ongoing* IE is present in the *Cells Status Item* IE, contained in the GNB-DU CONFIGURATION UPDATE message, and the corresponding *Service State IE* is set to "Out-of-Service", the gNB-CU shall ignore the *Switching Off Ongoing* IE.

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

If *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 *Available SNPN ID List* IE is contained in GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE message, the gNB-DU shall overwrite the whole available SNPN ID 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.

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

If the *Intended TDD DL-UL Configuration* IE is present in the GNB-DU CONFIGURATION UPDATE message, the receiving gNB-CU shall use the received information for Cross Link Interference management and/or NR-DC power coordination. The gNB-CU may merge the Intended TDD DL-UL Configuration information received from two or more gNB-DUs. The gNB-CU shall consider the received *Intended TDD DL-UL Configuration* IE content valid until reception of an update of the IE for the same cell(s).

If the *Aggressor gNB Set* ID IE is included in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, take it into account.

If the *Victim gNB Set* ID IE is included in the *Served Cell Information* IE in the GNB-DU CONFIGURATION UPDATE message, the gNB-CU shall, if supported, take it into account.

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

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

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

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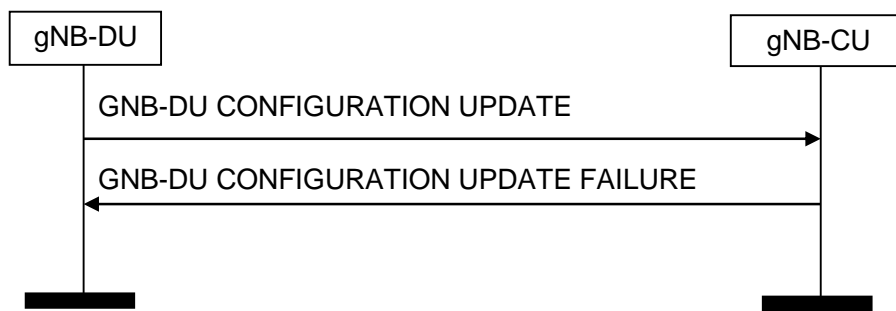
Figure 8.2.4.3-1: gNB-DU Configuration Update procedure: Unsuccessful Operation

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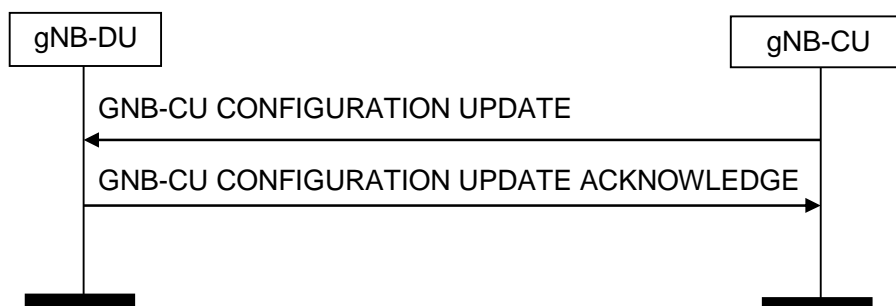
Figure 8.2.5.2-1: gNB-CU Configuration Update procedure: Successful Operation

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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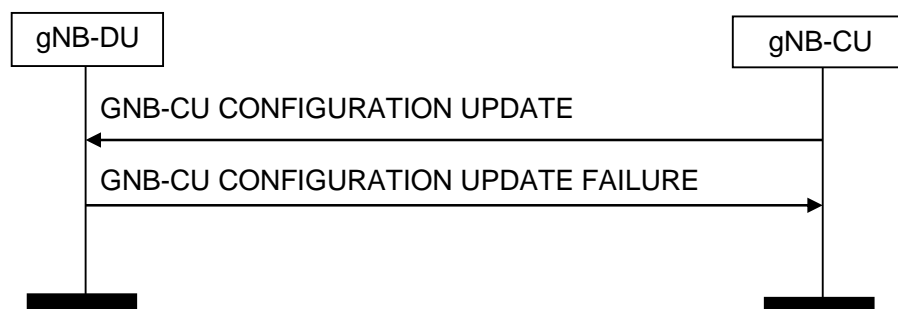
Figure 8.2.5.3-1: gNB-CU Configuration Update: Unsuccessful Operation

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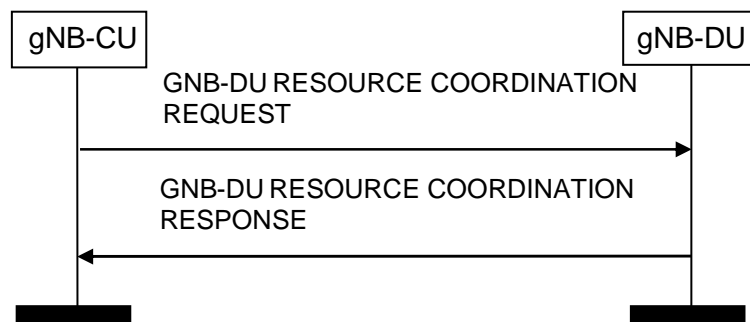
Figure 8.2.6.2-1: gNB-DU Resource Coordination, successful operation

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
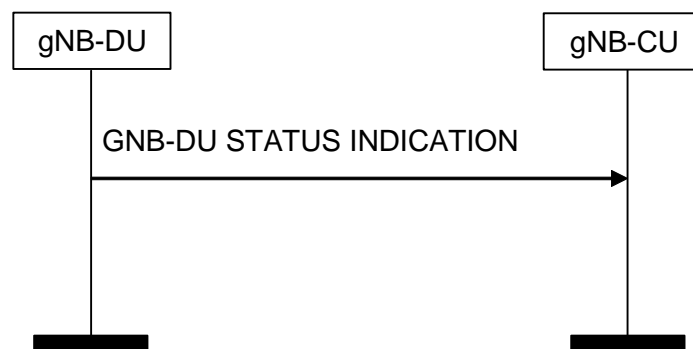
Figure 8.2.7.2-1: gNB-DU Status Indication procedure

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.

8.2.8 F1 Removal

8.2.8.1 General

The purpose of the F1 Removal procedure is to remove the interface instance and all related resources between the gNB-DU and the gNB-CU in a controlled manner. If successful, this procedure erases any existing application level configuration data in the two nodes.

> NOTE: In case the signalling transport is shared among several F1-C interface instances, and the TNL association is still used by one or several F1-C interface instances, the initiating node should not initiate the removal of the TNL association.

The procedure uses non-UE-associated signaling.

8.2.8.2 Successful Operation
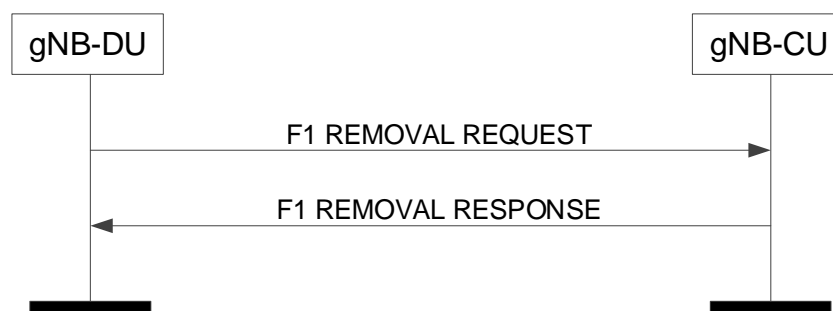
Figure 8.2.8-1: F1 Removal, gNB-DU initiated, successful operation
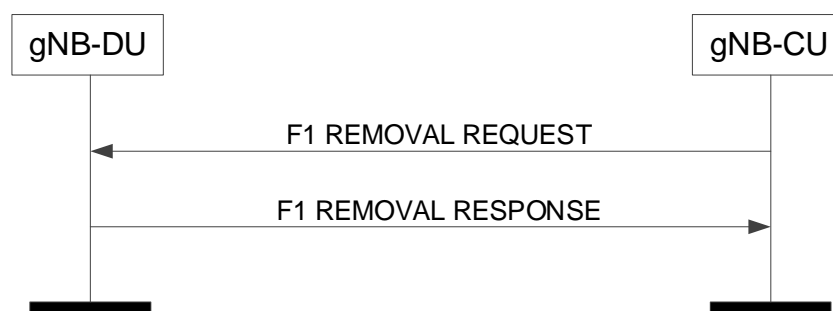
Figure 8.2.8.2-2: F1 Removal, gNB-CU initiated, successful operation

Successful F1 Removal, gNB-DU initiated

The gNB-DU initiates the procedure by sending the F1 REMOVAL REQUEST message to the gNB-CU. Upon reception of the F1 REMOVAL REQUEST message the gNB-CU shall reply with the F1 REMOVAL RESPONSE message. After receiving the F1 REMOVAL RESPONSE message, the gNB-DU may initiate removal of the TNL association towards the gNB-CU, if applicable, and may remove all resources associated with that signaling connection. The gNB-CU may then remove all resources associated with that interface instance.

Successful F1 Removal, gNB-CU initiated

The gNB-CU initiates the procedure by sending the F1 REMOVAL REQUEST message to the gNB-DU. Upon reception of the F1 REMOVAL REQUEST message the gNB-DU shall reply with the F1 REMOVAL RESPONSE message. After receiving the F1 REMOVAL RESPONSE message, the gNB-CU may initiate removal of the TNL association towards the gNB-DU, if applicable, and may remove all resources associated with that signaling connection. The gNB-DU may then remove all resources associated with that interface instance.

8.2.8.3 Unsuccessful Operation
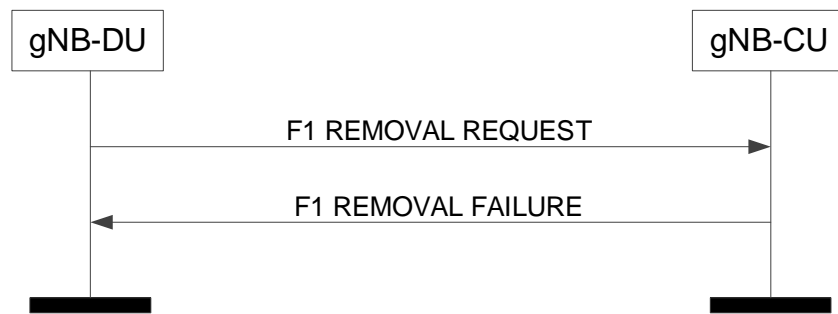
Figure 8.2.8.3-1: F1 Removal, gNB-DU initiated, unsuccessful operation
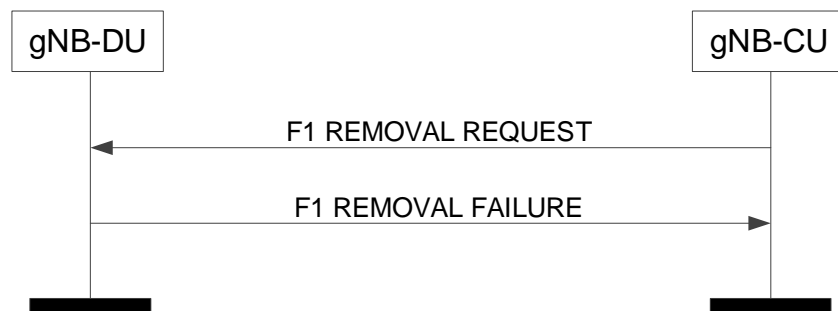
Figure 8.2.8.3-2: F1 Removal, gNB-CU initiated, unsuccessful operation

Unsuccessful F1 Removal, gNB-DU initiated

If the gNB-CU cannot accept to remove the signaling connection with the gNB-DU it shall respond with an F1 REMOVAL FAILURE message with an appropriate cause value.

Unsuccessful F1 Removal, gNB-CU initiated

If the gNB-DU cannot accept to remove the signaling connection with the gNB-CU it shall respond with an F1 REMOVAL FAILURE message with an appropriate cause value.

8.2.8.4 Abnormal Conditions

Not applicable.

8.2.9 Network Access Rate Reduction

8.2.9.1 General

The purpose of the Network Access Rate Reduction procedure is to indicate to the gNB-DU that the rate at which UEs are accessing the network need to be reduced from its current level.

The procedure uses non-UE associated signalling.

8.2.9.2 Successful operation
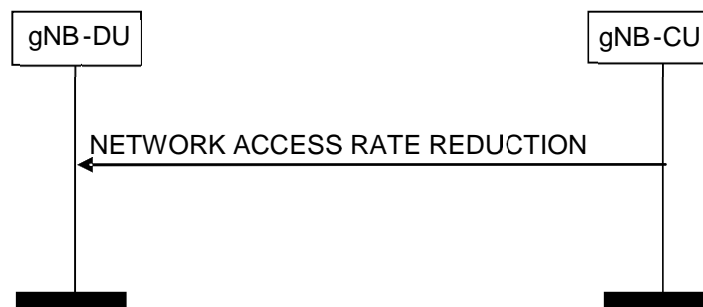
Figure 8.2.9.2-1: Network Access Rate Reduction, Successful operation

The gNB-CU initiates the procedure by sending a NETWORK ACCESS RATE REDUCTION message to the gNB-DU. When receiving the NETWORK ACCESS RATE REDUCTION message the gNB-DU should take into account the information contained in the *UAC assistance information* to set the parameters for Unified Access Barring.

If the *NID* IE is contained in the NETWORK ACCESS RATE REDUCTION message, the gNB-DU should take it into account and combine the *NID* IE with the *PLMN Identity* IE to identify the SNPN.

8.2.9.3 Abnormal Conditions

Not applicable

8.2.10 Resource Status Reporting Initiation

8.2.10.1 General

This procedure is used by an gNB-CU to request the reporting of load measurements to gNB-DU.

The procedure uses non UE-associated signalling.

8.2.10.2 Successful Operation
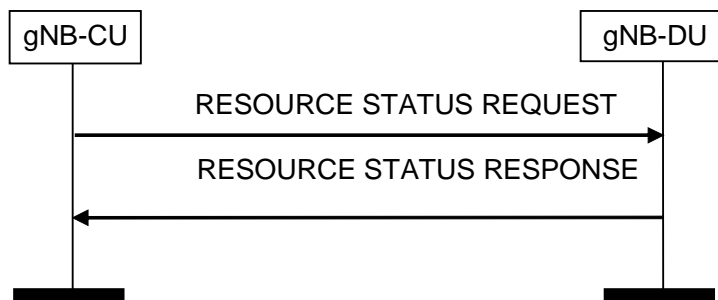
Figure 8.2.10.2-1: Resource Status Reporting Initiation, successful operation

gNB-CU initiates the procedure by sending the RESOURCE STATUS REQUEST message to gNB-DU to start a measurement, stop a measurement, or add cells to report for a measurement. Upon receipt, gNB-DU:

- shall initiate the requested measurement according to the parameters given in the request in case the *Registration Request* IE set to "start"; or

- shall stop all cells measurements and terminate the reporting in case the *Registration Request* IE is set to "stop"; or

- shall add cells indicated in the *Cell To Report List* IE to the measurements initiated before for the given measurement IDs, in case the *Registration Request* IE is set to "add". If measurements are already initiated for a cell indicated in the *Cell To Report List* IE, this information shall be ignored.

If the *Registration Request* IE is set to "start" in the RESOURCE STATUS REQUEST message and the *Report Characteristics* IE indicates cell specific measurements, the *Cell To Report List* IE shall be included.

If *Registration Request* IE is set to "add" in the RESOURCE STATUS REQUEST message, the *Cell To Report List* IE shall be included.

If gNB-DU is capable to provide all requested resource status information, it shall initiate the measurement as requested by gNB-CU, and respond with the RESOURCE STATUS RESPONSE message.

Interaction with other procedures

When starting a measurement, the *Report Characteristics* IE in the RESOURCE STATUS REQUEST indicates the type of objects gNB-DU shall perform measurements on. For each cell, gNB-DU shall include in the RESOURCE STATUS UPDATE message:

- the *Radio Resource Status* IE, if the first bit, "PRB Periodic" of the *Report Characteristics* IE included in the RESOURCE STATUS REQUEST message is set to 1. If the cell for which *Radio Resource Status* IE is requested to be reported supports more than one SSB, the *Radio Resource Status* IE for such cell shall include the *SSB Area Radio Resource Status Item* IE for all SSB areas supported by the cell. If the *SSB To Report List* IE is included for a cell, the *Radio Resource Status* IE for such cell shall only include the *SSB Area Radio Resource Status List* IE;

- the *TNL Capacity Indicator* IE, if the second bit, "TNL Capacity Ind Periodic" of the *Report Characteristics* IE included in the RESOURCE STATUS REQUEST message is set to 1;

- the *Composite Available Capacity Group* IE, if the third bit, "Composite Available Capacity Periodic" of the *Report Characteristics* IE included in the RESOURCE STATUS REQUEST message is set to 1. If *Cell Capacity Class Value* IE is included within the *Composite Available Capacity Group* IE, this IE is used to assign weights to the available capacity indicated in the *Capacity Value* IE. If the cell for which *Composite Available Capacity Group* IE is requested to be reported supports more than one SSB the *Composite Available Capacity Group* IE for such cell shall include the *SSB Area Capacity Value List* IE for all SSB areas supported by the cell, providing the SSB area capacity with respect to the *Cell Capacity Class Value* IE. If the *SSB To Report List* IE is included for a cell, the *Composite Available Capacity Group* IE for such cell shall include the requested *SSB Area Capacity Value List* IE providing the SSB area capacity with respect to the Cell Capacity Class Value. If the cell for which *Composite Available Capacity Group* IE is requested to be reported supports more than one slice, and if the *Slice To Report List* IE is included for a cell, the *Slice Available Capacity* IE for such cell shall include the requested *Slice Available Capacity Value Downlink* IE and *Slice Available Capacity Value Uplink* IE, providing the slice capacity with respect to the Cell Capacity Class Value.

- the *Hardware Load Indicator* IE, if the fourth bit, " HW LoadInd Periodic " of the *Report Characteristics* IE included in the RESOURCE STATUS REQUEST message is set to 1;

- the *Number of Active UEs* IE, if the fifth bit, "Number of Active UEs" of the *Report Characteristics* IE included in the RESOURCE STATUS REQUEST message is set to 1;

If the Reporting Periodicity IE in the RESOURCE STATUS REQUEST is present, this indicates the periodicity for the reporting of periodic measurements. If the Reporting Periodicity IE is absent, the gNB-DU shall report once.

8.2.10.3   Unsuccessful Operation
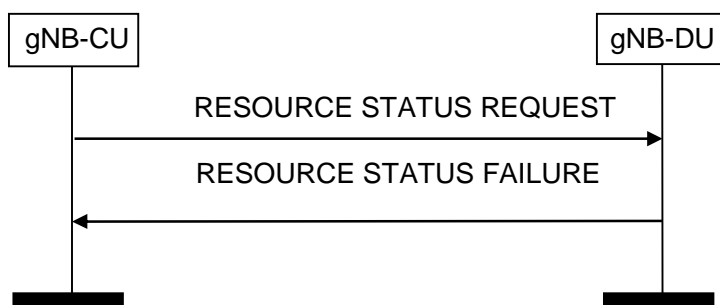
Figure 8.2.10.3-1: Resource Status Reporting Initiation, unsuccessful operation

If any of the requested measurements cannot be initiated, gNB-DU shall send the RESOURCE STATUS FAILURE message.

8.2.10.4 Abnormal Conditions

Void

8.2.11 Resource Status Reporting

8.2.11.1 General

This procedure is initiated by gNB-DU to report the result of measurements admitted by gNB-DU following a successful Resource Status Reporting Initiation procedure.

The procedure uses non UE-associated signalling.

8.2.11.2 Successful Operation

Figure 8.2.11.2-1: Resource Status Reporting, successful operation

The gNB-DU shall report the results of the admitted measurements in RESOURCE STATUS UPDATE message. The admitted measurements are the measurements that were successfully initiated during the preceding Resource Status Reporting Initiation procedure.

8.2.11.3 Unsuccessful Operation

Not applicable.

8.2.11.4 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,DRB, BH RLC channel, and SL DRB configuration. The procedure uses UE-associated signalling.

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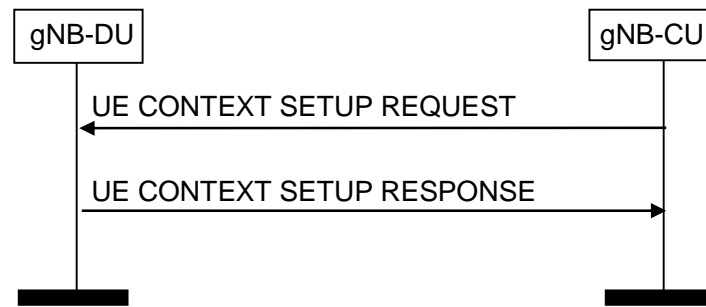
Figure 8.3.1.2-1: UE Context Setup Request procedure: Successful Operation

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 *UE-CapabilityRAT-ContainerList* IE is included in the UE CONTEXT SETUP REQUEST, the gNB-DU shall take this information into account for UE specific configurations.

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 consider it as a list of candidate SCells to be set up. 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 *Additional Duplication Indication* IE is contained in the *SRB To Be Setup List* IE, the gNB-DU shall, if supported, setup the indicated 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 the *BH Information* IE is included in the *UL UP TNL Information to be setup List* IE for a DRB, the gNB-DU shall, if supported, use the indicated BAP Routing ID and BH RLC channel for transmission of the corresponding GTP-U packets to the IAB-donor, as specified in TS 38.340 [30].

If the *BH RLC Channel 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 *Traffic Mapping Information* IE is included in the *BH RLC Channel To Be Setup Item IEs* IE for a BH RLC Channel, the gNB-DU shall, if supported, process the *Traffic Mapping Information* IE as follows:

- if the *IP to layer2 Traffic Mapping Info* IE is included, the gNB-DU shall store the mapping information contained in the *IP to layer2 Mapping Info To Add* IE, if present, for the egress BH RLC channel identified by the *BH RLC CH ID* IE, and shall remove the previously stored mapping information as indicated by the *IP to*

layer2 Mapping Info To Remove IE, if present. The gNB-DU shall use the mapping information stored for the mapping of IP traffic to layer 2, as specified in TS 38.340 [30].

- if the *BAP layer BH RLC channel Mapping Info* IE is included, the gNB-DU shall store the mapping information contained in the *BAP layer BH RLC channel Mapping Info To Add* IE, if present, for the egress BH RLC channel identified by the *BH RLC CH ID* IE, and shall remove the previously stored mapping information as indicated by the *BAP layer BH RLC channel Mapping Info To Remove* IE, if present. The gNB-DU shall use the mapping information stored when forwarding traffic on BAP-layer, as specified in TS 38.340 [30].

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]. The first *UP TNL Information* IE of the two *UP TNL Information* IEs is for the primary path.

If one or two *Additional PDCP Duplication UP TNL Information* IEs are included in the UE CONTEXT SETUP REQUEST message for a DRB, the gNB-DU shall, if supported, include one or two *Additional PDCP Duplication UP TNL Information* IEs in the UE CONTEXT SETUP RESPONSE message and setup one or two additional RLC entities for the indicated DRB. The gNB-CU and the gNB-DU use the *Additional PDCP Duplication 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 the *RLC Duplication State List* IE is included in the *RLC Duplication Information* IE contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, take it into account when activating/deactivating CA based PDCP duplication for the DRB with more than two RLC entities.

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 the *RLC Duplication State List* IE is included in the *RLC Duplication Information* IE contained in the UE CONTEXT SETUP REQUEST message for a DRB, the gNB-DU shall, if supported, take it into account when activating/deactivating DC based PDCP duplication for the DRB with more than two RLC entities. If the *Primary Path Indication* IE is included in the *RLC Duplication Information* IE, the gNB-DU shall, if supported, take it into account when performing DC based PDCP duplication for the DRB with more than two RLC entities.

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. If the *Additional RRM Policy Index* IE is received from an MeNB, the UE CONTEXT SETUP REQUEST message shall, if supported, contain the *Additional RRM Policy Index* 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]. The gNB-DU shall, if supported, store the received Additional RRM Policy Index 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, SRBs and BH RLC channels 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.

- A list of BH RLC channels which are successfully established shall be included in the *BH RLC Channel Setup List* IE;

- A list of BH RLC channels which failed to be established shall be included in the *BH RLC Channel Failed to be Setup List* IE;

- A list of SL DRBs which are successfully established shall be included in the *SL DRB Setup List* IE;

- A list of SL DRBs which failed to be established shall be included in the *SL DRB Failed to Setup List* IE.

When the gNB-DU reports the unsuccessful establishment of a DRB or SRB or SL DRB, 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].

For sidelink operation, the *CG-ConfigInfo* IE shall be included in the *CU to DU RRC Information* IE if the gNB-CU receives sidelink related UE information from UE. If the *CG-ConfigInfo* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall regard it as an indication of V2X sidelink information 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 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 received *CU to DU RRC Information* IE does not include source cell group configuration, the gNB-DU shall generate the cell group configuration using full configuration. Otherwise, delta configuration is allowed.

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

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 *Ignore PRACH Configuration* IE is present and set to "true" the *E-UTRA PRACH Configuration* IE in the UE CONTEXT SETUP REQUEST message shall be ignored. 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 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 NGEN-DC or NE-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 MR-DC Resource Coordination Information as defined in TS 38.423 [28], 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 MR-DC Resource Coordination Information at the gNB as described in TS 38.423 [28].

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.

The *UEAssistanceInformationEUTRA* 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 *UEAssistanceInformationEUTRA* 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 LTE sidelink 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], TS 38.423 [28].

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 set up 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 contained in the UE CONTEXT SETUP REQUEST message 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.

If the UE CONTEXT SETUP REQUEST message contains the *New gNB-CU UE F1AP ID* IE, the gNB-DU shall, if supported, replace the value received in the *gNB-CU UE F1AP ID* IE by the value of the *New gNB-CU UE F1AP ID* and use it for further signalling.

If the *RAN UE ID* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall store and replace any previous information received.

If the *Trace Activation* IE is included in the UE CONTEXT SETUP REQUEST message the gNB-DU shall, if supported, initiate the requested trace function as described in TS 32.422 [29].

In particular, the gNB-DU shall, if supported:

- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT and Trace", initiate the requested trace session and MDT session as described in TS 32.422 [29];

- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT Only", initiate the requested MDT session as described in TS 32.422 [29] and the gNB-DU shall ignore Interfaces To Trace IE, and Trace Depth IE. If the *Management Based MDT PLMN List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, store the received information in the UE context, and use this information to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [29].

For each QoS flow whose DRB has been successfully established and the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [21].

If the UE CONTEXT SETUP REQUEST message contains the *Configured BAP Address* IE, the gNB-DU shall, if supported, store this BAP address configured for the corresponding child IAB-node and use it as specified in TS 38.401 [4].

If the *BAP Control PDU Channel* IE is included in the *BH RLC Channel to be Setup List* IE, the gNB-DU shall, if supported, consider that the configured BH RLC channel can be used to transmit BAP Control PDUs, and use this BH RLC channel as specified in TS 38.340 [30].

If the *NR V2X Services Authorized* IE is contained in the UE CONTEXT SETUP REQUEST message and it contains one or more IEs set to "authorized", the gNB-DU node shall, if supported, consider that the UE is authorized for the relevant service(s).

If the *LTE V2X Services Authorized* IE is contained in the UE CONTEXT SETUP REQUEST message and it contains one or more IEs set to "authorized", the gNB-DU node shall, if supported, consider that the UE is authorized for the relevant service(s).

If the *NR UE Sidelink Aggregate Maximum Bit Rate* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, use it for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

If the *LTE UE Sidelink Aggregate Maximum Bit Rate* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, use it for the concerned UE's sidelink communication in network scheduled mode for LTE V2X services.

If the *PC5 Link Aggregated Bit Rate* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, use it for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

If the *TSC Traffic Characteristics* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, take into account the corresponding information received in the *TSC Traffic Characteristics* IE.

If the *Conditional Inter-DU Mobility Information* IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall consider that the request concerns a conditional handover or conditional PSCell change for the included *SpCell ID* IE and shall include it as the *Requested Target Cell ID* IE in the UE CONTEXT SETUP RESPONSE message. The gNB-DU shall regard it as a reconfiguration with sync as defined in TS 38.331 [8].

If the *Target gNB-DU UE F1AP ID* IE is contained in the *Conditional Inter-DU Mobility Information* IE included in the UE CONTEXT SETUP REQUEST message, then the gNB-DU shall replace the existing prepared conditional handover or conditional PSCell change identified by the *Target gNB-DU UE F1AP ID* IE and the *SpCell ID* IE.

If the *Serving NID* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall combine the *Serving NID* IE with the *Serving PLMN* IE to identify the serving NPN, and may take it into account for UE context establishment.

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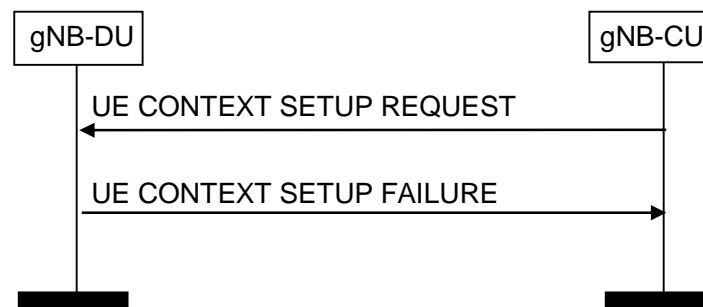
Figure 8.3.1.3-1: UE Context Setup Request procedure: unsuccessful Operation

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 *Conditional Inter-DU Mobility Information* IE was included in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall include the received *SpCell ID* IE as the *Requested Target Cell ID* IE in 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

If the gNB-DU receives a UE CONTEXT SETUP REQUEST message containing a *E-UTRAN QoS* IE for a GBR QoS DRB but where the *GBR QoS Information* IE is not present, the gNB-DU shall report the establishment of the corresponding DRB as failed in the *DRB Failed to Setup List* IE of the UE CONTEXT SETUP RESPONSE message with an appropriate cause value. If the gNB-DU receives a UE CONTEXT SETUP REQUEST message containing a *DRB QoS* IE for a GBR QoS DRB but where the *GBR QoS Flow Information* IE is not present, the gNB-DU shall report the establishment of the corresponding DRBs as failed in the *DRB Failed to Setup List* IE of the UE CONTEXT SETUP RESPONSE message with an appropriate cause value.

If the *Delay Critical* IE is included in the *Dynamic 5QI Descriptor* IE within the *DRB QoS* IE in the UE CONTEXT SETUP REQUEST message and is set to the value "delay critical" but the *Maximum Data Burst Volume* IE is not present, the gNB-DU shall report the establishment of the corresponding DRB as failed in the *DRB Failed to Setup List* IE of the of the UE CONTEXT SETUP RESPONSE message with an appropriate cause value.

In case of "CHO-replace" when the *Target gNB-DU UE F1AP ID* IE is included, if the candidate cell in the *SpCell ID* IE included in the UE CONTEXT SETUP REQUEST message was not prepared using the same UE-associated signaling connection, the gNB-DU shall ignore this candidate cell.

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 or candidate cells in conditional handover or conditional PSCell change. The procedure uses UE-associated signalling.

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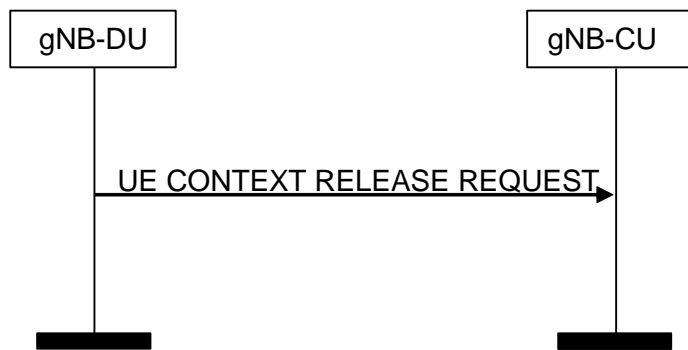
Figure 8.3.2.2-1: UE Context Release (gNB-DU initiated) procedure. Successful operation

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.

If the *Candidate Cells To Be Cancelled List* IE is included in the UE CONTEXT RELEASE REQUEST message, the gNB-CU shall consider that the only the resources reserved for the candidate cells identified by the included NR CGIs and associated to the UE-associated signaling identified by the *gNB-CU UE F1AP ID* IE and the *gNB-DU UE F1AP ID* IE are about to be released by the gNB-DU.

Interactions with UE Context Release procedure:

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

Interactions with UE Context Setup procedure:

The UE Context Release Request procedure may be performed before the UE Context Setup procedure to request the release of an existing UE-associated logical F1-connection and related resources in the gNB-DU.

8.3.2.3 Abnormal Conditions

If one or more candidate cells in the *Candidate Cells To Be Cancelled List* IE included in the UE CONTEXT RELEASE REQUEST message were not prepared using the same UE-associated signaling connection, the gNB-CU shall ignore those non-associated candidate cells.

8.3.3 UE Context Release (gNB-CU initiated)

8.3.3.1 General

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

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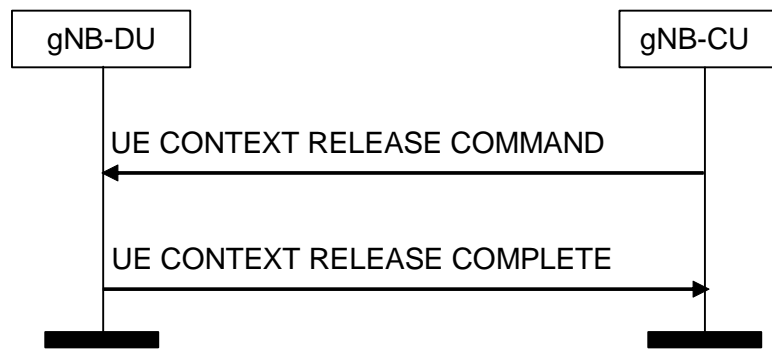
Figure 8.3.3.2-1: UE Context Release (gNB-CU initiated) procedure. Successful operation

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

Upon reception of the UE CONTEXT RELEASE COMMAND message, the gNB-DU shall release all related signalling and user data transport resources and reply with the UE CONTEXT RELEASE COMPLETE message.

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

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

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

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

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

If one or more candidate cells in the *Candidate Cells To Be Cancelled List* IE included in the UE CONTEXT RELEASE COMMAND message were not prepared using the same UE-associated signalling connection, the gNB-DU shall ignore those non-associated candidate cells.

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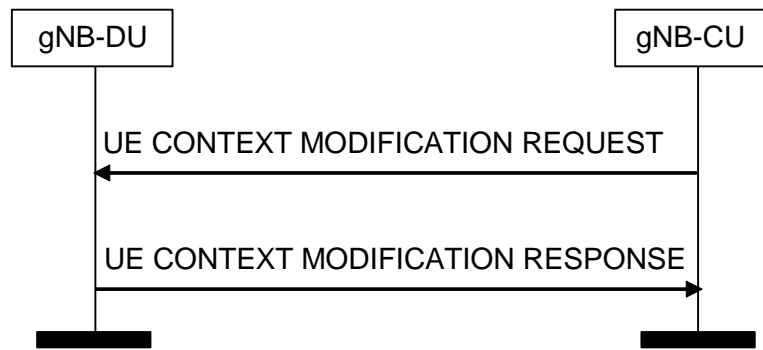
Figure 8.3.4.2-1: UE Context Modification procedure. Successful operation

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 consider it as a list of candidate SCells to be set up. 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 *Additional Duplication Indication* IE is contained in the *SRB To Be Setup List* IE, the gNB-DU shall, if supported, setup the indicated RLC entities for the indicated SRB.

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

If the *BH Information* IE is included in the *UL UP TNL Information to be setup List* IE for a DRB, the gNB-DU shall, if supported, use the indicated BAP Routing ID and BH RLC channel for transmission of the corresponding GTP-U packets to the IAB-donor, as specified in TS 38.340 [30].

If the *BH RLC Channel To Be Setup 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 *Traffic Mapping Information* IE is included in the *BH RLC Channel To Be Setup Item IEs* IE for a BH RLC Channel, the gNB-DU shall, if supported, process the *Traffic Mapping* Information IE following the behaviour described for the UE Context Setup procedure.

If the *BH RLC Channel To Be Modified 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 *Traffic Mapping Information* IE is included in the

BH RLC Channel To Be Modified Item IEs IE for a BH RLC Channel, the gNB-DU shall, if supported, process the *Traffic Mapping Information* IE following the behaviour described for the UE Context Setup procedure.

If the *BH RLC Channel To Be Released List* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall release the BH RLC channels in the list.

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]. The first *UP TNL Information* IE of the two *UP TNL Information* IEs is for the primary path.

If one or two *Additional PDCP Duplication UP TNL Information* IEs are included in the UE CONTEXT MODIFICATION REQUEST message for a DRB, the gNB-DU shall, if supported, include one or two *Additional PDCP Duplication UP TNL Information* IEs in the UE CONTEXT MODIFICATION RESPONSE message and setup one or two additional RLC entities for the indicated DRB. The gNB-CU and the gNB-DU use the *Additional PDCP Duplication 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 the *RLC Duplication State List* IE is included in the *RLC Duplication Information* IE contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take it into account for the DRB with more than two RLC entities.

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 id 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 *RLC Duplication State List* IE is included in the *RLC Duplication Information* IE contained in the UE CONTEXT MODIFICATION REQUEST message for a DRB, the gNB-DU shall, if supported, take it into account when activating/deactivating DC based PDCP duplication for the DRB with more than two RLC entities. If the *Primary Path Indication* IE is included in the *RLC Duplication Information* IE, the gNB-DU shall, if supported, take it into account when performing DC based PDCP duplication for the DRB with more than two RLC entities.

For a certain DRB which was allocated with two GTP-U tunnels, if such DRB is modified and given one GTP-U tunnel via the UE Context Modification procedure, the gNB-DU shall consider that the CA based PDCP duplication for the concerned DRB is de-configured. If such UE Context Modification procedure occurs, the *Duplication Activation* IE shall not be included for the concerned 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 *RRC Reconfiguration Complete Indicator* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall consider the ongoing reconfiguration procedure involving changes of the L1/L2 configuration at the gNB-DU signalled to the gNB-CU via the *CellGroupConfig* IE for MR-DC operation or standalone operation has been successfully performed when such IE is set to 'true'; otherwise (when such IE is set to 'failure'), the gNB-DU shall consider the ongoing reconfiguration procedure has been failed and it shall continue to use the old L1/L2 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 SMTC information of the measured frequency(ies) in the *MeasurementTimingConfiguration* IE of the *CU to DU RRC Information* IE that is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall generate the measurement gaps based on the received SMTC information. Then the gNB-DU shall send the measurement gaps information to the gNB-CU in the *MeasGapConfig* IE of the *DU to CU RRC Information* IE that is included in the UE CONTEXT MODIFICATION RESPONSE message.

For DC operation, if the gNB-CU includes the *CG-Config* IE in the *CU to DU RRC Information* IE that is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU may initiate low layer parameters coordination taking this information into account.

For sidelink operation, the *CG-ConfigInfo* IE shall be included in the *CU to DU RRC Information* IE if the gNB-CU receives sidelink related UE information from UE. If the *CG-ConfigInfo* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall regard it as an indication of V2X sidelink information as defined in TS 38.331 [8].

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. If the *Ignore PRACH Configuration* IE is present and set to "true" the *E-UTRA PRACH Configuration* IE in the UE CONTEXT MODIFICATION REQUEST message shall be ignored.

For NGEN-DC or NE-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 MR-DC Resource Coordination Information as defined in TS 38.423 [28], 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 MR-DC Resource Coordination Information at the gNB as described in TS 38.423 [28].

For EN-DC operation, and if the *Subscriber Profile ID for RAT/Frequency priority* IE is received from an MeNB, the UE CONTEXT MODIFICTION REQUEST message shall contain the *Subscriber Profile ID for RAT/Frequency priority* IE. If the *Additional RRM Policy Index* IE is received from an MeNB, the UE CONTEXT MODIFICATION REQUEST message shall , if supported, contain the *Additional RRM Policy Index* 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]. The gNB-DU shall, if supported, store the received Additional RRM Policy Index 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 *UEAssistanceInformationEUTRA* 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 *UEAssistanceInformationEUTRA* 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 LTE sidelink 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, SRBs and BH RLC Channels 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.

- A list of BH RLC channels which are successfully established shall be included in the *BH RLC Channel Setup List* IE;

- A list of BH RLC channels which failed to be established shall be included in the *BH RLC Channel Failed to be Setup List* IE;

- A list of BH RLC channels which are successfully modified shall be included in the *BH RLC Channel Modified List* IE;

- A list of BH RLC channels which failed to be modified shall be included in the *BH RLC Channel Failed to be Modified List* IE;

- A list of SL DRBs which are successfully established shall be included in the *SL DRB Setup List* IE;

- A list of SL DRBs which failed to be established shall be included in the *SL DRB Failed to be Setup List* IE;

- A list of SL DRBs which are successfully modified shall be included in the *SL DRB Modified List* IE;

- A list of SL DRBs which failed to be modified shall be included in the *SL DRB Failed to be Modified List* IE.

If the *BAP Control PDU Channel* IE is included in the *BH RLC Channel to be Setup List* IE, the gNB-DU shall, if supported, consider that the configured BH RLC channel can be used to transmit BAP Control PDUs, and use this BH RLC channel as specified in TS 38.340 [30].

If the *BAP Control PDU Channel* IE is included in the *BH RLC Channel to be Modified List* IE, the gNB-DU shall, if supported, consider that the configured BH RLC channel can be used to transmit BAP Control PDUs, and use this BH RLC channel as specified in TS 38.340 [30]. Otherwise, the gNB-DU shall consider that the configured BH RLC channel cannot be used to transmit BAP Control PDU.

When the gNB-DU reports the unsuccessful establishment of a DRB or SRB or SL DRB, 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], TS 38.423 [28].

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 *UE-CapabilityRAT-ContainerList* IE is included in the UE CONTEXT SETUP MODIFICATION REQUEST, the gNB-DU shall take this information into account for UE specific configurations.

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 set up 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 in the UE CONTEXT MODIFICATION REQUEST, 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 containded 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 in the UE CONTEXT MODIFICATION REQUEST 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.

If the *Lower Layer presence status change* IE set to "suspend lower layers" is included in the UE CONTEXT MODIFICATION REQUEST, the gNB-DU shall keep all lower layer configuration for UEs, and not transmit or receive data from UE.

If the *Lower Layer presence status change* IE set to "resume lower layers" is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall use the previously stored lower layer configuration for the UE.

If the *Full Configuration* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall generate a *CellGroupConfig* IE using full configuration and include it in the UE CONTEXT MODIFICATION RESPONSE.

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

For each QoS flow whose DRB has been successfully established or modified and the *QoS Monitoring Request* IE was included in the *QoS Flow Level QoS Parameters* IE contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [21].

If the *NR V2X Services Authorized* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, update its V2X services authorization information for the UE accordingly. If the *NR V2X Services Authorized* IE includes one or more IEs set to "not authorized", the gNB-DU shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant service(s).

If the *LTE V2X Services Authorized* IE is contained in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, update its V2X services authorization information for the UE accordingly. If the *LTE V2X Services Authorized* IE includes one or more IEs set to "not authorized", the gNB-DU shall, if supported, initiate actions to ensure that the UE is no longer accessing the relevant service(s).

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

- replace the previously provided UE LTE Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value;

- use the received value for the concerned UE's sidelink communication in network scheduled mode for LTE V2X services.

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

- replace the previously provided UE NR Sidelink Aggregate Maximum Bit Rate, if available in the UE context, with the received value;

- use the received value for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

If the *PC5 Link Aggregate Maximum Bit Rate* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported:

- replace the previously provided UE PC5 Link Aggregate Bit Rate, if available in the UE context, with the received value;

- use the received value for the concerned UE's sidelink communication in network scheduled mode for NR V2X services.

If the *TSC Traffic Characteristics* IE is included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take into account the corresponding information received in the *TSC Traffic Characteristics* IE.

If the *Conditional Intra-DU Mobility Information* IE is included in the UE CONTEXT MODIFICATION REQUEST message and the CHO Trigger is set to "CHO-initiation", the gNB-DU shall consider that the request concerns a conditional handover or conditional PSCell change for the included *SpCell ID* IE and shall include it as the *Requested Target Cell ID* IE in the UE CONTEXT MODIFICATION RESPONSE message. The gNB-DU shall regard it as a reconfiguration with sync as defined in TS 38.331 [8].

If the *Conditional Intra-DU Mobility Information* IE is included in the UE CONTEXT MODIFICATION REQUEST message and the CHO Trigger is set to "CHO-replace", the gNB-DU shall replace the existing prepared conditional mobility identified by the *gNB-DU UE F1AP ID* IE and the *SpCell ID* IE.

If the *Conditional Intra-DU Mobility Information* IE is included in the UE CONTEXT MODIFICATION REQUEST message and the CHO Trigger is set to "CHO-cancel", the gNB-DU shall consider that the gNB-CU is about to remove any reference to, and release any resources previously reserved for the candidate cells associated to the UE-associated signalling identified by the *gNB-CU UE F1AP ID* IE and the *gNB-DU UE F1AP ID* IE. If the *Candidate Cells To Be Cancelled List* IE is also included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall consider that only the resources reserved for the cells identified by the included NR CGIs are about to be released by the gNB-CU.

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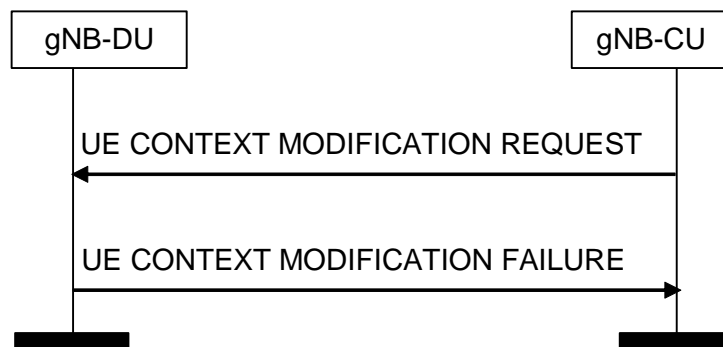
Figure 8.3.4.3-1: UE Context Modification procedure. Unsuccessful operation

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 *Conditional Intra-DU Mobility Information* IE was included in the UE CONTEXT MODIFICATION REQUEST message and set to "CHO-initiation", the gNB-DU shall include the received *SpCell ID* IE as the *Requested Target Cell ID* IE in the UE CONTEXT MODIFICATION FAILURE message.

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.

If the *Conditional Intra-DU Mobility Information* IE was included and set to "CHO-initiation" or "CHO-replace" but the *SpCell ID* IE was not included in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall respond with the UE CONTEXT MODIFICATION FAILURE message with an appropriate cause value.

8.3.4.4 Abnormal Conditions

If the gNB-DU receives a UE CONTEXT MODIFICATION REQUEST message containing a *E-UTRAN QoS* IE for a GBR QoS DRB but where the *GBR QoS Information* IE is not present, the gNB-DU shall report the establishment of the corresponding DRB as failed in the *DRB Failed to Setup List* IE of the UE CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

If the gNB-DU receives a UE CONTEXT MODIFICATION REQUEST message containing a *DRB QoS* IE for a GBR QoS DRB but where the *GBR QoS Flow Information* IE is not present, the gNB-DU shall report the establishment of the corresponding DRBs as failed in the *DRB Failed to Setup List* IE of the UE CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

If the *Delay Critical* IE is included in the *Dynamic 5QI Descriptor* IE within the *DRB QoS* IE in the UE CONTEXT MODIFICATION REQUEST message and is set to the value "delay critical" but the *Maximum Data Burst Volume* IE is not present, the gNB-DU shall report the establishment of the corresponding DRB as failed in the *DRB Failed to Setup List* IE of the of the UE CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

If one or more candidate cells in the *Candidate Cells To Be Cancelled List* IE included in the UE CONTEXT MODIFICATION REQUEST message were not prepared using the same UE-associated signaling connection, the gNB-DU shall ignore those non-associated candidate cells.

In case of "CHO-replace" when the *Target gNB-DU UE F1AP ID* IE is included, if the candidate cell in the *SpCell ID* IE included in the UE CONTEXT MODIFICATION REQUEST message was not prepared using the same UE-associated signalling connection, the gNB-DU shall ignore this candidate cell.

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, or sidelink radio bearer resources or candidate cells in conditional handover or conditional PSCell change. The procedure uses UE-associated signalling.

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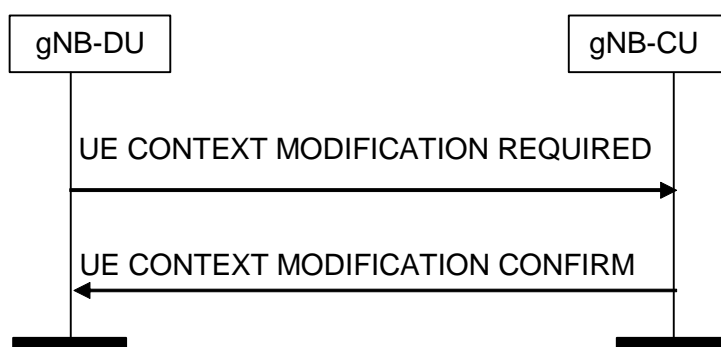
Figure 8.3.5.2-1: UE Context Modification Required procedure. Successful operation

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], and the first *UP TNL Information* IE is still for the primary path.

For a given bearer for which PDCP CA duplication was already configured, if one or two *Additional PDCP Duplication UP TNL Information* IEs are included in the UE CONTEXT MODIFICATION REQUIRED message for a DRB, the gNB-CU shall, if supported, include one or two *Additional PDCP Duplication UP TNL Information* IEs in the UE CONTEXT MODIFICATION CONFIRM message. The gNB-CU and gNB-DU use the *Additional PDCP Duplication 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], TS 38.423 [28].

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 *Ignore PRACH Configuration* IE is present and set to "true" the *E-UTRA PRACH Configuration* IE in the UE CONTEXT MODIFICATION CONFIRM message shall be ignored.

For NGEN-DC or NE-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 MR-DC Resource Coordination Information as defined in TS 38.423 [28], 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 MR-DC Resource Coordination Information at the gNB as described in TS 38.423 [28].

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.

If the *Candidate Cells To Be Cancelled List* IE is included in the UE CONTEXT MODIFICATION REQUIRED message, the gNB-CU shall consider that only the resources reserved for the candidate cells identified by the included NR CGIs and associated to the UE-associated signaling identified by the *gNB-CU UE F1AP ID* IE and the *gNB-CU UE F1AP ID* IE are about to be released by the gNB-DU.

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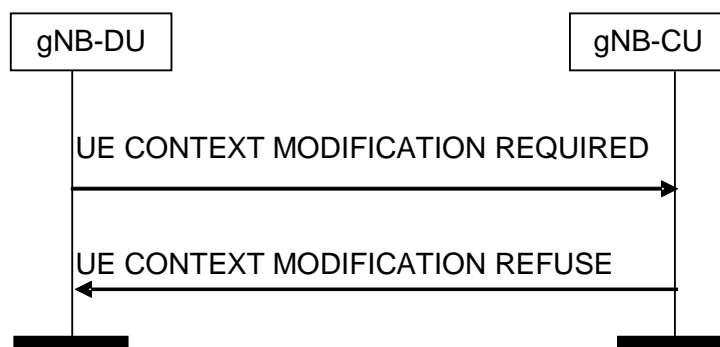
Figure 8.3.5.2A-1: UE Context Modification Required procedure. Unsuccessful operation.

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

If one or more candidate cells in the *Candidate Cells To Be Cancelled List* IE included in the UE CONTEXT MODIFICATION REQUIRED message were not prepared using the same UE-associated signaling connection, the gNB-CU shall ignore those non-associated candidate cells.

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
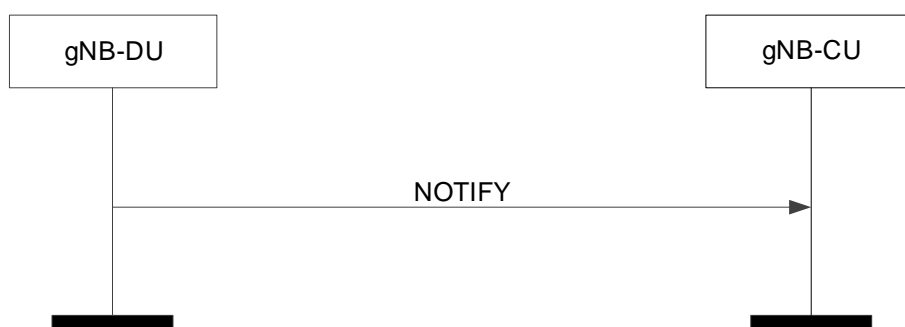
Figure 8.3.7.2-1: Notify procedure. Successful operation.

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. The gNB-DU may also indicate an alternative QoS parameter set which it can currently fulfil in the *Current QoS Parameters Set Index* IE.

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.

8.3.8   Access Success

8.3.8.1   General

The purpose of the Access Success procedure is to enable the gNB-DU to inform the gNB-CU of which cell the UE has successfully accessed during conditional handover or conditional PSCell change. The procedure uses UE-associated signalling.

8.3.8.2   Successful Operation

Figure 8.3.8.2-1: Access Success procedure. Successful operation.

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

Upon reception of the ACCESS SUCCESS message, the gNB-CU shall consider that the UE successfully accessed the cell indicated by the included *NR CGI* IE in this gNB-DU and consider all the other CHO preparations or conditional PSCell change preparations accepted for this UE under the same UE-associated signaling connection in this gNB-DU as cancelled.

Interaction with other procedure:

The gNB-CU may initiate UE Context Release procedure toward the other signalling connections or other candidate gNB-DUs for this UE, if any.

8.3.8.3   Abnormal Conditions

If the ACCESS SUCCESS message refers to a context that does not exist, the gNB-CU shall ignore the message.

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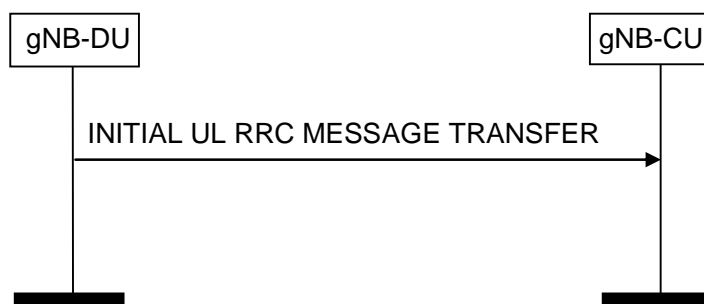
Figure 8.4.1.2-1: Initial UL RRC Message Transfer procedure.

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]. 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.

If the *RRC-Container-RRCSetupComplete* IE is included in the INITIAL UL RRC MESSAGE TRANSFER, the gNB-CU shall take it into account as specified in TS 38.401 [4].

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. If the *Additional RRM Policy Index* 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.

If the *UE Context not retrievable* IE set to "true" is included in the DL RRC MESSAGE TRANSFER, the DL RRC MESSAGE TRANSFER may contain the *Redirected RRC message* IE and use it as specified in TS 38.401 [4].

If the *UE Context not retrievable* IE set to "true" is included in the DL RRC MESSAGE TRANSFER, the DL RRC MESSAGE TRANSFER may contain the *PLMN Assistance Info for Network Sharing* IE, if available at the gNB-CU and may use it as specified in TS 38.401 [4].

If the DL RRC MESSAGE TRANSFER message contains the *New gNB-CU UE F1AP ID* IE, the gNB-DU shall, if supported, replace the value received in the *gNB-CU UE F1AP ID* IE by the value of the *New gNB-CU UE F1AP ID* and use it for further signalling.

Interactions with UE Context Release Request procedure:

If the *UE Context not retrievable* IE set to "true" is included in the DL RRC MESSAGE TRANSFER, the gNB-DU may trigger the UE Context Release Request procedure, as specified in TS 38.401 [4].

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.

If the *Selected PLMN ID* IE is contained in the UL RRC MESSAGE TRANSFER message, the gNB-CU may use it as specified in TS 38.401 [4].

If the UL RRC MESSAGE TRANSFER message contains the *New gNB-DU UE F1AP ID* IE, the gNB-CU shall, if supported, replace the value received in the *gNB-DU UE F1AP ID* IE by the value of the *New gNB-DU UE F1AP ID* and use it for further signalling.

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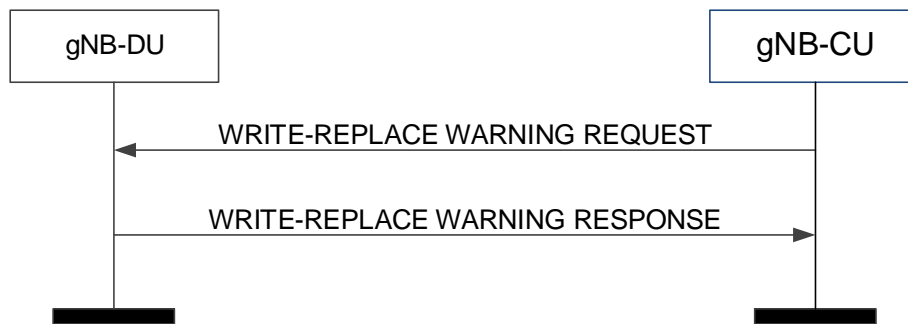
Figure 8.5.1.2-1: Write-Replace Warning procedure: successful operation

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.

If the *Notification Information* IE is included in the *PWS System Information* IE in the WRITE-REPLACE WARNING REQUEST message, the gNB-DU shall use this information to avoid that duplications trigger new broadcast or replace existing broadcast.

If the gNB-DU receives a WRITE-REPLACE WARNING REQUEST message with the *Notification Information* IE in the *PWS System Information* IE which are different from those of ongoing broadcast warning messages, and if the *SIB Type* IE is set to "8", the gNB-DU shall broadcast the received warning message concurrently with other ongoing messages.

If the gNB-DU receives a WRITE-REPLACE WARNING REQUEST message with the *Notification Information* IE in the *PWS System Information* IE which are different from those of ongoing broadcast warning messages, and if the *SIB Type* IE is set to the value other than '8' , the gNB-DU shall use the newly received one to replace the ongoing broadcast warning message with the same value of *SIB Type* IE.

If the *SIB Type* IE in the *PWS System Information* IE in the WRITE-REPLACE WARNING REQUEST message is set to "8" and if a value "0" is received in the *Number of Broadcast Requested* IE and if the *Repetition Period* IE is different from "0", the gNB-DU shall broadcast the received warning message indefinitely.

If *Additional SIB Message List* IE is included in *PWS System Information* IE, the gNB-DU shall store all SIB message(s) in *PWS System Information* IE, and consider that the first segment of public warning message is included in *SIB message* IE, and the remaining segments are listed in *Additional SIB Message List* IE in segmentation sequence order.

8.5.1.3 Unsuccessful Operation

Not applicable.

8.5.1.4 Abnormal Conditions

If the gNB-DU receives a PWS CANCEL REQUEST message which contains neither the *Cancel-all Warning Messages Indicator* IE nor the *Notification Information* IE, the gNB-DU shall consider it as a logical error.

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
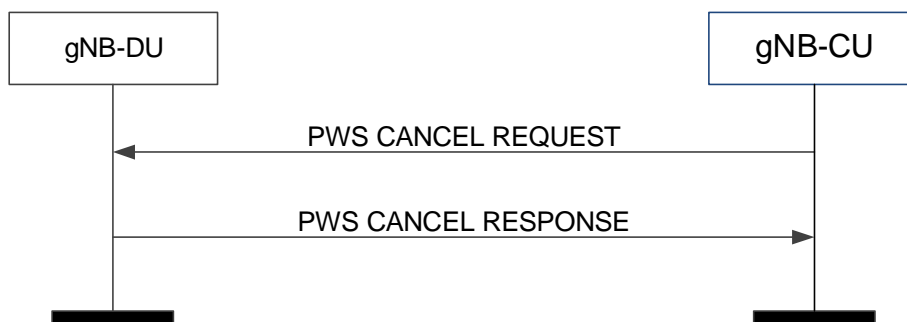
Figure 8.5.2.2-1: PWS Cancel procedure: successful operation

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.

If the *Cancel-All Warning Messages Indicator* IE is present in the PWS CANCEL REQUEST message, then the gNB-DU shall stop broadcasting and discard all warning messages for the area as indicated in the *Cell Broadcast To Be Cancelled List* IE or in all the cells of the gNB-DU if the *Cell Broadcast To Be Cancelled List* IE is not included. The gNB-DU shall acknowledge the PWS CANCEL REQUEST message by sending the PWS CANCEL RESPONSE message, and shall, if there is area to report where an ongoing broadcast was stopped successfully, include the *Cell Broadcast Cancelled List* IE with the *Number of Broadcasts* IE set to 0.

If the *Cell Broadcast To Be Cancelled List* IE is not included in the PWS CANCEL REQUEST message, the gNB-DU shall stop broadcasting and discard the warning message identified by the *Message Identifier* IE and the *Serial Number* IE in the *Notification Information* IE in all of the cells in the gNB-DU.

If the *Notification Information* IE is included in the PWS CANCEL REQUEST, the gNB-DU shall cancel broadcast of the public warning message identified by the *Notification Information* IE.

If an area included in the *Cell Broadcast To Be Cancelled List* IE in the PWS CANCEL REQUEST message does not appear in the *Cell Broadcast Cancelled List* IE in the PWS CANCEL RESPONSE, the gNB-CU shall consider that the gNB-DU had no ongoing broadcast to stop for the public warning message identified, if present, by the *Notification Information* IE in that area.

If the *Cell Broadcast Cancelled List* IE is not included in the PWS CANCEL RESPONSE message, the gNB-CU shall consider that the gNB-DU had no ongoing broadcast to stop for the public warning message identified, if present, by the *Notification Information* IE.

8.5.2.3 Unsuccessful Operation

Not applicable.

8.5.2.4 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
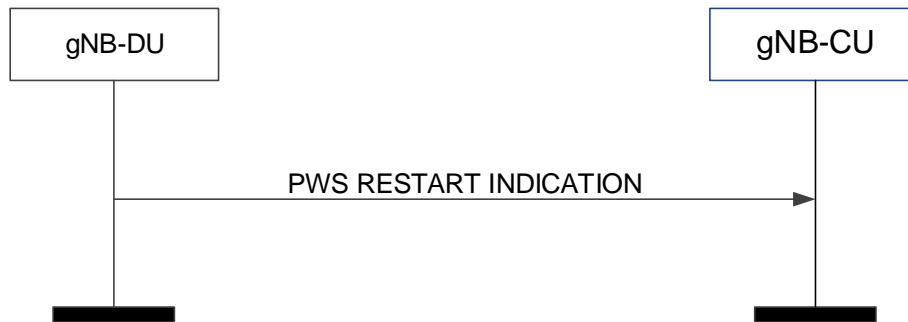
Figure 8.5.3.2-1: PWS restart indication

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
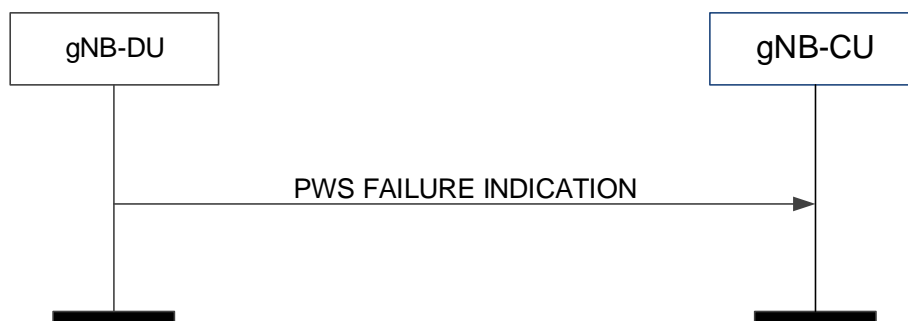
Figure 8.5.4.2-1: PWS failure indication

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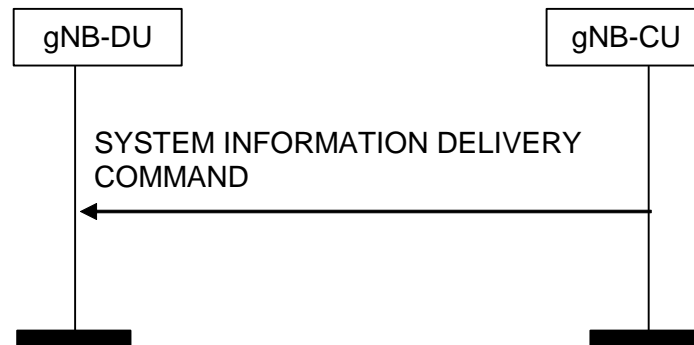
Figure 8.6.1.2-1: System Information Delivery procedure. Successful operation.

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
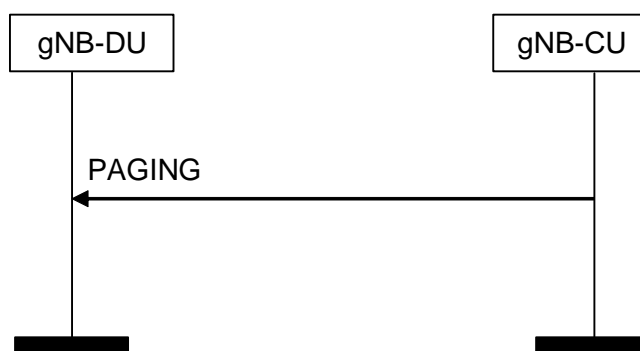
Figure 8.7.1.2-1: Paging procedure. Successful operation.

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.

8.8   Trace Procedures

8.8.1   Trace Start

8.8.1.1   General

The purpose of the Trace Start procedure is to allow the gNB-CU to request the gNB-DU to initiate a trace session for a UE. The procedure uses UE-associated signalling.

8.8.1.2   Successful Operation
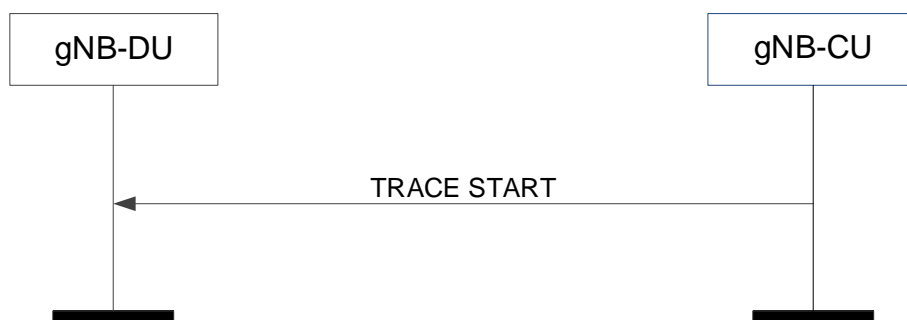
Figure 8.8.1.2-1: Trace start procedure: Successful Operation.

Upon reception of the TRACE START message, the gNB-DU shall initiate the requested trace session for the requested UE, as described in TS 32.422 [29]. In particular, the gNB-DU shall, if supported:

- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT and Trace" initiate the requested trace session and MDT session as described in TS 32.422 [29];

- if the *Trace Activation* IE includes the *MDT Activation* IE set to "Immediate MDT Only" initiate the requested MDT session as described in TS 32.422 [29] and the gNB-DU shall ignore *Interfaces To Trace* IE, and *Trace Depth* IE;

8.8.1.3 Abnormal Conditions

Void.

8.8.2 Deactivate Trace

8.8.2.1 General

The purpose of the Deactivate Trace procedure is to allow the gNB-CU to request the gNB-DU to stop the trace session for the indicated trace reference. The procedure uses UE-associated signalling.

8.8.2.2 Successful Operation

Figure 8.8.2.2-1: Deactivate trace procedure: Successful Operation

Upon reception of the DEACTIVATE TRACE message, the gNB-DU shall stop the trace session for the indicated trace reference contained in the *Trace ID* IE, as described in TS 32.422 [29].

8.8.2.3 Abnormal Conditions

Void.

8.8.3 Cell Traffic Trace

8.8.3.1 General

The purpose of the Cell Traffic Trace procedure is to send the allocated Trace Recording Session Reference and the Trace Reference to the gNB-CU. The procedure uses UE-associated signalling.

8.8.3.2 Successful Operation
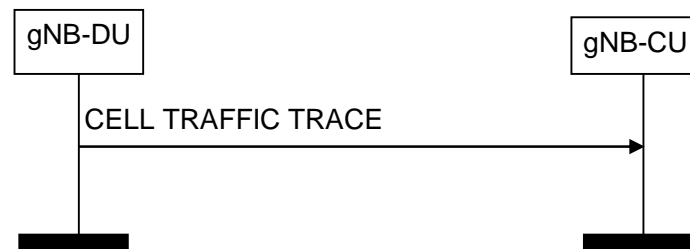
Figure 8.8.3.2-1: Cell Traffic Trace procedure. Successful operation.

The procedure is initiated with a CELL TRAFFIC TRACE message sent from the gNB-DU to the gNB-CU.

If the *Privacy Indicator* IE is included in the message, the gNB-CU shall store the information so that it can be transferred towards the AMF.

8.8.3.3 Abnormal Conditions

Void.

8.9 Radio Information Transfer procedures

8.9.1 DU-CU Radio Information Transfer

8.9.1.1 General

The purpose of the DU-CU Radio Information Transfer procedure is to transfer radio-related information from the gNB-DU to the gNB-CU. The procedure uses non-UE-associated signalling.

8.9.1.2 Successful operation

Figure 8.9.1.2-1: DU-CU Radio Information Transfer procedure.

The gNB-DU initiates the procedure by sending the DU-CU RADIO INFORMATION TRANSFER message to the gNB-CU.

The gNB-CU considers that the *RIM-RS Detection Status* IE indicates the RIM-RS detection status of the cell identified by *Aggressor Cell ID* IE.

8.9.1.3 Abnormal Conditions

Not applicable.

8.9.2 CU-DU Radio Information Transfer

8.9.2.1 General

The purpose of the CU-DU Radio Information Transfer procedure is to transfer radio-related information from the gNB-CU to the gNB-DU. The procedure uses non-UE-associated signalling.

8.9.2.2 Successful operation

Figure 8.9.2.2-1: CU-DU Radio Information Transfer procedure.

The gNB-CU initiates the procedure by sending the CU-DU RADIO INFORMATION TRANSFER message to the gNB-DU. The gNB-DU considers that the *RIM-RS Detection Status* IE indicates the detection status of RIM-RS associated with *Victim gNB Set ID* IE.

8.9.2.3 Abnormal Conditions

Not applicable.

8.10 IAB Procedures

8.10.0 General

In this version of the specification, the IAB procedures are used to configure IAB-donor-DU or IAB-DU.

NOTE: The IAB procedures are applicable for IAB-nodes and IAB-donor-DU, where the term "gNB-DU" applies to IAB-DU and IAB-donor-DU, and the term "gNB-CU" applies to IAB-donor-CU, unless otherwise specified.

8.10.1 BAP Mapping Configuration

8.10.1.1 General

The BAP Mapping Configuration Procedure is initiated by the gNB-CU in order to configure the DL/UL routing information and/or traffic mapping information needed for the gNB-DU. The procedure uses non-UE associated signalling.

NOTE: Implementation shall ensure the avoidance of potential race conditions, i.e. it shall ensure that conflicting traffic mapping configurations are not concurrently performed using the non-UE-associated BAP Mapping Configuration procedure and the UE-associated UE Context Management procedures.

8.10.1.2 Successful Operation
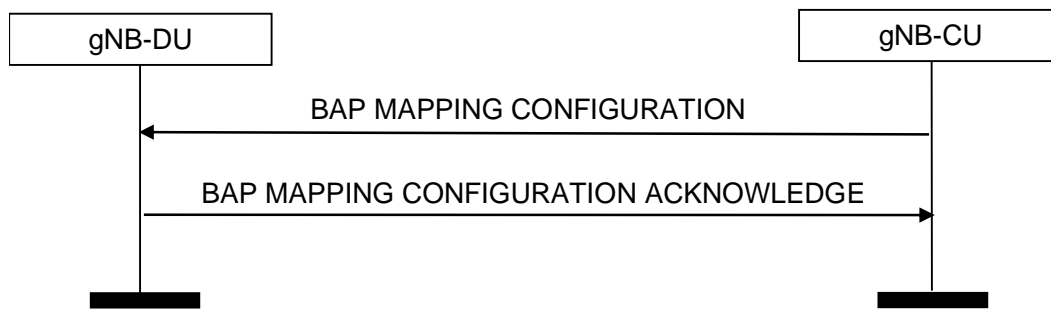
Figure 8.10.1.2-1: BAP Mapping Configuration procedure: Successful Operation

The gNB-CU initiates the procedure by sending BAP MAPPING CONFIGURATION message to the gNB-DU. The gNB-DU replies to the gNB-CU with BAP MAPPING CONFIGURATION ACKNOWLEDGE.

If *BH Routing Information Added List* IE is included in the BAP MAPPING CONFIGURATION message, the gNB-DU shall, if supported, store the BH routing information from this IE and use it for DL/UL traffic forwarding. If *BH Routing Information Added List* IE contains information for an existing BAP Routing ID, the gNB-DU shall, if supported, replace the previously stored routing information for this BAP Routing ID with the corresponding information in the *BH Routing Information Added List* IE.

If *BH Routing Information Removed List* IE is included in the BAP MAPPING CONFIGURATION message, the gNB-DU shall, if supported, remove the BH routing information according to such IE.

If the *Traffic Mapping Information* IE is included in the BAP MAPPING CONFIGURATION message, the gNB-DU shall, if supported, process the *Traffic Mapping Information* IE as follows:

- if the *IP to layer2 Traffic Mapping Info* IE is included, the gNB-DU shall store the mapping information contained in the *IP to layer2 Mapping Info To Add* IE, if present, and remove the previously stored mapping information as indicated by the *IP to layer2 Mapping Info To Remove* IE, if present. The gNB-DU shall use the mapping information stored for the mapping of IP traffic to layer 2, as specified in TS 38.340 [30].

- if the *BAP layer BH RLC channel Mapping Info* IE is included, the gNB-DU shall store the mapping information contained in the *BAP layer BH RLC channel Mapping Info To Add* IE, if present, and remove the previously stored mapping information as indicated by the *BAP layer BH RLC channel Mapping Info To Remove* IE, if present. The gNB-DU shall use the mapping information stored when forwarding traffic on BAP-layer, as specified in TS 38.340 [30].

8.10.1.3   Abnormal Conditions

Not applicable.

8.10.2   gNB-DU Resource Configuration

8.10.2.1   General

The gNB-DU Resource Configuration procedure is initiated by the gNB-CU in order to configure the resource usage for a gNB-DU. The procedure uses non-UE associated signalling.

In this version of the specification, this procedure is used to configure IAB resources.

8.10.2.2 Successful Operation
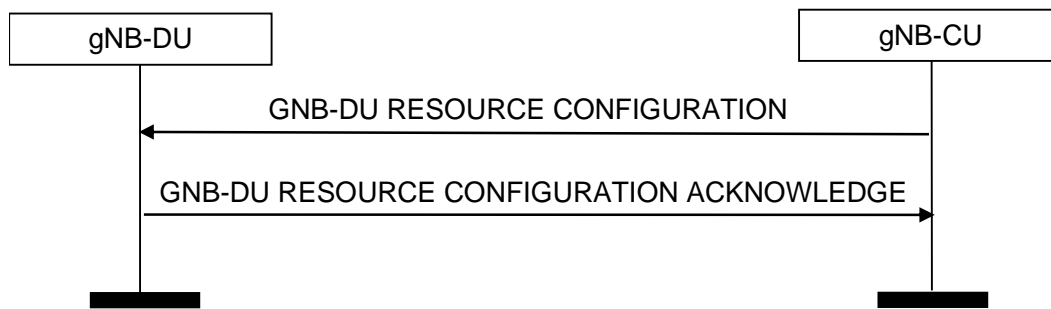
Figure 8.10.2.2-1: gNB-DU Resource Configuration procedure: Successful Operation

The gNB-CU initiates the procedure by sending the GNB-DU RESOURCE CONFIGURATION message to gNB-DU. The gNB-DU replies to the gNB-CU with the GNB-DU RESOURCE CONFIGURATION ACKNOWLEDGE message.

For each cell in the *Activated Cells to Be Updated List* IE of the GNB-DU RESOURCE CONFIGURATION message, the gNB-DU shall store the resource configuration contained in the *IAB-DU Cell Resource Configuration* IE and use it when performing scheduling in compliance with TS 38.213 [31].

If the *Child-Node List* IE is included in the GNB-DU RESOURCE CONFIGURATION message, the gNB-DU shall store the information therein for the child node(s) indicated by the *gNB-CU UE F1AP ID* IE and *gNB-DU UE F1AP ID* IE, in the cells(s) indicated by the *NR CGI* IE in the *Child-Node Cells List* IE.

If the *Child-Node List* IE is included in the GNB-DU RESOURCE CONFIGURATION message, for each child-node and for each cell served by this child node indicated in the *Child-Node Cells List* IE, the gNB-DU shall store the received information and use this information for scheduling, in compliance with TS 38.213 [31], clause 11.

8.10.2.3 Abnormal Conditions

Not applicable.

8.10.3 IAB TNL Address Allocation

8.10.3.1 General

The purpose of the IAB TNL Address Allocation procedure is to allocate TNL addresses to be used by the IAB-node(s).

NOTE: This procedure is applicable for IAB-donor-DU, where the term "gNB-DU" applies to IAB-donor-DU, and the term "gNB-CU" applies to IAB-donor-CU.

8.10.3.2 Successful Operation
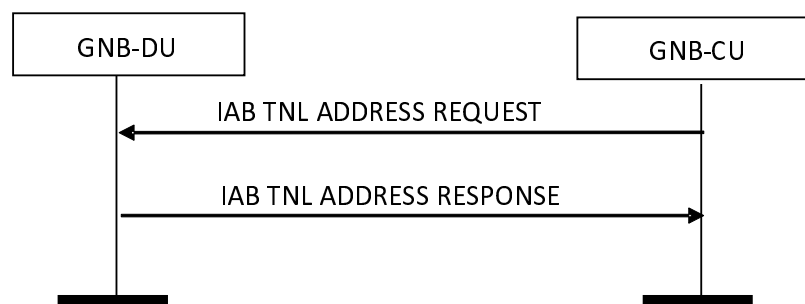
Figure 8.10.3.2-1: IAB TNL Address Allocation procedure: Successful Operation

The gNB-CU initiates the procedure by sending the IAB TNL ADDRESS REQUEST message to the gNB-DU.

If the IAB TNL ADDRESS REQUEST message contains the *IAB IPv4 Addresses Requested* IE, the gNB-DU shall allocate the individual TNL address(es) accordingly and include these IPv4 address(es) in the IAB TNL ADDRESS RESPONSE message.

If the IAB TNL ADDRESS REQUEST message contains the *IAB IPv6 Request Type* IE, the gNB-DU shall allocate the individual IPv6 address(es) or IPv6 address prefix(es) accordingly and include these IPv6 address(es) or IPv6 address prefix(es) in the IAB TNL ADDRESS RESPONSE message.

If the IAB TNL ADDRESS REQUEST message contains the *IAB TNL Addresses to Remove List* IE, the gNB-DU shall consider that the TNL address(es) and/or TNL address prefix(es) therein are no longer used by the IAB-node(s).

If the IAB TNL ADDRESS RESPONSE message contains the *IAB TNL Address Usage IE* in the *IAB Allocated TNL Address List Item* IE, the gNB-CU shall consider the indicated TNL address usage when allocating a TNL addressto an IAB-node. Otherwise, the gNB-CU shall consider that the TNL address can be used for all traffic when allocating the TNL address to an IAB-node.

8.10.3.3 Abnormal Conditions

Not applicable.

8.10.4 IAB UP Configuration Update

8.10.4.1 General

The purpose of the IAB UP Configuration Update procedure is to update the UP parameters including UL mapping configuration and the UL/DL UP TNL information between IAB-donor-CU and IAB-node. This procedure uses non-UE associated signalling.

NOTE: This procedure is applicable for IAB-nodes, where the term "gNB-DU" applies to IAB-DU, and the term "gNB-CU" applies to IAB-donor-CU.

NOTE: Implementation shall ensure the avoidance of potential race conditions, i.e. it shall ensure that the update of UP configuration (e.g. the UL/DL UP TNL information, UL mapping information) is not concurrently performed using the non-UE-associated IAB UP Configuration Update procedure and the UE-associated procedures for UE Context Management.

8.10.4.2 Successful Operation
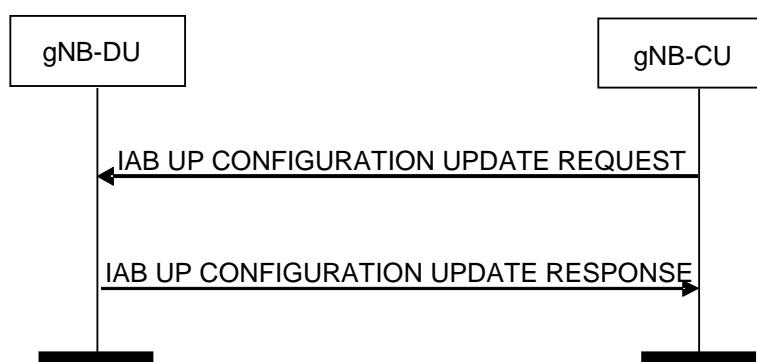
Figure 8.10.4.2-1: IAB UP Configuration Update procedure: Successful Operation

The gNB-CU initiates the procedure by sending the IAB UP CONFIGURATION UPDATE REQUEST message to the gNB-DU. The gNB-DU replies to the gNB-CU with the IAB UP CONFIGURATION UPDATE RESPONSE message.

If the *UL UP TNL Information to Update List* IE is included in the IAB UP CONFIGURATION UPDATE REQUEST message, the gNB-DU shall perform the mapping according to the new received *BH Information* IE for each F1-U GTP tunnel indicated by the *UL UP TNL Information* IE. If the *New UL UP TNL Information* IE is included in *UL UP TNL Information to Update List* IE, the gNB-DU shall use it to replace the information of UL F1-U GTP tunnel indicated by the *UL UP TNL Information* IE.

If the *UL UP TNL Address to Update List* IE is included in the IAB UP CONFIGURATION UPDATE REQUEST message, the gNB-DU shall replace the old TNL address with the new TNL address for all the maintained UL F1-U GTP tunnels corresponding to the old TNL address.

If the *DL UP TNL Address to Update List* IE is included in the IAB UP CONFIGURATION UPDATE RESPONSE message, the gNB-CU shall replace the old TNL address with the new TNL address for all the maintained DL F1-U GTP tunnels corresponding to the old TNL address.

8.10.4.3 Unsuccessful Operation
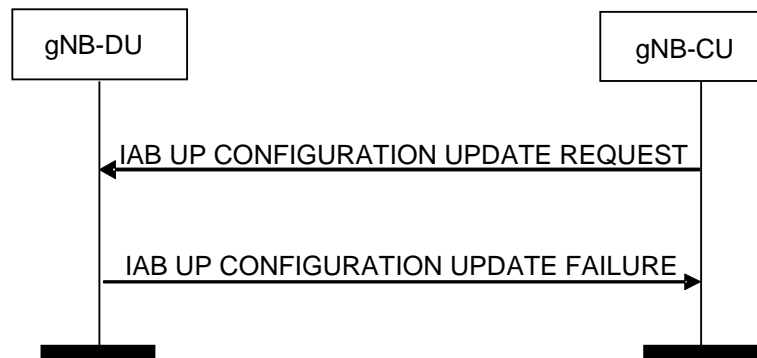
Figure 8.10.4.3-1: IAB UP Configuration Update procedure: Unsuccessful Operation

If the gNB-DU receives an IAB UP CONFIGURATION UPDATE REQUEST message and cannot perform any update accordingly, it shall consider the update procedure as failed and respond with an IAB UP CONFIGURATION UPDATE FAILURE message and an appropriate cause value.

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

8.10.4.4 Abnormal Conditions

Not applicable.

8.11 Self Optimisation Support procedures

8.11.1 Access and Mobility Indication

8.11.1.1 General

This procedure is initiated by gNB-CU to send the Access and Mobility related Information to gNB-DU.

The procedure uses non-UE-associated signalling.

8.11.1.2 Successful Operation
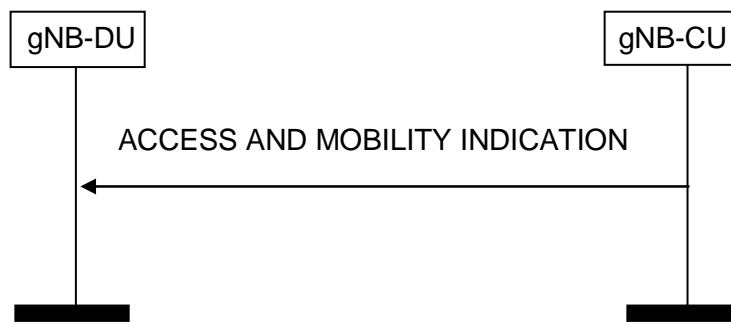
Figure 8.11.1.2-1: Access and Mobility Indication procedure. Successful operation

The Access and Mobility Indication procedure is initiated by ACCESS AND MOBILITY INDICATION message sent from gNB-CU to gNB-DU.

If the ACCESS AND MOBILITY INDICATION message contains the *RACH Report Information List* IE the gNB-DU shall take it into account for optimisation of RACH access procedures.

If the ACCESS AND MOBILITY INDICATION message contains the *RLF Report Information List* IE the gNB-DU shall take it into account for optimisation of mobility parameters.

8.11.1.3 Abnormal Conditions

Not applicable.

8.12 Reference Time Information Reporting procedures

8.12.1 Reference Time Information Reporting Control

8.12.1.1 General

The purpose of the Reference Time Information Reporting Control procedure is to command the gNB-DU to send the requested accurate reference time information to the gNB-CU. The procedure uses non-UE associated signalling.

8.12.1.2 Successful Operation
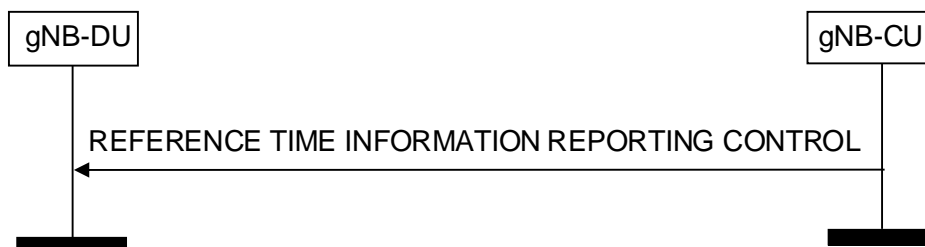
Figure 8.12.1.2-1: Reference Time Information Reporting Control

The gNB-CU initiates the procedure by sending REFERENCE TIME INFORMATION REPORTING CONTROL message to the gNB-DU. Upon reception of the REFERENCE TIME INFORMATION REPORTING CONTROL message, the gNB-DU shall, if supported, perform the requested reference time information reporting action.

The *Report Type* IE indicates to the gNB-DU whether:

- to report on demand;

- to report periodic, with a frequency as specified by the *Report Periodicity* IE;

- to stop periodic reporting.

8.12.1.3 Abnormal Conditions

Not applicable.

8.12.2 Reference Time Information Report

8.12.2.1 General

The purpose of the Reference Time Information Report procedure is to report the accurate reference time information from the gNB-DU to the gNB-CU. The procedure uses non-UE associated signalling.

8.12.2.2 Successful Operation
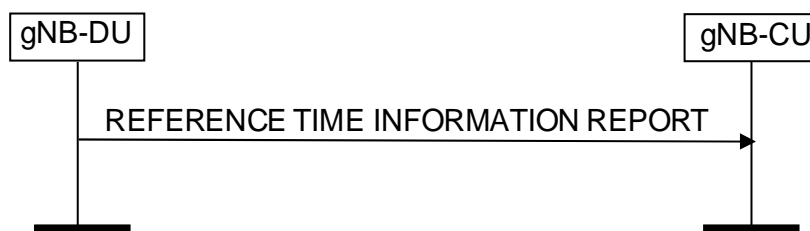
Figure 8.12.2-2-1: Reference Time Information Report

The gNB-DU initiates the procedure by sending a REFERENCE TIME INFORMATION REPORT message to the gNB-CU. The REFERENCE TIME INFORMATION REPORT message may be used as a response to the REFERENCE TIME INFORMATION REPORTING CONTROL message.

8.12.2.3 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 is 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 associated to an F1-C interface instance.

NOTE: If a TNL association is shared among several F1-C interface instances, several F1 Setup procedures are issued via the same TNL association after that TNL association has become operational.

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
gNB-DU ID	M		9.3.1.9		YES	reject
gNB-DU Name	O		PrintableString(SIZE(1..150,...))		YES	ignore
gNB-DU Served Cells List		*0.. 1*		List of cells configured in the gNB-DU	YES	reject
>gNB-DU Served Cells Item		*1.. <maxCellingNBDU>*			EACH	reject
>>Served Cell Information	M		9.3.1.10	Information about the cells configured in the gNB-DU	-	
>>gNB-DU System Information	O		9.3.1.18	RRC container with system information owned by gNB-DU	-	
gNB-DU RRC version	M		RRC version 9.3.1.70		YES	reject
Transport Layer Address Info	O		9.3.2.5		YES	ignore
BAP Address	O		9.3.1.111	Indicates a BAP address assigned to the IAB-node.	YES	ignore

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 associated to an F1-C interface instance.

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
>>IAB Info IAB-donor-CU	O		9.3.1.105	IAB-related configuration sent by the IAB-donor-CU.	YES	ignore
>>Available SNPN ID List	O		9.3.1.163	Indicates the available SNPN ID list. If this IE is included, the content of the *Available PLMN List* IE and *Extended Available PLMN List* IE if present in the *Cells to be Activated List Item* IE is ignored.	YES	ignore
gNB-CU RRC version	M		RRC version 9.3.1.70		YES	reject
Transport Layer Address Info	O		9.3.2.5		YES	ignore
Uplink BH Non-UP Traffic Mapping	O		9.3.1.103		YES	reject
BAP Address	O		9.3.1.111	Indicates a BAP address assigned to the IAB-donor-DU.	YES	ignore

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 associated to an F1-C interface instance.

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

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
Served Cells To Add List		*0..1*		Complete list of added cells served by the gNB-DU	YES	reject
>Served Cells To Add Item		*1 .. <maxCellingNBDU>*			EACH	reject
>>Served Cell Information	M		9.3.1.10	Information about the cells configured in the gNB-DU	-	
>>gNB-DU System Information	O		9.3.1.18	RRC container with system information owned by gNB-DU	-	
Served Cells To Modify List		*0..1*		Complete list of modified cells served by the gNB-DU	YES	reject
>Served Cells To Modify Item		*1 .. <maxCellingNBDU>*			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.. <maxCellingNBDU>			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 .. <maxCellingNBDU>			EACH	reject
>> NR CGI	M		9.3.1.12		-	
>>Service Status	M		9.3.1.68		-	
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 .. <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
gNB-DU TNL Association To Remove List		0..1			YES	reject
>gNB-DU TNL Association To Remove Item IEs		1..<maxnoofTNLAssociation>			EACH	reject
>>TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-DU.	-	-
>>TNL Association Transport Layer Address gNB-CU	O		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU	-	-
Transport Layer Address Info	O		9.3.2.5		YES	ignore

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.
maxnoofTNLAssociations	Maximum numbers of TNL Associations between the gNB-CU and the gNB-DU. Value is 32.

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 associated to an F1-C interface instance.

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

Direction: gNB-CU → gNB-DU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
Cells to be Activated List		*0.. 1*		List of cells to be activated	YES	reject
>Cells to be Activated List Item		*1.. <maxCellingNBDU>*			EACH	reject
>> NR CGI	M		9.3.1.12		-	
>> NR PCI	O		INTEGER (0..1007)	Physical Cell ID	-	
>> gNB-CU System Information	O		9.3.1.42	RRC container with system information owned by gNB-CU	YES	reject
>>Available PLMN List	O		9.3.1.65		YES	ignore
>>Extended Available PLMN List	O		9.3.1.76	This is included if *Available PLMN List* IE is included and if more than 6 Available PLMNs is to be signalled.	YES	ignore
>>IAB Info IAB-donor-CU	O		9.3.1.105	IAB-related configuration sent by the IAB-donor-CU.	YES	ignore
>>Available SNPN ID List	O		9.3.1.163	Indicates the available SNPN ID list. If this IE is included, the content of the *Available PLMN List* IE and *Extended Available PLMN List* IE if present in the *Cells to be Activated List Item* IE is ignored.	YES	ignore
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		-	-

Transport Layer Address Info	O		9.3.2.5		YES	ignore
Uplink BH Non-UP Traffic Mapping	O		9.3.1.103		YES	reject

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 associated to an F1-C interface instance.

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

Direction: gNB-CU → gNB-DU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
Cells to be Activated List		*0..1*		List of cells to be activated or modified	YES	reject
>Cells to be Activated List Item		*1.. \<maxCellingNBDU\>*			EACH	reject
>> NR CGI	M		9.3.1.12		-	
>> NR PCI	O		INTEGER (0..1007)	Physical Cell ID	-	
>> gNB-CU System Information	O		9.3.1.42	RRC container with system information owned by gNB-CU	YES	reject
>>Available PLMN List	O		9.3.1.65		YES	ignore

>>Extended Available PLMN List	O		9.3.1.76	This is included if *Available PLMN List* IE is included and if more than 6 Available PLMNs is to be signalled.	YES	ignore
>>IAB Info IAB-donor-CU	O		9.3.1.105	IAB-related configuration sent by the IAB-donor-CU.	YES	ignore
>>Available SNPN ID List	O			Indicates the available SNPN ID list. If this IE is included, the content of the *Available PLMN List* IE and *Extended Available PLMN List* IE if present in the *Cells to be Activated List Item* IE is ignored.	YES	ignore
Cells to be Deactivated List		*0..1*		List of cells to be deactivated	YES	reject
>Cells to be Deactivated List Item		*1.. <maxCellingNBD U>*			EACH	reject
>> NR CGI	M		9.3.1.12		-	
gNB-CU TNL Association To Add List		*0..1*			YES	ignore
>gNB-CU TNL Association To Add Item IEs		*1..<maxnoofTNLA ssociations>*			EACH	ignore
>>TNL Association Transport Layer Information	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU.	-	
>>TNL Association Usage	M		ENUMERAT ED (ue, non-ue, both, ...)	Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.472 [22].	-	

gNB-CU TNL Association To Remove List		*0..1*			YES	ignore
>gNB-CU TNL Association To Remove Item IEs		*1..<maxnoofTNLAssociation>*			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU.	-	
>>TNL Association Transport Layer Address gNB-DU	O		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-DU.	YES	reject
gNB-CU TNL Association To Update List		*0..1*			YES	ignore
>gNB-CU TNL Association To Update Item IEs		*1..<maxnoofTNLAssociations>*			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer 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.. <maxCellingNBDU>*			EACH	ignore
>>NR CGI	M		9.3.1.12		-	
>>Cell Barred	M		ENUMERATED (barred, not-barred, ...)		-	
>>IAB Barred	O		ENUMERATED (barred, not-barred, ...)		-	
Protected E-UTRA Resources List		*0..1*		List of Protected E-UTRA Resources.	YES	reject
>Protected E-UTRA Resources List Item		*1.. <maxCellineNB>*			EACH	reject

>>Spectrum Sharing Group ID	M		INTEGER (1.. maxCellineN B)	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		-	
Neighbour Cell Information List		*0..1*			YES	ignore
>Neighbour Cell Information List Item		*1 .. <maxCellingNBD U>*			EACH	ignore
>>NR CGI	M		9.3.1.12		-	
>>Intended TDD DL-UL Configuration	O		9.3.1.89		-	
Transport Layer Address Info	O		9.3.2.5		YES	ignore
Uplink BH Non-UP Traffic Mapping	O		9.3.1.103		YES	reject

Range bound	Explanation
maxCellingNBDU	Maximum nunmerbs of cells that can be served by a gNB-DU. Value is 512.
maxnoofTNLAssociations	Maximum numbers of TNL Associations between the gNB-CU and the gNB-DU. Value is 32.
maxCellineNB	Maximum no. cells that can be served by an eNB. Value is 256.

9.2.1.11 GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE

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

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

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
Cells Failed to be Activated List		*0..1*		List of cells which are failed to be activated	YES	reject
>Cells Failed to be Activated Item		*1.. <maxCellingNBDU>*			EACH	reject
>> NR CGI	M		9.3.1.12		-	
>>Cause	M		9.3.1.2		-	
Criticality Diagnostics	O		9.3.1.3		YES	ignore
gNB-CU TNL Association Setup List		0..1			YES	ignore
>gNB-CU TNL Association Setup Item IEs		1..<maxnoofTNLAssociations>			EACH	ignore
>>TNL Association Transport Layer Address	M		CP Transport Layer 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		-	-
Transport Layer Address Info	O		9.3.2.5		YES	ignore

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

9.2.1.16 F1 REMOVAL REQUEST

This message is sent by either the gNB-DU or the gNB-CU to intiate the removal of the interface instance and the related resources.

Direction: gNB-DU → gNB-CU, 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

9.2.1.17 F1 REMOVAL RESPONSE

This message is sent by either the gNB-DU or the gNB-CU to acknowledge the initiation of removal of the interface instance and the related resources.

Direction: gNB-CU → gNB-DU, 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
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.18 F1 REMOVAL FAILURE

This message is sent by either the gNB-DU or the gNB-CU to indicate that removing the interface instance and the related resources cannot be accepted.

Direction: gNB-CU → gNB-DU, gNB-DU → gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.2.3.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.19 NETWORK ACCESS RATE REDUCTION

This message is sent by the gNB-CU to indicate to the gNB-DU a need to reduce the rate at which UEs access the network.

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
UAC Assistance Information	M		9.3.1.83		YES	reject

9.2.1.20   RESOURCE STATUS REQUEST

This message is sent by gNB-CU to gNB-DU to initiate the requested measurement according to the parameters given in the 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
gNB-CU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU	YES	reject
gNB-DU Measurement ID	C-ifRegistrationRequestStoporAdd		INTEGER (1..4095,...)	Allocated by gNB-DU	YES	ignore
Registration Request	M		ENUMERATED (start, stop, add, …)	Type of request for which the resource status is required.	YES	ignore
Report Characteristics	C-ifRegistrationRequestStart		BIT STRING (SIZE(32))	Each position in the bitmap indicates measurement object the gNB-DU is requested to report. First Bit = PRB Periodic, Second Bit = TNL Capacity Ind Periodic, Third Bit = Composite Available Capacity Periodic, Fourth Bit = HW LoadInd Periodic, Fifth Bit = Number of Active UEs Other bits shall be ignored by the gNB-DU.	YES	ignore
Cell To Report List		*0..1*		Cell ID list to which the request applies.	YES	ignore
>Cell To Report Item		*1 .. \<maxCellingNBDU>*				
>>Cell ID	M		NR CGI 9.3.1.12		-	
>>SSB To Report List		*0..1*		SSB list to which the request applies.	-	
>>>SSB To Report Item		*1 .. < maxnoofSSBAreas>*			-	
>>>>SSB index	M		INTEGER (0..63)			
>>Slice To Report List		*0..1*		S-NSSAI list to which the request applies.	-	
>>>Slice To Report Item		*1..< maxnoofBPLMNsNR >*				
>>>>PLMN Identity	M		9.3.1.14	Broadcast PLMN		
>>>>S-NSSAI List		*1*			-	
>>>>>S-NSSAI Item		*1 .. < maxnoofSliceItems>*			-	
>>>>>>S-NSSAI	M		9.3.1.38		-	

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Reporting Periodicity	O		ENUMERATED (500ms, 1000ms, 2000ms, 5000ms,10000 ms, …)	Periodicity that can be used for reporting of PRB Periodic, TNL Capacity Ind Periodic, Composite Available Capacity Periodic. Also used as the averaging window length for all measurement object if supported.	YES	ignore

Condition	Explanation
ifRegistrationRequestStoporAdd	This IE shall be present if the *Registration Request* IE is set to the value "stop" or "add".
ifRegistrationRequestStart	This IE shall be present if the Registration Request IE is set to the value "start".

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.
maxnoofSSBAreas	Maximum no. SSB Areas that can be served by a NG-RAN node cell. Value is 64.
maxnoofSliceItems	Maximum no. of signalled slice support items. Value is 1024.
maxnoofBPLMNsNR	Maximum no. of PLMN Ids.broadcast in a cell. Value is 12.

9.2.1.21   RESOURCE STATUS RESPONSE

This message is sent by gNB-DU to gNB-CU to indicate that the requested measurement is successfully initiated.

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-CU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU	YES	reject
gNB-DU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-DU	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.22   RESOURCE STATUS FAILURE

This message is sent by gNB-DU to gNB-CU to indicate that for any of the requested measurement objects the measurement cannot be initiated.

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-CU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU	YES	reject
gNB-DU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-DU	YES	ignore
Cause	M		9.3.1.2	Ignored by the receiver when the Complete Failure Cause Information IE is included	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.23   RESOURCE STATUS UPDATE

This message is sent by gNB-DU to gNB-CU to report the results of the requested measurements.

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-CU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU	YES	reject
gNB-DU Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-DU	YES	ignore
Hardware Load Indicator	O		9.3.1.136		YES	ignore
TNL Capacity Indicator	O		9.3.1.128		YES	ignore
Cell Measurement Result		*0..1*			YES	ignore
>Cell Measurement Result Item		*1 .. <maxCellingNBDU>*			-	
>>Cell ID	M		NR CGI 9.3.1.12		-	
>>Radio Resource Status	O		9.3.1.129		-	
>>Composite Available Capacity Group	O		9.3.1.130		-	
>>Slice Available Capacity	O		9.3.1.134		-	
>>Number of Active UEs	O		9.3.1.135		-	

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

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 is 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 .. <maxnoofCandidateSpCells>*			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] for EN-DC case or *MR-DC Resource Coordination Information* IE as defined in TS 38.423 [28] for NGEN-DC and NE-DC cases.	YES	ignore
SCell To Be Setup List		*0..1*			YES	ignore
>SCell to Be Setup Item IEs		*1.. <maxnoofSCells>*			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB	-	
>>SCellIndex	M		INTEGER (1..31)		-	
>>SCell UL Configured	O		Cell UL Configured 9.3.1.33		-	
>>servingCellMO	O		INTEGER (1..64)		YES	ignore
SRB to Be Setup List		*0..1*			YES	reject
>SRB to Be Setup Item IEs		*1 .. <maxnoofSRBs>*			EACH	reject
>>SRB ID	M		9.3.1.7		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>Duplication Indication	O		ENUMERATED (true, ..., false)	If included, it should be set to true. This IE is ignored if the *Additional Duplication Indication* IE is present.	-	
>>Additional Duplication Indication	O		ENUMERATED (three, four, …)		YES	ignore
DRB to Be Setup List		*0..1*			YES	reject
>DRB to Be Setup Item IEs		*1 .. <maxnoofDRBs>*			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>CHOICE QoS Information	M				-	
>>>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
>>>>>TSC Traffic Characteristics	O		9.3.1.141	Traffic pattern information associated with the QFI. Details in TS 23.501 [21].	YES	ignore
>>UL UP TNL Information to be setup List		*1*			-	
>>>UL UP TNL Information to Be Setup Item IEs		*1 .. <maxnoofULUPTNLInformation>*			-	
>>>>UL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	gNB-CU endpoint of the F1 transport bearer. For delivery of UL PDUs.	-	
>>>>BH Information	O		9.3.1.114		-	
>>RLC Mode	M		9.3.1.27		-	
>>UL Configuration	O		UL Configuraiton 9.3.1.31	Information about UL usage in gNB-DU.	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication. This IE is ignored if the *RLC Duplication Information* IE is present.	-	
>> DC Based Duplication Configured	O		ENUMERAT ED (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 basedUL PDCP duplication. This IE is ignored if the *RLC Duplication Information* IE is present.	YES	reject
>>DL PDCP SN length	M		ENUMERAT ED (12bits, 18bits, ...)		YES	ignore
>>UL PDCP SN length	O		ENUMERAT ED (12bits, 18bits, ...)		YES	ignore
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. <maxnoofAd ditionalPDC PDuplication TNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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 Duplication Information	O		9.3.1.146		YES	ignore
Inactivity Monitoring Request	O		ENUMERAT ED (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
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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
RRC Delivery Status Request	O		ENUMERAT ED (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
New gNB-CU UE F1AP ID	O		gNB-CU UE F1AP ID 9.3.1.4		YES	reject
RAN UE ID	O		OCTET STRING (SIZE (8))		YES	ignore
Trace Activation	O		9.3.1.88		YES	ignore
Additional RRM Policy Index	O		9.3.1.90		YES	ignore
BH RLC Channel to be Setup List		*0..1*			YES	reject
>BH RLC Channel to be Setup Item IEs		*1 .. <maxnoofB HRLCChann els>*			EACH	reject
>>BH RLC CH ID	M		9.3.1.113		-	
>>CHOICE *BH QoS Information*	M					
>>>BH RLC CH QoS	M		QoS Flow Level QoS Parameters 9.3.1.45	Shall be used for SA case.		
>>>E-UTRAN BH RLC CH QoS	M		E-UTRAN QoS 9.3.1.19	Shall be used for EN-DC case.		
>>>Control Plane Traffic Type	M		9.3.1.115			
>>RLC Mode	M		9.3.1.27		-	
>>BAP Control PDU Channel	O		ENUMERAT ED (true, …)		-	
>>Traffic Mapping Information	O		9.3.1.95		-	
Configured BAP Address	O		9.3.1.111	The BAP address configured for the corresponding child IAB-node.	YES	reject
NR V2X Services Authorized	O		9.3.1.116		YES	ignore
LTE V2X Services Authorized	O		9.3.1.117		YES	ignore
NR UE Sidelink Aggregate Maximum Bit Rate	O		9.3.1.119	This IE applies only if the UE is authorized for NR V2X services.	YES	ignore
LTE UE Sidelink Aggregate Maximum Bit Rate	O		9.3.1.118	This IE applies only if the UE is authorized for LTE V2X services.	YES	ignore
PC5 Link Aggregated Bit Rate	O		Bit Rate 9.3.1.22	Only applies for non-GBR and unicast QoS Flows.	YES	ignore
SL DRB to Be Setup List		*0..1*			YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>SL DRB to Be Setup Item IEs		*1 .. <maxnoofSL DRBs>*			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	
>>**SL DRB Information**		*1*			YES	ignore
>>>SL DRB QoS	M		PC5 QoS Parameters 9.3.1.122		-	
>>>Flows Mapped to SL DRB Item		*1 .. <maxnoofP C5QoSFlow s>*			-	
>>>>PC5 QoS Flow Identifier			9.3.1.121		-	
>>RLC mode	M		9.3.1.27		-	
Conditional Inter-DU Mobility Information	O				YES	reject
>CHO Trigger	M		ENUMERAT ED (CHO-initiation, CHO-replace, …)		-	-
>Target gNB-DU UE F1AP ID	C-ifCHOmod		9.3.1.5	Allocated at the target gNB-DU	-	-
Management Based MDT PLMN List	O		MDT PLMN List 9.3.1.151		YES	ignore
Serving NID	O		9.3.1.155		YES	reject

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.
maxnoofBHRLCChannels	Maximum no. of BH RLC channels allowed towards one IAB-node, the maximum value is 65536.
maxnoofSLDRBs	Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512.
maxnoofPC5QoSFlows	Maximum no. of PC5 QoS flow allowed towards one UE for NR sidelink communication, the maximum value is 2048.
maxnoofAdditionalPDCPDuplicationTNL	Maximum no. of additional UP TNL Information allowed towards one DRB, the maximum value is 2.

Condition	Explanation
ifDRBSetup	This IE shall be present only if the *DRB to Be Setup List* IE is present.
ifCHOmod	This IE shall be present if the *CHO Trigger* IE is present and set to "CHO-replace".

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 *SgNB Resource Coordination Information* IE as defined in subclause 9.2.117 of TS 36.423 [9] for EN-DC case or *MR-DC Resource Coordination Information* IE as defined in TS 38.423 [28] for NGEN-DC and NE-DC cases.	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 or for the split secondary path for fallback to split bearer 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.	-	
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore

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IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>Additional PDCP Duplication TNL Items		*1 .. <maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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 Response	O		ENUMERATED (not-supported, ...)		YES	reject
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	-	
BH RLC Channel Setup List		*0..1*		The list of BH RLC channels which are successfully established.	YES	ignore
>BH RLC Channel Setup Item		*1 .. <maxnoofBHRLCChannels>*			EACH	ignore
>>BH RLC CH ID	M		9.3.1.113		-	
BH RLC Channel Failed to be Setup List		*0..1*		The list of BH RLC channels whose setup has failed.	YES	ignore
>BH RLC Channel Failed to be Setup Item		*1 .. <maxnoofBHRLCChannels>*			EACH	ignore
>>BH RLC CH ID	M		9.3.1.113		-	
>>Cause	O		9.3.1.2		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
SL DRB Setup List		*0..1*		The List of SL DRBs which are successfully established.	YES	ignore
>SL DRB Setup Item IEs		*1 .. <maxnoofSLDRBs>*			EACH	ignore
>>SL DRB ID	M		9.3.1.120		-	
SL DRB Failed To Setup List		*0..1*			EACH	ignore
>SL DRB Failed To Setup Item IE		*1 .. <maxnoofSLDRBs>*			EACH	ignore
>>SL DRB ID	M		9.3.1.120		-	
>>Cause	O		9.3.1.2		-	
Requested Target Cell ID	O		NR CGI 9.3.1.12	Special Cell indicated in the UE CONTEXT SETUP REQUEST message.	YES	reject

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.
maxnoofBHRLCChannels	Maximum no. of BH RLC channels allowed towards one IAB-node, the maximum value is 65536.
maxnoofSLDRBs	Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512.
maxnoofAdditionalPDCPDuplicationTNL	Maximum no. of additional 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]	-	
Requested Target Cell ID	O		NR CGI 9.3.1.12	Special Cell indicated in the UE CONTEXT SETUP REQUEST message.	YES	reject

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 connection or candidate cells in conditional handover or conditional PSCell change.

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	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
Candidate Cells To Be Cancelled List		*0 .. <maxnoofCellsinCHO>*			YES	reject
>Target Cell ID	M		NR CGI 9.3.1.12		-	-

Range bound	Explanation
maxnoofCellsinCHO	Maximum no. cells that can be prepared for a conditional mobility. Value is 16.

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 or candidate cells in conditional handover or conditional PSCell change.

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 *DL-DCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8] encapsulated in a PDCP PDU, or the *DL-CCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8].	YES	ignore
SRB ID	C-ifRRCContainer		9.3.1.7	The gNB-DU sends 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
Candidate Cells To Be Cancelled List		0 .. <maxnoofCellsinCHO>			YES	reject
>Target Cell ID	M		NR CGI 9.3.1.12		-	-

Range bound	Explanation
maxnoofCellsinCHO	Maximum no. cells that can be prepared for a conditional mobility. Value is 16.

Condition	Explanation
ifRRCContainer	This IE shall be present if the *RRC container* IE is present.

9.2.2.6 UE CONTEXT RELEASE COMPLETE

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

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

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 is 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] for EN-DC case or *MR-DC Resource Coordination Information* IE as defined in TS 38.423 [28] for NGEN-DC and NE-DC cases.	YES	ignore
RRC Reconfiguration Complete Indicator	O		9.3.1.30		YES	ignore
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	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	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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		ENUMERAT ED (true, ..., false)	This IE is ignored if the *Additional Duplication Indication* IE is present.	-	
>>Additional Duplication Indication	O		ENUMERAT ED (three, four, …)		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 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 .. \<maxnoofQ oSFlows>*			-	
>>>>>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
>>>>>TSC Traffic Characteristics	O		9.3.1.141	Traffic pattern information associated with the QFI. Details in TS 23.501 [21].	YES	ignore
>>UL UP TNL Information to be setup List		*1*			-	
>>>UL UP TNL Information to Be Setup Item IEs		*1 .. \<maxnoofUL UPTNLInfor mation>*			-	
>>>>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.	-	
>>>>BH Information	O		9.3.1.114		-	
>>RLC Mode	M		9.3.1.27		-	
>>UL Configuration	O		UL Configuratio n 9.3.1.31	Information about UL usage in gNB-DU.	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication. This IE is ignored if the *RLC Duplication Information* IE is present.	-	
>>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. This IE is ignored if the *RLC Duplication Activation* IE is present.	YES	reject
>>DL PDCP SN length	O		ENUMERATED (12bits, 18bits, ...)		YES	ignore
>>UL PDCP SN length	O		ENUMERATED (12bits, 18bits, ...)		YES	ignore
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. < maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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 Duplication Information	O		9.3.1.146		YES	ignore
DRB to Be Modified List		*0..1*			YES	reject
>DRB to Be Modified Item IEs		*1 .. <maxnoofDRBs>*			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>CHOICE QoS Information	O				-	
>>>E-UTRAN QoS	M		9.3.1.19	Used for EN-DC case to convey E-RAB Level QoS Parameters	-	
>>>DRB Information		*1*		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		-	

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IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>>Flows Mapped to DRB Item		*1 .. <maxnoofQ oSFlows>*			-	
>>>>>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
>>>>>TSC Traffic Characteristic s	O		9.3.1.141	Traffic pattern information associated with the QFI. Details in TS 23.501 [21].	YES	ignore
>> UL UP TNL Information to be setup List		*1*			-	
>>> UL UP TNL Information to Be Setup Item IEs		*1 .. <maxnoofUL UPTNLInfor mation>*			-	
>>>>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.	-	
>>>>BH Information	O		9.3.1.114		-	
>>UL Configuration	O		UL Configuratio n 9.3.1.31	Information about UL usage in gNB-DU.	-	
>>DL PDCP SN length	O		ENUMERAT ED(12bits,18 bits , ...)		YES	ignore
>>UL PDCP SN length	O		ENUMERAT ED (12bits, 18bits, ...)		YES	ignore
>>Bearer Type Change	O		ENUMERAT ED (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. This IE is ignored if the *RLC Duplication Information* IE is present.	YES	reject
>> DC Based Duplication Configured	O		ENUMERAT ED (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. This IE is ignored if the *RLC Duplication Activation* IE is present.	YES	reject
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. <maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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 Duplication Information	O		9.3.1.146		YES	ignore
SRB To Be Released List		*0..1*			YES	reject
>SRB To Be Released Item IEs		*1.. <maxnoofSRBs>*			EACH	reject
>>SRB ID	M		9.3.1.7			
DRB to Be Released List		*0..1*			YES	reject
>DRB to Be Released Item IEs		*1 .. <maxnoofDRBs>*			EACH	reject
>>DRB ID	M		9.3.1.8		-	
Inactivity Monitoring Request	O		ENUMERATED (true, ...)		YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject
DRX configuration indicator	O		ENUMERATED(release,...)		YES	ignore
RLC Failure Indication	O		9.3.1.66		YES	ignore
Uplink TxDirectCurrentList Information	O		9.3.1.67		YES	ignore
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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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
Full Configuration	O		ENUMERATED (full, ...)		YES	reject
Additional RRM Policy Index	O		9.3.1.90		YES	ignore
Lower Layer Presence Status Change	O		9.3.1.94		Yes	ignore
BH RLC Channel to be Setup List		*0..1*			YES	reject
>BH RLC Channel to be Setup Item IEs		*1 .. <maxnoofBHRLCChannels>*			EACH	reject
>>BH RLC CH ID	M		9.3.1.113		-	
>>CHOICE *BH QoS information*	M					
>>>BH RLC CH QoS	M		QoS Flow Level QoS Parameters 9.3.1.45	Shall be used for SA case.		
>>>E-UTRAN BH RLC CH QoS	M		E-UTRAN QoS 9.3.1.19	Shall be used for EN-DC case.		
>>>Control Plane Traffic Type	M		9.3.1.115			
>>RLC Mode	M		9.3.1.27		-	
>>BAP Control PDU Channel	O		ENUMERATED (true, …)		-	
>>Traffic Mapping Information	O		9.3.1.95		-	
BH RLC Channel to be Modified List		*0..1*			YES	reject
>BH RLC Channel to be Modified Item IEs		*1 .. <maxnoofBHRLCChannels>*			EACH	reject
>>BH RLC CH ID	M		9.3.1.113		-	
>>CHOICE *BH QoS information*	O					
>>>BH RLC CH QoS	M		QoS Flow Level QoS Parameters 9.3.1.45	Shall be used for SA case.		
>>>E-UTRAN BH RLC CH QoS	M		E-UTRAN QoS 9.3.1.19	Shall be used for EN-DC case.		
>>>Control Plane Traffic Type	M		9.3.1.115			
>>RLC Mode	O		9.3.1.27		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>BAP Control PDU Channel	O		ENUMERATED (true, …)		-	
>>Traffic Mapping Information	O		9.3.1.95		-	
BH RLC Channel to be Released List		*0..1*			YES	reject
>BH RLC Channel to be Released Item IEs		*1 .. <maxnoofBHRLCChannels >*			EACH	reject
>>BH RLC CH ID	M		9.3.1.113		-	
NR V2X Services Authorized	O		9.3.1.116		YES	ignore
LTE V2X Services Authorized	O		9.3.1.117		YES	ignore
NR UE Sidelink Aggregate Maximum Bit Rate	O		9.3.1.119	This IE applies only if the UE is authorized for NR V2X services.	YES	ignore
LTE UE Sidelink Aggregate Maximum Bit Rate	O		9.3.1.118	This IE applies only if the UE is authorized for LTE V2X services.	YES	ignore
PC5 Link Aggregated Bit Rate	O		Bit Rate 9.3.1.22	Only applies for non-GBR and unicast QoS Flows.	YES	ignore
SL DRB to Be Setup List		*0..1*			YES	reject
>SL DRB to Be Setup Item IEs		*1 .. <maxnoofSLDRBs>*			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	
>>SL DRB Information		*1*			YES	ignore
>>>SL DRB QoS	M		PC5 QoS Parameters 9.3.1.122		-	
>>>Flows Mapped to SL DRB Item		*1 .. <maxnoofPC5QoSFlows>*			-	
>>>>PC5 QoS Flow Identifier	M		9.3.1.121		-	
>>RLC mode	O		9.3.1.27		-	
SL DRB to Be Modified List		*0..1*			YES	reject
>SL DRB to Be Modified Item IEs		*1 .. <maxnoofSLDRBs>*			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	
>>SL DRB Information		*1*			YES	ignore
>>>SL DRB QoS	M		PC5 QoS Parameters 9.3.1.122		-	
>>>Flows Mapped to SL DRB Item		*1 .. <maxnoofPC5QoSFlows>*			-	
>>>>PC5 QoS Flow Identifier	M		9.3.1.121		-	
>>RLC mode	O		9.3.1.27		-	
SL DRB to Be Released List		*0..1*			YES	reject

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IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>SL DRB to Be Released Item IEs		*1 .. <maxnoofSL DRBs>*			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	
Conditional Intra-DU Mobility Information	O				YES	reject
>CHO Trigger	M		ENUMERATED (CHO-initiation, CHO-replace, CHO-cancel, …)		-	-
>Candidate Cells To Be Cancelled List	C-ifCHOcancel	*0 .. <maxnoofCe llsinCHO>*			-	-
>>Target Cell 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.
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.
maxnoofBHRLCChannels	Maximum no. of BH RLC channels allowed towards one IAB-node, the maximum value is 65536.
maxnoofSLDRBs	Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512.
maxnoofPC5QoSFlows	Maximum no. of PC5 QoS flow allowed towards one UE for NR sidelink communication, the maximum value is 2048.
maxnoofAdditionalPDCPDuplicationTNL	Maximum no. of additional UP TNL Information allowed towards one DRB, the maximum value is 2.
maxnoofCellsinCHO	Maximum no. cells that can be prepared for a conditional mobility. Value is 16.

Condition	Explanation
ifCHOcancel	This IE may be present if the CHO Trigger IE is present and set to "CHO-cancel".

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 *SgNB Resource Coordination Information* IE as defined in subclause 9.2.117 of TS 36.423 [9] for EN-DC case or *MR-DC Resource Coordination Information* IE as defined in TS 38.423 [28] for NGEN-DC and NE-DC cases.	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 the primary path or for the split secondary path for fallback to split bearer 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.	-	
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. < maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>>Additional PDCP Duplication 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 the primary path or for the split secondary path for fallback to split bearer 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.	-	
>>RLC Status	O		9.3.1.69	Indicates the RLC has been re-established at the gNB-DU.	YES	ignore
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. < maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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 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		-	

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IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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		ENUMERATED (Not-supported, ...)		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
C-RNTI	O		9.3.1.32	C-RNTI allocated at the gNB-DU	YES	ignore
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 PDCP duplication is applied	-	
Full Configuration	O		ENUMERATED (full, ...)		YES	reject
BH RLC Channel Setup List		*0..1*		The list of BH RLC channels which are successfully established.	YES	ignore
>BH RLC Channel Setup Item		*1 .. <maxnoofBHRLCChannels>*			EACH	ignore
>>BH RLC CH ID	M		9.3.1.113		-	

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IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
BH RLC Channel Failed to be Setup List		*0..1*		The list of BH RLC channels whose setup has failed.	YES	ignore
>BH RLC Channel Failed to be Setup Item		*1 .. <maxnoofBHRLCChannels>*			EACH	ignore
>>BH RLC CH ID	M		9.3.1.113		-	
>>Cause	O		9.3.1.2		-	
BH RLC Channel Modified List		*0..1*		The list of BH RLC channels which are successfully modified.	YES	ignore
>BH RLC Channel Modified Item		*1 .. <maxnoofBHRLCChannels>*			EACH	ignore
>>BH RLC CH ID	M		9.3.1.113		-	
BH RLC Channel Failed to be Modified List		*0..1*		The list of BH RLC channels whose modification has failed.	YES	ignore
>BH RLC Channel Failed to be Modified Item		*1 .. <maxnoofBHRLCChannels>*			EACH	ignore
>>BH RLC CH ID	M		9.3.1.113		-	
>>Cause	O		9.3.1.2		-	
SL DRB Setup List		*0..1*		The List of SL DRBs which are successfully established.	YES	ignore
>SL DRB Setup Item IEs		*1 .. <maxnoofSLDRBs>*			EACH	ignore
>>SL DRB ID	M		9.3.1.120		-	
SL DRB Modified List		*0..1*		The List of SL DRBs which are successfully modified.	YES	ignore
>SL DRB Modified Item IEs		*1 .. <maxnoofSLDRBs>*			EACH	ignore
>>SL DRB ID	M		9.3.1.120		-	
SL DRB Failed To Setup List		*0..1*		The List of SL DRBs which are failed to be setup.	YES	ignore
>SL DRB Failed To Setup Item		*1 .. <maxnoofSLDRBs>*			EACH	ignore
>>SL DRB ID	M		9.3.1.120		-	
>>cause	O		9.3.1.2		-	
SL DRB Failed To be Modified List		*0..1*		The List of SL DRBs which are failed to be modified.	YES	ignore
>SL DRB Failed To be Modified Item		*1 .. <maxnoofSLDRBs>*			EACH	ignore
>>SL DRB ID	M		9.3.1.120		-	
>>cause	O		9.3.1.2		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Requested Target Cell ID	O		NR CGI 9.3.1.12	Special Cell indicated in the UE CONTEXT MODIFICATIO N REQUEST message.	YES	reject

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.
maxnoofBHRLCChannels	Maximum no. of BH RLC channels allowed towards one IAB-node, the maximum value is 65536.
maxnoofSLDRBs	Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512.
maxnoofAdditionalPDCPDuplicationTNL	Maximum no. of additional UP TNL Information allowed towards one DRB, the maximum value is 2.

9.2.2.9   UE CONTEXT MODIFICATION FAILURE

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

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Requested Target Cell ID	O		NR CGI 9.3.1.12	Special Cell indicated in the UE CONTEXT MODIFICATI ON REQUEST message.	YES	reject

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] for EN-DC case or *MR-DC Resource Coordination Information* IE as defined in TS 38.423 [28] for NGEN-DC and NE-DC cases.	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-DU endpoint of the F1 transport bearer. For delivery of DL PDUs.	-	
>>RLC Status	O		9.3.1.69	Indicates the RLC has been re-established at the gNB-DU.	YES	ignore
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. <maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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.	-	
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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>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
BH RLC Channel Required to be Released List		0..1			YES	reject
>BH RLC Channel Required to be Released Item IEs		1 .. <maxnoofBHRLCChannels>			EACH	reject
>>BH RLC CH ID	M		9.3.1.113		-	
SL DRB Required to Be Modified List		0..1			YES	reject
>SL DRB Required to Be Modified Item IEs		1 .. <maxnoofSLDRBs>			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	
SL DRB Required to be Released List		0..1			YES	reject
>SL DRB Required to be Release Item IEs		1 .. <maxnoofSLDRBs>			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	
Candidate Cells To Be Cancelled List		0 .. <maxnoofCellsinCHO>			YES	reject
>Target Cell ID	M		NR CGI 9.3.1.12		-	-

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.
maxnoofBHRLCChannels	Maximum no. of BH RLC channels allowed towards one IAB-node, the maximum value is 65536.
maxnoofSLDRBs	Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512.
maxnoofAdditionalPDCPDuplicationTNL	Maximum no. of additional UP TNL Information allowed towards one DRB, the maximum value is 2.
maxnoofCellsinCHO	Maximum no. cells that can be prepared for a conditional mobility. Value is 16.

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] for EN-DC case or *MR-DC Resource Coordination Information* IE as defined in TS 38.423 [28] for NGEN-DC and NE-DC cases.	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-CU endpoint of the F1 transport bearer. For delivery of UL PDUs.	-	
>>Additional PDCP Duplication TNL List		*0..1*			YES	ignore
>>>Additional PDCP Duplication TNL Items		*1 .. <maxnoofAdditionalPDCPDuplicationTNL>*			EACH	ignore
>>>>Additional PDCP Duplication 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 DL-DCCH-Message IE as defined in subclause 6.2 of 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
SL DRB Modified List		*0..1*			YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>SL DRB Modified Item IEs		*1 .. <maxnoofSL DRBs>*			EACH	reject
>>SL DRB ID	M		9.3.1.120		-	

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.
maxnoofSLDRBs	Maximum no. of SL DRB allowed for NR sidelink communication per UE, the maximum value is 512.
maxnoofAdditionalPDCPDuplicationTNL	Maximum no. of additional 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 .. <maxnoof DRBs>*			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, ...)		-	
>>Current QoS Parameters Set Index	O		Alternative QoS Parameters set Notify Index 9.3.1.124	Index to the currently fulfilled alternative QoS parameters set. Value 0 indicates that NG-RAN cannot even fulfil the lowest alternative parameter set.	YES	ignore

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

9.2.2.14   ACCESS SUCCESS

This message is sent by the gNB-DU to inform the gNB-CU of which cell the UE has successfully accessed during conditional handover or conditional PSCell change.

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	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
NR CGI	M		9.3.1.12		YES	reject

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 *UL-CCCH-Message* IE or *UL-CCCH1-Message* IE as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
DU to CU RRC Container	O		OCTET STRING	*CellGroupConfig* IE as defined in subclause 6.3.2 in TS 38.331 [8]. Required at least to carry SRB1 configuration. The ReconfigurationWithSync field is not included in the *CellGroupConfig* IE.	YES	reject
SUL Access Indication	O		ENUMERATED (true, ...)		YES	ignore
Transaction ID	M		9.3.1.23		YES	Ignore
RAN UE ID	O		OCTET STRING (SIZE (8))		YES	ignore
RRC-Container-RRCSetupComplete	O		9.3.1.6	Includes the *UL-DCCH-Message* IE including the RRCSetupComplete message, as defined in subclause 6.2 of TS 38.331 [8].	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		YES	reject
SRB ID	M		9.3.1.7		YES	reject
Execute Duplication	O		ENUMERATED (true, ...)		YES	ignore
RRC-Container	M		9.3.1.6	Includes the *DL-DCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8] encapsulated in a PDCP PDU, or the *DL-CCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject
RRC Delivery Status Request	O		ENUMERATED (true, …)	Indicates whether RRC DELIVERY REPORT procedure is requested for the RRC message.	YES	ignore
UE Context not retrievable	O		ENUMERATED (true, ...)		YES	reject
Redirected RRC message	O		RRC Container 9.3.1.6	Includes the *UL-CCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8].	YES	reject
PLMN Assistance Info for Network Sharing	O		PLMN Identity 9.3.1.14		YES	ignore
New gNB-CU UE F1AP ID	O		gNB-CU UE F1AP ID 9.3.1.4		YES	reject
Additional RRM Policy Index	O		9.3.1.90		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 *UL-DCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8], encapsulated in a PDCP PDU.	YES	reject
Selected PLMN ID	O		PLMN Identity 9.3.1.14		YES	reject
New gNB-DU UE F1AP ID	O		gNB-DU UE F1AP ID 9.3.1.5		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.. <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.

9.2.4.2 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.. <maxCel lingNBD U>*			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
Notification Information	O			This IE is ignored If the *Cancel-all Warning Messages Indicator* IE is included.	YES	reject
>Message Identifier	M		9.3.1.81			
>Serial Number	M		9.3.1.82			

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.. \<maxCel lingNBD U>*			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..<maxCellingNBDU>*			EACH	reject
>>NR CGI	M		9.3.1.12		-	
>>Number of Broadcasts	M		INTEGER (0..65535)	This IE is not used in the specification and is ignored.	-	

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 .. <*maxnoofPagingCells*>			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.

9.2.7 Trace Messages

9.2.7.1 TRACE START

This message is sent by the gNB-CU to initiate a trace session for a UE.

Direction: gNB-CU $\rightarrow$ 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
Trace Activation	M		9.3.1.88		YES	ignore

9.2.7.2 DEACTIVATE TRACE

This message is sent by the gNB-CU to deactivate a trace session.

Direction: gNB-CU $\rightarrow$ 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
Trace ID	M		OCTET STRING (SIZE(8))	As per Trace ID in *Trace Activation* IE	YES	ignore

9.2.7.3 CELL TRAFFIC TRACE

This message is sent by the gNB-DU to to transfer trace specific information.

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
Trace ID	M		OCTET STRING (SIZE(8))	This IE is composed of the following: Trace Reference defined in TS 32.422 [29] (leftmost 6 octets, with PLMN information encoded as in 9.3.1.14), and Trace Recording Session Reference defined in TS 32.422 [29] (last 2 octets).	YES	ignore
Trace Collection Entity IP Address	M		Transport Layer Address 9.3.2.3	For File based Reporting. Defined in TS 32.422 [29]. Should be ignored if URI is present	YES	ignore
Privacy Indicator	O		ENUMERATED (Immediate MDT, Logged MDT, ...)		YES	ignore
Trace Collection Entity URI	O		URI 9.3.2.6	For Streaming based Reporting. Defined in TS 32.422 [11] Replaces Trace Collection Entity IP Address if present		

9.2.8 Radio Information Transfer messages

9.2.8.1 DU-CU RADIO INFORMATION TRANSFER

This message is sent by a gNB-DU to a gNB-CU, to convey radio-related information.

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
CHOICE *DU-CU Radio Information Type*	M				YES	ignore
>*RIM*						
>>DU-CU RIM Information	M		9.3.1.91		-	-

9.2.8.2 CU-DU RADIO INFORMATION TRANSFER

This message is sent by a gNB-CU to a gNB-DU, to convey radio-related information.

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
CHOICE *CU-DU Radio Information Type*	M				YES	ignore
>*RIM*						
>>CU-DU RIM Information	M		9.3.1.92		-	-

9.2.9 IAB messages

9.2.9.1 BAP MAPPING CONFIGURATION

This message is sent by the gNB-CU to provide the backhaul routing information and/or traffic mapping information 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
Transaction ID	M		9.3.1.23		YES	reject
BH Routing Information Added List		*0...1*			YES	ignore
>**BH Routing Information Added List Item**		*1.. <maxnoof RoutingEntries>*			EACH	ignore
>>BAP Routing ID	M		9.3.1.110		-	
>>Next-Hop BAP Address	M		9.3.1.111	Indicates the BAP address of the next hop IAB-node or IAB-donor-DU.	-	
BH Routing Information Removed List		*0...1*			YES	ignore
>**BH Routing Information Removed List Item**		*1.. <maxnoof RoutingEntries>*			EACH	ignore
>>BAP Routing ID	M		9.3.1.110		-	
Traffic Mapping Information	O		9.3.1.95		-	

Range bound	Explanation
maxnoofRoutingEntries	Maximum no. of routing entries, the maximum value is 1024.

9.2.9.2 BAP MAPPING CONFIGURATION ACKNOWLEDGE

This message is sent by the gNB-DU as a response to a BAP MAPPING CONFIGURATION 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
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.9.3 GNB-DU RESOURCE CONFIGURATION

This message is sent by the gNB-CU to provide the resource configuration for an 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
Transaction ID	M		9.3.1.23		YES	reject
Activated Cells to Be Updated List		*0..1*		List of activated cells served by the IAB-DU or the IAB-donor-DU whose resource configuration is updated	YES	reject
>Activated Cells To Be Updated List Item		*1 .. <maxnoofServed CellsIAB>*			EACH	reject
>> NR CGI	M		9.3.1.12		-	
>>CHOICE *IAB-DU Cell Resource Configuration-Mode-Info*	M				-	
>>>TDD						
>>>>TDD Info		*1*				
>>>>>gNB-DU Cell Resource Configuration-TDD	M		gNB-DU Cell Resource Configuration 9.3.1.107	Contains TDD resource configuration of the gNB-DU's cell.	-	
>>>FDD						
>>>>FDD Info		*1*			-	
>>>>>gNB-DU Cell Resource Configuration-FDD-UL	M		gNB-DU Cell Resource Configuration 9.3.1.107	Contains FDD UL resource configuration of the gNB-DU's cell.	-	
>>>>>gNB-DU Cell Resource Configuration-FDD-DL	M		gNB-DU Cell Resource Configuration 9.3.1.107	Contains FDD DL resource configuration of the gNB-DU's cell.	-	
Child-Nodes List		*0..1*		List of child IAB-nodes served by the IAB-DU or IAB-donor-DU.	YES	reject

>Child-Nodes List Item		*1 .. <maxnoofChildIABNodes>*			EACH	reject
>>gNB-CU UE F1AP ID	M		9.3.1.4	Identifier of a descendant node IAB-MT at the IAB-donor-CU.	YES	reject
>>gNB-DU UE F1AP ID	M		9.3.1.5	Identifier of a child-node IAB-MT at an IAB-DU or IAB-donor-DU.	YES	reject
>>Child-Node Cells List		*0..1*		List of cells served by the child-node IAB-DU whose resource configuration is updated.	YES	reject
>>>Child-Node Cells List Item		*1 .. <maxnoofServedCellsIAB >*			EACH	reject
>>>>NR CGI	M		9.3.1.12		-	
>>>>CHOICE *IAB-DU Cell Resource Configuration-Mode-Info*	O				-	
>>>>>TDD					-	
>>>>>>TDD Info		*1*			-	
>>>>>>>gNB-DU Cell Resource Configuration-TDD	M		gNB-DU Cell Resource Configuration 9.3.1.107	Contains TDD resource configuration of gNB-DU's cell.	-	
>>>>>FDD					-	
>>>>>>FDD Info		*1*			-	
>>>>>>>gNB-DU Cell Resource Configuration-FDD-UL	M		gNB-DU Cell Resource Configuration 9.3.1.107	Contains FDD UL resource configuration of gNB-DU's cell.	-	
>>>>>>> gNB-DU Cell Resource Configuration-FDD-DL	M		gNB-DU Cell Resource Configuration 9.3.1.107	Contains FDD DL resource configuration of gNB-DU's cell.	-	
>>>>IAB STC Info	O		9.3.1.109	STC configuration of child-node IAB-DU's cell.		

>>>>RACH Config Common	O		OCTET STRING	Corresponds to the *rach-ConfigComm on* as defined in subclause 6.3.2 of TS 38.331 [8].		
>>>>RACH Config Common IAB	O		OCTET STRING	Corresponds to the IAB-specific *rach-ConfigComm on* as defined in subclause 6.3.2 of TS 38.331 [8].		
>>>>CSI-RS Configuration	O		OCTET STRING	Corresponds to the *NZP-CSI-RS-Resource* as defined in subclause 6.3.2 of TS 38.331 [8].		
>>>>SR Configuration	O		OCTET STRING	Corresponds to the *SchedulingR equestResou rceConfig* as defined in subclause 6.3.2 of TS 38.331 [8].		
>>>>PDCCH Configuration SIB1	O		OCTET STRING	Corresponds to the *PDCCH-ConfigSIB1* as defined in subclause 6.3.2 of TS 38.331 [8].		
>>>>SCS Common	O		OCTET STRING	Corresponds to the *subCarrierSp acingCommo n* as defined in subclause 6.2.2 of TS 38.331 [8].		
>>>>Multiplexing Info	O		9.3.1.108	Contains information on multiplexing with cells configured for collocated IAB-MT.		

Range bound	Explanation
maxnoofChildIABNodes	Maximum number of child nodes served by an IAB-DU or IAB-donor-DU. Value is 1024.
maxnoofServedCellsIAB	Maximum number of cells served by an IAB-DU or IAB-donor-DU. Value is 512.

9.2.9.4 GNB-DU RESOURCE CONFIGURATION ACKNOWLEDGE

This message is sent by the gNB-DU to acknowledge the reception of an GNB-DU RESOURCE CONFIGURATION 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
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.9.5 IAB TNL ADDRESS REQUEST

This message is sent by the gNB-CU to request the allocation of IP addresses for IAB-node(s).

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
IAB IPv4 Addresses Requested	O		IAB TNL Addresses Requested 9.3.1.101		YES	reject
CHOICE *IAB IPv6 Request Type*	O				YES	reject
>IPv6 Address					-	
>>IAB IPv6 Addresses Requested	M		IAB TNL Addresses Requested 9.3.1.101		-	
>IPv6 Prefix					-	
>>IAB IPv6 Address Prefixes Requested	M		IAB TNL Addresses Requested 9.3.1.101		-	
IAB TNL Addresses To Remove List		*0..1*			YES	reject
>IAB TNL Addresses To Remove Item		*1..<maxno ofTLAsIAB >*			EACH	reject
>>IAB TNL Address	M		9.3.1.102		-	

Range bound	Explanation
maxnoofTLAsIAB	Maximum no. of individual IPv4/IPv6 addresses or IPv6 address prefixes that can be allocated in one procedure execution. The value is 1024.

9.2.9.6 IAB TNL ADDRESS RESPONSE

This message is sent by the gNB-DU to indicate the TNL addresses allocated to IAB-node(s).

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
IAB Allocated TNL Address List		*1*			YES	reject
>IAB Allocated TNL Address Item		*1..<maxno ofTLAsIAB >*			EACH	reject
>>IAB TNL Address	M		9.3.1.102		-	
>>IAB TNL Address Usage	O		ENUMERATED (F1-C, F1-U, Non-F1, …)	The usage of the allocated IPv4 or IPv6 address or IPv6 address prefix.	-	

Range bound	Explanation
maxnoofTLAsIAB	Maximum no. of IPv6 addresses or IPv6 address prefixes and/or individual IPv4 addresses that can be allocated in one procedure execution. The value is 1024.

9.2.9.7 IAB UP CONFIGURATON UPDATE REQUEST

This message is sent by the gNB-CU to provide the updated UL BH Information or the updated UL UP TNL Information/Address 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
Transaction ID	M		9.3.1.23		YES	reject
UL UP TNL Information to Update List		*0..1*			YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>UL UP TNL Information to Update List Item IEs		*1.. < maxnoofU LUPTNLIn formationf orIAB>*			EACH	ignore
>>UL UP TNL Information	M		UP Transport Layer Information 9.3.2.1	This field indicates the UL UP TNL Information used before configuration update.	-	
>>New UL UP TNL Information	O		UP Transport Layer Information 9.3.2.1	If present, this field indicates the new UL UP TNL Information used after configuration update.	-	
>>BH Information	M		9.3.1.114		-	
UL UP TNL Address to Update List		*0..1*			YES	ignore
>UL UP TNL Address to Update List Item IEs		*1.. < maxnoofU PTNLAddr esses>*			EACH	ignore
>>Old TNL Address	M		Transport Layer Address 9.3.2.3	The old UL UP Transport Layer Address of gNB-CU used for UL F1-U GTP Tunnel before the configuration update.	-	
>>New TNL Address	M		Transport Layer Address 9.3.2.3	The corresponding new UL UP Transport Layer Address that replaces the old one.	-	

Range bound	Explanation
maxnoofULUPTNLInformationforIAB	Maximum no. of UL UP TNL Information allowed towards one IAB node, the maximum value is 32768.
maxnoofUPTNLAddresses	Maximum no. of TNL addresses for F1-U. Value is 8.

9.2.9.8   IAB UP CONFIGURATION UPDATE RESPONSE

This message is sent by the gNB-DU to provide the updated TNL address(es) of the DL F1-U GTP tunnels to the gNB-CU.

Direction: gNB-DU $\rightarrow$ 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
Criticality Diagnostics	O		9.3.1.3		YES	ignore
DL UP TNL Address to Update List		*0..1*			YES	ignore
>DL UP TNL Address to Update List Item IEs		*1.. < maxnoofUPTNLAddr esses>*			EACH	ignore
>>Old TNL Address	M		Transport Layer Address 9.3.2.3	The old DL UP Transport Layer Address of gNB-DU used for DL F1-U GTP tunnel before the configuration update.	-	
>>New TNL Address	M		Transport Layer Address 9.3.2.3	The corresponding new Transport Layer Address used to replace the old one.	-	

Range bound	Explanation
maxnoofUPTNLAddresses	Maximum no. of TNL addresses for F1-U. Value is 8.

9.2.9.9 IAB UP CONFIGURATION UPDATE FAILURE

This message is sent by the gNB-DU to indicate an IAB UP 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

9.2.10 Self Optimisation Support Messages

9.2.10.1 ACCESS AND MOBILITY INDICATION

This message is sent by gNB-CU to gNB-DU to provide access and mobility information 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	ignore
Transaction ID	M		9.3.1.23		YES	reject
RACH Report Information List		*0..1*			YES	ignore
>RACH Report Information Item		*1 .. <maxnoof RACHRep orts>*			-	
>>RACH Report Container	M		OCTET STRING	RACH-ReportList-r16 IE as defined in subclause 6.2.2 in TS 38.331 [8].	-	
>>UE Assistant Identifier	O		gNB-DU UE F1AP ID 9.3.1.5		-	
RLF Report Information List		*0..1*			YES	ignore
>RLF Report Information Item		*1 .. <maxnoof RLFRepor ts>*			-	
>>NR UE RLF Report Container	M		OCTET STRING	*nr-RLF-Report-r16* IE contained in the *UEInformationRes ponse* message defined in TS 38.331 [8].	-	
>>UE Assistant Identifier	O		gNB-DU UE F1AP ID 9.3.1.5		-	

Range bound	Explanation
maxnoofRACHReports	Maximum no. of RACH Reports, the maximum value is 64.
maxnoofRLFReports	Maximum no. of RLF Reports, the maximum value is 64.

9.2.11   Reference Time Information Reporting messages

9.2.11.1   REFERENCE TIME INFORMATION REPORTING CONTROL

This message is sent by the gNB-CU and is used to request the gNB-DU to deliver the accurate reference time information.

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
Reporting Request Type	M		9.3.1.147		YES	reject

9.2.11.2   REFERENCE TIME INFORMATION REPORT

This message is sent by the gNB-DU and is used to report the accurate reference time information 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
Transaction ID	M		9.3.1.23		YES	ignore
Time Reference Information	M		9.3.1.148		YES	ignore

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(s), AMF initiated abnormal release, Release due to Pre-Emption, PLMN not served by the gNB-CU, Multiple DRB ID Instances, Unknown DRB ID, Multiple BH RLC CH ID Instances, Unknown BU RLC CH ID, CHO-CPC resources to be changed, NPN not supported, NPN access denied)	
>*Transport Layer*				
>>Transport Layer Cause	M		ENUMERATED (Unspecified, Transport Resource Unavailable, ... , Unknown TNL address for IAB, Unknown UP TNL information for IAB)	
>*Protocol*				
>>Protocol Cause	M		ENUMERATED (Transfer Syntax Error, Abstract Syntax Error (Reject), Abstract Syntax Error (Ignore and Notify), Message not Compatible with Receiver State, Semantic Error, Abstract Syntax Error (Falsely Constructed Message), Unspecified, ...)	
>*Misc*				
>>Miscellaneous Cause	M		ENUMERATED (Control Processing Overload, Not enough User Plane Processing Resources, Hardware Failure, O&M Intervention, Unspecified, ...)	

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

Radio Network Layer cause	Meaning
Unspecified	Sent for radio network layer cause when none of the specified cause values applies.
RL Failure-RLC	The action is due to an RL failure caused by exceeding the maximum number of ARQ retransmissions.
Unknown or already allocated gNB-CU UE F1AP ID	The action failed because the gNB-CU UE F1AP ID is either unknown, or (for a first message received at the gNB-CU) is known and already allocated to an existing context.
Unknown or already allocated gNB-DU UE F1AP ID	The action failed because the gNB-DU UE F1AP ID is either unknown, or (for a first message received at the gNB-DU) is known and already allocated to an existing context.
Unknown or inconsistent pair of UE F1AP ID	The action failed because both UE F1AP IDs are unknown, or are known but do not define a single UE context.
Interaction with other procedure	The action is due to an ongoing interaction with another procedure.
Not supported QCI Value	The action failed because the requested QCI is not supported.
Action Desirable for Radio Reasons	The reason for requesting the action is radio related.
No Radio Resources Available	The cell(s) in the requested node don't have sufficient radio resources available.
Procedure cancelled	The sending node cancelled the procedure due to other urgent actions to be performed.
Normal Release	The action is due to a normal release of the UE (e.g. because of mobility) and does not indicate an error.
Cell Not Available	The action failed due to no cell available in the requested node.
RL Failure-others	The action is due to an RL failure caused by other radio link failures than exceeding the maximum number of ARQ retransmissions.
UE rejection	The action is due to gNB-CU's rejection of a UE access request.
Resources not available for the slice(s)	The requested resources are not available for the slice(s).
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.
PLMN not served by the gNB-CU	The PLMN indicated by the UE is not served by the gNB-CU.
Multiple DRB ID Instances	The action failed because multiple instances of the same DRB had been provided.
Unknown DRB ID	The action failed because the DRB ID is unknow.
Multiple BH RLC CH ID Instances	The action failed because multiple instances of the same BH RLC CH ID had been provided. This cause value is only applicable to IAB.
Unknown BH RLC CH ID	The action failed because the BH RLC CH ID is unknown. This cause value is only applicable to IAB.
CHO-CPC resources to be changed	The gNB-DU requires gNB-CU to replace, i.e. overwrite the configuration of indicated candidate target cell.
NPN not supported	The action fails because the indicated SNPN is not supported in the node.
NPN access denied	The action is due to rejection of a UE access request for NPN.

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.
Unknown TNL address for IAB	The action failed because the TNL address is unknown. This cause value is only applicable to IAB.
Unknown UP TNL information for IAB	The action failed because the UP TNL information is unknown. This cause value is only applicable to IAB.

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

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

> NOTE: If F1-C signalling transport is shared among multiple interface instances, the value of the gNB-CU UE F1AP ID is allocated so that it can be associated with the corresponding F1-C interface instance.

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.

> NOTE: If F1-C signalling transport is shared among multiple interface instances, the value of the gNB-CU UE F1AP ID is allocated so that it can be associated with the corresponding F1-C interface instance.

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 *SRB-Identity* 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 *DRB-Identity* 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..<*maxnoofB PLMNs*>		Broadcast PLMNs in SIB 1 associated to the NR Cell Identity in the *NR CGI* IE	-	
>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
>NPN Support Information	O		9.3.1.156	Supported NPNs per PLMN.	YES	reject
>Extended TAI Slice Support List	O		Extended Slice Support List 9.3.1.165	Additional Supported S-NSSAIs per TA.	YES	reject
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		-	
>>>UL Carrier List	O		NR Carrier List 9.3.1.137	If included, the UL Transmission Bandwidth IE shall be ignored.	YES	ignore
>>>DL Carrier List	O		NR Carrier List 9.3.1.164	If included, the *UL Transmission Bandwidth* IE shall be ignored.	YES	ignore
>*TDD*					-	
>>TDD Info		1			-	
>>>NR FreqInfo	M		NR Frequency Info 9.3.1.17		-	
>>>Transmission Bandwidth	M		Transmission Bandwidth 9.3.1.15		-	
>>>Intended TDD DL-UL Configuration	O		9.3.1.89		YES	ignore
>>>TDD UL-DL Configuration Common NR	O		OCTET STRING	The *tdd-UL-DL-ConfigurationComm on* as defined in TS 38.331 [8]	YES	ignore
>>>Carrier List	O		NR Carrier List 9.3.1.137	If included, the Transmission Bandwidth IE shall be ignored.	YES	ignore

Measurement Timing Configuration	M		OCTET STRING	Contains the *MeasurementTimingConfiguration* 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.	-	
>>NPN Support Information	O		9.3.1.156	Supported NPNs per PLMN.	YES	reject
>>Extended TAI Slice Support List	O		Extended Slice Support List 9.3.1.165	Additional Supported S-NSSAIs per TA.	-	
Cell Direction	O		9.3.1.78		YES	ignore
Cell Type	O		9.3.1.87		YES	ignore
Broadcast PLMN Identity Info List		*0..<maxnoofBPLMNsNR>*		This IE corresponds to the *PLMN-IdentityInfoList* IE in *SIB1* as specified in TS 38.331 [8]. All PLMN Identities and associated information contained in the *PLMN-IdentityInfoList* IE are included and provided in the same order as broadcast in SIB1.	YES	ignore
>PLMN Identity List	M		Available PLMN List 9.3.1.65	Broadcast PLMN IDs in SIB1 associated to the *NR Cell Identity* IE	-	
>Extended PLMN Identity List	O		Extended Available PLMN List 9.3.1.76		-	
>5GS-TAC	O		OCTET STRING (3)		-	
>NR Cell Identity	M		BIT STRING (36)		-	
>RANAC	O		RAN Area Code 9.3.1.57		-	
>NPN Broadcast Information	O		9.3.1.157	If this IE is included the content of the *PLMN Identity List* IE and *Extended PLMN Identity List* IE if present in the *Broadcast PLMN Identity Info List* IE is ignored.	YES	reject

Aggressor gNB Set ID	O		9.3.1.93	This IE indicates the associated aggressor gNB Set ID of the cell	YES	ignore
Victim gNB Set ID	O		9.3.1.93	This IE indicates the associated Victim gNB Set ID of the cell	YES	ignore
IAB Info IAB-DU	O		9.3.1.106		YES	ignore
SSB Positions In Burst	O		9.3.1.138		YES	ignore
NR PRACH Configuration	O		9.3.1.139		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.
maxnoofBPLMNsNR	Maximum no. of PLMN Ids.broadcast in an NR cell. Value is 12.

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 (SIZE(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 (SIZE(3))	- 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 -The PLMN identity consists of 3 digits from MCC followed by either -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	Criticality	Assigned Criticality
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..<maxno ofNrCellB ands>*			–	
>>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..<maxno ofNrCellB ands>*			–	
>>>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.	–	
Frequency Shift 7p5khz	O		ENUMERATED (false, true, ...)	Indicate whether the value of Δ_{shift} is 0kHz or 7.5kHz when calculating $F_{REF,shift}$ as defined in Section 5.4.2.1 of TS 38.104 [17].	YES	ignore

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	Criticality	Assigned Criticality
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].	-	
SIB12 message	O		OCTET STRING	SIB12 message, as defined in TS 38.331 [8].	YES	Ignore
SIB13 message	O		OCTET STRING	SIB13 message, as defined in TS 38.331 [8].	YES	Ignore
SIB14 message	O		OCTET STRING	SIB14 message, as defined in TS 38.331 [8].	YES	ignore
SIB10 message	O		OCTET STRING	SIB10 message, as defined in TS 38.331 [8].	YES	ignore

9.3.1.19   E-UTRAN QoS

This IE defines the QoS to be applied to a DRB or to a BH RLC channel 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]. For a BH RLC channel, the Packet Delay Budget included in QCI defines the upper bound for the time that a packet may be delayed between the gNB-DU and its child IAB-MT.
Allocation and Retention Priority	M		9.3.1.20	
GBR QoS Information	O		9.3.1.21	This IE shall be present for GBR bearers only and is 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(sh all not trigger pre-emption, may trigger pre-emption)	**Desc.:** This IE indicates the pre-emption capability of the request on other E-RABs (see TS 23.401 [10]). **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 (see TS 23.401 [10]). **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 use the same Transaction ID. The Transaction ID is determined by the initiating peer of a procedure.

NOTE: If F1-C signalling transport is shared among multiple interface instances, the Transaction ID is allocated so that it can be associated with an F1-C interface instance. The Transaction ID may identify more than one interface instance.

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	This IE is used in the NG-RAN and it consists of the 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 *MeasurementTimingConfiguration* 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
CG-Config	O		OCTET STRING	CG-Config, as defined in TS 38.331 [8].	YES	ignore
UEAssistanceInformationEUTRA	O		OCTET STRING	UEAssistanceInformationEUTRA, 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, NGEN-DC and NR-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 [8]. This field is not used in NR-DC.		
Selected BandCombinationIndex	O		OCTET STRING	BandCombinationIndex, as defined in TS 38.331 [8]. For (NG)EN-DC and NR 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 (NG)EN-DC and NR 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
DRX Config	O		OCTET STRING	DRX-Config, as defined in TS 38.331 [8]. This field is only used in NR-DC.	YES	ignore
PDCCH BlindDetectionSCG	O		OCTET STRING	pdcch-BlindDetectionSCG, as defined in TS 38.331 [8]. This IE is used between the MgNB-DU and the MgNB-CU.	YES	ignore

Requested PDCCH BlindDetectionSCG	O		OCTET STRING	requestedPDCCH-BlindDetectionSCG, as defined in TS 38.331 [8]. This IE is used between the SgNB-DU and the SgNB-CU.	YES	ignore
Ph-InfoMCG	O		OCTET STRING	PH-TypeListMCG, 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 MCG.	YES	ignore
MeasGapSharingConfig	O		OCTET STRING	MeasGapSharingConfig as defined in TS 38.331 [8].	YES	ignore
SL-PHY-MAC-RLC-Config	O		OCTET STRING	SL-PHY-MAC-RLC-Config as defined in TS 38.331 [8].	YES	ignore
SL-ConfigDedicatedEUTRA	O		OCTET STRING	SL-ConfigDedicatedEUTRA as defined in TS 38.331 [8].	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

9.3.1.27 RLC Mode

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

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

9.3.1.28 SUL Information

This IE provides information about the SUL carrier.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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		–	
Carrier List	O		NR Carrier List 9.3.1.137	If included, the SUL Transmission Bandwidth IE shall be ignored.	YES	ignore
Frequency Shift 7p5khz	O		ENUMERATED (false, true, ...)	Indicate whether the value of Δ_{shift} is 0kHz or 7.5kHz when calculating $F_{REF,shift}$ as defined in Section 5.4.2.1 of TS 38.104 [17].	YES	ignore

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	M		INTEGER (1.. 256, ...)	
>NG-RAN				
>> *Index to RAT/Frequency Selection Priority*	M		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 *LogicalChannelIdentity* 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 ofSliceIte ms>*		
>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 as defined in TS 23.003 [23].

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	Criticality	Assigned Criticality
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. Values 6, 7, 8 and values 10 and higher are not applicable in this version of the specifications.		
>>SIB message	M		OCTET STRING	SIB message containing SIB as defined in TS 38.331 [8].		
>>Value Tag	M		INTEGER (0..31, ...)			
>>areaScope	O		ENUMERATED (true, …)	Indicates that a SIB is area specific. If the field is not present, the SIB is cell specific.	YES	ignore
SystemInformationAreaID	O		BIT STRING (SIZE (24))	Indicates the system information area that the cell belongs to, if any.	YES	ignore

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, to a DRB or to a BH RLC channel.

NOTE: For a BH RLC channel, the listed mandatory IEs and the *GRB QoS Flow Information* IE are applicable, where *GBR QoS Flow Information* IE may be present if BH RLC channel conveys the traffic belonging to a GRB QoS Flow.

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 and is ignored otherwise.	-	
Reflective QoS Attribute	O		ENUMERATED (subject to, ...)	Details in TS 23.501 [21]. This IE applies to non-GBR flows only and is 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
QoS Monitoring Request	O		ENUMERATED (UL, DL, Both, …)	Indicates to measure UL, or DL, or both UL/DL delays for the associated QoS flow..	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	Criticality	Assigned Criticality
Maximum Flow Bit Rate Downlink	M		Bit Rate 9.3.1.22	Maximum Bit Rate in DL. Details in TS 23.501 [21].	-	
Maximum Flow Bit Rate Uplink	M		Bit Rate 9.3.1.22	Maximum Bit Rate in UL. Details in TS 23.501 [21].	-	
Guaranteed Flow Bit Rate Downlink	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate (provided there is data to deliver) in DL. Details in TS 23.501 [21].	-	
Guaranteed Flow Bit Rate Uplink	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate (provided there is data to deliver). Details in TS 23.501 [21].	-	
Maximum Packet Loss Rate Downlink	O		Maximum Packet Loss Rate 9.3.1.50	Indicates the maximum rate for lost packets that can be tolerated in the downlink direction. Details in TS 23.501 [21].	-	
Maximum Packet Loss Rate Uplink	O		Maximum Packet Loss Rate 9.3.1.50	Indicates the maximum rate for lost packets that can be tolerated in the uplink direction. Details in TS 23.501 [21].	-	
Alternative QoS Parameters Set List	O		9.3.1.125	Indicates alternative sets of QoS Parameters for the QoS flow.	YES	ignore

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	Criticality	Assigned Criticality
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]. For a BH RLC channel, the Packet Delay Budget defines the upper bound for the time that a packet may be delayed between the gNB-DU and its child IAB-MT. This IE is ignored if the *Extended Packet Delay Budget* IE is present.	-	
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 *Delay Critical* IE is set to "delay critical" and is ignored otherwise.	-	
Extended Packet Delay Budget	O		9.3.1.145	Packet Delay Budget is specified in TS 23.501 [21].	YES	ignore
CN Packet Delay Budget Downlink	O		Extended Packet Delay Budget 9.3.1.145	Core Network Packet Delay Budget is specified in TS 23.501 [21]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore
CN Packet Delay Budget Uplink	O		Extended Packet Delay Budget 9.3.1.145	Core Network Packet Delay Budget is specified in TS 23.501 [21]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore

Condition	Explanation
ifGBRflow	This IE shall be present if the *GBR QoS Flow Information* IE is present in the *QoS Flow Level QoS Parameters* 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
Priority Level	M		INTEGER (0..15)	**Desc.**: This IE defines the relative importance of a resource request (see TS 23.501 [21]). **Usage**: Values are ordered in decreasing order of priority, i.e., with 1 as the highest priority and 15 as the lowest priority. Further usage is defined in TS 23.501 [21].
Pre-emption Capability	M		ENUMERATED (shall not trigger pre-emption, may trigger pre-emption)	**Desc.**: This IE indicates the pre-emption capability of the request on other QoS flows (see TS 23.501 [21]). **Usage**: The QoS flow shall not pre-empt other QoS flows or, the QoS flow may pre-empt other QoS flows. Note: The Pre-emption Capability indicator applies to the allocation of resources for a QoS flow and as such it provides the trigger to the pre-emption procedures/processes of the NG-RAN node.
Pre-emption Vulnerability	M		ENUMERATED (not pre-emptable, pre-emptable)	**Desc.**: This IE indicates the vulnerability of the QoS flow to pre-emption of other QoS flows (see TS 23.501 [21]). **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. Note: The Pre-emption Vulnerability indicator applies for the entire duration of the QoS flow, unless modified and as such indicates whether the QoS flow is a target of the pre-emption procedures/processes of the NG-RAN node.

9.3.1.49 Non Dynamic 5QI Descriptor

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
5QI	M		INTEGER (0..255,...)	This IE contains the standardized or pre-configured 5QI as specified in TS 23.501 [21]. For a BH RLC channel, the Packet Delay Budget included in 5QI defines the upper bound for the time that a packet may be delayed between the gNB-DU and its child IAB-MT.	-	
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	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.	-	
CN Packet Delay Budget Downlink	O		Extended Packet Delay Budget 9.3.1.145	Core Network Packet Delay Budget is specified in TS 23.501 [21]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore
CN Packet Delay Budget Uplink	O		Extended Packet Delay Budget 9.3.1.145	Core Network Packet Delay Budget is specified in TS 23.501 [21]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore

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, and applies to GBR QoS Flows only.

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, and applies to delay critical GBR QoS flows only.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Maximum Data Burst Volume	M		INTEGER (0..4095, ..., 4096.. 2000000)	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.

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	Criticality	Assigned Criticality
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].	-	
Notification Information	O				YES	ignore
>Message Identifier	M		9.3.1.81		-	
>Serial Number	M		9.3.1.82		-	
Additional SIB Message List	O		9.3.1.86	Additional SIB messages containing different segments of a public warning message if segmentation is applied, as defined in TS 38.331 [8].	Yes	reject

9.3.1.59 Repetition Period

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

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

9.3.1.60 Number of Broadcasts Requested

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

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

9.3.1.61 Void

9.3.1.62 SIType List

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SI type item IEs		*1.. <maxnoofSI Types>*		
>SI Type	M		INTEGER (1..32, ...)	Indicates a certain SI type required to be broadcasted by the gNB-DU. The SI Type value of other SI starts from 2

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 Identifieris 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..< maxnoofBPLMNs >*		
>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.

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	C-ifTDD		INTEGER (0..63)	See section 5.7.1. in TS 36.211 [27]

Condition	Explanation
ifTDD	This IE shall be present if the *EUTRA-Mode-Info* IE in the *Resource Coordination E-UTRA Cell Information* IE is set to the value "TDD".

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	Criticality	Assigned Criticality
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		E-UTRA Transmission Bandwidth 9.3.1.80	Present if *UL EARFCN* IE is present.	-	
>>>DL Transmission Bandwidth	M		E-UTRA Transmission Bandwidth 9.3.1.80		-	
>*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		E-UTRA Transmission Bandwidth 9.3.1.80		-	
>>>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	M		9.3.1.74		-	
Ignore PRACH Configuration	O		ENUMERATED (true,...)		YES	reject

Range bound	Explanation

ETSI

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, …)	

9.3.1.80 E-UTRA Transmission Bandwidth

This IE is used to indicate the E-UTRA UL or DL transmission bandwidth expressed in units of resource blocks " N_{RB} " (TS 36.104 [25]). The values bw1, bw6, bw15, bw25, bw50, bw75, bw100 correspond to the number of resource blocks " N_{RB} " 6, 15, 25, 50, 75, 100.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
E-UTRA Transmission Bandwidth	**M**		ENUMERATED (bw6, bw15, bw25, bw50, bw75, bw100,...)	

9.3.1.81 Message Identifier

This IE identifies the warning message.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Message Identifier	M		BIT STRING (SIZE(16))	This IE is set by the 5GC, transferred to the UE by the NG-RAN node.

9.3.1.82 Serial Number

This IE identifies a particular message from the source and type indicated by the Message Identifier and is altered every time the message with a given Message Identifier is changed.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Serial Number	M		BIT STRING (SIZE(16))	

9.3.1.83 UAC Assistance Information

This information element contains assistance information helping the gNB-DU to set parameters for Unified Access Class barring.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UAC PLMN List		*1*		
>UAC PLMN Item		*1..<maxnoofUAC PLMNs>*		
>>PLMN Identity	M		9.3.1.14	
>>UAC Type List		*1*		
>>>UAC Type Item		*1..<maxnoofUACp erPLMN>*		
>>>>UAC Reduction Indication	M		9.3.1.85	
>>>>CHOICE UAC Category Type	M			
>>>>>UAC Standardized				
>>>>>> UAC Action	M		9.3.1.84	
>>>>>UAC Operator Defined				
>>>>>>Access Category	M		INTEGER (32..63, …)	Indicates the operator defined Access Category as defined in subclause 6.3.2 in TS 38.331 [8].
>>>>>>Access Identity	M		BIT STRING (SIZE(7))	Indicates whether access attempt is allowed for each Access Identity as defined in subclause 6.3.2 in TS 38.331 [8].
>>NID	O		9.3.1.155	

Range bound	Explanation
maxnoofUACPLMNs	Maximum no. of UAC PLMN Ids. Value is 12.
maxnoofUACperPLMN	Maximum no. of signalled categories per PLMN. Value is 64.

9.3.1.84 UAC Action

This IE indicates which signalling traffic is expected to be reduced by the gNB-CU, as defined in clause 8.7.7 of TS 38.413 [3]

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UAC Action	M		ENUMERATED (Reject RRC connection establishments for non-emergency MO DT, Reject RRC connection establishments for Signalling, Permit Emergency Sessions and mobile terminated services only, Permit High Priority Sessions and mobile terminated services only,…)	

9.3.1.85 UAC reduction Indication

This IE indicates the percentage of signalling traffic expected to be reduced by the gNB-CU, relative to the instantaneous incoming rate from the gNB-DU

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UAC reduction Indication	M		INTEGER (0..100)	Value 0 indicates that no access rate reduction is desired. Value 100 indicates that full access rate reduction is desired.

9.3.1.86 Additional SIB Message List

This IE indicates the list of additional SIB messages containing all the remaining segments of a public warning message if segmentation is applied to such message.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Additional SIB Message List Item IEs		*1.. <maxnoofAdditionalSIBs >*		
>Additional SIB	M		OCTET STRING	SIB message containing one segment of a public warning message, as defined in TS 38.331 [8].

Range bound	Explanation
maxnoofAdditionalSIBs	Maximum no. of additional segments of a public warning message. Value is 63.

9.3.1.87 Cell Type

This IE provides the cell coverage area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Size	M		ENUMERATED (verysmall, small, medium, large, …)	

9.3.1.88 Trace Activation

This IE defines parameters related to a trace session activation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Trace ID	M		OCTET STRING (SIZE(8))	This IE is composed of the following: Trace Reference defined in TS 32.422 [29] (leftmost 6 octets, with PLMN information encoded as in 9.3.1.14), and Trace Recording Session Reference defined in TS 32.422 [29] (last 2 octets).
Interfaces To Trace	M		BIT STRING (SIZE(8))	Each position in the bitmap represents an NG-RAN node interface: first bit = NG-C, second bit = Xn-C, third bit = Uu, fourth bit = F1-C, fifth bit = E1: other bits reserved for future use. Value '1' indicates 'should be traced'. Value '0' indicates 'should not be traced'.
Trace Depth	M		ENUMERATED (minimum, medium, maximum, minimumWithoutVendor SpecificExtension, mediumWithoutVendorS pecificExtension, maximumWithoutVendor SpecificExtension, …)	Defined in TS 32.422 [29].
Trace Collection Entity IP Address	M		Transport Layer Address 9.3.2.3	For File based Reporting. Defined in TS 32.422 [29]. Should be ignored if URI is present.
MDT Configuration	O		9.3.1.150	
Trace Collection Entity URI	O		URI 9.3.2.6	For Streaming based Reporting. Defined in TS 32.422 [11] Replaces Trace Collection Entity IP Address if present

9.3.1.89 Intended TDD DL-UL Configuration

This IE contains the subcarrier spacing, cyclic prefix and TDD DL-UL slot configuration of an NR cell that the receiving NG-RAN node needs to take into account for cross-link interference mitigation, and/or for NR-DC power coordination, when operating its own cells.

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].
NR Cyclic Prefix	M		ENUMERATED (Normal, Extended, …)	The type of cyclic prefix, which determines the number of symbols in a slot.
NR DL-UL Transmission Periodicity	M		ENUMERATED (ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms3, ms4, ms5, ms10, ms20, ms40, ms60, ms80, ms100, ms120, ms140, ms160, …)	The periodicity is expressed in the format msXpYZ, and equals X.YZ milliseconds.
Slot Configuration List		1		
>Slot Configuration List Item		*1..<maxnoofslots>*		
>>Slot Index	M		INTEGER (0..319)	
>>CHOICE *Symbol Allocation in Slot*	M			
>>>*All DL*			NULL	This choice implies that all symbols in the slot are DL symbols.
>>>*All UL*			NULL	This choice implies that all symbols in the slot are UL symbols.
>>>*Both DL and UL*				
>>>>Number of DL Symbols	M		INTEGER (0..13)	Number of consecutive DL symbols at the beginning of the slot identified by Slot Index. If extended cyclic prefix is used, the maximum value is 11.
>>>>Number of UL Symbols	M		INTEGER (0..13)	Number of consecutive UL symbols in the end of the slot identified by Slot Index. If extended cyclic prefix is used, the maximum value is 11.

Range bound	Explanation
maxnoofslots	Maximum length of number of slots in a 10-ms period. Value is 320.

9.3.1.90   Additional RRM Policy Index

The *Additional RRM Policy Index* IE is used to provide additional information independent from the Subscriber Profile ID for RAT/Frequency priority as specified in TS 36.300 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Additional RRM Policy Index	M		BIT STRING (32)	

9.3.1.91   DU-CU RIM Information

This IE conveys the Remote Interference Management message from the gNB-DU to the gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Victim gNB Set ID	M		9.3.1.93	
RIM-RS Detection Status	M		ENUMERATED(RS detected, RS disappeared)	This IE indicates detection status of RIM-RS in gNB-DU
Aggressor Cell List		*1*		
>**Aggressor Cell List Item**		*1..< maxCellingNBDU >*		
>>Aggressor Cell ID	M		NR CGI 9.3.1.12	

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

9.3.1.92 CU-DU RIM Information

This IE conveys the Remote Interference Management message from the gNB-CU to the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Victim gNB Set ID	M		9.3.1.93	
RIM-RS Detection Status	M		ENUMERATED(RS detected, RS disappeared)	This IE indicates detection status of RIM-RS in remote gNB(s).

9.3.1.93 gNB Set ID

The gNB Set ID IE is used to identify a group of gNBs which transmit the same RIM-RS.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB Set ID	M		BIT STRING (SIZE(22))	

9.3.1.94 Lower Layer Presence Status Change

This IE indicates lower layer resources' presence status shall be changed.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Lower Layer Presence Status Change	M		ENUMERATED (suspend lower layers, resume lower layers ...)	"suspend lower layers" will store CellGroupConfig. From the parameters received within the ReconfigurationWithSync, only the sPCellConfigCommon is stored. "resume lower layers" shall restore SCG and it is set only after "suspend lower layers" has been indicated.

9.3.1.95 Traffic Mapping Information

This IE includes the information used by the gNB-DU to perform traffic mapping.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE *Traffic Mapping Information Type*	M			
>IP to layer2 Traffic Mapping Info				
>>IP to layer2 Traffic Mapping Info To Add	O		IP-to-layer-2 traffic mapping Information List 9.3.1.96	This IE indicates the mapping information for forwarding of IP traffic to layer-2 to be added.
>>IP to layer2 Traffic Mapping Info To Remove	O		Mapping Information to Remove 9.3.1.99	This IE indicates the mapping information for forwarding of IP traffic to layer 2 to be removed.
>BAP layer BH RLC channel Mapping Info				
>>BAP layer BH RLC channel Mapping Info To Add	O		BAP layer BH RLC channel mapping Information List 9.3.1.98	This IE indicates the mapping information for forwarding of traffic on BAP layer to be added.
>>BAP layer BH RLC channel Mapping Info To Remove	O		Mapping Information to Remove 9.3.1.99	This IE indicates the mapping information for forwarding of traffic on BAP layer to be removed.

9.3.1.96   IP-to-layer-2 traffic mapping Information List

This IE includes the information used by the IAB-donor-DU to perform the mapping from IP layer to layer-2. If this IE appears in the UE-associated F1AP signalling, the *BH Information* IE should only contain the *BAP Routing ID* IE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IP-to-layer-2 mapping information Item		1.. <*maxnoofMappingEntries*>		
>Mapping Information Index	M		9.3.1.100	
>IP header information	M		9.3.1.97	
>BH Information	M		9.3.1.114	

Range bound	Explanation
maxnoofMappingEntries	Maximum no. of mapping entries, the maximum value is 67108864 (i.e. 2^26).

9.3.1.97   IP Header Information

This IE indicates the IP header information included in the *Traffic Mapping Information* IE for DL traffic.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Destination IAB TNL Address	M		9.3.1.102	This IE indicates the destination IPv4 address, or IPv6 address or IPv6 prefix of a DL packet.
DS Information List		0.. <*maxnoofDSInfo*>		
>DSCP	M		BIT STRING (SIZE(6))	This IE indicates the DS information of DL traffic.
IPv6 Flow Label	O		BIT STRING (SIZE(20))	This IE indicates the IPv6 Flow Label of DL traffic.

Range bound	Explanation
maxnoofDSInfo	Maximum no. of DSCP values related to a destination IP address that can be mapped to one BH RLC channel, the maximum value is 64.

9.3.1.98 BAP layer BH RLC channel mapping Information List

This IE includes the information used by the IAB-DU to perform the BH RLC channel mapping when forwarding traffic on BAP layer.

When this IE is included in the UE-associated F1AP signalling for setting up or modifying a BH RLC channel, it contains either the *Prior-Hop BAP Address* IE and the *Ingress BH RLC CH ID* IE to configure a mapping in downlink direction, or the *Next-Hop BAP address* IE and the *Egress BH RLC CH ID* IE to configure a mapping in uplink direction. This IE indicates the BH RLC channel served by the collocated IAB-MT.

When this IE is included in the non-UE-associated F1AP signalling, it shall contain the *Prior-Hop BAP Address* IE, the *Ingress BH RLC CH ID* IE, the *Next-Hop BAP address* IE and the *Egress BH RLC CH ID* IE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BAP layer BH RLC channel mapping info Item		1.. *<maxnoofMappingEntries>*		
>Mapping Information Index	M		9.3.1.100	
>Prior-Hop BAP Address	O		9.3.1.111	
>Ingress BH RLC CH ID	O		BH RLC Channel ID 9.3.1.113	
>Next-Hop BAP Address	O		9.3.1.111	
>Egress BH RLC CH ID	O		BH RLC Channel ID 9.3.1.113	

Range bound	Explanation
maxnoofMappingEntries	Maximum no. of mapping entries, the maximum value is 67108864 (i.e. 2^26).

9.3.1.99 Mapping Information to Remove

This IE includes a list of mapping information indexes corresponding to the mapping configuration which is to be removed.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Mapping Information to Remove List Item		1.. *<maxnoofMappingEntries>*		
>Mapping Information Index	M		9.3.1.100	

Range bound	Explanation
maxnoofMappingEntries	Maximum no. of mapping entries, the maximum value is 67108864 (i.e. 2^26).

9.3.1.100 Mapping Information Index

This IE includes an index of one mapping information entry at the IAB-donor-DU or an IAB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Mapping Information Index	M		BIT STRING (SIZE(26))	

9.3.1.101 IAB TNL Addresses Requested

The *IAB TNL Addresses Requested* IE indicates the number of IPv4 or IPv6 addresses or IPv6 address prefixes requested for the indicated usage.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
TNL Addresses or Prefixes Requested - All Traffic	O		INTEGER (1..256)	The number of TNL addresses/ IPv6 prefixes requested for all traffic.
TNL Addresses or Prefixes Requested - F1-C traffic	O		INTEGER (1..256)	The number of TNL addresses/IPv6 prefixes requested for F1-C traffic.
TNL Addresses or Prefixes Requested - F1-U traffic	O		INTEGER (1..256)	The number of TNL addresses/ IPv6 prefixes requested for F1-U traffic.
TNL Addresses or Prefixes Requested - Non-F1 traffic	O		INTEGER (1..256)	The number of TNL addresses/ IPv6 prefixes requested for non-F1 traffic.

9.3.1.102 IAB TNL Address

The *IAB TNL Address* IE indicates an IPv4 or IPv6 address or an IPv6 address prefix assigned to an IAB-node.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE *IAB TNL Address*	M			
>IPv4 Address			BIT STRING (SIZE(32))	The IPv4 address allocated to an IAB-node.
>IPv6 Address			BIT STRING (SIZE(128))	The IPv6 address allocated to an IAB-node.
>IPv6 Prefix			BIT STRING (SIZE(64))	The IPv6 address prefix allocated to an IAB-node.

9.3.1.103 Uplink BH Non-UP Traffic Mapping

This IE indicates the mapping of uplink non-UP traffic to a BH RLC channel and BAP Routing ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Uplink Non-UP Traffic Mapping List		*0..1*		
>Uplink Non-UP Traffic Mapping List Item IEs		*1 .. <maxnoofNonUPTrafficMappings>*		
>>Non-UP Traffic Type	M		9.3.1.104	
>>BH Information	M		9.3.1.114	

Range bound	Explanation
maxnoofNonUPTrafficMappings	Maximum no. of non-UP traffic mappings. Value is 32.

9.3.1.104   Non-UP Traffic Type

This IE indicates the type of non-UP traffic.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Non-UP Traffic Type	M		ENUMERATED(UE-associated F1AP, non-UE-associated F1AP, non-F1, BAP control PDU, ...)	

9.3.1.105   IAB Info IAB-donor-CU

This IE contains cell-specific IAB-related information sent by an IAB-donor-CU to an IAB-DU or IAB-donor-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IAB STC Info	O		9.3.1.109	Contains STC configuration of IAB-DU or IAB-donor-DU.

9.3.1.106   IAB Info IAB-DU

This IE contains cell-specific IAB-related information sent by an IAB-DU or IAB-donor-DU to an IAB-donor-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Multiplexing Info	O		9.3.1.108	Contains the information about multiplexing with cells configured for a collocated IAB-MT. Applicable for an IAB-DU.
IAB STC Info	O		9.3.1.109	Contains the information about STC configuration of IAB-DU or IAB-donor-DU.

9.3.1.107   gNB-DU Cell Resource Configuration

This IE contains the resource configuration of the cells served by a gNB-DU, i.e. the TDD resource parameters for each activated cell (TS 38.213 [31], clause 11.1.1).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Subcarrier Spacing	M		ENUMERATED (kHz15, kHz30, kHz60, kHz120, kHz240, spare3, spare2, spare1, …)	Subcarrier spacing used as reference for the TDD slot configuration.	YES	reject
DUF Transmission Periodicity	M		ENUMERATED (ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, …)		YES	reject
DUF Slot Configuration List		*0..1*				
>**DUF Slot Configuration Item**		*1..<maxno ofDUFSlot s>*		The *maxNrofSlots* in TS 38.331 [8].	-	
>>CHOICE *DUF Slot Configuration*	M				-	
>>>Explicit Format	M				-	
>>>>Permutation	M		ENUMERATED (DFU, UFD, …)		-	
>>>>Number of Downlink Symbols	O		INTEGER (0..14)		-	
>>>>Number of Uplink Symbols	O		INTEGER (0..14)		-	
>>>Implicit Format	M				-	
>>>>DUF Slot Format Index	M		INTEGER (0..254)	Index into Table 11.1.1-x and Table 14-1 in TS 38.213 [31], excluding the last row.	-	
HSNA Transmission Periodicity	M		ENUMERATED (ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, ms20, ms40, ms80, ms160, …)		YES	reject
HSNA Slot Configuration List		0..1				
>**HSNA Slot Configuration Item**		*1..<maxno ofHSNASl ots>*				
>>HSNA Downlink	O		ENUMERATED (HARD, SOFT, NOTAVAILABL E)	HSNA value for downlink symbols in a slot.	-	
>>HSNA Uplink	O		ENUMERATED (HARD, SOFT, NOTAVAILABL E)	HSNA value for uplink symbols in a slot.	-	
>>HSNA Flexible	O		ENUMERATED (HARD, SOFT, NOTAVAILABL E)	HSNA value for flexible symbols in a slot.	-	

Range bound	Explanation
maxnoofDUFSlots	Maximum no. of slots in 10ms. Value is 320.
maxnoofSymbols	Maximum no. of symbols in a slot. Value is 14.
maxnoofHSNASlots	Maximum no of "Hard", "Soft" or "Not available" slots in 160ms. Value is 5120.

9.3.1.108   Multiplexing Info

This IE contains information about the multiplexing capabilities between the gNB-DU's cell and the cells configured on the collocated IAB-MT.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IAB-MT Cell List		*0..1*		
>IAB-MT Cell Item		*1 .. <maxnoofServingCells>*		
>>NR Cell Identity	M		BIT STRING (SIZE(36))	Cell identity of a serving cell configured for a collocated IAB-MT.
>>DU_RX/MT_RX	M		ENUMERATED (supported, not supported)	An indication of whether the IAB-node supports simultaneous reception at its DU and MT side.
>>DU_TX/MT_TX	M		ENUMERATED (supported, not supported)	An indication of whether the IAB-node supports simultaneous transmission at its DU and MT side.
>>DU_TX/MT_RX	M		ENUMERATED (supported, not supported)	An indication of whether the IAB-node supports simultaneous transmission at its DU and reception at its MT side.
>>DU_RX/MT_TX	M		ENUMERATED (supported, not supported)	An indication of whether the IAB-node supports simultaneous reception at its DU and transmission at its MT side.

Range bound	Explanation
maxnoofServingCells	Maximum no. of serving cells for IAB-MT. Value is 32, as defined by the *maxNrofServingCells* in TS 38.331 [8].

9.3.1.109   IAB STC Info

This IE contains cell SSB Transmission Configuration (STC) information of an IAB-DU or IAB-donor-DU. The information is used by neighbour IAB-MTs for discovery and measurements of this IAB-DU or IAB-donor-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IAB STC-Info List		0,,1		
>IAB STC-Info Item		1 ..<maxnoofIABSTCInfo>		
>>SSB Frequency Info	M		INTEGER (0.. maxNRARFCN)	The SSB central frequency.
>>SSB Subcarrier Spacing	M		ENUMERATED (kHz15, kHz30, kHz120, kHz240, spare3, spare2, spare1, …)	The SSB subcarrier spacing.
>>SSB Transmission Periodicity	M		ENUMERATED (sf5, sf10, sf20, sf40, sf80, sf160, sf320, sf640, ,,,)	
>>SSB Transmission Timing Offset	M		INTEGER (0.. 127, …)	SSB transmission timing offset in number of half-frames.
>>CHOICE *SSB Transmission Bitmap*	M			The *SSB-ToMeasure* IE defined in TS 38.331 [8].
>>>Short Bitmap	O		BIT STRING (SIZE (4))	
>>>Medium Bitmap	O		BIT STRING (SIZE (8))	
>>>Long Bitmap	O		BIT STRING (SIZE (64))	

Range bound	Explanation
maxnoofIABSTCInfo	Maximum no. of STC configurations. Value is 5. This includes 1 STC configuration for access and 4 STC configurations for backhaul.
maxNRARFCN	Maximum value of NR ARFCNs. Value is 3279165.

9.3.1.110   BAP Routing ID

This IE indicates the BAP Routing ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BAP Address	M		9.3.1.111	
Path ID	M		BAP Path ID 9.3.1.112	

9.3.1.111   BAP Address

This IE indicates the BAP address of an IAB-node or of an IAB-donor-DU, and it is part of the BAP Routing ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BAP Address	M		BIT STRING (SIZE(10))	Corresponds to the *bap-Address-r16*, defined in subclause 6.2.2 of TS 38.331 [8].

9.3.1.112   BAP Path ID

This IE indicates the BAP path ID, which is part of the BAP Routing ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BAP Path ID	M		BIT STRING (SIZE(10))	Corresponds to the *Bap-Pathid-r16* defined in subclause 6.3.2 of TS 38.331 [8].

9.3.1.113   BH RLC Channel ID

This IE uniquely identifies a BH RLC channel for an IAB-node and IAB-donor-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BH RLC CH ID	M		BIT STRING (SIZE(16))	

9.3.1.114   BH Information

This IE includes the backhaul information for UL or DL.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BAP Routing ID	O		9.3.1.110	This IE is not needed for the BAP control PDU. For UL F1-U traffic, the BAP address included in this IE also indicates the IAB-donor-DU via which the DL traffic is transmitted.
Egress BH RLC CH List		*0..1*		
>Egress BH RLC CH List Item		*1.. <maxnoofEgressLinks>*		
>>Next-Hop BAP Address	M		9.3.1.111	This IE identifies the next-hop node on the backhaul path to receive the packet. The value of this IE should be unique in the whole list.
>>Egress BH RLC CH ID	M		BH RLC Channel ID 9.3.1.113	This IE identifies the BH RLC channel in the link between the gNB-DU and the node identified by the *Next-Hop BAP Address* IE.

Range bound	Explanation
maxnoofEgressLinks	Maximum no. of egress links. Value is 2.

9.3.1.115   Control Plane Traffic Type

This IE indicates the control plane traffic type carried over a BH RLC channel.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Control Plane Traffic Type	M		INTEGER (1..3, ...)	Control plane traffic types with different priorities are identified by the different codepoints in this IE, where 1 has the highest priority.

9.3.1.116 NR V2X Services Authorized

This IE provides information on the authorization status of the UE to use the NR sidelink for V2X services.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Vehicle UE	O		ENUMERATED (authorized, not authorized, ...)	Indicates whether the UE is authorized as Vehicle UE.
Pedestrian UE	O		ENUMERATED (authorized, not authorized, ...)	Indicates whether the UE is authorized as Pedestrian UE.

9.3.1.117 LTE V2X Services Authorized

This IE provides information on the authorization status of the UE to use the LTE sidelink for V2X services.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Vehicle UE	O		ENUMERATED (authorized, not authorized, ...)	Indicates whether the UE is authorized as Vehicle UE.
Pedestrian UE	O		ENUMERATED (authorized, not authorized, ...)	Indicates whether the UE is authorized as Pedestrian UE.

9.3.1.118 LTE UE Sidelink Aggregate Maximum Bit Rate

This IE provides information on the Aggregate Maximum Bitrate of the UE's communication over LTE sidelink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
LTE UE Sidelink Aggregate Maximum Bit Rate	M		Bit Rate 9.3.1.4	Value 0 shall be considered as a logical error by the receiving gNB-DU.

9.3.1.119 NR UE Sidelink Aggregate Maximum Bit Rate

This IE provides information on the Aggregate Maximum Bitrate of the UE's communication over NR sidelink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR UE Sidelink Aggregate Maximum Bit Rate	M		Bit Rate 9.3.1.4	Value 0 shall be considered as a logical error by the receiving gNB-DU.

9.3.1.120 SL DRB ID

This IE uniquely identifies a SL DRB for a UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SL DRB ID	M		INTEGER (1.. 512, ...)	Corresponds to the *SLRB-Uu-ConfigIndex* defined in TS 38.331 [8].

9.3.1.121 PC5 QoS Flow Identifier

This IE uniquely identifies one sidelink QoS flow between the UE and the network in the scope of UE.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PC5 QoS Flow Identifier	M		INTEGER (1.. 2048)	Corresponds to the *SL-QoS-FlowIdentity* defined in TS 38.331 [8].

9.3.1.122 PC5 QoS Parameters

This IE defines the QoS to be applied to a SL DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE *PC5 QoS Characteristics*	M				-	
>*Non-dynamic PQI*					-	
>>Non Dynamic PQI Descriptor	M		9.3.1.126		-	
>*Dynamic PQI*					-	
>>Dynamic PQI Descriptor	M		9.3.1.127		-	
PC5 Flow Bit Rates	O			Only applies for GBR QoS Flows.	-	
>Guaranteed Flow Bit Rate	M		Bit Rate 9.3.1.22	Guaranteed Bit Rate for the PC5 QoS flow. Details in TS 23.501 [21].	-	
>Maximum Flow Bit Rate	M		Bit Rate 9.3.1.22	Maximum Bit Rate for the PC5 QoS flow. Details in TS 23.501 [21].	-	

Range bound	Explanation
maxnoofPC5QoSFlows	Maximum no. of PC5 QoS flows allowed towards one UE for NR sidelink communication, the maximum value is 2048.

9.3.1.123 Alternative QoS Parameters Set Index

This IE indicates the QoS parameters set which can currently be fulfilled.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative QoS Parameters Set Index	M		INTEGER (1..8, ...)	Indicates the index of the item within the *Alternative QoS Parameter Set List* IE corresponding to the currently fulfilled alternative QoS parameters set.

9.3.1.124   Alternative QoS Parameters Set Notify Index

This IE indicates the QoS parameters set which can currently be fulfilled.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative QoS Parameters Set Notify Index	M		INTEGER (0..8, ...)	Indicates the index of the item within the the *Alternative QoS Parameter Set List* IE corresponding to the currently fulfilled alternative QoS parameters set. Value 0 indicates that NG-RAN cannot even fulfil the lowest alternative parameter set.

9.3.1.125   Alternative QoS Parameters Set List

This IE contains alternative sets of QoS parameters which the NG-RAN node can indicate to be fulfilled when notification control is enabled and it cannot fulfil the requested list of QoS parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Alternative QoS Parameters Set Item		*1..<maxnoofQoSParaSets>*		
>Alternative QoS Parameters Set Index	M		9.3.1.123	
>Guaranteed Flow Bit Rate Downlink	O		Bit Rate 9.3.1.4	
>Guaranteed Flow Bit Rate Uplink	O		Bit Rate 9.3.1.4	
>Packet Delay Budget	O		9.3.1.51	
>Packet Error Rate	O		9.3.1.52	

Range bound	Explanation
maxnoofQoSParaSets	Maximum no. of alternative sets of QoS Parameters allowed for the QoS profile. Value is 8.

9.3.1.126   Non Dynamic PQI Descriptor

This IE indicates the QoS Characteristics for a standardized or pre-configured PQI for sidelink.

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]
QoS Priority Level	O		INTEGER (1..8,…)	For details see TS 23.501 [21]. When included overrides standardized or pre-configured value.
Averaging Window	O		9.3.1.53	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.

9.3.1.127   Dynamic PQI Descriptor

This IE indicates the QoS Characteristics for a Non-standardised or not pre-configured PQI for sidelink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Resource Type	O		ENUMERATED (GBR, non-GBR, delay critical GBR, …)	
QoS Priority Level	O		INTEGER (1..8, …)	For details see TS 23.501 [21].
Packet Delay Budget	O		9.3.1.51	For details see TS 23.501 [21].
Packet Error Rate	O		9.3.1.52	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 *Delay Critical* IE is set to "delay critical" and is ignored otherwise.

Condition	Explanation
ifGBRflow	This IE shall be present if the *GBR QoS Flow Information* IE is present in the *QoS Flow Level QoS Parameters* IE.

9.3.1.128   TNL Capacity Indicator

The *TNL Capacity Indicator* IE indicates the offered and available capacity of the Transport Network experienced by the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL TNL Offered Capacity	M		INTEGER (1.. 16777216,...)	Maximum capacity offered by the transport portion of the gNB-DU – gNB-CU in kbps
DL TNL Available Capacity	M		INTEGER (0.. 100,...)	Available capacity over the transport portion serving the node in percentage. Value 100 corresponds to the offered capacity
UL TNL Offered Capacity	M		INTEGER (1.. 16777216,...)	Maximum capacity offered by the transport portion of the gNB-DU – gNB-CU in kbps
UL TNL Available Capacity	M		INTEGER (0.. 100,...)	Available capacity over the transport portion serving the node in percentage. Value 100 corresponds to the offered capacity

9.3.1.129   Radio Resource Status

The *Radio Resource Status* IE indicates the usage of the PRBs per cell and per SSB area for all traffic in Downlink and Uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SSB Area Radio Resource Status List		*1*		
>SSB Area Radio Resource Status Item		*1..<maxnoofSSBAreas>*		
>>SSB Index	M		INTEGER (0..63)	
>>SSB Area DL GBR PRB usage	M		INTEGER (0..100)	Per SSB area DL GBR PRB usage
>>SSB Area UL GBR PRB usage	M		INTEGER (0..100)	Per SSB area UL GBR PRB usage
>>SSB Area DL non-GBR PRB usage	M		INTEGER (0..100)	Per SSB area DL non-GBR PRB usage
>>SSB Area UL non-GBR PRB usage	M		INTEGER (0..100)	Per SSB area UL non-GBR PRB usage
>>SSB Area DL Total PRB usage	M		INTEGER (0..100)	Per SSB area DL Total PRB usage
>>SSB Area UL Total PRB usage	M		INTEGER (0..100)	Per SSB area UL Total PRB usage
>>DL scheduling PDCCH CCE usage	O		INTEGER (0..100)	
>>UL scheduling PDCCH CCE usage	O		INTEGER (0..100)	

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

9.3.1.130 Composite Available Capacity Group

The *Composite Available Capacity Group* IE indicates the overall available resource level per cell and per SSB area in the cell in Downlink and Uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Composite Available Capacity Downlink	M		Composite Available Capacity 9.3.1.131	For the Downlink
Composite Available Capacity Uplink	M		Composite Available Capacity 9.3.1.131	For the Uplink

9.3.1.131 Composite Available Capacity

The *Composite Available Capacity* IE indicates the overall available resource level in the cell in either Downlink or Uplink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Capacity Class Value	O		9.3.1.132	
Capacity Value	M		9.3.1.133	'0' indicates no resource is available, Measured on a linear scale.

9.3.1.132 Cell Capacity Class Value

The *Cell Capacity Class Value* IE indicates the value that classifies the cell capacity with regards to the other cells. The *Cell Capacity Class Value* IE only indicates resources that are configured for traffic purposes.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Capacity Class Value	M		INTEGER (1..100,...)	Value 1 shall indicate the minimum cell capacity, and 100 shall indicate the maximum cell capacity. There should be a linear relation between cell capacity and Cell Capacity Class Value.

9.3.1.133   Capacity Value

The *Capacity Value* IE indicates the amount of resources per cell and per SSB area that are available relative to the total gNB-DU resources. The capacity value should be measured and reported so that the minimum gNB-DU resource usage of existing services is reserved according to implementation. The *Capacity Value* IE can be weighted according to the ratio of cell capacity class values, if available.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Capacity Value	M		INTEGER (0..100)	Value 0 shall indicate no available capacity, and 100 shall indicate maximum available capacity with respect to the whole cell. Capacity Value should be measured on a linear scale.
SSB Area Capacity Value List		*0..1*		
>SSB Area Capacity Value Item		*1..<maxnoofSSBAreas>*		
>>SSB Index	M		INTEGER (0..63)	
>>SSB Area Capacity Value	M		INTEGER (0..100)	Value 0 shall indicate no available capacity, and 100 shall indicate maximum available capacity . SSB Area Capacity Value should be measured on a linear scale.

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

9.3.1.134   Slice Available Capacity

The *Slice Available Capacity* IE indicates the amount of resources per network slice that are available per cell relative to the total gNB-DU resources per cell. The *Slice Capacity Value Downlink* IE and the *Slice Capacity Value Uplink* IE can be weighted according to the ratio of the corresponding cell capacity class values contained in the *Composite Available Capacity Group* IE, if available.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Slice Available Capacity List		*1*		
Slice Available Capacity Item		*1..< maxnoofBPLMNsNR >*		
>PLMN Identity	M		9.3.1.14	Broadcast PLMN
>S-NSSAI Available Capacity List		*1*		
>>S-NSSAI Available Capacity Item	M	*1 .. < maxnoofSliceItems>*		
>>>S-NSSAI			9.3.1.38	
>>>Slice Available Capacity Value Downlink	O		INTEGER (0..100)	Value 0 shall indicate no available capacity, and 100 shall indicate maximum available capacity . Slice Capacity Value should be measured on a linear scale.
>>>Slice Available Capacity Value Uplink	O		INTEGER (0..100)	Value 0 shall indicate no available capacity, and 100 shall indicate maximum available capacity . Slice Capacity Value should be measured on a linear scale.

Range bound	Explanation
maxnoofSliceItems	Maximum no. of signalled slice support items. Value is 1024.
maxnoofBPLMNsNR	Maximum no. of PLMN Ids.broadcast in a cell. Value is 12.

9.3.1.135 Number of Active UEs

The *Number of Active UEs* IE indicates the mean number of active UEs as defined in TS 38.314 [32].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Mean number of Active UEs	M		INTEGER (0..16777215, ...)	As defined in TS 38.314 [32] and where value "1" is equivalent to 0.1 Active UEs, value "2" is equivalent to 0.2 Active UEs, value *n* is equivalent to n/10 Active UEs.

9.3.1.136 Hardware Load Indicator

The *Hardware Load Indicator* IE indicates the status of the Hardware Load.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL Hardware Load Indicator	M		INTEGER (0..100)	This indicates the load in percent
UL Hardware Load Indicator	M		INTEGER (0..100)	This indicates the load in percent

9.3.1.137 NR Carrier List

This IE indicates the SCS-specific carriers per TDD, per DL, per UL or per SUL of an NR cell.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR Carrier Item		*1..<maxnoofN RSCSs>*		
>NR SCS	M		ENUMERATED (scs15, scs30, scs60, scs120, …)	SCS for the corresponding carrier.
>Offset to Carrier	M		INTEGER (0.. 2199, ...)	Offset in frequency domain between Point A (lowest subcarrier of common RB 0) and the lowest usable subcarrier on this carrier in number of PRBs (using the *NR SCS* IE defined for this carrier). The maximum value corresponds to 275×8−1. See TS 38.211 [33], clause 4.4.2.
>Carrier Bandwidth	M		INTEGER (1.. maxnoofPhysicalRe sourceBlocks, ...)	Width of this carrier in number of PRBs (using the *NR SCS* IE defined for this carrier). See TS 38.211 [33], clause 4.4.2.

Range bound	Explanation
maxnoofNRSCSs	Maximum no. of SCS-specific carriers per TDD, per DL, per UL or per SUL of an NR cell. Value is 5.
maxnoofPhysicalResourceBlocks	Maximum no. of Physical Resource Blocks. Value is 275.

9.3.1.138 SSB Positions In Burst

Indicates the time domain positions of the transmitted SS-blocks in a half frame with SS/PBCH blocks as defined in TS 38.213 [31], clause 4.1.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *ssb-PositionsInBurst*	M			The first/ leftmost bit corresponds to SS/PBCH block index 0, the second bit corresponds to SS/PBCH block index 1, and so on. Value 0 in the bitmap indicates that the corresponding SS/PBCH block is not transmitted while value 1 indicates that the corresponding SS/PBCH block is transmitted.
>*ShortBitmap*				
>>ShortBitmap	M		BIT STRING (SIZE(4))	
>*MediumBitmap*				
>>MediumBitmap	M		BIT STRING (SIZE(8))	
>*LongBitmap*				
>>LongBitmap	M		BIT STRING (SIZE(64))	

9.3.1.139 NR PRACH Configuration

This IE indicates the PRACH resources by a NR cell.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
UL PRACH Configuration	M		NR PRACH Configuration List 9.3.1.140	
SUL PRACH Configuration	O		NR PRACH Configuration List 9.3.1.140	

9.3.1.140   NR PRACH Configuration List

This IE indicates the PRACH resources used or reserved in the UL carrier(s) or SUL carrier(s) of the current NR cell.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR PRACH Configuration Item		*0..< maxnoofPrach Configuration >*		Length=0 means releasing of all NR PRACH Configuration Items for this UL or SUL.
>NR SCS	M		ENUMERATED (scs15, scs30, scs60, scs120, …)	The SCS of the carrier to which this *PRACH Configuration Item* relates, i.e. Δf in Section 5.3.2 in TS 38.211 [33]. The values scs15, scs30, scs60 and scs120 corresponds to the sub carrier spacing in TS 38.104 [17]. NOTE: Its value may not be identical to the SCS of MSG1.
> PRACH Frequency Start from Carrier	M		INTEGER (0.. maxNrofPhysicalResourceBlocks-1, …)	Lowest number of resource blocks which can be used to deliver MSG1, counting from the start number of the corresponding carrier. Identical to RB_{start} in Section 5.1.2.2.2 in TS 38.214 [34] plus *msg1-FrequencyStart* in TS 38.331 [8].
>MSG1-FDM	M		ENUMERATED (one, two, four, eight, …)	M in Section 6.3.3.2 in TS 38.211 [33].
>PRACH Configuration Index	M		INTEGER (0.. 255, …)	See Section 6.3.3.2 in TS 38.211 [33].
>SSB per RACH Occasion	M		ENUMERATED (oneEighth, oneFourth, oneHalf, one, two, four, eight, sixteen, ...)	Number of SSBs per RACH occasion. Value *oneEight* corresponds to one SSB associated with 8 RACH occasions, value *oneFourth* corresponds to one SSB associated with 4 RACH occasions, and so on.
>CHOICE *FreqDomainLength*	M			For the case of PRACH resources reserved for BFR or MSG1-based SI Request, *L139* is always used.
>>*L839*				
>>>**L839 Info**		*1*		
>>>>Root Sequence Index	M		INTEGER (0..837)	See Section 6.3.3.1 in TS 38.211 [33].
>>>>Restricted Set Config	M		ENUMERATED (unrestrictedSet, restrictedSetTypeA, restrictedSetTypeB, …)	See Section 6.3.3.1 in TS 38.211 [33].
>>*L139*				
>>>**L139 Info**		*1*		
>>>>MSG1 SCS	M		ENUMERATED (scs15, scs30, scs60, scs120, …)	Subcarrier Spacing used in sending MSG1, i.e. Δf_{RA} in Section 5.3.2 in TS 38.211 [33].
>>>>Root Sequence Index	M		INTEGER (0..137)	See Section 6.3.3.1 in TS 38.211 [33].
>Zero Correlation Zone Config	M		INTEGER (0..15)	See Section 6.3.3.1 in TS 38.211 [33].

Range bound	Explanation
maxnoofPhysicalResourceBlocks-1	Maximum no. of Physical Resource Blocks minus 1. Value is 274.
maxnoofPrachConfiguration	Maximum no. of PRACH Configuration. Value is 16.

9.3.1.141 TSC Traffic Characteristics

This IE provides the traffic characteristics of TSC QoS flows.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
TSC Assistance Information Downlink	O		TSC Assistance Information 9.3.1.142	
TSC Assistance Information Uplink	O		TSC Assistance Information 9.3.1.142	

9.3.1.142 TSC Assistance Information

This IE provides the TSC assistance information for a TSC QoS flow in the uplink or downlink (see TS 23.501 [21]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Periodicity	M		9.3.1.143	Periodicity as specified in TS 23.501 [21].
Burst Arrival Time	O		9.3.1.144	Burst Arrival Time as specified in TS 23.501 [21].

9.3.1.143 Periodicity

This IE indicates the Periodicity as defined in TS 23.501 [21].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Periodicity	M		INTEGER (0..640000, …)	Periodicity expressed in units of 1 us.

9.3.1.144 Burst Arrival Time

This IE indicates the Burst Arrival Time as defined in TS 23.501 [21].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Burst Arrival Time	M		OCTET STRING	Encoded in the same format as the *ReferenceTime* IE as defined in TS 38.331 [8]. The value is truncated to 1 us granularity.

9.3.1.145 Extended 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
Extended Packet Delay Budget	M		INTEGER (0..65535, …)	Upper bound value for the delay that a packet may experience expressed in unit of 0.01ms.

9.3.1.146 RLC Duplication Information

The IE contains the RLC duplication information in case that the indicated DRB is configured with more than two RLC entities as specified in TS 38.331 [8].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
RLC Duplication State List		1		
>RLC Duplication State Items		1 .. <maxnoofRLC DuplicationState>		Each position in the list represents a secondary RLC entity in ascending order by the logical channel ID in the order of MCG and SCG.
>>Duplication State	M		ENUMERATED (Active, Inactive, ...)	
Primary Path Indication	O		ENUMERATED (True, False...)	Indicates whether the primary path is located at the gNB-DU for DC based PDCP duplication.

Range bound	Explanation
maxnoofRLCDuplicationState	Maximum no of Secondary RLC entities. Value is 3.

9.3.1.147 Reporting Request Type

This IE indicates the type of accurate reference time information reporting to be handled by the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Event Type	M		ENUMERATED (on demand, periodic, stop, …)	
Report Periodicity Value	C-ifEventTyp eisPeriodi c		INTEGER (0..512, …)	Indicates the periodicity of accurate reference time information report, Unit in radio frame.

C-ifEventYpeisStop	Explanation
ifEventTypeisPeriodic	This IE shall be present if the *Event Type* IE is set to "periodic".

9.3.1.148 Time Reference Information

This IE contains the time reference information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Reference Time	M		9.3.1.149	
Reference SFN	M		INTEGER (0..1023)	
Uncertainty	O		INTEGER (0..32767, …)	This field indicates the uncertainty of the reference time information provided in ReferenceTimeInfo IE, refer to 6.3.2 of TS 38.331 [8].
Time Information Type	O		ENUMERATED (localClock)	

9.3.1.149 Reference Time

This IE provides the accurate Reference Time information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Reference Time	M		OCTET STRING	Includes the *ReferenceTime* IE as defined in 6.3.2 of TS 38.331 [8].

9.3.1.150 MDT Configuration

The IE defines the MDT configuration parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MDT Activation	M		ENUMERATED (Immediate MDT only, Immediate MDT and Trace, …)		–	
Measurements to Activate	M		BITSTRING (SIZE(8))	Each position in the bitmap indicates a MDT measurement, as defined in TS 37.320 [35]. Second Bit = M2, Fifth Bit = M5, Seventh Bit = M6, Eighth Bit = M7. Value "1" indicates "activate" and value "0" indicates "do not activate". This version of the specification does not use bits 1, bit 3, bit 4 and bit 6.	–	
M2 Configuration	C-ifM2		ENUMERATED (true, …)			
M5 Configuration	C-ifM5		9.3.1.152			
M6 Configuration	C-ifM6		9.3.1.153			
M7 Configuration	C-ifM7		9.3.1.154			

Condition	Explanation
ifM2	This IE shall be present if the *Measurements to Activate* IE has the second bit set to "1".
ifM5	This IE shall be present if the *Measurements to Activate* IE has the fifth bit set to "1".
ifM6	This IE shall be present if the *Measurements to Activate* IE has the seventh bit set to "1".
ifM7	This IE shall be present if the *Measurements to Activate* IE has the eighth bit set to "1".

9.3.1.151 MDT PLMN List

The purpose of the *MDT PLMN List* IE is to provide the list of PLMN allowed for MDT.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT PLMN List		1..<maxnoofM DTPLMNs>		
>PLMN Identity	M		PLMN ID 9.3.1.14	

Range bound	Explanation
maxnoofMDTPLMNs	Maximum no. of PLMNs in the MDT PLMN list. Value is 16.

9.3.1.152 M5 Configuration

This IE defines the parameters for M5 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
M5 Collection Period	M		ENUMERATED (ms1024, ms2048, ms5120, ms10240, min1, …)	
M5 Links to log	M		ENUMERATED(upli nk, downlink, both-uplink-and-downlink, …)	

9.3.1.153 M6 Configuration

This IE defines the parameters for M6 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
M6 Report Interval	M		ENUMERATED (ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1,min6, min12, min30,…)	
M6 Links to log	M		ENUMERATED(upli nk, downlink, both-uplink-and-downlink, …)	

Condition	Explanation
ifUL	This IE shall be present if the *M6 Links to log* IE is set to "uplink" or to "both-uplink-and-downlink".

9.3.1.154 M7 Configuration

This IE defines the parameters for M7 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
M7 Collection Period	M		INTEGER (1..60, …)	Unit: minutes
M7 Links to log	M		ENUMERATED(dow nlink, …)	

9.3.1.155   NID

This IE is used to identify (together with a PLMN identifier) a Stand-alone Non-Public Network. The NID is specified in TS 23.003 [23].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NID	M		BIT STRING (SIZE(44))	

9.3.1.156   NPN Support Information

This IE contains NPN related information associated with Network Slicing information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE *NPN Support Information*	M			
>*SNPN Information*				
>>NID	M		9.3.1.155	

9.3.1.157   NPN Broadcast Information

This IE contains NPN related broadcast information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE *NPN Broadcast Information per PLMN*	M			
>*SNPN Information*				
>>Broadcast SNPN ID List	M		9.3.1.158	
>*PNI-NPN Information*				
>>Broadcast PNI-NPN ID List	M		9.3.1.162	

9.3.1.158   Broadcast SNPN ID List

This IE contains SNPN related broadcast information associated with a set of PLMNs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Broadcast SNPN ID List		*1..<maxnoofNIDs>*		
>PLMN Identity	M		9.3.1.14	
>Broadcast NID List	M		9.3.1.159	

Range bound	Explanation
maxnoofNIDs	Maximum no. of NIDs broadcast in a cell. Value is 12.

9.3.1.159   Broadcast NID List

This IE contains a list of NIDs.

IE/Group Name	Presence	RangeNIDsupported	IE type and reference	Semantics description
Broadcast NID		*1..<maxnoofNIDsupported*		
>NID	M		9.3.1.155	

Range bound	Explanation
maxnoofNIDsupported	Maximum no. of NIDs broadcast in a cell. Value is 12.

9.3.1.160 Broadcast CAG-Identifier List

This IE contains a list of CAG-Identifiers.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Broadcast CAG-Identifier List		*1..<maxnoofCAGsupported>*		
>CAG ID	M		9.3.1.161	

Range bound	Explanation
maxnoofCAGsupported	Maximum no. of CAG-Identifiers broadcast in a cell. Value is 12.

9.3.1.161 CAG ID

This IE is used to identify (together with a PLMN identifier) a Public Network Integrated NPN, as defined in TS 23.003 [23].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CAG ID	M		BIT STRING (SIZE (32))	Closed Access Group ID used in NR.

9.3.1.162 Broadcast PNI-NPN ID Information

This IE contains a list of PNI-NPN IDs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Broadcast PNI-NPN ID Information		*1..<maxnoofBPLMNs>*		Broadcast PLMNs
>PLMN Identity	M		9.3.1.14	
>Broadcast CAG-Identifier List	M		9.3.1.160	

Range bound	Explanation
maxnoofBPLMNs	Maximum no. of broadcast PLMNs by a cell. Value is 12.

9.3.1.163 Available SNPN ID List

This IE indicates the list of available SNPN ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Available SNPN ID List		*1..<maxnoofNIDs>*		
>PLMN Identity	M		9.3.1.14	
>Available NID List	M		Broadcast NID List 9.3.1.159	

Range bound	Explanation
maxnoofNIDs	Maximum no. of NIDs broadcast in a cell. Value is 12.

9.3.1.164   NR Carrier List

This IE indicates the SCS-specific carriers per TDD, per DL, per UL or per SUL of an NR cell.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR Carrier Item		*1..<maxnoofNRSCSs>*		
>NR SCS	M		ENUMERATED (scs15, scs30, scs60, scs120, …)	SCS for the corresponding carrier.
>Offset to Carrier	M		INTEGER (0.. 2199, ...)	Offset in frequency domain between Point A (lowest subcarrier of common RB 0) and the lowest usable subcarrier on this carrier in number of PRBs (using the *NR SCS* IE defined for this carrier). The maximum value corresponds to 275×8−1. See TS 38.211 [33], clause 4.4.2.
>Carrier Bandwidth	M		INTEGER (1.. maxnoofPhysicalResourceBlocks, ...)	Width of this carrier in number of PRBs (using the *NR SCS* IE defined for this carrier). See TS 38.211 [33], clause 4.4.2.

Range bound	Explanation
maxnoofNRSCSs	Maximum no. of SCS-specific carriers per TDD, per DL, per UL or per SUL of an NR cell. Value is 5.
maxnoofPhysicalResourceBlocks	Maximum no. of Physical Resource Blocks. Value is 275.

9.3.1.165   Extended Slice Support List

This IE indicates a list of supported slices.

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

Range bound	Explanation
maxnoofExtSliceItems	Maximum no. of signalled slice support items. Value is 65535.

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	Criticality	Assigned Criticality
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	M		Transport Layer Address 9.3.2.3		-	
>> Port Number	M		BIT STRING (SIZE(16))		Yes	reject

9.3.2.5 Transport Layer Address Info

This IE is used for signalling TNL Configuration information for IPSec tunnel over which GTP traffic is transmitted.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transport UP Layer Address Info to Add List		*0..1*		
>Transport UP Layer Address Info to Add Item		*1..<maxnoofTLAs>*		
>>IP-Sec Transport Layer Address	M		Transport Layer Address 9.3.2.3	Transport Layer Address for IP-Sec endpoint.
>>GTP Transport Layer Address To Add List		*0..1*		
>>>GTP Transport Layer Address To Add Item		*1..<maxnoofGTPTLAs>*		
>>>>GTP Transport Layer Address Info	M		Transport Layer Address 9.3.2.3	GTP Transport Layer Address for GTP end-points.
Transport UP Layer Address Info to Remove List		*0..1*		
>Transport UP Layer Address Info to Remove Item		*1..<maxnoofTLAs>*		
>>IP-Sec Transport Layer Address	M		Transport Layer Address 9.3.2.3	Transport Layer Address for IP-Sec endpoint.
>>GTP Transport Layer Address To Remove List		*0..1*		
>>>GTP Transport Layer Address To Remove Item		*1..<maxnoofGTPTLAs>*		
>>>>GTP Transport Layer Address Info	M		Transport Layer Address 9.3.2.3	GTP Transport Layer Address for GTP end-points.

maxnoofTLAs	Maximum no. of F1 Transport Layer Address in the message. Value is 16.
maxnoofGTPTLAs	Maximum no. of F1 GTP Transport Layer Address for a GTP end-point in the message. Value is 16.

9.3.2.6 URI

This IE is an URI.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
URI	M		VisibleString	String representing URI (Uniform Resource Identifier)

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,
```

```
    GNBDUResourceCoordinationRequest,
    GNBDUResourceCoordinationResponse,
    PrivateMessage,
    UEInactivityNotification,
    InitialULRRCMessageTransfer,
    SystemInformationDeliveryCommand,
    Paging,
    Notify,
    WriteReplaceWarningRequest,
    WriteReplaceWarningResponse,
    PWSCancelRequest,
    PWSCancelResponse,
    PWSRestartIndication,
    PWSFailureIndication,
    GNBDUStatusIndication,
    RRCDeliveryReport,
    UEContextModificationRefuse,
    F1RemovalRequest,
    F1RemovalResponse,
    F1RemovalFailure,
    NetworkAccessRateReduction,
    TraceStart,
    DeactivateTrace,
    DUCURadioInformationTransfer,
    CUDURadioInformationTransfer,
    BAPMappingConfiguration,
    BAPMappingConfigurationAcknowledge,
    GNBDUResourceConfiguration,
    GNBDUResourceConfigurationAcknowledge,
    IABTNLAddressRequest,
    IABTNLAddressResponse,
    IABUPConfigurationUpdateRequest,
    IABUPConfigurationUpdateResponse,
    IABUPConfigurationUpdateFailure,
    ResourceStatusRequest,
    ResourceStatusResponse,
    ResourceStatusFailure,
    ResourceStatusUpdate,
    AccessAndMobilityIndication,
    ReferenceTimeInformationReportingControl,
    ReferenceTimeInformationReport,
    AccessSuccess,
    CellTrafficTrace


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-GNBDUResourceCoordination,
    id-privateMessage,
    id-UEInactivityNotification,
    id-InitialULRRCMessageTransfer,
    id-SystemInformationDeliveryCommand,
    id-Paging,
    id-Notify,
    id-WriteReplaceWarning,
    id-PWSCancel,
    id-PWSRestartIndication,
    id-PWSFailureIndication,
    id-GNBDUStatusIndication,
    id-RRCDeliveryReport,
    id-F1Removal,
    id-NetworkAccessRateReduction,
    id-TraceStart,
    id-DeactivateTrace,
    id-DUCURadioInformationTransfer,
    id-CUDURadioInformationTransfer,
    id-BAPMappingConfiguration,
    id-GNBDUResourceConfiguration,
    id-IABTNLAddressAllocation,
    id-IABUPConfigurationUpdate,
    id-resourceStatusReportingInitiation,
    id-resourceStatusReporting,
    id-accessAndMobilityIndication,
    id-ReferenceTimeInformationReportingControl,
    id-ReferenceTimeInformationReport,
    id-accessSuccess,
    id-cellTrafficTrace


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          |
    f1Removal                          |
    bAPMappingConfiguration            |
    gNBDUResourceConfiguration         |
    iABTNLAddressAllocation            |
    iABUPConfigurationUpdate           |
    resourceStatusReportingInitiation,
    ...
}

F1AP-ELEMENTARY-PROCEDURES-CLASS-2 F1AP-ELEMENTARY-PROCEDURE ::= {
    errorIndication                        |
    uEContextReleaseRequest                |
    dLRRCMessageTransfer                   |
    uLRRCMessageTransfer                   |
    uEInactivityNotification               |
    privateMessage                         |
    initialULRRCMessageTransfer            |
    systemInformationDelivery              |
    paging                                 |
    notify                                 |
    pWSRestartIndication                   |
    pWSFailureIndication                   |
    gNBDUStatusIndication                  |
    rRCDeliveryReport                      |
    networkAccessRateReduction             |
    traceStart                             |
    deactivateTrace                        |
    dUCURadioInformationTransfer           |
    cUDURadioInformationTransfer           |
    resourceStatusReporting                |
    accessAndMobilityIndication            |
    referenceTimeInformationReportingControl|
    referenceTimeInformationReport         |
    accessSuccess                          |
    cellTrafficTrace                       ,
    ...
}
```

```
-- ************************************************************
--
-- 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      PWSCancelRequest
        SUCCESSFUL OUTCOME      PWSCancelResponse
        PROCEDURE CODE          id-PWSCancel
        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
}

dLRRCMessageTransfer F1AP-ELEMENTARY-PROCEDURE ::= {
        INITIATING MESSAGE      DLRRCMessageTransfer
        PROCEDURE CODE          id-DLRRCMessageTransfer
        CRITICALITY             ignore
}

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

```
        INITIATING MESSAGE        ULRRCMessageTransfer
        PROCEDURE CODE            id-ULRRCMessageTransfer
        CRITICALITY               ignore
}


uEInactivityNotification  F1AP-ELEMENTARY-PROCEDURE ::= {
        INITIATING MESSAGE        UEInactivityNotification
        PROCEDURE CODE            id-UEInactivityNotification
        CRITICALITY               ignore
}

gNBDUResourceCoordination F1AP-ELEMENTARY-PROCEDURE ::= {
        INITIATING MESSAGE        GNBDUResourceCoordinationRequest
        SUCCESSFUL OUTCOME        GNBDUResourceCoordinationResponse
        PROCEDURE CODE            id-GNBDUResourceCoordination
        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
}

networkAccessRateReduction F1AP-ELEMENTARY-PROCEDURE ::= {
        INITIATING MESSAGE        NetworkAccessRateReduction
        PROCEDURE CODE            id-NetworkAccessRateReduction
        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
}

f1Removal F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE       F1RemovalRequest
    SUCCESSFUL OUTCOME       F1RemovalResponse
    UNSUCCESSFUL OUTCOME     F1RemovalFailure
    PROCEDURE CODE           id-F1Removal
    CRITICALITY              reject
}

traceStart F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE       TraceStart
    PROCEDURE CODE           id-TraceStart
    CRITICALITY              ignore
}

deactivateTrace F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE       DeactivateTrace
    PROCEDURE CODE           id-DeactivateTrace
    CRITICALITY              ignore
}

dUCURadioInformationTransfer F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE       DUCURadioInformationTransfer
    PROCEDURE CODE           id-DUCURadioInformationTransfer
    CRITICALITY              ignore
}

cUDURadioInformationTransfer F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE       CUDURadioInformationTransfer
    PROCEDURE CODE           id-CUDURadioInformationTransfer
    CRITICALITY              ignore
}
```

```
bAPMappingConfiguration F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        BAPMappingConfiguration
    SUCCESSFUL OUTCOME        BAPMappingConfigurationAcknowledge
    PROCEDURE CODE            id-BAPMappingConfiguration
    CRITICALITY               reject
}

gNBDUResourceConfiguration F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        GNBDUResourceConfiguration
    SUCCESSFUL OUTCOME        GNBDUResourceConfigurationAcknowledge
    PROCEDURE CODE            id-GNBDUResourceConfiguration
    CRITICALITY               reject
}

iABTNLAddressAllocation F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        IABTNLAddressRequest
    SUCCESSFUL OUTCOME        IABTNLAddressResponse
    PROCEDURE CODE            id-IABTNLAddressAllocation
    CRITICALITY               reject
}

iABUPConfigurationUpdate F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        IABUPConfigurationUpdateRequest
    SUCCESSFUL OUTCOME        IABUPConfigurationUpdateResponse
    UNSUCCESSFUL OUTCOME      IABUPConfigurationUpdateFailure
    PROCEDURE CODE            id-IABUPConfigurationUpdate
    CRITICALITY               reject
}

resourceStatusReportingInitiation F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        ResourceStatusRequest
    SUCCESSFUL OUTCOME        ResourceStatusResponse
    UNSUCCESSFUL OUTCOME      ResourceStatusFailure
    PROCEDURE CODE            id-resourceStatusReportingInitiation
    CRITICALITY               reject
}

resourceStatusReporting F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        ResourceStatusUpdate
    PROCEDURE CODE            id-resourceStatusReporting
    CRITICALITY               ignore
}

accessAndMobilityIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        AccessAndMobilityIndication
    PROCEDURE CODE            id-accessAndMobilityIndication
    CRITICALITY               ignore
}

referenceTimeInformationReportingControl F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE        ReferenceTimeInformationReportingControl
    PROCEDURE CODE            id-ReferenceTimeInformationReportingControl
    CRITICALITY               ignore
}
```

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```
referenceTimeInformationReport F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ReferenceTimeInformationReport
    PROCEDURE CODE          id-ReferenceTimeInformationReport
    CRITICALITY             ignore
}

accessSuccess F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      AccessSuccess
    PROCEDURE CODE          id-accessSuccess
    CRITICALITY             ignore
}

cellTrafficTrace F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      CellTrafficTrace
    PROCEDURE CODE          id-cellTrafficTrace
    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,
LowerLayerPresenceStatusChange,
NotificationControl,
NRCGI,
NRPCI,
UEContextNotRetrievable,
Potential-SpCell-Item,
RAT-FrequencyPriorityInformation,
ResourceCoordinationTransferContainer,
RRCContainer,
RRCContainer-RRCSetupComplete,
RRCReconfigurationCompleteIndicator,
SCellIndex,
SCell-ToBeRemoved-Item,
SCell-ToBeSetup-Item,
SCell-ToBeSetupMod-Item,
SCell-FailedtoSetup-Item,
SCell-FailedtoSetupMod-Item,
ServCellIndex,
Served-Cell-Information,
Served-Cells-To-Add-Item,
```

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```
     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,
```

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```
        NeedforGap,
        RRCDeliveryStatus,
        ResourceCoordinationTransferInformation,
        Dedicated-SIDelivery-NeededUE-Item,
        Associated-SCell-Item,
        IgnoreResourceCoordinationContainer,
        PagingOrigin,
        UAC-Assistance-Info,
        RANUEID,
        GNB-DU-TNL-Association-To-Remove-Item,
        NotificationInformation,
        TraceActivation,
        TraceID,
        Neighbour-Cell-Information-Item,
        SymbolAllocInSlot,
        NumDLULSymbols,
        AdditionalRRMPriorityIndex,
        DUCURadioInformationType,
        CUDURadioInformationType,
        Transport-Layer-Address-Info,
        BHChannels-ToBeSetup-Item,
        BHChannels-Setup-Item,
        BHChannels-FailedToBeSetup-Item,
        BHChannels-ToBeModified-Item,
        BHChannels-ToBeReleased-Item,
        BHChannels-ToBeSetupMod-Item,
        BHChannels-FailedToBeModified-Item,
        BHChannels-FailedToBeSetupMod-Item,
        BHChannels-Modified-Item,
        BHChannels-SetupMod-Item,
        BHChannels-Required-ToBeReleased-Item,
        BAPAddress,
        BAPPathID,
        BAPRoutingID,
        BH-Routing-Information-Added-List-Item,
        BH-Routing-Information-Removed-List-Item,
        Child-Nodes-List,
        Child-Nodes-List-Item,
        Child-Node-Cells-List,
        Child-Node-Cells-List-Item,
        Activated-Cells-to-be-Updated-List,
        Activated-Cells-to-be-Updated-List-Item,
        UL-BH-Non-UP-Traffic-Mapping,
        IABTNLAddressesRequested,
        IABIPv6RequestType,
        IAB-TNL-Addresses-To-Remove-Item,
        IABTNLAddress,
        IAB-Allocated-TNL-Address-Item,
        IABv4AddressesRequested,
        TrafficMappingInfo,
        UL-UP-TNL-Information-to-Update-List-Item,
        UL-UP-TNL-Address-to-Update-List-Item,
        DL-UP-TNL-Address-to-Update-List-Item,
        NRV2XServicesAuthorized,
```

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```
    LTEV2XServicesAuthorized,
    NRUESidelinkAggregateMaximumBitrate,
    LTEUESidelinkAggregateMaximumBitrate,
    SLDRBs-SetupMod-Item,
    SLDRBs-ModifiedConf-Item,
    SLDRBID,
    SLDRBs-FailedToBeModified-Item,
    SLDRBs-FailedToBeSetup-Item,
    SLDRBs-FailedToBeSetupMod-Item,
    SLDRBs-Modified-Item,
    SLDRBs-Required-ToBeModified-Item,
    SLDRBs-Required-ToBeReleased-Item,
    SLDRBs-Setup-Item,
    SLDRBs-ToBeModified-Item,
    SLDRBs-ToBeReleased-Item,
    SLDRBs-ToBeSetup-Item,
    SLDRBs-ToBeSetupMod-Item,
    GNBCUMeasurementID,
    GNBDUMeasurementID,
    RegistrationRequest,
    ReportCharacteristics,
    CellToReportList,
    HardwareLoadIndicator,
    CellMeasurementResultList,
    ReportingPeriodicity,
    TNLCapacityIndicator,
    RACHReportInformationList,
    RLFReportInformationList,
    ReportingRequestType,
    TimeReferenceInformation,
    ConditionalInterDUMobilityInformation,
    ConditionalIntraDUMobilityInformation,
    TargetCellList,
    MDTPLMNList,
    PrivacyIndicator,
    TransportLayerAddress,
    URI-address,
    NID


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-new-gNB-CU-UE-F1AP-ID,
        id-new-gNB-DU-UE-F1AP-ID,
        id-oldgNB-DU-UE-F1AP-ID,
        id-PLMNAssistanceInfoForNetShar,
        id-Potential-SpCell-Item,
        id-Potential-SpCell-List,
        id-RAT-FrequencyPriorityInformation,
        id-RedirectedRRCmessage,
        id-ResetType,
        id-ResourceCoordinationTransferContainer,
        id-RRCContainer,
        id-RRCContainer-RRCSetupComplete,
        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-SelectedPLMNID,
        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-UEContextNotRetrievable,
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,
```

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```
    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-UAC-Assistance-Info,
    id-RANUEID,
    id-PagingOrigin,
    id-GNB-DU-TNL-Association-To-Remove-Item,
    id-GNB-DU-TNL-Association-To-Remove-List,
    id-NotificationInformation,
    id-TraceActivation,
    id-TraceID,
    id-Neighbour-Cell-Information-List,
    id-Neighbour-Cell-Information-Item,
    id-SymbolAllocInSlot,
    id-NumDLULSymbols,
    id-AdditionalRRMPriorityIndex,
    id-DUCURadioInformationType,
    id-CUDURadioInformationType,
    id-LowerLayerPresenceStatusChange,
    id-Transport-Layer-Address-Info,
    id-BHChannels-ToBeSetup-List,
    id-BHChannels-ToBeSetup-Item,
    id-BHChannels-Setup-List,
    id-BHChannels-Setup-Item,
    id-BHChannels-ToBeModified-Item,
    id-BHChannels-ToBeModified-List,
    id-BHChannels-ToBeReleased-Item,
    id-BHChannels-ToBeReleased-List,
    id-BHChannels-ToBeSetupMod-Item,
    id-BHChannels-ToBeSetupMod-List,
    id-BHChannels-FailedToBeSetup-Item,
    id-BHChannels-FailedToBeSetup-List,
    id-BHChannels-FailedToBeModified-Item,
    id-BHChannels-FailedToBeModified-List,
    id-BHChannels-FailedToBeSetupMod-Item,
    id-BHChannels-FailedToBeSetupMod-List,
    id-BHChannels-Modified-Item,
    id-BHChannels-Modified-List,
    id-BHChannels-SetupMod-Item,
    id-BHChannels-SetupMod-List,
```

```
id-BHChannels-Required-ToBeReleased-Item,
id-BHChannels-Required-ToBeReleased-List,
id-BAPAddress,
id-ConfiguredBAPAddress,
id-BH-Routing-Information-Added-List,
id-BH-Routing-Information-Added-List-Item,
id-BH-Routing-Information-Removed-List,
id-BH-Routing-Information-Removed-List-Item,
id-UL-BH-Non-UP-Traffic-Mapping,
id-Child-Nodes-List,
id-Activated-Cells-to-be-Updated-List,
id-IABIPv6RequestType,
id-IAB-TNL-Addresses-To-Remove-List,
id-IAB-TNL-Addresses-To-Remove-Item,
id-IAB-Allocated-TNL-Address-List,
id-IAB-Allocated-TNL-Address-Item,
id-IABv4AddressesRequested,
id-TrafficMappingInformation,
id-UL-UP-TNL-Information-to-Update-List,
id-UL-UP-TNL-Information-to-Update-List-Item,
id-UL-UP-TNL-Address-to-Update-List,
id-UL-UP-TNL-Address-to-Update-List-Item,
id-DL-UP-TNL-Address-to-Update-List,
id-DL-UP-TNL-Address-to-Update-List-Item,
id-NRV2XServicesAuthorized,
id-LTEV2XServicesAuthorized,
id-NRUESidelinkAggregateMaximumBitrate,
id-LTEUESidelinkAggregateMaximumBitrate,
id-PC5LinkAMBR,
id-SLDRBs-FailedToBeModified-Item,
id-SLDRBs-FailedToBeModified-List,
id-SLDRBs-FailedToBeSetup-Item,
id-SLDRBs-FailedToBeSetup-List,
id-SLDRBs-Modified-Item,
id-SLDRBs-Modified-List,
id-SLDRBs-Required-ToBeModified-Item,
id-SLDRBs-Required-ToBeModified-List,
id-SLDRBs-Required-ToBeReleased-Item,
id-SLDRBs-Required-ToBeReleased-List,
id-SLDRBs-Setup-Item,
id-SLDRBs-Setup-List,
id-SLDRBs-ToBeModified-Item,
id-SLDRBs-ToBeModified-List,
id-SLDRBs-ToBeReleased-Item,
id-SLDRBs-ToBeReleased-List,
id-SLDRBs-ToBeSetup-Item,
id-SLDRBs-ToBeSetup-List,
id-SLDRBs-ToBeSetupMod-Item,
id-SLDRBs-ToBeSetupMod-List,
id-SLDRBs-SetupMod-List,
id-SLDRBs-FailedToBeSetupMod-List,
id-SLDRBs-SetupMod-Item,
id-SLDRBs-FailedToBeSetupMod-Item,
id-SLDRBs-ModifiedConf-List,
```

```
         id-SLDRBs-ModifiedConf-Item,
         id-gNBCUMeasurementID,
         id-gNBDUMeasurementID,
         id-RegistrationRequest,
         id-ReportCharacteristics,
         id-CellToReportList,
         id-CellMeasurementResultList,
         id-HardwareLoadIndicator,
         id-ReportingPeriodicity,
         id-TNLCapacityIndicator,
         id-RACHReportInformationList,
         id-RLFReportInformationList,
         id-ReportingRequestType,
         id-TimeReferenceInformation,
         id-ConditionalInterDUMobilityInformation,
         id-ConditionalIntraDUMobilityInformation,
         id-targetCellsToCancel,
         id-requestedTargetCellGlobalID,
         id-TraceCollectionEntityIPAddress,
         id-ManagementBasedMDTPLMNList,
         id-PrivacyIndicator,
         id-TraceCollectionEntityURI,
         id-ServingNID,
         maxCellingNBDU,
         maxnoofCandidateSpCells,
         maxnoofDRBs,
         maxnoofErrors,
         maxnoofIndividualF1ConnectionsToReset,
         maxnoofPotentialSpCells,
         maxnoofSCells,
         maxnoofSRBs,
         maxnoofPagingCells,
         maxnoofTNLAssociations,
         maxCellineNB,
         maxnoofUEIDs,
         maxnoofBHRLCChannels,
         maxnoofRoutingEntries,
         maxnoofChildIABNodes,
         maxnoofServedCellsIAB,
         maxnoofTLAsIAB,
         maxnoofULUPTNLInformationforIAB,
         maxnoofUPTNLAddresses,
         maxnoofSLDRBs


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              ResetAll,
    partOfF1-Interface        UE-associatedLogicalF1-ConnectionListRes,
    choice-extension          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} },
    ...
}
```

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```
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   }|
    { ID id-Transport-Layer-Address-Info  CRITICALITY ignore  TYPE Transport-Layer-Address-Info  PRESENCE optional }|
    { ID id-BAPAddress                 CRITICALITY ignore  TYPE BAPAddress                     PRESENCE optional },
    ...
}


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   }|
    { ID id-Transport-Layer-Address-Info  CRITICALITY ignore  TYPE Transport-Layer-Address-Info  PRESENCE optional }|
    { ID id-UL-BH-Non-UP-Traffic-Mapping  CRITICALITY reject   TYPE UL-BH-Non-UP-Traffic-Mapping  PRESENCE optional }|
    { ID id-BAPAddress                 CRITICALITY ignore  TYPE BAPAddress                     PRESENCE optional },
    ...
}


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 }|
    { ID id-GNB-DU-TNL-Association-To-Remove-List  CRITICALITY reject   TYPE GNB-DU-TNL-Association-To-Remove-List       PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info           CRITICALITY ignore   TYPE Transport-Layer-Address-Info               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 } }

GNB-DU-TNL-Association-To-Remove-List   ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF ProtocolIE-SingleContainer { { GNB-DU-TNL-Association-
To-Remove-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-TNL-Association-To-Remove-ItemIEs F1AP-PROTOCOL-IES  ::= {
    { ID id-GNB-DU-TNL-Association-To-Remove-Item        CRITICALITY reject  TYPE     GNB-DU-TNL-Association-To-Remove-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 }|
    { ID id-Transport-Layer-Address-Info     CRITICALITY ignore  TYPE Transport-Layer-Address-Info       PRESENCE optional }|
    { ID id-UL-BH-Non-UP-Traffic-Mapping     CRITICALITY reject  TYPE UL-BH-Non-UP-Traffic-Mapping       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 }|
    { ID id-Neighbour-Cell-Information-List          CRITICALITY ignore   TYPE      Neighbour-Cell-Information-List            PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info            CRITICALITY ignore   TYPE      Transport-Layer-Address-Info               PRESENCE optional }|
    { ID id-UL-BH-Non-UP-Traffic-Mapping            CRITICALITY reject   TYPE      UL-BH-Non-UP-Traffic-Mapping               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.. maxCellineNB))   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},
```

```
    ...
}

Neighbour-Cell-Information-List ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF ProtocolIE-SingleContainer { { Neighbour-Cell-Information-ItemIEs } }
Neighbour-Cell-Information-ItemIEs F1AP-PROTOCOL-IES    ::= {
    { ID id-Neighbour-Cell-Information-Item                    CRITICALITY ignore  TYPE Neighbour-Cell-Information-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-ListPRESENCE optional }|
    { ID id-Dedicated-SIDelivery-NeededUE-List      CRITICALITY ignore  TYPE Dedicated-SIDelivery-NeededUE-List         PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info            CRITICALITY ignore  TYPE Transport-Layer-Address-Info              PRESENCE optional },
    ...
}

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 }|
    { ID id-new-gNB-CU-UE-F1AP-ID                 CRITICALITY reject  TYPE GNB-DU-UE-F1AP-ID                        PRESENCE optional }|
    { ID id-RANUEID                               CRITICALITY ignore  TYPE RANUEID                                  PRESENCE optional }|
    { ID id-TraceActivation                       CRITICALITY ignore  TYPE TraceActivation                          PRESENCE optional }|
    { ID id-AdditionalRRMPriorityIndex            CRITICALITY ignore  TYPE AdditionalRRMPriorityIndex               PRESENCE optional }|
    { ID id-BHChannels-ToBeSetup-List             CRITICALITY reject  TYPE BHChannels-ToBeSetup-List                PRESENCE optional }|
    { ID id-ConfiguredBAPAddress                  CRITICALITY reject  TYPE BAPAddress                               PRESENCE optional }|
```

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    { ID id-NRV2XServicesAuthorized              CRITICALITY ignore  TYPE NRV2XServicesAuthorized              PRESENCE optional }|
    { ID id-LTEV2XServicesAuthorized             CRITICALITY ignore  TYPE LTEV2XServicesAuthorized             PRESENCE optional }|
    { ID id-NRUESidelinkAggregateMaximumBitrate  CRITICALITY ignore  TYPE NRUESidelinkAggregateMaximumBitrate  PRESENCE optional }|
    { ID id-LTEUESidelinkAggregateMaximumBitrate CRITICALITY ignore  TYPE LTEUESidelinkAggregateMaximumBitrate PRESENCE optional }|
    { ID id-PC5LinkAMBR                          CRITICALITY ignore  TYPE BitRate                              PRESENCE optional}|
    { ID id-SLDRBs-ToBeSetup-List                CRITICALITY reject  TYPE SLDRBs-ToBeSetup-List                PRESENCE optional}|
    { ID id-ConditionalInterDUMobilityInformation CRITICALITY reject TYPE ConditionalInterDUMobilityInformation PRESENCE optional}|
    { ID id-ManagementBasedMDTPLMNList           CRITICALITY ignore  TYPE      MDTPLMNList                     PRESENCE optional }|
    { ID id-ServingNID                           CRITICALITY reject  TYPE NID                                  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} }
BHChannels-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-ToBeSetup-ItemIEs} }
SLDRBs-ToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-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},
    ...
}

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

SLDRBs-ToBeSetup-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-SLDRBs-ToBeSetup-Item                CRITICALITY reject  TYPE SLDRBs-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 }|
    { ID id-BHChannels-Setup-List                    CRITICALITY ignore  TYPE BHChannels-Setup-List                    PRESENCE optional }|
    { ID id-BHChannels-FailedToBeSetup-List          CRITICALITY ignore  TYPE BHChannels-FailedToBeSetup-List          PRESENCE optional }|
    { ID id-SLDRBs-Setup-List                        CRITICALITY ignore  TYPE SLDRBs-Setup-List                        PRESENCE optional }|
    { ID id-SLDRBs-FailedToBeSetup-List              CRITICALITY ignore  TYPE SLDRBs-FailedToBeSetup-List              PRESENCE optional }|
    { ID id-requestedTargetCellGlobalID              CRITICALITY reject  TYPE NRCGI                                    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} }
BHChannels-Setup-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-Setup-ItemIEs} }
BHChannels-FailedToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-FailedToBeSetup-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},
    ...
}

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

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

SLDRBs-Setup-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-Setup-ItemIEs} }

SLDRBs-FailedToBeSetup-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-FailedToBeSetup-ItemIEs} }

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

SLDRBs-FailedToBeSetup-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-SLDRBs-FailedToBeSetup-Item    CRITICALITY ignore  TYPE SLDRBs-FailedToBeSetup-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 }|
```

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```
    { ID id-requestedTargetCellGlobalID CRITICALITY reject  TYPE NRCGI                          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  }|
    { ID id-targetCellsToCancel             CRITICALITY reject  TYPE TargetCellList           PRESENCE optional   },
    ...
}



-- *************************************************************
--
-- 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 conditional }|
    { 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 }|
    { ID id-targetCellsToCancel            CRITICALITY reject  TYPE TargetCellList          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 }|
```

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    { 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 }|
    { ID id-FullConfiguration                     CRITICALITY reject   TYPE FullConfiguration                      PRESENCE optional }|
    { ID id-AdditionalRRMPriorityIndex            CRITICALITY ignore   TYPE AdditionalRRMPriorityIndex             PRESENCE optional }|
    { ID id-LowerLayerPresenceStatusChange        CRITICALITY ignore   TYPE LowerLayerPresenceStatusChange         PRESENCE optional }|
    { ID id-BHChannels-ToBeSetupMod-List          CRITICALITY reject   TYPE BHChannels-ToBeSetupMod-List           PRESENCE optional }|
    { ID id-BHChannels-ToBeModified-List          CRITICALITY reject   TYPE BHChannels-ToBeModified-List           PRESENCE optional }|
    { ID id-BHChannels-ToBeReleased-List          CRITICALITY reject   TYPE BHChannels-ToBeReleased-List           PRESENCE optional }|
    { ID id-NRV2XServicesAuthorized               CRITICALITY ignore   TYPE NRV2XServicesAuthorized                PRESENCE optional }|
    { ID id-LTEV2XServicesAuthorized              CRITICALITY ignore   TYPE LTEV2XServicesAuthorized               PRESENCE optional }|
    { ID id-NRUESidelinkAggregateMaximumBitrate   CRITICALITY ignore   TYPE NRUESidelinkAggregateMaximumBitrate    PRESENCE optional }|
    { ID id-LTEUESidelinkAggregateMaximumBitrate  CRITICALITY ignore   TYPE LTEUESidelinkAggregateMaximumBitrate   PRESENCE optional }|
    { ID id-PC5LinkAMBR                           CRITICALITY ignore   TYPE BitRate                                PRESENCE optional}|
    { ID id-SLDRBs-ToBeSetupMod-List              CRITICALITY reject   TYPE SLDRBs-ToBeSetupMod-List               PRESENCE optional }|
    { ID id-SLDRBs-ToBeModified-List              CRITICALITY reject   TYPE SLDRBs-ToBeModified-List               PRESENCE optional }|
    { ID id-SLDRBs-ToBeReleased-List              CRITICALITY reject   TYPE SLDRBs-ToBeReleased-List               PRESENCE optional }|
    { ID id-ConditionalIntraDUMobilityInformation CRITICALITY reject   TYPE ConditionalIntraDUMobilityInformation  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} }
BHChannels-ToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-ToBeSetupMod-ItemIEs} }

DRBs-ToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF ProtocolIE-SingleContainer { { DRBs-ToBeModified-ItemIEs} }
BHChannels-ToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-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} }
```

```
BHChannels-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-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},
    ...
}

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

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

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

```
SLDRBs-ToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-ToBeSetupMod-ItemIEs} }
SLDRBs-ToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-ToBeModified-ItemIEs} }
SLDRBs-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-ToBeReleased-ItemIEs} }


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


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


SLDRBs-ToBeReleased-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-SLDRBs-ToBeReleased-Item        CRITICALITY reject  TYPE SLDRBs-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 }|
    { ID id-FullConfiguration                         CRITICALITY reject  TYPE FullConfiguration                         PRESENCE optional }|
    { ID id-BHChannels-SetupMod-List                  CRITICALITY ignore  TYPE BHChannels-SetupMod-List                  PRESENCE optional}|
    { ID id-BHChannels-Modified-List                  CRITICALITY ignore  TYPE BHChannels-Modified-List                  PRESENCE optional}|
    { ID id-BHChannels-FailedToBeSetupMod-List        CRITICALITY ignore  TYPE BHChannels-FailedToBeSetupMod-List        PRESENCE optional }|
    { ID id-BHChannels-FailedToBeModified-List        CRITICALITY ignore  TYPE BHChannels-FailedToBeModified-List        PRESENCE optional }|
```

```
        { ID id-SLDRBs-SetupMod-List              CRITICALITY ignore  TYPE SLDRBs-SetupMod-List              PRESENCE optional }|
        { ID id-SLDRBs-Modified-List              CRITICALITY ignore  TYPE SLDRBs-Modified-List              PRESENCE optional }|
        { ID id-SLDRBs-FailedToBeSetupMod-List    CRITICALITY ignore  TYPE SLDRBs-FailedToBeSetupMod-List    PRESENCE optional }|
        { ID id-SLDRBs-FailedToBeModified-List    CRITICALITY ignore  TYPE SLDRBs-FailedToBeModified-List    PRESENCE optional }|
        { ID id-requestedTargetCellGlobalID       CRITICALITY reject  TYPE NRCGI                             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} }
BHChannels-SetupMod-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-SetupMod-ItemIEs} }
BHChannels-Modified-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-Modified-ItemIEs } }
BHChannels-FailedToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-FailedToBeModified-
ItemIEs} }
BHChannels-FailedToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-FailedToBeSetupMod-
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},
    ...
}

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


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

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

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

SLDRBs-SetupMod-List             ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-SetupMod-ItemIEs} }
SLDRBs-Modified-List             ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-Modified-ItemIEs } }
SLDRBs-FailedToBeModified-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-FailedToBeModified-ItemIEs} }
SLDRBs-FailedToBeSetupMod-List ::= SEQUENCE (SIZE(1..maxnoofSLDRBs)) OF ProtocolIE-SingleContainer { { SLDRBs-FailedToBeSetupMod-ItemIEs} }

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

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

```
    ...
}

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

SLDRBs-FailedToBeModified-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-SLDRBs-FailedToBeModified-Item    CRITICALITY ignore  TYPE SLDRBs-FailedToBeModified-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 }|
    { ID id-requestedTargetCellGlobalID     CRITICALITY reject  TYPE NRCGI                       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   }|
    { ID id-BHChannels-Required-ToBeReleased-List      CRITICALITY reject  TYPE BHChannels-Required-ToBeReleased-List      PRESENCE optional}|
    { ID id-SLDRBs-Required-ToBeModified-List          CRITICALITY reject  TYPE SLDRBs-Required-ToBeModified-List          PRESENCE optional}|
    { ID id-SLDRBs-Required-ToBeReleased-List          CRITICALITY reject  TYPE SLDRBs-Required-ToBeReleased-List          PRESENCE optional}|
    { ID id-targetCellsToCancel                        CRITICALITY reject  TYPE TargetCellList                             PRESENCE optional},
    ...
}

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 } }

BHChannels-Required-ToBeReleased-List ::= SEQUENCE (SIZE(1..maxnoofBHRLCChannels)) OF ProtocolIE-SingleContainer { { BHChannels-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},
    ...
}

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

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

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

SLDRBs-Required-ToBeReleased-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-SLDRBs-Required-ToBeReleased-Item          CRITICALITY reject  TYPE SLDRBs-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 }|
    { ID id-SLDRBs-ModifiedConf-List                 CRITICALITY ignore  TYPE SLDRBs-ModifiedConf-List                 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},
    ...
}

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

SLDRBs-ModifiedConf-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-SLDRBs-ModifiedConf-Item     CRITICALITY ignore  TYPE SLDRBs-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 }|
    { ID id-NotificationInformation                CRITICALITY reject TYPE NotificationInformation                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  }|
    { ID id-RANUEID                             CRITICALITY ignore  TYPE RANUEID                             PRESENCE optional }|
    { ID id-RRCContainer-RRCSetupComplete       CRITICALITY ignore  TYPE RRCContainer-RRCSetupComplete       PRESENCE optional },
    ...
}


-- ****************************************************************
--
-- 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 }|
    { ID id-UEContextNotRetrievable             CRITICALITY reject  TYPE UEContextNotRetrievable             PRESENCE optional }|
```

```
    { ID id-RedirectedRRCmessage                CRITICALITY reject  TYPE OCTET STRING                 PRESENCE optional }|
    { ID id-PLMNAssistanceInfoForNetShar        CRITICALITY ignore  TYPE PLMN-Identity                PRESENCE optional }|
    { ID id-new-gNB-CU-UE-F1AP-ID               CRITICALITY reject  TYPE GNB-CU-UE-F1AP-ID            PRESENCE optional }|
    { ID id-AdditionalRRMPriorityIndex          CRITICALITY ignore  TYPE AdditionalRRMPriorityIndex   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  }|
    { ID id-SelectedPLMNID                   CRITICALITY reject  TYPE PLMN-Identity           PRESENCE optional   }|
    { ID id-new-gNB-DU-UE-F1AP-ID            CRITICALITY reject  TYPE GNB-DU-UE-F1AP-ID       PRESENCE optional   },
    ...
}

-- **************************************************************
--
-- 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},
    ...
}


-- *************************************************************
--
-- NETWORK ACCESS RATE REDUCTION ELEMENTARY PROCEDURE
--
-- *************************************************************

-- *************************************************************
--
-- Network Access Rate Reduction
--
-- *************************************************************

NetworkAccessRateReduction ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        {{ NetworkAccessRateReductionIEs }},
    ...
}

NetworkAccessRateReductionIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                       CRITICALITY reject  TYPE TransactionID                       PRESENCE mandatory   }|
    { ID id-UAC-Assistance-Info                 CRITICALITY reject  TYPE UAC-Assistance-Info                 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  },
    ...
```

```
}

-- ***************************************************************
--
-- F1 Removal ELEMENTARY PROCEDURE
--
-- ***************************************************************


-- ***************************************************************
--
-- F1 Removal Request
--
-- ***************************************************************

F1RemovalRequest ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container       {{ F1RemovalRequestIEs }},
    ...
}

F1RemovalRequestIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID                      PRESENCE mandatory  },
    ...
}

-- ***************************************************************
--
-- F1 Removal Response
--
-- ***************************************************************

F1RemovalResponse ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container       {{ F1RemovalResponseIEs }},
    ...
}

F1RemovalResponseIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID              CRITICALITY reject  TYPE TransactionID                  PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics     CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional  },

    ...
}

-- ***************************************************************
--
-- F1 Removal Failure
--
-- ***************************************************************

F1RemovalFailure ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container       {{ F1RemovalFailureIEs }},
    ...
}

F1RemovalFailureIEs F1AP-PROTOCOL-IES ::= {
```

```
    { ID id-TransactionID              CRITICALITY reject  TYPE TransactionID              PRESENCE mandatory }|
    { ID id-Cause                      CRITICALITY ignore  TYPE Cause                      PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics     CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional  },

    ...
}


-- *************************************************************
--
-- TRACE ELEMENTARY PROCEDURES
--
-- *************************************************************

-- *************************************************************
--
-- TRACE START
--
-- *************************************************************

TraceStart ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { {TraceStartIEs} },
    ...
}

TraceStartIEs 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-TraceActivation            CRITICALITY ignore  TYPE TraceActivation            PRESENCE mandatory },
    ...
}

-- *************************************************************
--
-- DEACTIVATE TRACE
--
-- *************************************************************

DeactivateTrace ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { {DeactivateTraceIEs} },
    ...
}

DeactivateTraceIEs 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-TraceID                    CRITICALITY ignore  TYPE TraceID                    PRESENCE mandatory },
    ...
}

-- *************************************************************
--
-- CELL TRAFFIC TRACE
--
```

```
-- ***************************************************************


CellTrafficTrace ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { {CellTrafficTraceIEs} },
    ...
}

CellTrafficTraceIEs 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-TraceID                         CRITICALITY ignore  TYPE TraceID                     PRESENCE mandatory   }|
    {ID id-TraceCollectionEntityIPAddress  CRITICALITY ignore  TYPE TransportLayerAddress       PRESENCE mandatory   }|
    {ID id-PrivacyIndicator                CRITICALITY ignore  TYPE PrivacyIndicator            PRESENCE optional }|

    {ID id-TraceCollectionEntityURI CRITICALITY ignore  TYPE URI-address        PRESENCE optional },
    ...

}


-- ***************************************************************
--
-- DU-CU Radio Information Transfer ELEMENTARY PROCEDURE
--
-- ***************************************************************


-- ***************************************************************
--
-- DU-CU Radio Information Transfer
--
-- ***************************************************************

DUCURadioInformationTransfer ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        {{ DUCURadioInformationTransferIEs}},
    ...
}

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


-- ***************************************************************
--
-- CU-DU Radio Information Transfer ELEMENTARY PROCEDURE
--
-- ***************************************************************


-- ***************************************************************
--
-- CU-DU Radio Information Transfer
--
```

```
-- ***************************************************************

CUDURadioInformationTransfer ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        {{ CUDURadioInformationTransferIEs}},
    ...
}

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

-- ***************************************************************
--
-- IAB PROCEDURES
--
-- ***************************************************************
-- ***************************************************************
--
-- BAP Mapping Configuration ELEMENTARY PROCEDURE
--
-- ***************************************************************


-- ***************************************************************
--
-- BAP MAPPING CONFIGURATION
-- ***************************************************************


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

BAPMappingConfiguration-IEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID        CRITICALITY reject  TYPE    TransactionID    PRESENCE mandatory}|
    { ID id-BH-Routing-Information-Added-List       CRITICALITY ignore  TYPE    BH-Routing-Information-Added-List  PRESENCE optional}|
    { ID id-BH-Routing-Information-Removed-List     CRITICALITY ignore  TYPE    BH-Routing-Information-Removed-List PRESENCE optional}|
    { ID id-TrafficMappingInformation              CRITICALITY ignore  TYPE    TrafficMappingInfo                 PRESENCE optional},
    ...
}

BH-Routing-Information-Added-List ::= SEQUENCE (SIZE(1.. maxnoofRoutingEntries))   OF ProtocolIE-SingleContainer { { BH-Routing-Information-Added-
List-ItemIEs } }
BH-Routing-Information-Removed-List ::= SEQUENCE (SIZE(1.. maxnoofRoutingEntries))  OF ProtocolIE-SingleContainer { { BH-Routing-Information-
Removed-List-ItemIEs } }

BH-Routing-Information-Added-List-ItemIEs    F1AP-PROTOCOL-IES ::= {
    { ID id-BH-Routing-Information-Added-List-Item                 CRITICALITY ignore  TYPE BH-Routing-Information-Added-List-Item
    PRESENCE optional},
    ...
}
```

```
BH-Routing-Information-Removed-List-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-BH-Routing-Information-Removed-List-Item            CRITICALITY ignore  TYPE BH-Routing-Information-Removed-List-Item
    PRESENCE optional},
    ...
}


-- *************************************************************
--
-- BAP MAPPING CONFIGURATION ACKNOWLEDGE
-- *************************************************************

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

BAPMappingConfigurationAcknowledge-IEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE    TransactionID          PRESENCE mandatory}|
    { ID id-CriticalityDiagnostics CRITICALITY ignore  TYPE    CriticalityDiagnostics  PRESENCE optional},
    ...
}




-- *************************************************************
--
-- GNB-DU Configuration ELEMENTARY PROCEDURE
--
-- *************************************************************


-- *************************************************************
--
-- GNB-DU RESOURCE CONFIGURATION
-- *************************************************************


GNBDUResourceConfiguration ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container        {{ GNBDUResourceConfigurationIEs}},
    ...
}


GNBDUResourceConfigurationIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                       CRITICALITY reject  TYPE TransactionID                         PRESENCE mandatory   }|
    { ID id-Activated-Cells-to-be-Updated-List      CRITICALITY reject   TYPE Activated-Cells-to-be-Updated-List PRESENCE optional}|
    { ID id-Child-Nodes-List                    CRITICALITY reject   TYPE Child-Nodes-List                     PRESENCE optional},
    ...
}


-- *************************************************************
```

ETSI

```
--
-- GNB-DU RESOURCE CONFIGURATION ACKNOWLEDGE
-- ************************************************************


GNBDUResourceConfigurationAcknowledge ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { { GNBDUResourceConfigurationAcknowledgeIEs} },
    ...
}


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

-- ************************************************************
--
-- IAB TNL Address Allocation ELEMENTARY PROCEDURE
--
-- ************************************************************


-- ************************************************************
--
-- IAB TNL ADDRESS REQUEST
-- ************************************************************



IABTNLAddressRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { {IABTNLAddressRequestIEs} },
    ...
}

IABTNLAddressRequestIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                    CRITICALITY reject  TYPE TransactionID                          PRESENCE mandatory   }|
    { ID id-IABv4AddressesRequested          CRITICALITY reject  TYPE IABv4AddressesRequested               PRESENCE optional }|
    { ID id-IABIPv6RequestType               CRITICALITY reject  TYPE IABIPv6RequestType                    PRESENCE optional }|
    { ID id-IAB-TNL-Addresses-To-Remove-List CRITICALITY reject  TYPE IAB-TNL-Addresses-To-Remove-List      PRESENCE optional },
    ...
}


IAB-TNL-Addresses-To-Remove-List     ::= SEQUENCE (SIZE(1..maxnoofTLAsIAB))  OF ProtocolIE-SingleContainer { { IAB-TNL-Addresses-To-Remove-ItemIEs }
}

IAB-TNL-Addresses-To-Remove-ItemIEs F1AP-PROTOCOL-IES::= {
    { ID id-IAB-TNL-Addresses-To-Remove-Item             CRITICALITY reject  TYPE IAB-TNL-Addresses-To-Remove-Item            PRESENCE mandatory},
    ...
}


-- ************************************************************
```

```
--
-- IAB TNL ADDRESS RESPONSE
-- ************************************************************


IABTNLAddressResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container         { {IABTNLAddressResponseIEs} },
    ...
}


IABTNLAddressResponseIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                            CRITICALITY reject  TYPE TransactionID                       PRESENCE mandatory   }|
    { ID id-IAB-Allocated-TNL-Address-List           CRITICALITY reject  TYPE IAB-Allocated-TNL-Address-List      PRESENCE mandatory   },
    ...
}


IAB-Allocated-TNL-Address-List ::= SEQUENCE (SIZE(1.. maxnoofTLAsIAB))  OF ProtocolIE-SingleContainer { { IAB-Allocated-TNL-Address-List-ItemIEs }
}


IAB-Allocated-TNL-Address-List-ItemIEs  F1AP-PROTOCOL-IES::= {
    { ID id-IAB-Allocated-TNL-Address-Item          CRITICALITY reject  TYPE IAB-Allocated-TNL-Address-Item           PRESENCE mandatory},
    ...
}

-- ************************************************************
--
-- IAB UP Configuration Update ELEMENTARY PROCEDURE
--
-- ************************************************************


-- ************************************************************
--
-- IAB UP Configuration Update Request
--
-- ************************************************************

IABUPConfigurationUpdateRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container         { { IABUPConfigurationUpdateRequestIEs} },
    ...
}

IABUPConfigurationUpdateRequestIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                           CRITICALITY reject  TYPE TransactionID                       PRESENCE mandatory   }|
    { ID id-UL-UP-TNL-Information-to-Update-List    CRITICALITY ignore  TYPE UL-UP-TNL-Information-to-Update-List  PRESENCE optional }|
    { ID id-UL-UP-TNL-Address-to-Update-List        CRITICALITY ignore  TYPE UL-UP-TNL-Address-to-Update-List     PRESENCE optional },
    ...
}

UL-UP-TNL-Information-to-Update-List ::= SEQUENCE (SIZE(1.. maxnoofULUPTNLInformationforIAB))   OF ProtocolIE-SingleContainer { { UL-UP-TNL-
Information-to-Update-List-ItemIEs } }
```

```
UL-UP-TNL-Information-to-Update-List-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-UL-UP-TNL-Information-to-Update-List-Item   CRITICALITY ignore  TYPE UL-UP-TNL-Information-to-Update-List-Item PRESENCE optional},
    ...
}

UL-UP-TNL-Address-to-Update-List ::= SEQUENCE (SIZE(1.. maxnoofUPTNLAddresses)) OF ProtocolIE-SingleContainer { { UL-UP-TNL-Address-to-Update-List-
ItemIEs } }

UL-UP-TNL-Address-to-Update-List-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-UL-UP-TNL-Address-to-Update-List-Item   CRITICALITY ignore  TYPE UL-UP-TNL-Address-to-Update-List-Item PRESENCE optional},
    ...
}


-- ************************************************************
--
-- IAB UP Configuration Update Response
--
-- ************************************************************

IABUPConfigurationUpdateResponse ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container        { { IABUPConfigurationUpdateResponseIEs} },
    ...
}

IABUPConfigurationUpdateResponseIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                   CRITICALITY reject  TYPE TransactionID                     PRESENCE mandatory   }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics            PRESENCE optional }|
    { ID id-DL-UP-TNL-Address-to-Update-List   CRITICALITY reject  TYPE DL-UP-TNL-Address-to-Update-List PRESENCE optional },
    ...
}

DL-UP-TNL-Address-to-Update-List ::= SEQUENCE (SIZE(1.. maxnoofUPTNLAddresses)) OF ProtocolIE-SingleContainer { { DL-UP-TNL-Address-to-Update-List-
ItemIEs } }

DL-UP-TNL-Address-to-Update-List-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-DL-UP-TNL-Address-to-Update-List-Item   CRITICALITY ignore  TYPE DL-UP-TNL-Address-to-Update-List-Item PRESENCE optional},
    ...
}

-- ************************************************************
--
-- IAB UP Configuration Update Failure
--
-- ************************************************************

IABUPConfigurationUpdateFailure ::= SEQUENCE {
    protocolIEs        ProtocolIE-Container        { { IABUPConfigurationUpdateFailureIEs} },
    ...
}

IABUPConfigurationUpdateFailureIEs 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 },
    ...
}


-- **************************************************************
--
-- Resource Status Reporting Initiation ELEMENTARY PROCEDURE
--
-- **************************************************************


-- **************************************************************
--
-- Resource Status Request
--
-- **************************************************************

ResourceStatusRequest::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { {ResourceStatusRequestIEs} },
    ...
}

ResourceStatusRequestIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID            CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-gNBCUMeasurementID       CRITICALITY reject  TYPE GNBCUMeasurementID     PRESENCE mandatory }|
    { ID id-gNBDUMeasurementID       CRITICALITY ignore  TYPE GNBDUMeasurementID     PRESENCE conditional  }|
    { ID id-RegistrationRequest      CRITICALITY ignore  TYPE RegistrationRequest    PRESENCE mandatory }|
    { ID id-ReportCharacteristics    CRITICALITY ignore  TYPE ReportCharacteristics  PRESENCE conditional  }|
    { ID id-CellToReportList         CRITICALITY ignore  TYPE CellToReportList       PRESENCE optional  }|
    { ID id-ReportingPeriodicity     CRITICALITY ignore  TYPE ReportingPeriodicity   PRESENCE  optional },
    ...
}



-- **************************************************************
--
-- Resource Status Response
--
-- **************************************************************

ResourceStatusResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { { ResourceStatusResponseIEs} },
    ...
}


ResourceStatusResponseIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID            CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-gNBCUMeasurementID       CRITICALITY reject  TYPE GNBCUMeasurementID     PRESENCE mandatory }|
    { ID id-gNBDUMeasurementID       CRITICALITY ignore  TYPE GNBDUMeasurementID     PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics   CRITICALITY ignore  TYPE CriticalityDiagnostics PRESENCE optional  },
    ...
}
```

```
-- *************************************************************
--
-- Resource Status Failure
--
-- *************************************************************

ResourceStatusFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { { ResourceStatusFailureIEs} },
    ...
}

ResourceStatusFailureIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID            CRITICALITY reject  TYPE TransactionID           PRESENCE mandatory }|
    { ID id-gNBCUMeasurementID       CRITICALITY reject  TYPE GNBCUMeasurementID      PRESENCE mandatory }|
    { ID id-gNBDUMeasurementID       CRITICALITY ignore  TYPE GNBDUMeasurementID      PRESENCE mandatory }|
    { ID id-Cause                    CRITICALITY ignore  TYPE Cause                   PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics   CRITICALITY ignore  TYPE CriticalityDiagnostics PRESENCE optional  },
    ...
}

-- *************************************************************
--
-- Resource Status Reporting ELEMENTARY PROCEDURE
--
-- *************************************************************


-- *************************************************************
--
-- Resource Status Update
--
-- *************************************************************

ResourceStatusUpdate ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        {{ ResourceStatusUpdateIEs}},
    ...
}

ResourceStatusUpdateIEs F1AP-PROTOCOL-IES ::= {
   { ID id-TransactionID               CRITICALITY reject  TYPE TransactionID              PRESENCE mandatory }|
   { ID id-gNBCUMeasurementID          CRITICALITY reject  TYPE GNBCUMeasurementID         PRESENCE mandatory }|
   { ID id-gNBDUMeasurementID          CRITICALITY ignore  TYPE GNBDUMeasurementID         PRESENCE mandatory }|
   { ID id-HardwareLoadIndicator       CRITICALITY ignore  TYPE HardwareLoadIndicator      PRESENCE optional  }|
   { ID id-TNLCapacityIndicator        CRITICALITY ignore  TYPE TNLCapacityIndicator       PRESENCE optional  }|
   { ID id-CellMeasurementResultList   CRITICALITY ignore  TYPE CellMeasurementResultList  PRESENCE optional  },
    ...
}

-- *************************************************************
--
--  Access And Mobility Indication ELEMENTARY PROCEDURE
--
-- *************************************************************
```

```
-- ************************************************************
--
-- Access And Mobility Indication
--
-- ************************************************************

AccessAndMobilityIndication ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { { AccessAndMobilityIndicationIEs} },
    ...
}

AccessAndMobilityIndicationIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                        CRITICALITY reject   TYPE TransactionID                      PRESENCE mandatory }|
    { ID id-RACHReportInformationList            CRITICALITY ignore   TYPE RACHReportInformationList          PRESENCE optional }|
    { ID id-RLFReportInformationList             CRITICALITY ignore   TYPE RLFReportInformationList           PRESENCE optional },
    ...
}


-- ************************************************************
--
-- REFERENCE TIME INFORMATION REPORTING CONTROL
--
-- ************************************************************

ReferenceTimeInformationReportingControl::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { ReferenceTimeInformationReportingControlIEs} },
    ...
}

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


-- ************************************************************
--
-- REFERENCE TIME INFORMATION REPORT
--
-- ************************************************************

ReferenceTimeInformationReport::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { ReferenceTimeInformationReportIEs} },
    ...
}

ReferenceTimeInformationReportIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID              CRITICALITY ignore   TYPE TransactionID                PRESENCE mandatory }|
    { ID id-TimeReferenceInformation   CRITICALITY ignore   TYPE TimeReferenceInformation     PRESENCE mandatory },
    ...
}
```

```
-- *************************************************************
--
-- Access Success
--
-- *************************************************************

AccessSuccess ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        {{ AccessSuccessIEs}},
    ...
}

AccessSuccessIEs 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-NRCGI                                CRITICALITY reject  TYPE NRCGI                          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-Cell-Type,
    id-CellGroupConfig,
    id-AvailablePLMNList,
    id-PDUSessionID,
    id-ULPDUSessionAggregateMaximumBitRate,
    id-DC-Based-Duplication-Configured,
```

```
        id-DC-Based-Duplication-Activation,
        id-Duplication-Activation,
        id-DLPDCPSNLength,
        id-ULPDCPSNLength,
        id-RLC-Status,
        id-MeasurementTimingConfiguration,
        id-DRB-Information,
        id-QoSFlowMappingIndication,
        id-ServingCellMO,
        id-RLCMode,
        id-ExtendedServedPLMNs-List,
        id-ExtendedAvailablePLMN-List,
        id-DRX-LongCycleStartOffset,
        id-SelectedBandCombinationIndex,
        id-SelectedFeatureSetEntryIndex,
        id-Ph-InfoSCG,
        id-latest-RRC-Version-Enhanced,
        id-RequestedBandCombinationIndex,
        id-RequestedFeatureSetEntryIndex,
        id-DRX-Config,
        id-UEAssistanceInformation,
        id-PDCCH-BlindDetectionSCG,
        id-Requested-PDCCH-BlindDetectionSCG,
        id-BPLMN-ID-Info-List,
        id-NotificationInformation,
        id-TNLAssociationTransportLayerAddressgNBDU,
        id-portNumber,
        id-AdditionalSIBMessageList,
        id-IgnorePRACHConfiguration,
        id-CG-Config,
        id-Ph-InfoMCG,
        id-AggressorgNBSetID,
        id-VictimgNBSetID,
        id-MeasGapSharingConfig,
        id-systemInformationAreaID,
        id-areaScope,
        id-IntendedTDD-DL-ULConfig,
        id-QosMonitoringRequest,
        id-BHInfo,
        id-IAB-Info-IAB-DU,
        id-IAB-Info-IAB-donor-CU,
        id-IAB-Barred,
        id-SIB12-message,
        id-SIB13-message,
        id-SIB14-message,
        id-UEAssistanceInformationEUTRA,
        id-SL-PHY-MAC-RLC-Config,
        id-SL-ConfigDedicatedEUTRA,
        id-AlternativeQoSParaSetList,
        id-CurrentQoSParaSetIndex,
        id-CarrierList,
        id-ULCarrierList,
        id-FrequencyShift7p5khz,
        id-SSB-PositionsInBurst,
```

```
        id-NRPRACHConfig,
        id-TDD-UL-DLConfigCommonNR,
        id-CNPacketDelayBudgetDownlink,
        id-CNPacketDelayBudgetUplink,
        id-ExtendedPacketDelayBudget,
        id-TSCTrafficCharacteristics,
        id-AdditionalPDCPDuplicationTNL-List,
        id-RLCDuplicationInformation,
        id-AdditionalDuplicationIndication,
        id-mdtConfiguration,
        id-TraceCollectionEntityURI,
        id-NID,
        id-NPNSupportInfo,
        id-NPNBroadcastInformation,
        id-AvailableSNPN-ID-List,
        id-SIB10-message,
        id-RequestedP-MaxFR2,
        id-DLCarrierList,
        id-ExtendedTAISliceSupportList,
        maxNRARFCN,
        maxnoofErrors,
        maxnoofBPLMNs,
        maxnoofBPLMNsNR,
        maxnoofDLUPTNLInformation,
        maxnoofNrCellBands,
        maxnoofULUPTNLInformation,
        maxnoofQoSFlows,
        maxnoofSliceItems,
        maxnoofSIBTypes,
        maxnoofSITypes,
        maxCellineNB,
        maxnoofExtendedBPLMNs,
        maxnoofAdditionalSIBs,
        maxnoofUACPLMNs,
        maxnoofUACperPLMN,
        maxCellingNBDU,
        maxnoofTLAs,
        maxnoofGTPTLAs,
        maxnoofslots,
        maxnoofNonUPTrafficMappings,
        maxnoofServingCells,
        maxnoofServedCellsIAB,
        maxnoofChildIABNodes,
        maxnoofIABSTCInfo,
        maxnoofSymbols,
        maxnoofDUFSlots,
        maxnoofHSNASlots,
        maxnoofEgressLinks,
        maxnoofMappingEntries,
        maxnoofDSInfo,
        maxnoofQoSParaSets,
        maxnoofPC5QoSFlows,
        maxnoofSSBAreas,
        maxnoofBPLMNsNR,
```

```
    maxnoofNRSCSs,
    maxnoofPhysicalResourceBlocks,
    maxnoofPhysicalResourceBlocks-1,
    maxnoofPRACHconfigs,
    maxnoofRACHReports,
    maxnoofRLFReports,
    maxnoofAdditionalPDCPDuplicationTNL,
    maxnoofRLCDuplicationState,
    maxnoofCHOcells,
    maxnoofMDTPLMNs,
    maxnoofCAGsupported,
    maxnoofNIDsupported,
    maxnoofNRSCSs,
    maxnoofPhysicalResourceBlocks,
    maxnoofExtSliceItems


FROM F1AP-Constants

    Criticality,
    ProcedureCode,
    ProtocolIE-ID,
    TriggeringMessage

FROM F1AP-CommonDataTypes

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

FROM F1AP-Containers;

-- A

Activated-Cells-to-be-Updated-List ::= SEQUENCE (SIZE(1..maxnoofServedCellsIAB)) OF Activated-Cells-to-be-Updated-List-Item

Activated-Cells-to-be-Updated-List-Item ::= SEQUENCE{
    nRCGI                                     NRCGI,
    iAB-DU-Cell-Resource-Configuration-Mode-Info    IAB-DU-Cell-Resource-Configuration-Mode-Info,
    iE-Extensions                             ProtocolExtensionContainer { { Activated-Cells-to-be-Updated-List-Item-ExtIEs} } OPTIONAL
}

Activated-Cells-to-be-Updated-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

AdditionalDuplicationIndication ::= ENUMERATED {
    three,
    four,
    ...
}
```

```
AdditionalPDCPDuplicationTNL-List ::= SEQUENCE (SIZE(1..maxnoofAdditionalPDCPDuplicationTNL)) OF AdditionalPDCPDuplicationTNL-Item

AdditionalPDCPDuplicationTNL-Item ::=SEQUENCE {
    additionalPDCPDuplicationUPTNLInformation        UPTransportLayerInformation,
    iE-Extensions    ProtocolExtensionContainer { { AdditionalPDCPDuplicationTNL-ItemExtIEs } }  OPTIONAL,
    ...
}

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

AdditionalSIBMessageList ::= SEQUENCE (SIZE(1..maxnoofAdditionalSIBs)) OF AdditionalSIBMessageList-Item

AdditionalSIBMessageList-Item ::= SEQUENCE {
    additionalSIB          OCTET STRING,
    iE-Extensions        ProtocolExtensionContainer { { AdditionalSIBMessageList-Item-ExtIEs} } OPTIONAL
}

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

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

AggressorCellList ::= SEQUENCE (SIZE(1..maxCellingNBDU)) OF AggressorCellList-Item

AggressorCellList-Item ::= SEQUENCE {
    aggressorCell-ID        NRCGI,
    iE-Extensions    ProtocolExtensionContainer { { AggressorCellList-Item-ExtIEs } }        OPTIONAL
}

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

AggressorgNBSetID ::= SEQUENCE {
    aggressorgNBSetID        GNBSetID,
    iE-Extensions    ProtocolExtensionContainer { { AggressorgNBSetID-ExtIEs } } OPTIONAL
}

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

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

AllocationAndRetentionPriority-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
```

```
     ...
}

AlternativeQoSParaSetList ::= SEQUENCE (SIZE(1..maxnoofQoSParaSets)) OF AlternativeQoSParaSetItem

AlternativeQoSParaSetItem ::= SEQUENCE {
    alternativeQoSParaSetIndex        QoSParaSetIndex,
    guaranteedFlowBitRateDL           BitRate                 OPTIONAL,
    guaranteedFlowBitRateUL           BitRate                 OPTIONAL,
    packetDelayBudget                 PacketDelayBudget       OPTIONAL,
    packetErrorRate                   PacketErrorRate         OPTIONAL,
    iE-Extensions                     ProtocolExtensionContainer { {AlternativeQoSParaSetItem-ExtIEs} } OPTIONAL,
    ...
}

AlternativeQoSParaSetItem-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..maxnoofBPLMNs)) OF AvailablePLMNList-Item

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

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

AvailableSNPN-ID-List ::= SEQUENCE (SIZE(1..maxnoofNIDsupported)) OF AvailableSNPN-ID-List-Item

AvailableSNPN-ID-List-Item ::= SEQUENCE {
    pLMN-Identity         PLMN-Identity,
    availableNIDList       BroadcastNIDList,
    iE-Extensions         ProtocolExtensionContainer { { AvailableSNPN-ID-List-ItemExtIEs} } OPTIONAL,
    ...
}

AvailableSNPN-ID-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

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

-- B

BAPAddress ::= BIT STRING (SIZE(10))

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

BAPlayerBHRLCchannelMappingInfo ::= SEQUENCE {
    bAPlayerBHRLCchannelMappingInfoToAdd          BAPlayerBHRLCchannelMappingInfoList          OPTIONAL,
    bAPlayerBHRLCchannelMappingInfoToRemove       MappingInformationtoRemove                   OPTIONAL,
    iE-Extensions                                 ProtocolExtensionContainer { { BAPlayerBHRLCchannelMappingInfo-ExtIEs} } OPTIONAL,
    ...
}

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

BAPlayerBHRLCchannelMappingInfoList ::= SEQUENCE (SIZE(1..maxnoofMappingEntries)) OF BAPlayerBHRLCchannelMappingInfo-Item

BAPlayerBHRLCchannelMappingInfo-Item ::= SEQUENCE {
    mappingInformationIndex      MappingInformationIndex,
    priorHopBAPAddress           BAPAddress         OPTIONAL,
    ingressbHRLCChannelID        BHRLCChannelID     OPTIONAL,
    nextHopBAPAddress            BAPAddress         OPTIONAL,
    egressbHRLCChannelID         BHRLCChannelID     OPTIONAL,
    iE-Extensions                ProtocolExtensionContainer { { BAPlayerBHRLCchannelMappingInfo-ItemExtIEs} } OPTIONAL,
    ...
}

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

BAPPathID ::= BIT STRING (SIZE(10))

BAPRoutingID ::= SEQUENCE {
    bAPAddress      BAPAddress,
    bAPPathID       BAPPathID,
    iE-Extensions   ProtocolExtensionContainer { { BAPRoutingIDExtIEs } }   OPTIONAL
}

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

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

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

BHRLCChannelID ::= BIT STRING (SIZE(16))

BHChannels-FailedToBeModified-Item ::= SEQUENCE {
```

```
    bHRLCChannelID       BHRLCChannelID,
    cause        Cause        OPTIONAL,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-FailedToBeModified-ItemExtIEs } } OPTIONAL
}

BHChannels-FailedToBeModified-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BHChannels-FailedToBeSetup-Item ::= SEQUENCE {
    bHRLCChannelID       BHRLCChannelID,
    cause   Cause   OPTIONAL,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-FailedToBeSetup-ItemExtIEs } }    OPTIONAL
}

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

BHChannels-FailedToBeSetupMod-Item ::= SEQUENCE {
    bHRLCChannelID       BHRLCChannelID,
    cause        Cause            OPTIONAL ,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-FailedToBeSetupMod-ItemExtIEs } } OPTIONAL
}

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

BHChannels-Modified-Item ::= SEQUENCE {
    bHRLCChannelID           BHRLCChannelID,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-Modified-ItemExtIEs } }    OPTIONAL
}

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

BHChannels-Required-ToBeReleased-Item ::= SEQUENCE {
    bHRLCChannelID       BHRLCChannelID,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-Required-ToBeReleased-ItemExtIEs } }    OPTIONAL
}

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

BHChannels-Setup-Item ::= SEQUENCE {
    bHRLCChannelID                            BHRLCChannelID,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-Setup-ItemExtIEs } }    OPTIONAL
}

BHChannels-Setup-ItemExtIEs       F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

BHChannels-SetupMod-Item ::= SEQUENCE {
    bHRLCChannelID                          BHRLCChannelID,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-SetupMod-ItemExtIEs } }   OPTIONAL
}

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

BHChannels-ToBeModified-Item ::= SEQUENCE {
    bHRLCChannelID              BHRLCChannelID,
    bHQoSInformation              BHQoSInformation,
    rLCmode             RLCMode OPTIONAL,
    bAPCtrlPDUChannel    BAPCtrlPDUChannel        OPTIONAL,
    trafficMappingInfo  TrafficMappingInfo      OPTIONAL,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-ToBeModified-ItemExtIEs } }   OPTIONAL
}

BHChannels-ToBeModified-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BHChannels-ToBeReleased-Item ::= SEQUENCE {
    bHRLCChannelID        BHRLCChannelID,
    iE-Extensions    ProtocolExtensionContainer { { BHChannels-ToBeReleased-ItemExtIEs } }   OPTIONAL
}

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

BHChannels-ToBeSetup-Item ::= SEQUENCE  {
    bHRLCChannelID                       BHRLCChannelID,
    bHQoSInformation                     BHQoSInformation,
    rLCmode                              RLCMode,
    bAPCtrlPDUChannel                    BAPCtrlPDUChannel        OPTIONAL,
    trafficMappingInfo                   TrafficMappingInfo      OPTIONAL,
    iE-Extensions                        ProtocolExtensionContainer { { BHChannels-ToBeSetup-ItemExtIEs } } OPTIONAL
}

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

BHChannels-ToBeSetupMod-Item ::= SEQUENCE {
    bHRLCChannelID              BHRLCChannelID,
    bHQoSInformation              BHQoSInformation,
    rLCmode             RLCMode,
    bAPCtrlPDUChannel    BAPCtrlPDUChannel        OPTIONAL,
    trafficMappingInfo  TrafficMappingInfo      OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { { BHChannels-ToBeSetupMod-ItemExtIEs } }   OPTIONAL
}
```

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


BHInfo ::= SEQUENCE {
    bAProutingID            BAPRoutingID    OPTIONAL,
    egressBHRLCCHList        EgressBHRLCCHList   OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { BHInfo-ExtIEs} } OPTIONAL
}


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


BHQoSInformation ::= CHOICE {
    bHRLCCHQoS              QoSFlowLevelQoSParameters,
    eUTRANBHRLCCHQoS        EUTRANQoS,
    cPTrafficType          CPTrafficType,
    choice-extension        ProtocolIE-SingleContainer { { BHQoSInformation-ExtIEs} }
}


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


BH-Routing-Information-Added-List-Item ::= SEQUENCE {
    bAPRoutingID            BAPRoutingID,
    nextHopBAPAddress        BAPAddress,
    iE-Extensions           ProtocolExtensionContainer { { BH-Routing-Information-Added-List-ItemExtIEs} }   OPTIONAL
}


BH-Routing-Information-Added-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


BH-Routing-Information-Removed-List-Item ::= SEQUENCE {
    bAPRoutingID            BAPRoutingID,
    iE-Extensions           ProtocolExtensionContainer { { BH-Routing-Information-Removed-List-ItemExtIEs} } OPTIONAL
}


BH-Routing-Information-Removed-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


BPLMN-ID-Info-List ::= SEQUENCE (SIZE(1..maxnoofBPLMNsNR)) OF BPLMN-ID-Info-Item


BPLMN-ID-Info-Item ::= SEQUENCE {
    pLMN-Identity-List       AvailablePLMNList,
    extended-PLMN-Identity-List ExtendedAvailablePLMN-List  OPTIONAL,
    fiveGS-TAC               FiveGS-TAC                 OPTIONAL,
    nr-cell-ID               NRCellIdentity,
    ranac                    RANAC                      OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { BPLMN-ID-Info-ItemExtIEs} } OPTIONAL,
```

```
    ...
}

BPLMN-ID-Info-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    {   ID id-NPNBroadcastInformation      CRITICALITY reject EXTENSION NPNBroadcastInformation     PRESENCE optional},
    ...
}

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 }|
{ ID id-NPNSupportInfo  CRITICALITY reject  EXTENSION NPNSupportInfo        PRESENCE optional    }|
{ ID id-ExtendedTAISliceSupportList CRITICALITY reject  EXTENSION ExtendedSliceSupportList      PRESENCE optional  },
    ...
}

BroadcastCAGList ::= SEQUENCE (SIZE(1..maxnoofCAGsupported)) OF CAGID

BroadcastNIDList ::= SEQUENCE (SIZE(1..maxnoofNIDsupported)) OF NID

BroadcastSNPN-ID-List ::= SEQUENCE (SIZE(1..maxnoofNIDsupported)) OF BroadcastSNPN-ID-List-Item

BroadcastSNPN-ID-List-Item ::= SEQUENCE {
    pLMN-Identity              PLMN-Identity,
    broadcastNIDList           BroadcastNIDList,
    iE-Extensions              ProtocolExtensionContainer { { BroadcastSNPN-ID-List-ItemExtIEs} } OPTIONAL,
    ...
}

BroadcastSNPN-ID-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BroadcastPNI-NPN-ID-List ::= SEQUENCE (SIZE(1..maxnoofCAGsupported)) OF BroadcastPNI-NPN-ID-List-Item

BroadcastPNI-NPN-ID-List-Item ::= SEQUENCE {
    pLMN-Identity              PLMN-Identity,
    broadcastCAGList           BroadcastCAGList,
    iE-Extensions              ProtocolExtensionContainer { { BroadcastPNI-NPN-ID-List-ItemExtIEs} } OPTIONAL,
    ...
}

BroadcastPNI-NPN-ID-List-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
BurstArrivalTime ::= OCTET STRING
```

```
-- C
CAGID ::= BIT STRING (SIZE(32))

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

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

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

CapacityValue::= SEQUENCE {
    capacityValue                INTEGER (0..100),
    sSBAreaCapacityValueList     SSBAreaCapacityValueList        OPTIONAL,
    iE-Extensions                ProtocolExtensionContainer { { CapacityValue-ExtIEs} } OPTIONAL
}

CapacityValue-ExtIEs    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,
```

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```
        ...
}

CauseRadioNetwork ::= 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,
    plmn-not-served-by-the-gNB-CU,
    multiple-drb-id-instances,
    unknown-drb-id,
    multiple-bh-rlc-ch-id-instances,
    unknown-bh-rlc-ch-id,
    cho-cpc-resources-tobechanged,
    nPN-not-supported,
    nPN-access-denied
}

CauseTransport ::= ENUMERATED {
    unspecified,
    transport-resource-unavailable,
    ...,
    unknown-TNL-address-for-IAB,
    unknown-UP-TNL-information-for-IAB
}

CellGroupConfig ::= OCTET STRING

CellCapacityClassValue ::= INTEGER (1..100,...)

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

CellMeasurementResultList ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF CellMeasurementResultItem

CellMeasurementResultItem ::= SEQUENCE {
    cellID                        NRCGI,
    radioResourceStatus           RadioResourceStatus            OPTIONAL,
    compositeAvailableCapacityGroup CompositeAvailableCapacityGroup OPTIONAL,
    sliceAvailableCapacity        SliceAvailableCapacity         OPTIONAL,
    numberofActiveUEs             NumberofActiveUEs              OPTIONAL,
```

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

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

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

Cells-Failed-to-be-Activated-List-ItemExtIEs    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,
    ...
}
```

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```
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 }|
    { ID id-IAB-Info-IAB-donor-CU        CRITICALITY ignore  EXTENSION IAB-Info-IAB-donor-CU        PRESENCE optional}|
    { ID id-AvailableSNPN-ID-List        CRITICALITY ignore  EXTENSION AvailableSNPN-ID-List        PRESENCE optional },
    ...
}

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 ::= {
    { ID id-IAB-Barred  CRITICALITY ignore  EXTENSION IAB-Barred        PRESENCE optional },

    ...
}
```

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

CellSize ::= ENUMERATED {verysmall, small, medium, large, ...}

CellToReportList ::= SEQUENCE (SIZE(1.. maxCellingNBDU)) OF CellToReportItem

CellToReportItem ::= SEQUENCE {
    cellID     NRCGI,
    sSBToReportList     SSBToReportList      OPTIONAL,
    sliceToReportList   SliceToReportList    OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { CellToReportItem-ExtIEs} } OPTIONAL
}

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

CellType ::= SEQUENCE {
    cellSize       CellSize,
    iE-Extensions      ProtocolExtensionContainer { {CellType-ExtIEs} }    OPTIONAL,
    ...
}

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

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

Child-Node-Cells-List ::= SEQUENCE (SIZE(1..maxnoofChildIABNodes)) OF Child-Node-Cells-List-Item

Child-Node-Cells-List-Item ::=  SEQUENCE{
    nRCGI                             NRCGI,
    iAB-DU-Cell-Resource-Configuration-Mode-Info    IAB-DU-Cell-Resource-Configuration-Mode-Info,
    iAB-STC-Info                      IAB-STC-Info,
    rACH-Config-Common                RACH-Config-Common,
    rACH-Config-Common-IAB            RACH-Config-Common-IAB,
    cSI-RS-Configuration              OCTET STRING,
    sR-Configuration                  OCTET STRING,
    pDCCH-ConfigSIB1                  OCTET STRING,
    sCS-Common                        OCTET STRING,
    multiplexingInfo                  MultiplexingInfo,
    iE-Extensions                     ProtocolExtensionContainer {{Child-Node-Cells-List-Item-ExtIEs}}     OPTIONAL
}

Child-Node-Cells-List-Item-ExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Child-Nodes-List ::= SEQUENCE (SIZE(1..maxnoofChildIABNodes)) OF Child-Nodes-List-Item

Child-Nodes-List-Item ::= SEQUENCE{
```

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```
    gNB-CU-UE-F1AP-ID   GNB-CU-UE-F1AP-ID,
    gNB-DU-UE-F1AP-ID   GNB-DU-UE-F1AP-ID,
    child-Node-Cells-List   Child-Node-Cells-List,
    iE-Extensions               ProtocolExtensionContainer {{Child-Nodes-List-Item-ExtIEs}}     OPTIONAL
}

Child-Nodes-List-Item-ExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

CHOtrigger-InterDU ::= ENUMERATED {
    cho-initiation,
    cho-replace,
    ...
}

CHOtrigger-IntraDU ::= ENUMERATED {
    cho-initiation,
    cho-replace,
    cho-cancel,
    ...
}

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

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

CompositeAvailableCapacityGroup ::= SEQUENCE {
    compositeAvailableCapacityDownlink  CompositeAvailableCapacity,
    compositeAvailableCapacityUplink    CompositeAvailableCapacity,
    iE-Extensions   ProtocolExtensionContainer { { CompositeAvailableCapacityGroup-ExtIEs} } OPTIONAL
}

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

CompositeAvailableCapacity ::= SEQUENCE {
    cellCapacityClassValue  CellCapacityClassValue     OPTIONAL,
    capacityValue           CapacityValue,
    iE-Extensions   ProtocolExtensionContainer { { CompositeAvailableCapacity-ExtIEs} } OPTIONAL
}

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

ConditionalInterDUMobilityInformation ::= SEQUENCE {
    cho-trigger                     CHOtrigger-InterDU,
```

```
    targetgNB-DUUEF1APID          GNB-DU-UE-F1AP-ID                            OPTIONAL
        -- This IE shall be present if the cho-trigger IE is present and set to "cho-replace" --,
    iE-Extensions                 ProtocolExtensionContainer { { ConditionalInterDUMobilityInformation-ExtIEs} } OPTIONAL,
    ...
}


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


ConditionalIntraDUMobilityInformation ::= SEQUENCE {
    cho-trigger                   CHOtrigger-IntraDU,
    targetCellsTocancel           TargetCellList                      OPTIONAL,
    -- This IE may be present if the cho-trigger IE is present and set to "cho-cancel"
    iE-Extensions                 ProtocolExtensionContainer { { ConditionalIntraDUMobilityInformation-ExtIEs} } OPTIONAL,
    ...
}


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


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 ::= {
    ...
}


CPTrafficType ::= INTEGER (1..3,...)

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, ...)

CUDURadioInformationType ::= CHOICE {
    rIM                        CUDURIMInformation,
    choice-extension           ProtocolIE-SingleContainer { { CUDURadioInformationType-ExtIEs} }
}

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

CUDURIMInformation ::= SEQUENCE {
    victimgNBSetID        GNBSetID,
    rIMRSDetectionStatus    RIMRSDetectionStatus,
    iE-Extensions          ProtocolExtensionContainer { { CUDURIMInformation-ExtIEs} } OPTIONAL
}

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

CUtoDURRCInformation ::= SEQUENCE {
    cG-ConfigInfo                          CG-ConfigInfo                          OPTIONAL,
    uE-CapabilityRAT-ContainerList    UE-CapabilityRAT-ContainerList       OPTIONAL,
    measConfig                             MeasConfig                             OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { CUtoDURRCInformation-ExtIEs} } OPTIONAL,
    ...
}

CUtoDURRCInformation-ExtIEs 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 }|
    { ID id-CG-Config                       CRITICALITY ignore  EXTENSION CG-Config                          PRESENCE optional }|
    { ID id-UEAssistanceInformationEUTRA    CRITICALITY ignore  EXTENSION UEAssistanceInformationEUTRA       PRESENCE optional },
    ...
}

-- D

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

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

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

DL-UP-TNL-Address-to-Update-List-Item    ::= SEQUENCE {
    oldIPAdress                      TransportLayerAddress,
    newIPAdress                      TransportLayerAddress,
    iE-Extensions   ProtocolExtensionContainer { { DL-UP-TNL-Address-to-Update-List-ItemExtIEs } }   OPTIONAL,
    ...
}

DL-UP-TNL-Address-to-Update-List-ItemExtIEs      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 }|
    { ID id-AdditionalPDCPDuplicationTNL-List   CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List   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 ::= {
    { ID id-AdditionalPDCPDuplicationTNL-List   CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List       PRESENCE optional },
    ...
}

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

DRB-Notify-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-CurrentQoSParaSetIndex   CRITICALITY ignore  EXTENSION QoSParaSetNotifyIndex PRESENCE optional },
    ...
}

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 }|
    { ID id-AdditionalPDCPDuplicationTNL-List   CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List       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 ::= {
```

```
    { ID id-AdditionalPDCPDuplicationTNL-List    CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List       PRESENCE optional }|
    { ID id-RLCDuplicationInformation            CRITICALITY ignore  EXTENSION RLCDuplicationInformation              PRESENCE optional}, ...
}

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 ::= {
    { ID id-AdditionalPDCPDuplicationTNL-List    CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List       PRESENCE optional },
    ...
}


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-DLPDCPSNLength                       CRITICALITY ignore  EXTENSION PDCPSNLength                           PRESENCE optional }|
    { ID id-ULPDCPSNLength                       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 }|
    { ID id-AdditionalPDCPDuplicationTNL-List    CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List       PRESENCE optional }|
    { ID id-RLCDuplicationInformation            CRITICALITY ignore  EXTENSION RLCDuplicationInformation              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            PRESENCE optional }|
    { ID id-DLPDCPSNLength                     CRITICALITY ignore  EXTENSION PDCPSNLength                     PRESENCE mandatory }|
    { ID id-ULPDCPSNLength                     CRITICALITY ignore  EXTENSION PDCPSNLength                     PRESENCE optional }|
    { ID id-AdditionalPDCPDuplicationTNL-List  CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List  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    PRESENCE optional }|
    { ID id-DC-Based-Duplication-Activation    CRITICALITY reject  EXTENSION DuplicationActivation            PRESENCE optional }|
    { ID id-DLPDCPSNLength                     CRITICALITY ignore  EXTENSION PDCPSNLength                     PRESENCE optional }|
    { ID id-ULPDCPSNLength                     CRITICALITY ignore  EXTENSION PDCPSNLength                     PRESENCE optional }|
    { ID id-AdditionalPDCPDuplicationTNL-List  CRITICALITY ignore  EXTENSION AdditionalPDCPDuplicationTNL-List  PRESENCE optional }|
    { ID id-RLCDuplicationInformation          CRITICALITY ignore  EXTENSION RLCDuplicationInformation        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)

DSInformationList ::= SEQUENCE (SIZE(0..maxnoofDSInfo)) OF DSCP

DSCP ::= BIT STRING (SIZE (6))

DUtoCURRCContainer ::= OCTET STRING

DUCURadioInformationType ::= CHOICE {
    rIM                         DUCURIMInformation,
    choice-extension            ProtocolIE-SingleContainer { { DUCURadioInformationType-ExtIEs} }
}

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

DUCURIMInformation ::= SEQUENCE {
    victimgNBSetID          GNBSetID,
    rIMRSDetectionStatus    RIMRSDetectionStatus,
    aggressorCellList       AggressorCellList,
    iE-Extensions           ProtocolExtensionContainer { { DUCURIMInformation-ExtIEs} }    OPTIONAL
}

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

DUF-Slot-Config-Item    ::= CHOICE {
    explicitFormat          ExplicitFormat,
    implicitFormat          ImplicitFormat,
    choice-extension            ProtocolIE-SingleContainer { { DUF-Slot-Config-Item-ExtIEs} }
}

DUF-Slot-Config-Item-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}
DUF-Slot-Config-List    ::= SEQUENCE (SIZE(1..maxnoofDUFSlots)) OF DUF-Slot-Config-Item

DUFSlotformatIndex ::= INTEGER(0..254)

DUFTransmissionPeriodicity ::= ENUMERATED { ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, ...}

DU-RX-MT-RX ::= ENUMERATED {supported, not-supported}

DU-TX-MT-TX ::= ENUMERATED {supported, not-supported}

DU-RX-MT-TX ::= ENUMERATED {supported, not-supported}

DU-TX-MT-RX ::= ENUMERATED {supported, not-supported}

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           PRESENCE optional }|
    { ID id-SelectedBandCombinationIndex       CRITICALITY ignore  EXTENSION SelectedBandCombinationIndex       PRESENCE optional }|
    { ID id-SelectedFeatureSetEntryIndex       CRITICALITY ignore  EXTENSION SelectedFeatureSetEntryIndex       PRESENCE optional }|
    { ID id-Ph-InfoSCG                         CRITICALITY ignore  EXTENSION Ph-InfoSCG                          PRESENCE optional }|
    { ID id-RequestedBandCombinationIndex      CRITICALITY ignore  EXTENSION RequestedBandCombinationIndex      PRESENCE optional }|
    { ID id-RequestedFeatureSetEntryIndex      CRITICALITY ignore  EXTENSION RequestedFeatureSetEntryIndex      PRESENCE optional }|
    { ID id-DRX-Config                         CRITICALITY ignore  EXTENSION DRX-Config                          PRESENCE optional }|
    { ID id-PDCCH-BlindDetectionSCG            CRITICALITY ignore  EXTENSION PDCCH-BlindDetectionSCG             PRESENCE optional }|
    { ID id-Requested-PDCCH-BlindDetectionSCG  CRITICALITY ignore  EXTENSION Requested-PDCCH-BlindDetectionSCG  PRESENCE optional }|
    { ID id-Ph-InfoMCG                         CRITICALITY ignore  EXTENSION Ph-InfoMCG                          PRESENCE optional }|
    { ID id-MeasGapSharingConfig               CRITICALITY ignore  EXTENSION MeasGapSharingConfig               PRESENCE optional }|
    { ID id-SL-PHY-MAC-RLC-Config              CRITICALITY ignore  EXTENSION SL-PHY-MAC-RLC-Config              PRESENCE optional }|
    { ID id-SL-ConfigDedicatedEUTRA            CRITICALITY ignore  EXTENSION SL-ConfigDedicatedEUTRA            PRESENCE optional }|
    { ID id-RequestedP-MaxFR2                  CRITICALITY ignore  EXTENSION RequestedP-MaxFR2                   PRESENCE optional },
    ...
}


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


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


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


Dynamic5QIDescriptor    ::= SEQUENCE {
    qoSPriorityLevel                    INTEGER (1..127),
    packetDelayBudget                   PacketDelayBudget,
    packetErrorRate                     PacketErrorRate,
    fiveQI                              INTEGER (0..255, ...)                           OPTIONAL,
    delayCritical                       ENUMERATED {delay-critical, non-delay-critical}    OPTIONAL,
    -- C-ifGBRflow: This IE shall be present if the GBR QoS Flow Information IE is present in the QoS Flow Level QoS Parameters IE.
    averagingWindow                     AveragingWindow                                 OPTIONAL,
    -- C-ifGBRflow: This IE shall be present if the GBR QoS Flow Information IE is present in the QoS Flow Level QoS Parameters IE.
    maxDataBurstVolume                  MaxDataBurstVolume                              OPTIONAL,
    iE-Extensions                       ProtocolExtensionContainer { { Dynamic5QIDescriptor-ExtIEs } } OPTIONAL
}


Dynamic5QIDescriptor-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-ExtendedPacketDelayBudget          CRITICALITY ignore  EXTENSION ExtendedPacketDelayBudget    PRESENCE optional    }|
    { ID id-CNPacketDelayBudgetDownlink        CRITICALITY ignore  EXTENSION ExtendedPacketDelayBudget    PRESENCE optional    }|
    { ID id-CNPacketDelayBudgetUplink          CRITICALITY ignore  EXTENSION ExtendedPacketDelayBudget    PRESENCE optional    },
    ...
}


DynamicPQIDescriptor    ::= SEQUENCE {
```

```
    resourceType                        ENUMERATED {gbr, non-gbr, delay-critical-grb, ...}       OPTIONAL,
    qoSPriorityLevel                    INTEGER (1..8, ...),
    packetDelayBudget                   PacketDelayBudget,
    packetErrorRate                     PacketErrorRate,
    averagingWindow                     AveragingWindow                                OPTIONAL,
    -- C-ifGBRflow: This IE shall be present if the GBR QoS Flow Information IE is present in the QoS Flow Level QoS Parameters IE.
    maxDataBurstVolume                  MaxDataBurstVolume                             OPTIONAL,
    iE-Extensions                       ProtocolExtensionContainer { { DynamicPQIDescriptor-ExtIEs } } OPTIONAL
}


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


-- E

EgressBHRLCCHList ::= SEQUENCE (SIZE(1..maxnoofEgressLinks)) OF EgressBHRLCCHItem

EgressBHRLCCHItem ::= SEQUENCE {
    nextHopBAPAddress       BAPAddress,
    bHRLCChannelID          BHRLCChannelID,
    iE-Extensions           ProtocolExtensionContainer {{EgressBHRLCCHItemExtIEs }}  OPTIONAL
}


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

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 ::= {
    { ID id-portNumber  CRITICALITY reject  EXTENSION PortNumber       PRESENCE optional},
    ...
}

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

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

ExplicitFormat ::=  SEQUENCE {
    permutation         Permutation,
    noofDownlinkSymbols NoofDownlinkSymbols,
    noofUplinkSymbols   NoofUplinkSymbols,
    iE-Extensions       ProtocolExtensionContainer { { ExplicitFormat-ExtIEs} } OPTIONAL
}

ExplicitFormat-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

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 ::= {
    { ID id-NPNSupportInfo           CRITICALITY reject  EXTENSION NPNSupportInfo              PRESENCE optional  }|
{ ID id-ExtendedTAISliceSupportList CRITICALITY reject  EXTENSION ExtendedSliceSupportList    PRESENCE optional  },
    ...
}

ExtendedSliceSupportList ::= SEQUENCE (SIZE(1.. maxnoofExtSliceItems)) OF SliceSupportItem

EUTRACells-List  ::= SEQUENCE (SIZE (1.. maxCellineNB)) 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,
    uL-Transmission-Bandwidth       EUTRA-Transmission-Bandwidth    OPTIONAL,
    dL-Transmission-Bandwidth       EUTRA-Transmission-Bandwidth,
    iE-Extensions                   ProtocolExtensionContainer { {EUTRA-Coex-FDD-Info-ExtIEs} } OPTIONAL,
    ...
}

EUTRA-Coex-FDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-ULCarrierList           CRITICALITY ignore  EXTENSION NRCarrierList               PRESENCE optional }|
    {  ID id-DLCarrierList          CRITICALITY ignore EXTENSION NRCarrierList                PRESENCE optional },
    ...
}

EUTRA-Coex-Mode-Info ::= CHOICE {
```

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```
    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,
    -- C-ifTDD: This IE shall be present if the EUTRA-Mode-Info IE in the Resource Coordination E-UTRA Cell Information IE is set to the value
"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 ::= {
    ...
}

EventType ::= ENUMERATED {
    on-demand,
    periodic,
    stop,
    ...
}

ExtendedPacketDelayBudget ::= INTEGER (1..65535, ...)

-- 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,
    ...
```

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```
}

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}|
    {ID id-TSCTrafficCharacteristics   CRITICALITY ignore  EXTENSION TSCTrafficCharacteristics      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 ::= {
    ...
}

FreqDomainLength ::= CHOICE {
    l839                      L839Info,
    l139                      L139Info,
    choice-extension          ProtocolIE-SingleContainer { {FreqDomainLength-ExtIEs} }
}

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

FrequencyShift7p5khz ::= ENUMERATED {false, true, ...}

FullConfiguration ::= ENUMERATED {full, ...}

FlowsMappedToSLDRB-List ::= SEQUENCE (SIZE(1.. maxnoofPC5QoSFlows)) OF FlowsMappedToSLDRB-Item

FlowsMappedToSLDRB-Item ::= SEQUENCE {
    pc5QoSFlowIdentifier      PC5QoSFlowIdentifier,
    iE-Extensions             ProtocolExtensionContainer { {FlowsMappedToSLDRB-Item-ExtIEs} } OPTIONAL,
    ...
}
```

```
FlowsMappedToSLDRB-Item-ExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- 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 ::= {
    {   ID id-AlternativeQoSParaSetList CRITICALITY ignore  EXTENSION AlternativeQoSParaSetList PRESENCE optional  },
    ...
}

CG-Config ::= OCTET STRING

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

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

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

GNB-CUSystemInformation-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    {ID id-systemInformationAreaID  CRITICALITY ignore  EXTENSION SystemInformationAreaID PRESENCE optional},
    ...
}

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 ::= {
    {ID id-TNLAssociationTransportLayerAddressgNBDU CRITICALITY reject  EXTENSION CP-TransportLayerAddress PRESENCE optional},
    ...
}


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-Cell-Resource-Configuration  ::= SEQUENCE {
    subcarrierSpacing             SubcarrierSpacing,
```

```
    dUFTransmissionPeriodicity       DUFTransmissionPeriodicity,
    dUF-Slot-Config-List             DUF-Slot-Config-List,
    hSNATransmissionPeriodicity      HSNATransmissionPeriodicity,
    hNSASlotConfigList               HSNASlotConfigList,
    iE-Extensions                    ProtocolExtensionContainer { { GNB-DU-Cell-Resource-Configuration-ExtIEs } } OPTIONAL
}

GNB-DU-Cell-Resource-Configuration-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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 ::= {
    { ID id-SIB12-message        CRITICALITY ignore  EXTENSION SIB12-message     PRESENCE optional}|
    { ID id-SIB13-message        CRITICALITY ignore  EXTENSION SIB13-message     PRESENCE optional}|
    { ID id-SIB14-message        CRITICALITY ignore  EXTENSION SIB14-message     PRESENCE optional}|
    { ID id-SIB10-message        CRITICALITY ignore  EXTENSION SIB10-message     PRESENCE optional},
    ...
}

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

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

GNB-DU-TNL-Association-To-Remove-Item::= SEQUENCE {
    tNLAssociationTransportLayerAddress     CP-TransportLayerAddress    ,
    tNLAssociationTransportLayerAddressgNBCU        CP-TransportLayerAddress        OPTIONAL,
    iE-Extensions                  ProtocolExtensionContainer { { GNB-DU-TNL-Association-To-Remove-Item-ExtIEs} } OPTIONAL
}
```

```
GNB-DU-TNL-Association-To-Remove-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNBSetID ::= BIT STRING (SIZE(22))

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

GTPTLAs ::= SEQUENCE (SIZE(1.. maxnoofGTPTLAs)) OF  GTPTLA-Item


GTPTLA-Item ::= SEQUENCE {
    gTPTransportLayerAddress             TransportLayerAddress,
    iE-Extensions   ProtocolExtensionContainer { { GTPTLA-Item-ExtIEs } }          OPTIONAL
}

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

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

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

-- H

HandoverPreparationInformation ::= OCTET STRING

HardwareLoadIndicator ::= SEQUENCE {
    dLHardwareLoadIndicator       INTEGER (0..100, ...),
    uLHardwareLoadIndicator       INTEGER (0..100, ...),
    iE-Extensions                 ProtocolExtensionContainer { { HardwareLoadIndicator-ExtIEs } } OPTIONAL,
    ...
}

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

HSNASlotConfigList ::= SEQUENCE (SIZE(1..maxnoofHSNASlots)) OF HSNASlotConfigItem

HSNASlotConfigItem  ::= SEQUENCE {
    hSNADownlink         HSNADownlink       OPTIONAL,
    hSNAUplink           HSNAUplink         OPTIONAL,
    hSNAFlexible         HSNAFlexible       OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { { HSNASlotConfigItem-ExtIEs } } OPTIONAL
```

```
}

HSNASlotConfigItem-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
HSNADownlink ::= ENUMERATED { hard, soft, notavailable }

HSNAFlexible ::= ENUMERATED { hard, soft, notavailable }

HSNAUplink ::= ENUMERATED { hard, soft, notavailable }

HSNATransmissionPeriodicity ::= ENUMERATED { ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, ms20, ms40, ms80, ms160, ...}

-- I

IAB-Barred  ::= ENUMERATED {barred, not-barred, ...}

IAB-Info-IAB-donor-CU ::=   SEQUENCE{
    iAB-STC-Info    IAB-STC-Info,
    iE-Extensions                ProtocolExtensionContainer { { IAB-Info-IAB-donor-CU-ExtIEs } } OPTIONAL
}

IAB-Info-IAB-donor-CU-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-Info-IAB-DU ::= SEQUENCE{
    multiplexingInfo        MultiplexingInfo,
    iAB-STC-Info        IAB-STC-Info,
    iE-Extensions                ProtocolExtensionContainer { { IAB-Info-IAB-DU-ExtIEs } } OPTIONAL
}

IAB-Info-IAB-DU-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-MT-Cell-List ::= SEQUENCE (SIZE(1..maxnoofServingCells)) OF IAB-MT-Cell-List-Item

IAB-MT-Cell-List-Item ::=   SEQUENCE {
    nRCellIdentity            NRCellIdentity,
    dU-RX-MT-RX               DU-RX-MT-RX,
    dU-TX-MT-TX               DU-TX-MT-TX,
    dU-RX-MT-TX               DU-RX-MT-TX,
    dU-TX-MT-RX               DU-TX-MT-RX,
    iE-Extensions            ProtocolExtensionContainer { { IAB-MT-Cell-List-Item-ExtIEs } } OPTIONAL
}

IAB-MT-Cell-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-STC-Info    ::= SEQUENCE{
    iAB-STC-Info-List    IAB-STC-Info-List,
    iE-Extensions        ProtocolExtensionContainer { { IAB-STC-Info-ExtIEs } } OPTIONAL
```

```
}

IAB-STC-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-STC-Info-List ::=   SEQUENCE (SIZE(1..maxnoofIABSTCInfo)) OF IAB-STC-Info-Item

IAB-STC-Info-Item::=    SEQUENCE {
    sSB-freqInfo                      SSB-freqInfo,
    sSB-subcarrierSpacing             SSB-subcarrierSpacing,
    sSB-transmissionPeriodicity       SSB-transmissionPeriodicity,
    sSB-transmissionTimingOffset      SSB-transmissionTimingOffset,
    sSB-transmissionBitmap            SSB-transmissionBitmap,
    iE-Extensions     ProtocolExtensionContainer { { IAB-STC-Info-Item-ExtIEs } } OPTIONAL
}

IAB-STC-Info-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-Allocated-TNL-Address-Item  ::= SEQUENCE {
    iABTNLAddress             IABTNLAddress,
    iABTNLAddressUsage        IABTNLAddressUsage     OPTIONAL,
    iE-Extensions     ProtocolExtensionContainer { { IAB-Allocated-TNL-Address-Item-ExtIEs } } OPTIONAL
}

IAB-Allocated-TNL-Address-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-DU-Cell-Resource-Configuration-Mode-Info    ::= CHOICE {
    fDD    IAB-DU-Cell-Resource-Configuration-FDD-Info,
    tDD    IAB-DU-Cell-Resource-Configuration-TDD-Info,
    choice-extension           ProtocolIE-SingleContainer { { IAB-DU-Cell-Resource-Configuration-Mode-Info-ExtIEs} }
}

IAB-DU-Cell-Resource-Configuration-Mode-Info-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

IAB-DU-Cell-Resource-Configuration-FDD-Info ::= SEQUENCE {
    gNB-DU-Cell-Resource-Configuration-FDD-UL         GNB-DU-Cell-Resource-Configuration,
    gNB-DU-Cell-Resource-Configuration-FDD-DL         GNB-DU-Cell-Resource-Configuration,
    iE-Extensions                  ProtocolExtensionContainer { {IAB-DU-Cell-Resource-Configuration-FDD-Info-ExtIEs} } OPTIONAL,
    ...
}

IAB-DU-Cell-Resource-Configuration-FDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-DU-Cell-Resource-Configuration-TDD-Info ::= SEQUENCE {
    gNB-DU-Cell-Resourc-Configuration-TDD             GNB-DU-Cell-Resource-Configuration,
```

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```
    iE-Extensions                    ProtocolExtensionContainer { {IAB-DU-Cell-Resource-Configuration-TDD-Info-ExtIEs} } OPTIONAL,
    ...
}

IAB-DU-Cell-Resource-Configuration-TDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IABIPv6RequestType   ::= CHOICE {
    iPv6Address                      IABTNLAddressesRequested,
    iPv6Prefix                       IABTNLAddressesRequested,
    choice-extension                 ProtocolIE-SingleContainer { { IABIPv6RequestType-ExtIEs} }
}

IABIPv6RequestType-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

IABTNLAddress ::= CHOICE {
    iPv4Address                      BIT STRING (SIZE(32)),
    iPv6Address                      BIT STRING (SIZE(128)),
    iPv6Prefix                       BIT STRING (SIZE(64)),
    choice-extension                 ProtocolIE-SingleContainer { { IABTNLAddress-ExtIEs} }
}

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

IABTNLAddressesRequested ::= SEQUENCE {
    tNLAddressesOrPrefixesRequestedAllTraffic   INTEGER (1..256)   OPTIONAL,
    tNLAddressesOrPrefixesRequestedF1-C         INTEGER (1..256)   OPTIONAL,
    tNLAddressesOrPrefixesRequestedF1-U         INTEGER (1..256)   OPTIONAL,
    tNLAddressesOrPrefixesRequestedNoNF1        INTEGER (1..256)   OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { { IABTNLAddressesRequested-ExtIEs } } OPTIONAL
}

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

IAB-TNL-Addresses-To-Remove-Item ::= SEQUENCE {
    iABTNLAddress         IABTNLAddress,
    iE-Extensions         ProtocolExtensionContainer { { IAB-TNL-Addresses-To-Remove-Item-ExtIEs} } OPTIONAL
}

IAB-TNL-Addresses-To-Remove-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IABTNLAddressUsage ::= ENUMERATED {
    f1-c,
    f1-u,
    non-f1,
```

```
    ...
}


IABv4AddressesRequested ::= SEQUENCE {
    iABv4AddressesRequested          IABTNLAddressesRequested,
    iE-Extensions          ProtocolExtensionContainer { { IABv4AddressesRequested-ExtIEs} } OPTIONAL
}

IABv4AddressesRequested-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ImplicitFormat  ::= SEQUENCE     {
    dUFSlotformatIndex          DUFSlotformatIndex,
    iE-Extensions          ProtocolExtensionContainer { { ImplicitFormat-ExtIEs } } OPTIONAL
}

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

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

IgnoreResourceCoordinationContainer ::= ENUMERATED { yes,...}
InactivityMonitoringRequest ::= ENUMERATED { true,...}
InactivityMonitoringResponse ::= ENUMERATED { not-supported,...}
InterfacesToTrace ::= BIT STRING (SIZE(8))

IntendedTDD-DL-ULConfig ::= SEQUENCE {
    nRSCS                     ENUMERATED { scs15, scs30, scs60, scs120,...},
    nRCP                      ENUMERATED { normal, extended,...},
    nRDLULTxPeriodicity       ENUMERATED { ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms3, ms4, ms5, ms10, ms20, ms40, ms60, ms80, ms100, ms120,
ms140, ms160, ...},
    slot-Configuration-List    Slot-Configuration-List,
    iE-Extensions                     ProtocolExtensionContainer { {IntendedTDD-DL-ULConfig-ExtIEs} } OPTIONAL
}

IntendedTDD-DL-ULConfig-ExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IPHeaderInformation ::= SEQUENCE {
    destinationIABTNLAddress          IABTNLAddress,
    dsInformationList                 DSInformationList,
    iPv6FlowLabel                     BIT STRING (SIZE (20))  OPTIONAL,
    iE-Extensions                     ProtocolExtensionContainer { { IPHeaderInformation-ItemExtIEs} } OPTIONAL,
    ...
}

IPHeaderInformation-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
IPtolayer2TrafficMappingInfo ::= SEQUENCE {
    iPtolayer2TrafficMappingInfoToAdd                IPtolayer2TrafficMappingInfoList          OPTIONAL,
    iPtolayer2TrafficMappingInfoToRemove             MappingInformationtoRemove                OPTIONAL,
    iE-Extensions                                    ProtocolExtensionContainer { { IPtolayer2TrafficMappingInfo-ItemExtIEs} } OPTIONAL,
    ...
}

IPtolayer2TrafficMappingInfoList ::= SEQUENCE (SIZE(1..maxnoofMappingEntries)) OF IPtolayer2TrafficMappingInfo-Item

IPtolayer2TrafficMappingInfo-Item ::= SEQUENCE {
    mappingInformationIndex    MappingInformationIndex,
    iPHeaderInformation        IPHeaderInformation,
    bHInfo                     BHInfo, iE-Extensions       ProtocolExtensionContainer { { IPtolayer2TrafficMappingInfo-ItemExtIEs} }
OPTIONAL,
    ...
}

IPtolayer2TrafficMappingInfo-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- J

-- K

-- L

L139Info ::= SEQUENCE {
    msg1SCS                    ENUMERATED {scs15, scs30, scs60, scs120, ...},
    rootSequenceIndex          INTEGER (0..137)                                OPTIONAL,
    iE-Extension               ProtocolExtensionContainer { {L139Info-ExtIEs} }        OPTIONAL,
    ...
}

L139Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

L839Info ::= SEQUENCE {
    rootSequenceIndex          INTEGER (0..837),
    restrictedSetConfig        ENUMERATED {unrestrictedSet, restrictedSetTypeA,
                                           restrictedSetTypeB, ...},
    iE-Extension        ProtocolExtensionContainer { {L839Info-ExtIEs} }        OPTIONAL,
    ...
}

L839Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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, ...}

LowerLayerPresenceStatusChange ::= ENUMERATED {
    suspend-lower-layers,
    resume-lower-layers,
    ...

}

LTEUESidelinkAggregateMaximumBitrate ::= SEQUENCE {
    uELTESidelinkAggregateMaximumBitrate        BitRate,
    iE-Extensions                   ProtocolExtensionContainer { {LTEUESidelinkAggregateMaximumBitrate-ExtIEs} } OPTIONAL
}

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

LTEV2XServicesAuthorized ::= SEQUENCE {
    vehicleUE        VehicleUE                                               OPTIONAL,
    pedestrianUE     PedestrianUE                                            OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {LTEV2XServicesAuthorized-ExtIEs} }        OPTIONAL
}

LTEV2XServicesAuthorized-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- M

MappingInformationIndex ::= BIT STRING (SIZE (26))

MappingInformationtoRemove  ::= SEQUENCE (SIZE(1..maxnoofMappingEntries)) OF MappingInformationIndex

MaskedIMEISV ::=    BIT STRING (SIZE (64))

MaxDataBurstVolume  ::= INTEGER (0..4095, ..., 4096.. 2000000)
MaxPacketLossRate ::= INTEGER (0..1000)

MIB-message ::= OCTET STRING

MeasConfig ::= OCTET STRING

MeasGapConfig ::= OCTET STRING

MeasGapSharingConfig ::= OCTET STRING

MeasurementTimingConfiguration ::= OCTET STRING

MessageIdentifier ::= BIT STRING (SIZE (16))

MultiplexingInfo    ::= SEQUENCE{
    iAB-MT-Cell-List    IAB-MT-Cell-List,
    iE-Extensions        ProtocolExtensionContainer { {MultiplexingInfo-ExtIEs} } OPTIONAL
```

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```
}

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

M2Configuration ::= ENUMERATED {true, ...}


M5Configuration ::= SEQUENCE {
    m5period          M5period,
    m5-links-to-log   M5-Links-to-log,
    iE-Extensions     ProtocolExtensionContainer { { M5Configuration-ExtIEs} } OPTIONAL,
    ...
}

M5Configuration-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

M5period ::= ENUMERATED { ms1024, ms2048, ms5120, ms10240, min1, ... }

M5-Links-to-log ::= ENUMERATED {uplink, downlink, both-uplink-and-downlink, ...}


M6Configuration ::= SEQUENCE {
    m6report-Interval  M6report-Interval,
    m6-links-to-log    M6-Links-to-log,
    iE-Extensions      ProtocolExtensionContainer { { M6Configuration-ExtIEs} } OPTIONAL,
    ...
}

M6Configuration-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

M6report-Interval ::= ENUMERATED { ms120, ms240, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1, min6, min12, min30, ... }



M6-Links-to-log ::= ENUMERATED {uplink, downlink, both-uplink-and-downlink, ...}


M7Configuration ::= SEQUENCE {
    m7period          M7period,
    m7-links-to-log   M7-Links-to-log,
    iE-Extensions     ProtocolExtensionContainer { { M7Configuration-ExtIEs} } OPTIONAL,
    ...
}

M7Configuration-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
M7period     ::= INTEGER(1..60, ...)

M7-Links-to-log ::= ENUMERATED {downlink, ...}

MDT-Activation ::= ENUMERATED {
    immediate-MDT-only,
    immediate-MDT-and-Trace,
    ...
}

MDTConfiguration ::= SEQUENCE {
    mdt-Activation             MDT-Activation,
    measurementsToActivate     MeasurementsToActivate,
    m2Configuration            M2Configuration     OPTIONAL,
    -- C-ifM2: This IE shall be present if the Measurements to Activate IE has the second bit set to "1".
    m5Configuration            M5Configuration     OPTIONAL,
    -- C-ifM5: This IE shall be present if the Measurements to Activate IE has the fifth bit set to "1".
    m6Configuration            M6Configuration     OPTIONAL,
    -- C-ifM6: This IE shall be present if the Measurements to Activate IE has the seventh bit set to "1".
    m7Configuration            M7Configuration     OPTIONAL,
    -- C-ifM7: This IE shall be present if the Measurements to Activate IE has the eighth bit set to "1".
    iE-Extensions              ProtocolExtensionContainer { { MDTConfiguration-ExtIEs} } OPTIONAL,
    ...
}
MDTConfiguration-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


MDTPLMNList ::= SEQUENCE (SIZE(1..maxnoofMDTPLMNs)) OF PLMN-Identity

MeasurementsToActivate ::= BIT STRING (SIZE (8))

-- N

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

Neighbour-Cell-Information-Item ::= SEQUENCE {
    nRCGI              NRCGI,
    intendedTDD-DL-ULConfig     IntendedTDD-DL-ULConfig OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { Neighbour-Cell-Information-ItemExtIEs } }    OPTIONAL
}

Neighbour-Cell-Information-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

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

NID ::= BIT STRING (SIZE(44))

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 ::= {
    { ID id-CNPacketDelayBudgetDownlink CRITICALITY ignore  EXTENSION ExtendedPacketDelayBudget  PRESENCE optional }|
    { ID id-CNPacketDelayBudgetUplink   CRITICALITY ignore  EXTENSION ExtendedPacketDelayBudget  PRESENCE optional },
    ...
}

NonDynamicPQIDescriptor ::= SEQUENCE {
    fiveQI                  INTEGER (0..255, ...),
    qoSPriorityLevel        INTEGER (1..8, ...)             OPTIONAL,
    averagingWindow         AveragingWindow                 OPTIONAL,
    maxDataBurstVolume      MaxDataBurstVolume              OPTIONAL,
    iE-Extensions  ProtocolExtensionContainer { { NonDynamicPQIDescriptor-ExtIEs } } OPTIONAL
}

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

NonUPTrafficType ::=    ENUMERATED {ue-associated, non-ue-associated, non-f1, bap-control-pdu,...}

NoofDownlinkSymbols ::= INTEGER (0..14)

NoofUplinkSymbols   ::= INTEGER (0..14)

Notification-Cause ::= ENUMERATED {fulfilled, not-fulfilled, ...}

NotificationControl ::= ENUMERATED {active, not-active, ...}

NotificationInformation ::= SEQUENCE {
    message-Identifier  MessageIdentifier,
```

```
    serialNumber          SerialNumber,
    iE-Extensions   ProtocolExtensionContainer { { NotificationInformationExtIEs} } OPTIONAL,
    ...
}

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

NPNBroadcastInformation ::= CHOICE {
    sNPN-Broadcast-Information                 NPN-Broadcast-Information-SNPN,
    pNI-NPN-Broadcast-Information              NPN-Broadcast-Information-PNI-NPN,
    choice-extension                   ProtocolIE-SingleContainer { {NPNBroadcastInformation-ExtIEs} }
}

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

NPN-Broadcast-Information-SNPN ::= SEQUENCE {
    broadcastSNPNID-List        BroadcastSNPN-ID-List,
    iE-Extension                ProtocolExtensionContainer { {NPN-Broadcast-Information-SNPN-ExtIEs} } OPTIONAL,
    ...
}

NPN-Broadcast-Information-SNPN-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
NPN-Broadcast-Information-PNI-NPN ::= SEQUENCE {
    broadcastPNI-NPN-ID-Information    BroadcastPNI-NPN-ID-List,
    iE-Extension                           ProtocolExtensionContainer { {NPN-Broadcast-Information-PNI-NPN-ExtIEs} } OPTIONAL,
    ...
}

NPN-Broadcast-Information-PNI-NPN-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


NPNSupportInfo ::= CHOICE {
    sNPN-Information        NID,
    choice-extension       ProtocolIE-SingleContainer { { NPNSupportInfo-ExtIEs } }
}

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

NRCarrierList ::= SEQUENCE (SIZE(1..maxnoofNRSCSs)) OF NRCarrierItem

NRCarrierItem ::= SEQUENCE {
    carrierSCS                 NRSCS,
    offsetToCarrier            INTEGER (0..2199, ...),
    carrierBandwidth           INTEGER (0..maxnoofPhysicalResourceBlocks, ...),
```

```
    iE-Extension              ProtocolExtensionContainer { {NRCarrierItem-ExtIEs} }              OPTIONAL,
    ...
}

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

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 ::= {
    { ID id-FrequencyShift7p5khz   CRITICALITY ignore  EXTENSION FrequencyShift7p5khz  PRESENCE optional },
    ...
}

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 ::= {
    ...
}




NRPRACHConfig ::= SEQUENCE {
    ulPRACHConfigList         NRPRACHConfigList                                OPTIONAL,
    sulPRACHConfigList        NRPRACHConfigList                                OPTIONAL,
    iE-Extension              ProtocolExtensionContainer { {NRPRACHConfig-ExtIEs} }   OPTIONAL,
    ...
}

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

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```
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)


NRPRACHConfigList ::= SEQUENCE (SIZE(0..maxnoofPRACHconfigs)) OF NRPRACHConfigItem

NRPRACHConfigItem ::= SEQUENCE {
    nRSCS                   NRSCS,
    prachFreqStartfromCarrier   INTEGER (0..maxnoofPhysicalResourceBlocks-1, ...),
    msg1FDM                 ENUMERATED {one, two, four, eight, ...},
    parchConfigIndex        INTEGER (0..255, ...),
    ssb-perRACH-Occasion    ENUMERATED {oneEighth, oneFourth, oneHalf, one,
                                        two, four, eight, sixteen, ...},
    freqDomainLength        FreqDomainLength,
    zeroCorrelZoneConfig    INTEGER (0..15),
    iE-Extension        ProtocolExtensionContainer { { NRPRACHConfigItem-ExtIEs} }      OPTIONAL,
    ...
}

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

NRSCS ::= ENUMERATED { scs15, scs30, scs60, scs120, ...}

NRUERLFReportContainer ::= OCTET STRING

NumberofActiveUEs ::= INTEGER(0..16777215, ...)

NumberOfBroadcasts ::= INTEGER (0..65535)

NumberofBroadcastRequest ::= INTEGER (0..65535)

NumDLULSymbols ::= SEQUENCE {
    numDLSymbols    INTEGER (0..13, ...),
    numULSymbols    INTEGER (0..13, ...),
    iE-Extensions           ProtocolExtensionContainer { { NumDLULSymbols-ExtIEs} } OPTIONAL
}

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

NRV2XServicesAuthorized ::= SEQUENCE {
    vehicleUE           VehicleUE                                           OPTIONAL,
    pedestrianUE        PedestrianUE                                        OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {NRV2XServicesAuthorized-ExtIEs} } OPTIONAL
}
```

```
NRV2XServicesAuthorized-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

NRUESidelinkAggregateMaximumBitrate ::= SEQUENCE {
    uENRSidelinkAggregateMaximumBitrate     BitRate,
    iE-Extensions                   ProtocolExtensionContainer { {NRUESidelinkAggregateMaximumBitrate-ExtIEs} } OPTIONAL
}

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

-- O

OffsetToPointA  ::= INTEGER (0..2199,...)


-- P

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

PacketErrorRate ::= SEQUENCE {
    pER-Scalar        PER-Scalar,
    pER-Exponent      PER-Exponent,
    iE-Extensions     ProtocolExtensionContainer { {PacketErrorRate-ExtIEs} } OPTIONAL,
    ...
}

PacketErrorRate-ExtIEs 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 {
```

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```
    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,...}

PC5QoSFlowIdentifier ::= INTEGER (1..2048)

PC5-QoS-Characteristics ::= CHOICE {
    non-Dynamic-PQI         NonDynamicPQIDescriptor,
    dynamic-PQI             DynamicPQIDescriptor,
    choice-extension        ProtocolIE-SingleContainer { { PC5-QoS-Characteristics-ExtIEs } }
}

PC5-QoS-Characteristics-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}


PC5QoSParameters    ::= SEQUENCE {
    pC5-QoS-Characteristics         PC5-QoS-Characteristics,
    pC5-QoS-Flow-Bit-Rates          PC5FlowBitRates         OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { PC5QoSParameters-ExtIEs } }  OPTIONAL,
    ...
}

PC5QoSParameters-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PC5FlowBitRates ::= SEQUENCE {
    guaranteedFlowBitRate       BitRate,
    maximumFlowBitRate          BitRate,
    iE-Extensions               ProtocolExtensionContainer { { PC5FlowBitRates-ExtIEs } }   OPTIONAL,
    ...
}

PC5FlowBitRates-ExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDCCH-BlindDetectionSCG ::= OCTET STRING

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

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

```
PDUSessionID ::= INTEGER (0..255)

ReportingPeriodicityValue ::= INTEGER (0..512, ...)

Periodicity ::= INTEGER (0..640000, ...)

Permutation ::= ENUMERATED {dfu, ufd, ...}

Ph-InfoMCG  ::= OCTET STRING

Ph-InfoSCG  ::= OCTET STRING

PLMN-Identity ::= OCTET STRING (SIZE(3))

PortNumber ::= BIT STRING (SIZE (16))

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

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 ::= {
    ...
```

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```
}

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 ::= {
    {ID id-NotificationInformation     CRITICALITY ignore  EXTENSION NotificationInformation    PRESENCE optional}|
    { ID id-AdditionalSIBMessageList    CRITICALITY reject  EXTENSION AdditionalSIBMessageList   PRESENCE optional},
    ...
}

PrivacyIndicator ::= ENUMERATED {immediate-MDT, logged-MDT, ...}

-- 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}|
    { ID id-QosMonitoringRequest                         CRITICALITY ignore  EXTENSION QosMonitoringRequest 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 mandatory},
    ...
}

QosMonitoringRequest ::= ENUMERATED {ul, dl, both, ...}

QoSParaSetIndex ::= INTEGER (1..8, ...)

QoSParaSetNotifyIndex ::= INTEGER (0..8, ...)

-- R

RACH-Config-Common  ::= OCTET STRING

RACH-Config-Common-IAB  ::= OCTET STRING

RACHReportContainer::= OCTET STRING

RACHReportInformationList    ::= SEQUENCE (SIZE(1.. maxnoofRACHReports)) OF RACHReportInformationItem

RACHReportInformationItem    ::= SEQUENCE {
    rACHReportContainer          RACHReportContainer,
    uEAssitantIdentifier         GNB-DU-UE-F1AP-ID      OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { RACHReportInformationItem-ExtIEs} }  OPTIONAL,
    ...
}

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


RadioResourceStatus ::= SEQUENCE {
    sSBAreaRadioResourceStatusList      SSBAreaRadioResourceStatusList,
    iE-Extensions   ProtocolExtensionContainer { { RadioResourceStatus-ExtIEs} } OPTIONAL
}

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

```
RANAC ::= INTEGER (0..255)

RANUEID ::= OCTET STRING (SIZE (8))

RANUEPagingIdentity ::= SEQUENCE    {
    iRNTI                       BIT STRING (SIZE(40)),
    iE-Extensions               ProtocolExtensionContainer { { RANUEPagingIdentity-ExtIEs } }   OPTIONAL}

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

RAT-FrequencyPriorityInformation::= CHOICE {
    eNDC        SubscriberProfileIDforRFP,
    nGRAN       RAT-FrequencySelectionPriority,
    choice-extension            ProtocolIE-SingleContainer { { RAT-FrequencyPriorityInformation-ExtIEs} }
}

RAT-FrequencyPriorityInformation-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

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

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

ReferenceSFN ::= INTEGER (0..1023)

ReferenceTime ::= OCTET STRING

RegistrationRequest ::= ENUMERATED{start, stop, add, ...}

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

ReportingPeriodicity ::= ENUMERATED{ms500, ms1000, ms2000, ms5000, ms10000, ...}

RequestedBandCombinationIndex ::= OCTET STRING

RequestedFeatureSetEntryIndex ::= OCTET STRING

RequestedP-MaxFR2 ::= OCTET STRING

Requested-PDCCH-BlindDetectionSCG ::= 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 ::= {
     {ID id-IgnorePRACHConfiguration     CRITICALITY reject EXTENSION IgnorePRACHConfiguration     PRESENCE optional },
     ...
}

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, ...)

ReportingRequestType ::= SEQUENCE {
     eventType                 EventType,
     reportingPeriodicityValue                  ReportingPeriodicityValue       OPTIONAL,
     -- C-ifEventTypeisPeriodic: This IE shall be present if the Event Type IE is set to "periodic" in the Event Type IE.
     iE-Extensions                   ProtocolExtensionContainer { {ReportingRequestType-ExtIEs} } OPTIONAL
}

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

RLCDuplicationInformation ::= SEQUENCE {
     rLCDuplicationStateList          RLCDuplicationStateList,
     primaryPathIndication            PrimaryPathIndication   OPTIONAL,
     iE-Extensions                    ProtocolExtensionContainer { {RLCDuplicationInformation-ExtIEs} }   OPTIONAL
}

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

RLCDuplicationStateList ::= SEQUENCE (SIZE(1..maxnoofRLCDuplicationState)) OF RLCDuplicationState-Item

RLCDuplicationState-Item ::=SEQUENCE {
     duplicationState       DuplicationState,
     iE-Extensions    ProtocolExtensionContainer { {RLCDuplicationState-Item-ExtIEs } }   OPTIONAL,
     ...
}
```

```
RLCDuplicationState-Item-ExtIEs     F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

RLCFailureIndication ::= SEQUENCE {
    assocatedLCID               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 ::= {
    ...
}

RLFReportInformationList    ::= SEQUENCE (SIZE(1.. maxnoofRLFReports)) OF RLFReportInformationItem

RLFReportInformationItem    ::= SEQUENCE {
    nRUERLFReportContainer      NRUERLFReportContainer,
    uEAssitantIdentifier            GNB-DU-UE-F1AP-ID       OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { RLFReportInformationItem-ExtIEs} } OPTIONAL,
    ...
}

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

RIMRSDetectionStatus ::= ENUMERATED {rs-detected, rs-disappeared, ...}

RRCContainer ::= OCTET STRING

RRCContainer-RRCSetupComplete ::= OCTET STRING

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

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```
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 ::= {
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```
    ...
}

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, ...)

SerialNumber ::= BIT STRING (SIZE (16))

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 }|
    {   ID id-BPLMN-ID-Info-List         CRITICALITY ignore  EXTENSION BPLMN-ID-Info-List       PRESENCE optional }|
    {   ID id-Cell-Type                  CRITICALITY ignore  EXTENSION CellType                 PRESENCE optional}|
    {   ID id-AggressorgNBSetID          CRITICALITY ignore  EXTENSION AggressorgNBSetID        PRESENCE optional}|
    {   ID id-VictimgNBSetID             CRITICALITY ignore  EXTENSION VictimgNBSetID           PRESENCE optional}|
    {   ID id-IAB-Info-IAB-DU            CRITICALITY ignore  EXTENSION IAB-Info-IAB-DU          PRESENCE optional}|
    {   ID id-SSB-PositionsInBurst       CRITICALITY ignore  EXTENSION SSB-PositionsInBurst     PRESENCE optional }|
    {   ID id-NRPRACHConfig              CRITICALITY ignore  EXTENSION NRPRACHConfig            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

SIB10-message ::= OCTET STRING

SIB12-message ::= OCTET STRING

SIB13-message ::= OCTET STRING

SIB14-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 ::= {
    {ID id-areaScope    CRITICALITY ignore  EXTENSION   AreaScope   PRESENCE optional},
    ...
}

SLDRBID ::= INTEGER (1..512, ...)

SLDRBInformation ::= SEQUENCE {
    sLDRB-QoS               PC5QoSParameters,
    flowsMappedToSLDRB-List FlowsMappedToSLDRB-List,
    ...
}

SLDRBs-FailedToBeModified-Item  ::= SEQUENCE {
    sLDRBID     SLDRBID    ,
    cause       Cause      OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-FailedToBeModified-ItemExtIEs } } OPTIONAL
}

SLDRBs-FailedToBeModified-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SLDRBs-FailedToBeSetup-Item ::= SEQUENCE {
    sLDRBID SLDRBID,
    cause   Cause   OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-FailedToBeSetup-ItemExtIEs } }       OPTIONAL
}

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

SLDRBs-FailedToBeSetupMod-Item  ::= SEQUENCE {
    sLDRBID     SLDRBID ,
    cause       Cause           OPTIONAL ,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-FailedToBeSetupMod-ItemExtIEs } } OPTIONAL
}

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

SLDRBs-Modified-Item    ::= SEQUENCE {
    sLDRBID                         SLDRBID,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-Modified-ItemExtIEs } }   OPTIONAL
}
```

```
SLDRBs-Modified-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SLDRBs-ModifiedConf-Item    ::= SEQUENCE {
    sLDRBID                        SLDRBID,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-ModifiedConf-ItemExtIEs } }   OPTIONAL
}

SLDRBs-ModifiedConf-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SLDRBs-Required-ToBeModified-Item   ::= SEQUENCE {
    sLDRBID                        SLDRBID,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-Required-ToBeModified-ItemExtIEs } } OPTIONAL
}

SLDRBs-Required-ToBeModified-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SLDRBs-Required-ToBeReleased-Item   ::= SEQUENCE {
    sLDRBID    SLDRBID,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-Required-ToBeReleased-ItemExtIEs } } OPTIONAL
}

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

SLDRBs-Setup-Item ::= SEQUENCE {
    sLDRBID                        SLDRBID,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-Setup-ItemExtIEs } }  OPTIONAL
}

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

SLDRBs-SetupMod-Item    ::= SEQUENCE {
    sLDRBID                        SLDRBID,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-SetupMod-ItemExtIEs } }   OPTIONAL
}

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

SLDRBs-ToBeModified-Item    ::= SEQUENCE {
    sLDRBID                        SLDRBID,
    sLDRBInformation               SLDRBInformation      OPTIONAL,
    rLCMode                        RLCMode        OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { SLDRBs-ToBeModified-ItemExtIEs } }   OPTIONAL
```

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```
}

SLDRBs-ToBeModified-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SLDRBs-ToBeReleased-Item    ::= SEQUENCE {
    sLDRBID          SLDRBID,
    iE-Extensions    ProtocolExtensionContainer { { SLDRBs-ToBeReleased-ItemExtIEs } }   OPTIONAL
}

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

SLDRBs-ToBeSetup-Item ::= SEQUENCE  {
    sLDRBID                   SLDRBID,
    sLDRBInformation          SLDRBInformation,
    rLCMode                   RLCMode,

    iE-Extensions    ProtocolExtensionContainer { { SLDRBs-ToBeSetup-ItemExtIEs } } OPTIONAL
}

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

SLDRBs-ToBeSetupMod-Item    ::= SEQUENCE {
    sLDRBID                   SLDRBID,
    sLDRBInformation          SLDRBInformation,
    rLCMode                   RLCMode         OPTIONAL,
    iE-Extensions    ProtocolExtensionContainer { { SLDRBs-ToBeSetupMod-ItemExtIEs } }   OPTIONAL
}

SLDRBs-ToBeSetupMod-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SL-PHY-MAC-RLC-Config ::= OCTET STRING

SL-ConfigDedicatedEUTRA ::= OCTET STRING

SliceAvailableCapacity ::= SEQUENCE {
    sliceAvailableCapacityList  SliceAvailableCapacityList,
    iE-Extensions               ProtocolExtensionContainer { { SliceAvailableCapacity-ExtIEs} } OPTIONAL
}

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

SliceAvailableCapacityList ::= SEQUENCE (SIZE(1.. maxnoofBPLMNsNR)) OF SliceAvailableCapacityItem

SliceAvailableCapacityItem ::= SEQUENCE {
```

```
    pLMNIdentity                      PLMN-Identity,
    sNSSAIAvailableCapacity-List      SNSSAIAvailableCapacity-List,
    iE-Extensions    ProtocolExtensionContainer { { SliceAvailableCapacityItem-ExtIEs} } OPTIONAL
}

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

SNSSAIAvailableCapacity-List ::= SEQUENCE (SIZE(1.. maxnoofSliceItems)) OF SNSSAIAvailableCapacity-Item

SNSSAIAvailableCapacity-Item ::= SEQUENCE {
    sNSSAI        SNSSAI,
    sliceAvailableCapacityValueDownlink INTEGER (0..100)   OPTIONAL,
    sliceAvailableCapacityValueUplink   INTEGER (0..100)   OPTIONAL,
    iE-Extensions                 ProtocolExtensionContainer { { SNSSAIAvailableCapacity-Item-ExtIEs } } OPTIONAL
}

SNSSAIAvailableCapacity-Item-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 ::= {
    ...
}

SliceToReportList ::= SEQUENCE (SIZE(1.. maxnoofBPLMNsNR)) OF SliceToReportItem

SliceToReportItem ::= SEQUENCE {
    pLMNIdentity                 PLMN-Identity,
    sNSSAIlist                   SNSSAI-list,
    iE-Extensions                ProtocolExtensionContainer { { SliceToReportItem-ExtIEs} } OPTIONAL
}

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

SNSSAI-list ::= SEQUENCE (SIZE(1.. maxnoofSliceItems)) OF SNSSAI-Item

SNSSAI-Item ::= SEQUENCE {
    sNSSAI        SNSSAI,
    iE-Extensions                ProtocolExtensionContainer { { SNSSAI-Item-ExtIEs } }   OPTIONAL
}

SNSSAI-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

Slot-Configuration-List ::= SEQUENCE (SIZE(1.. maxnoofslots)) OF Slot-Configuration-Item

Slot-Configuration-Item ::= SEQUENCE {
    slotIndex              INTEGER (0..319, ...),
    symbolAllocInSlot      SymbolAllocInSlot,
    iE-Extensions   ProtocolExtensionContainer { { Slot-Configuration-ItemExtIEs } }    OPTIONAL
}

Slot-Configuration-ItemExtIEs   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..maxCellineNB)

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 ::= {
    { ID id-AdditionalDuplicationIndication CRITICALITY ignore  EXTENSION AdditionalDuplicationIndication    PRESENCE optional },
    ...
}

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

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

SSB-freqInfo ::= INTEGER (0..maxNRARFCN)

SSB-subcarrierSpacing ::=  ENUMERATED {kHz15, kHz30, kHz120, kHz240, spare3, spare2, spare1, ...}

SSB-transmissionPeriodicity ::= ENUMERATED {sf10, sf20, sf40, sf80, sf160, sf320, sf640, ...}

SSB-transmissionTimingOffset ::= INTEGER (0..127, ...)

SSB-transmissionBitmap ::= CHOICE {
    shortBitmap        BIT STRING (SIZE (4)),
    mediumBitmap       BIT STRING (SIZE (8)),
    longBitmap         BIT STRING (SIZE (64)),
    choice-extension    ProtocolIE-SingleContainer { { SSB-transmisisonBitmap-ExtIEs} }
}

SSB-transmisisonBitmap-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

SSBAreaCapacityValueList ::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF    SSBAreaCapacityValueItem

SSBAreaCapacityValueItem ::= SEQUENCE {
    sSBIndex             INTEGER(0..63),
    sSBAreaCapacityValue    INTEGER (0..100),
    iE-Extensions   ProtocolExtensionContainer { { SSBAreaCapacityValueItem-ExtIEs} } OPTIONAL
}

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

SSBAreaRadioResourceStatusList::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF    SSBAreaRadioResourceStatusItem

SSBAreaRadioResourceStatusItem::= SEQUENCE {
```

```
    sSBIndex                     INTEGER(0..63),
    sSBAreaDLGBRPRBusage         INTEGER (0..100),
    sSBAreaULGBRPRBusage         INTEGER (0..100),
    sSBAreaDLnon-GBRPRBusage     INTEGER (0..100),
    sSBAreaULnon-GBRPRBusage     INTEGER (0..100),
    sSBAreaDLTotalPRBusage       INTEGER (0..100),
    sSBAreaULTotalPRBusage       INTEGER (0..100),
    dLschedulingPDCCHCCEusage    INTEGER (0..100)          OPTIONAL,
    uLschedulingPDCCHCCEusage    INTEGER (0..100)          OPTIONAL,
    iE-Extensions                ProtocolExtensionContainer { { SSBAreaRadioResourceStatusItem-ExtIEs} } OPTIONAL
}

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

SSB-PositionsInBurst ::= CHOICE {
    shortBitmap                  BIT STRING (SIZE (4)),
    mediumBitmap                 BIT STRING (SIZE (8)),
    longBitmap                   BIT STRING (SIZE (64)),
    choice-extension             ProtocolIE-SingleContainer { {SSB-PositionsInBurst-ExtIEs} }
}

SSB-PositionsInBurst-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

SSBToReportList ::= SEQUENCE (SIZE(1.. maxnoofSSBAreas)) OF SSBToReportItem

SSBToReportItem ::= SEQUENCE {
    sSBIndex                     INTEGER(0..63),
    iE-Extensions                ProtocolExtensionContainer { { SSBToReportItem-ExtIEs} } OPTIONAL
}

SSBToReportItem-ExtIEs   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 ::= {
    { ID id-CarrierList            CRITICALITY ignore  EXTENSION NRCarrierList          PRESENCE optional }|
    { ID id-FrequencyShift7p5khz   CRITICALITY ignore  EXTENSION FrequencyShift7p5khz   PRESENCE optional },
    ...
}

SubcarrierSpacing ::=   ENUMERATED { kHz15, kHz30, kHz60, kHz120, kHz240, spare3, spare2, spare1, ...}

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

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


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

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

SymbolAllocInSlot ::= CHOICE {
    all-DL             NULL,
    all-UL             NULL,
    both-DL-and-UL          NumDLULSymbols,
    choice-extension          ProtocolIE-SingleContainer { { SymbolAllocInSlot-ExtIEs } }
}

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

SystemInformationAreaID ::=BIT STRING (SIZE (24))

-- T

FiveGS-TAC ::= OCTET STRING (SIZE(3))

Configured-EPS-TAC ::= OCTET STRING (SIZE(2))

TargetCellList ::= SEQUENCE (SIZE(1..maxnoofCHOcells)) OF TargetCellList-Item

TargetCellList-Item ::= SEQUENCE {
    target-cell                      NRCGI,
    iE-Extensions                    ProtocolExtensionContainer { { TargetCellList-Item-ExtIEs} } OPTIONAL
}

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

TDD-Info ::= SEQUENCE {
    nRFreqInfo                   NRFreqInfo,
    transmission-Bandwidth        Transmission-Bandwidth,
    iE-Extensions                ProtocolExtensionContainer { {TDD-Info-ExtIEs} } OPTIONAL,
    ...
}

TDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    {ID id-IntendedTDD-DL-ULConfig  CRITICALITY ignore  EXTENSION   IntendedTDD-DL-ULConfig PRESENCE optional}|
    {ID id-TDD-UL-DLConfigCommonNR  CRITICALITY ignore  EXTENSION TDD-UL-DLConfigCommonNR   PRESENCE optional }|
```

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    {ID id-CarrierList                 CRITICALITY ignore  EXTENSION NRCarrierList           PRESENCE optional },
    ...
}

TDD-UL-DLConfigCommonNR ::= OCTET STRING

TimeReferenceInformation ::= SEQUENCE {
    referenceTime                ReferenceTime,
    referenceSFN                 ReferenceSFN,
    uncertainty                  Uncertainty,
    timeInformationType          TimeInformationType,
    iE-Extensions       ProtocolExtensionContainer { {TimeReferenceInformation-ExtIEs} }   OPTIONAL
}

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

TimeInformationType ::= ENUMERATED {localClock}

TimeToWait ::= ENUMERATED {v1s, v2s, v5s, v10s, v20s, v60s, ...}

TNLAssociationUsage ::= ENUMERATED {
    ue,
    non-ue,
    both,
    ...
}

TNLCapacityIndicator::= SEQUENCE {
    dLTNLOfferedCapacity        INTEGER (1.. 16777216,...),
    dLTNLAvailableCapacity      INTEGER (0.. 100,...),
    uLTNLOfferedCapacity        INTEGER (1.. 16777216,...),
    uLTNLAvailableCapacity      INTEGER (0.. 100,...),
    iE-Extensions   ProtocolExtensionContainer { { TNLCapacityIndicator-ExtIEs} } OPTIONAL
}

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

TraceActivation ::= SEQUENCE {
    traceID                       TraceID,
    interfacesToTrace             InterfacesToTrace,
    traceDepth                    TraceDepth,
    traceCollectionEntityIPAddress    TransportLayerAddress,
    iE-Extensions       ProtocolExtensionContainer { {TraceActivation-ExtIEs} } OPTIONAL
}

TraceActivation-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    {ID id-mdtConfiguration CRITICALITY ignore  EXTENSION   MDTConfiguration       PRESENCE optional}|
    {ID id-TraceCollectionEntityURI CRITICALITY ignore  EXTENSION URI-address      PRESENCE optional  },
    ...
}
```

```
TraceDepth ::= ENUMERATED {
    minimum,
    medium,
    maximum,
    minimumWithoutVendorSpecificExtension,
    mediumWithoutVendorSpecificExtension,
    maximumWithoutVendorSpecificExtension,
    ...
}

TraceID ::= OCTET STRING (SIZE(8))

TrafficMappingInfo  ::= CHOICE {
    iPtolayer2TrafficMappingInfo            IPtolayer2TrafficMappingInfo,
    bAPlayerBHRLCchannelMappingInfo         BAPlayerBHRLCchannelMappingInfo,
    choice-extension                        ProtocolIE-SingleContainer { { TrafficMappingInfo-ExtIEs} }
}

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

TransportLayerAddress        ::= BIT STRING (SIZE(1..160, ...))

TransactionID                ::= INTEGER (0..255, ...)

Transmission-Bandwidth ::= SEQUENCE {
    nRSCS    NRSCS,
    nRNRB    NRNRB,
    iE-Extensions              ProtocolExtensionContainer { { Transmission-Bandwidth-ExtIEs} } OPTIONAL,
    ...
}

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


Transport-UP-Layer-Address-Info-To-Add-List ::= SEQUENCE (SIZE(1.. maxnoofTLAs)) OF Transport-UP-Layer-Address-Info-To-Add-Item

Transport-UP-Layer-Address-Info-To-Add-Item ::= SEQUENCE {
    iP-SecTransportLayerAddress    TransportLayerAddress,
    gTPTransportLayerAddressToAdd           GTPTLAs                         OPTIONAL,
    iE-Extensions                  ProtocolExtensionContainer { { Transport-UP-Layer-Address-Info-To-Add-ItemExtIEs } } } OPTIONAL
}

Transport-UP-Layer-Address-Info-To-Add-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Transport-UP-Layer-Address-Info-To-Remove-List  ::= SEQUENCE (SIZE(1.. maxnoofTLAs)) OF Transport-UP-Layer-Address-Info-To-Remove-Item

Transport-UP-Layer-Address-Info-To-Remove-Item ::= SEQUENCE {
```

```
    iP-SecTransportLayerAddress        TransportLayerAddress,
    gTPTransportLayerAddressToRemove                 GTPTLAs                              OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { Transport-UP-Layer-Address-Info-To-Remove-ItemExtIEs } } OPTIONAL
}


Transport-UP-Layer-Address-Info-To-Remove-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


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

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


Transport-Layer-Address-Info ::= SEQUENCE {
    transport-UP-Layer-Address-Info-To-Add-List     Transport-UP-Layer-Address-Info-To-Add-List                 OPTIONAL,
    transport-UP-Layer-Address-Info-To-Remove-List  Transport-UP-Layer-Address-Info-To-Remove-List              OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { Transport-Layer-Address-Info-ExtIEs } }                       OPTIONAL
}


Transport-Layer-Address-Info-ExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


TSCAssistanceInformation ::= SEQUENCE {
    periodicity         Periodicity,
    burstArrivalTime      BurstArrivalTime                                           OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { {TSCAssistanceInformation-ExtIEs} }    OPTIONAL,
    ...
}


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


TSCTrafficCharacteristics ::= SEQUENCE {
    tSCAssistanceInformationDL     TSCAssistanceInformation                              OPTIONAL,
    tSCAssistanceInformationUL     TSCAssistanceInformation                              OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {TSCTrafficCharacteristics-ExtIEs} }   OPTIONAL,
    ...
}


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

-- U
UAC-Assistance-Info ::= SEQUENCE {
    uACPLMN-List        UACPLMN-List,
    iE-Extensions        ProtocolExtensionContainer { { UAC-Assistance-InfoExtIEs} } OPTIONAL
}
```

```
UAC-Assistance-InfoExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UACPLMN-List ::= SEQUENCE (SIZE(1..maxnoofUACPLMNs)) OF UACPLMN-Item

UACPLMN-Item::= SEQUENCE {
    pLMNIdentity                PLMN-Identity,
    uACType-List                UACType-List,   iE-Extensions      ProtocolExtensionContainer { { UACPLMN-Item-ExtIEs} } OPTIONAL
}

UACPLMN-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-NID CRITICALITY ignore  EXTENSION NID   PRESENCE optional },
    ...
}

UACType-List ::= SEQUENCE (SIZE(1..maxnoofUACperPLMN)) OF UACType-Item

UACType-Item::= SEQUENCE {
    uACReductionIndication      UACReductionIndication,
    uACCategoryType             UACCategoryType,
    iE-Extensions       ProtocolExtensionContainer { { UACType-Item-ExtIEs } } OPTIONAL
}

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

UACCategoryType ::= CHOICE {
    uACstandardized             UACAction,
    uACOperatorDefined          UACOperatorDefined,
    choice-extension            ProtocolIE-SingleContainer { { UACCategoryType-ExtIEs } }
}

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

UACOperatorDefined ::= SEQUENCE {
    accessCategory                  INTEGER (32..63,...),
    accessIdentity                  BIT STRING (SIZE(7)),
    iE-Extensions       ProtocolExtensionContainer { { UACOperatorDefined-ExtIEs} } OPTIONAL
}

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


UACAction ::= ENUMERATED {
    reject-non-emergency-mo-dt,
    reject-rrc-cr-signalling,
    permit-emergency-sessions-and-mobile-terminated-services-only,
```

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```
        permit-high-priority-sessions-and-mobile-terminated-services-only,
        ...
}

UACReductionIndication ::= INTEGER (0..100)


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

UEAssistanceInformationEUTRA ::= OCTET STRING

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

UE-CapabilityRAT-ContainerList::= OCTET STRING

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

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

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

UL-BH-Non-UP-Traffic-Mapping ::= SEQUENCE {
    uL-BH-Non-UP-Traffic-Mapping-List        UL-BH-Non-UP-Traffic-Mapping-List,
    iE-Extensions   ProtocolExtensionContainer { { UL-BH-Non-UP-Traffic-Mapping-ExtIEs } } OPTIONAL
}

UL-BH-Non-UP-Traffic-Mapping-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UL-BH-Non-UP-Traffic-Mapping-List ::= SEQUENCE (SIZE(1..maxnoofNonUPTrafficMappings)) OF UL-BH-Non-UP-Traffic-Mapping-Item

UL-BH-Non-UP-Traffic-Mapping-Item ::= SEQUENCE {
    nonUPTrafficType                NonUPTrafficType,
    bHInfo                      BHInfo,
    iE-Extensions                   ProtocolExtensionContainer { { UL-BH-Non-UP-Traffic-Mapping-ItemExtIEs } }   OPTIONAL
}

UL-BH-Non-UP-Traffic-Mapping-ItemExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

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```
}

ULConfiguration ::= SEQUENCE    {
    uLUEConfiguration        ULUEConfiguration,
    iE-Extensions   ProtocolExtensionContainer { { ULConfigurationExtIEs } }    OPTIONAL,
    ...
}
ULConfigurationExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ULUEConfiguration ::= ENUMERATED {no-data, shared, only, ...}

UL-UP-TNL-Information-to-Update-List-Item   ::= SEQUENCE {
    uLUPTNLInformation       UPTransportLayerInformation,
    newULUPTNLInformation    UPTransportLayerInformation     OPTIONAL,
    bHInfo  BHInfo,
    iE-Extensions   ProtocolExtensionContainer { { UL-UP-TNL-Information-to-Update-List-ItemExtIEs } } OPTIONAL,
    ...
}

UL-UP-TNL-Information-to-Update-List-ItemExtIEs     F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UL-UP-TNL-Address-to-Update-List-Item   ::= SEQUENCE {
    oldIPAdress                     TransportLayerAddress,
    newIPAdress                     TransportLayerAddress,
    iE-Extensions   ProtocolExtensionContainer { { UL-UP-TNL-Address-to-Update-List-ItemExtIEs } }  OPTIONAL,
    ...
}

UL-UP-TNL-Address-to-Update-List-ItemExtIEs     F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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 ::= {
    { ID id-BHInfo      CRITICALITY ignore  EXTENSION BHInfo        PRESENCE optional   },
    ...
}

Uncertainty ::= INTEGER (0..32767, ...)

UplinkTxDirectCurrentListInformation ::= OCTET STRING

UPTransportLayerInformation      ::= CHOICE {
```

```
    gTPTunnel        GTPTunnel,
    choice-extension            ProtocolIE-SingleContainer { { UPTransportLayerInformation-ExtIEs} }
}

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

URI-address ::= VisibleString

-- V

VictimgNBSetID ::= SEQUENCE {
    victimgNBSetID      GNBSetID,
    iE-Extensions   ProtocolExtensionContainer { { VictimgNBSetID-ExtIEs } }        OPTIONAL
}

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

VehicleUE ::= ENUMERATED {
    authorized,
    not-authorized,
    ...
}

PedestrianUE ::= ENUMERATED {
    authorized,
    not-authorized,
    ...
}

-- 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-DLRRCMessageTransfer                   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
id-F1Removal                              ProcedureCode ::= 26
id-NetworkAccessRateReduction             ProcedureCode ::= 27
id-TraceStart                             ProcedureCode ::= 28
id-DeactivateTrace                        ProcedureCode ::= 29
id-DUCURadioInformationTransfer           ProcedureCode ::= 30
id-CUDURadioInformationTransfer           ProcedureCode ::= 31
id-BAPMappingConfiguration                ProcedureCode ::= 32
id-GNBDUResourceConfiguration             ProcedureCode ::= 33
id-IABTNLAddressAllocation                ProcedureCode ::= 34
id-IABUPConfigurationUpdate               ProcedureCode ::= 35
id-resourceStatusReportingInitiation      ProcedureCode ::= 36
id-resourceStatusReporting                ProcedureCode ::= 37
id-accessAndMobilityIndication            ProcedureCode ::= 38
id-accessSuccess                          ProcedureCode ::= 39
id-cellTrafficTrace                       ProcedureCode ::= 40
```

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

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

maxNRARFCN                              INTEGER ::= 3279165
maxnoofErrors                           INTEGER ::= 256
maxnoofIndividualF1ConnectionsToReset   INTEGER ::= 65536
maxCellingNBDU                          INTEGER ::= 512
maxnoofSCells                           INTEGER ::= 32
maxnoofSRBs                             INTEGER ::= 8
maxnoofDRBs                             INTEGER ::= 64
maxnoofULUPTNLInformation               INTEGER ::= 2
maxnoofDLUPTNLInformation               INTEGER ::= 2
maxnoofBPLMNs                           INTEGER ::= 6
maxnoofCandidateSpCells                 INTEGER ::= 64
maxnoofPotentialSpCells                 INTEGER ::= 64
maxnoofNrCellBands                      INTEGER ::= 32
maxnoofSIBTypes                         INTEGER ::= 32
maxnoofSITypes                          INTEGER ::= 32
maxnoofPagingCells                      INTEGER ::= 512
maxnoofTNLAssociations                  INTEGER ::= 32
maxnoofQoSFlows                         INTEGER ::= 64
maxnoofSliceItems                       INTEGER ::= 1024
maxCellineNB                            INTEGER ::= 256
maxnoofExtendedBPLMNs                   INTEGER ::= 6
maxnoofUEIDs                            INTEGER ::= 65536
maxnoofBPLMNsNR                         INTEGER ::= 12
maxnoofUACPLMNs                         INTEGER ::= 12
maxnoofUACperPLMN                       INTEGER ::= 64
maxnoofAdditionalSIBs                   INTEGER ::= 63
maxnoofslots                            INTEGER ::= 320
maxnoofTLAs                             INTEGER ::= 16
maxnoofGTPTLAs                          INTEGER ::= 16
maxnoofBHRLCChannels                    INTEGER ::= 65536
maxnoofRoutingEntries                   INTEGER ::= 1024
maxnoofIABSTCInfo                       INTEGER ::= 45
maxnoofSymbols                          INTEGER ::= 14
maxnoofServingCells                     INTEGER ::= 32
maxnoofDUFSlots                         INTEGER ::= 320
maxnoofHSNASlots                        INTEGER ::= 5120
maxnoofServedCellsIAB                   INTEGER ::= 512
maxnoofChildIABNodes                    INTEGER ::= 1024
maxnoofNonUPTrafficMappings             INTEGER ::= 32
```

```
maxnoofTLAsIAB                             INTEGER ::= 1024
maxnoofMappingEntries                      INTEGER ::= 67108864
maxnoofDSInfo                              INTEGER ::= 64
maxnoofEgressLinks                         INTEGER ::= 2
maxnoofULUPTNLInformationforIAB            INTEGER ::= 32678
maxnoofUPTNLAddresses                      INTEGER ::= 8
maxnoofSLDRBs                              INTEGER ::= 512
maxnoofQoSParaSets                         INTEGER ::= 8
maxnoofPC5QoSFlows                         INTEGER ::= 2048
maxnoofSSBAreas                            INTEGER ::= 64
maxnoofPhysicalResourceBlocks              INTEGER ::= 275
maxnoofPhysicalResourceBlocks-1            INTEGER ::= 274
maxnoofPRACHconfigs                        INTEGER ::= 16
maxnoofRACHReports                         INTEGER ::= 64
maxnoofRLFReports                          INTEGER ::= 64
maxnoofAdditionalPDCPDuplicationTNL        INTEGER ::= 2
maxnoofRLCDuplicationState                 INTEGER ::= 3
maxnoofCHOcells                            INTEGER ::= 16
maxnoofMDTPLMNs                            INTEGER ::= 16
maxnoofCAGsupported                        INTEGER ::= 12
maxnoofNIDsupported                        INTEGER ::= 12
maxnoofNRSCSs                              INTEGER ::= 5
maxnoofExtSliceItems                       INTEGER ::= 65535


-- ************************************************************
--
-- IEs
--
-- ************************************************************


id-Cause                                        ProtocolIE-ID ::= 0
id-Cells-Failed-to-be-Activated-List            ProtocolIE-ID ::= 1
id-Cells-Failed-to-be-Activated-List-Item       ProtocolIE-ID ::= 2
id-Cells-to-be-Activated-List                   ProtocolIE-ID ::= 3
id-Cells-to-be-Activated-List-Item              ProtocolIE-ID ::= 4
id-Cells-to-be-Deactivated-List                 ProtocolIE-ID ::= 5
id-Cells-to-be-Deactivated-List-Item            ProtocolIE-ID ::= 6
id-CriticalityDiagnostics                       ProtocolIE-ID ::= 7
id-CUtoDURRCInformation                         ProtocolIE-ID ::= 9
id-DRBs-FailedToBeModified-Item                 ProtocolIE-ID ::= 12
id-DRBs-FailedToBeModified-List                 ProtocolIE-ID ::= 13
id-DRBs-FailedToBeSetup-Item                    ProtocolIE-ID ::= 14
id-DRBs-FailedToBeSetup-List                    ProtocolIE-ID ::= 15
id-DRBs-FailedToBeSetupMod-Item                 ProtocolIE-ID ::= 16
id-DRBs-FailedToBeSetupMod-List                 ProtocolIE-ID ::= 17
id-DRBs-ModifiedConf-Item                       ProtocolIE-ID ::= 18
id-DRBs-ModifiedConf-List                       ProtocolIE-ID ::= 19
id-DRBs-Modified-Item                           ProtocolIE-ID ::= 20
id-DRBs-Modified-List                           ProtocolIE-ID ::= 21
id-DRBs-Required-ToBeModified-Item              ProtocolIE-ID ::= 22
id-DRBs-Required-ToBeModified-List              ProtocolIE-ID ::= 23
id-DRBs-Required-ToBeReleased-Item              ProtocolIE-ID ::= 24
id-DRBs-Required-ToBeReleased-List              ProtocolIE-ID ::= 25
id-DRBs-Setup-Item                              ProtocolIE-ID ::= 26
```

```
id-DRBs-Setup-List                           ProtocolIE-ID ::= 27
id-DRBs-SetupMod-Item                        ProtocolIE-ID ::= 28
id-DRBs-SetupMod-List                        ProtocolIE-ID ::= 29
id-DRBs-ToBeModified-Item                    ProtocolIE-ID ::= 30
id-DRBs-ToBeModified-List                    ProtocolIE-ID ::= 31
id-DRBs-ToBeReleased-Item                    ProtocolIE-ID ::= 32
id-DRBs-ToBeReleased-List                    ProtocolIE-ID ::= 33
id-DRBs-ToBeSetup-Item                       ProtocolIE-ID ::= 34
id-DRBs-ToBeSetup-List                       ProtocolIE-ID ::= 35
id-DRBs-ToBeSetupMod-Item                    ProtocolIE-ID ::= 36
id-DRBs-ToBeSetupMod-List                    ProtocolIE-ID ::= 37
id-DRXCycle                                  ProtocolIE-ID ::= 38
id-DUtoCURRCInformation                      ProtocolIE-ID ::= 39
id-gNB-CU-UE-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-NotficationControl                           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-DLPDCPSNLength                               ProtocolIE-ID ::= 161
id-GNB-DUConfigurationQuery                     ProtocolIE-ID ::= 162
id-MeasurementTimingConfiguration               ProtocolIE-ID ::= 163
id-DRB-Information                              ProtocolIE-ID ::= 164
id-ServingPLMN                                  ProtocolIE-ID ::= 165
id-Protected-EUTRA-Resources-Item               ProtocolIE-ID ::= 168
id-GNB-CU-RRC-Version                           ProtocolIE-ID ::= 170
id-GNB-DU-RRC-Version                           ProtocolIE-ID ::= 171
id-GNBDUOverloadInformation                     ProtocolIE-ID ::= 172
id-CellGroupConfig                              ProtocolIE-ID ::= 173
id-RLCFailureIndication                         ProtocolIE-ID ::= 174
id-UplinkTxDirectCurrentListInformation         ProtocolIE-ID ::= 175
id-DC-Based-Duplication-Configured              ProtocolIE-ID ::= 176
id-DC-Based-Duplication-Activation              ProtocolIE-ID ::= 177
id-SULAccessIndication                          ProtocolIE-ID ::= 178
id-AvailablePLMNList                            ProtocolIE-ID ::= 179
id-PDUSessionID                                 ProtocolIE-ID ::= 180
id-ULPDUSessionAggregateMaximumBitRate          ProtocolIE-ID ::= 181
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
id-new-gNB-CU-UE-F1AP-ID                          ProtocolIE-ID ::= 217
id-RedirectedRRCmessage                           ProtocolIE-ID ::= 218
id-new-gNB-DU-UE-F1AP-ID                          ProtocolIE-ID ::= 219
id-NotificationInformation                        ProtocolIE-ID ::= 220
id-PLMNAssistanceInfoForNetShar                   ProtocolIE-ID ::= 221
id-UEContextNotRetrievable                        ProtocolIE-ID ::= 222
id-BPLMN-ID-Info-List                             ProtocolIE-ID ::= 223
id-SelectedPLMNID                                 ProtocolIE-ID ::= 224
id-UAC-Assistance-Info                            ProtocolIE-ID ::= 225
id-RANUEID                                        ProtocolIE-ID ::= 226
id-GNB-DU-TNL-Association-To-Remove-Item          ProtocolIE-ID ::= 227
id-GNB-DU-TNL-Association-To-Remove-List          ProtocolIE-ID ::= 228
id-TNLAssociationTransportLayerAddressgNBDU       ProtocolIE-ID ::= 229
id-portNumber                                     ProtocolIE-ID ::= 230
id-AdditionalSIBMessageList                       ProtocolIE-ID ::= 231
id-Cell-Type                                      ProtocolIE-ID ::= 232
id-IgnorePRACHConfiguration                       ProtocolIE-ID ::= 233
id-CG-Config                                      ProtocolIE-ID ::= 234
id-PDCCH-BlindDetectionSCG                        ProtocolIE-ID ::= 235
id-Requested-PDCCH-BlindDetectionSCG              ProtocolIE-ID ::= 236
id-Ph-InfoMCG                                     ProtocolIE-ID ::= 237
id-MeasGapSharingConfig                           ProtocolIE-ID ::= 238
id-systemInformationAreaID                        ProtocolIE-ID ::= 239
id-areaScope                                      ProtocolIE-ID ::= 240
id-RRCContainer-RRCSetupComplete                  ProtocolIE-ID ::= 241
id-TraceActivation                                ProtocolIE-ID ::= 242
id-TraceID                                        ProtocolIE-ID ::= 243
id-Neighbour-Cell-Information-List                ProtocolIE-ID ::= 244
id-SymbolAllocInSlot                              ProtocolIE-ID ::= 246
id-NumDLULSymbols                                 ProtocolIE-ID ::= 247
id-AdditionalRRMPriorityIndex                     ProtocolIE-ID ::= 248
id-DUCURadioInformationType                       ProtocolIE-ID ::= 249
id-CUDURadioInformationType                       ProtocolIE-ID ::= 250
```

```
id-AggressorgNBSetID                             ProtocolIE-ID ::= 251
id-VictimgNBSetID                                ProtocolIE-ID ::= 252
id-LowerLayerPresenceStatusChange                ProtocolIE-ID ::= 253
id-Transport-Layer-Address-Info                  ProtocolIE-ID ::= 254
id-Neighbour-Cell-Information-Item                ProtocolIE-ID ::= 255
id-IntendedTDD-DL-ULConfig                       ProtocolIE-ID ::= 256
id-QosMonitoringRequest                          ProtocolIE-ID ::= 257
id-BHChannels-ToBeSetup-List                     ProtocolIE-ID ::= 258
id-BHChannels-ToBeSetup-Item                     ProtocolIE-ID ::= 259
id-BHChannels-Setup-List                         ProtocolIE-ID ::= 260
id-BHChannels-Setup-Item                         ProtocolIE-ID ::= 261
id-BHChannels-ToBeModified-Item                  ProtocolIE-ID ::= 262
id-BHChannels-ToBeModified-List                  ProtocolIE-ID ::= 263
id-BHChannels-ToBeReleased-Item                  ProtocolIE-ID ::= 264
id-BHChannels-ToBeReleased-List                  ProtocolIE-ID ::= 265
id-BHChannels-ToBeSetupMod-Item                  ProtocolIE-ID ::= 266
id-BHChannels-ToBeSetupMod-List                  ProtocolIE-ID ::= 267
id-BHChannels-FailedToBeModified-Item            ProtocolIE-ID ::= 268
id-BHChannels-FailedToBeModified-List            ProtocolIE-ID ::= 269
id-BHChannels-FailedToBeSetupMod-Item            ProtocolIE-ID ::= 270
id-BHChannels-FailedToBeSetupMod-List            ProtocolIE-ID ::= 271
id-BHChannels-Modified-Item                      ProtocolIE-ID ::= 272
id-BHChannels-Modified-List                      ProtocolIE-ID ::= 273
id-BHChannels-SetupMod-Item                      ProtocolIE-ID ::= 274
id-BHChannels-SetupMod-List                      ProtocolIE-ID ::= 275
id-BHChannels-Required-ToBeReleased-Item         ProtocolIE-ID ::= 276
id-BHChannels-Required-ToBeReleased-List         ProtocolIE-ID ::= 277
id-BHChannels-FailedToBeSetup-Item               ProtocolIE-ID ::= 278
id-BHChannels-FailedToBeSetup-List               ProtocolIE-ID ::= 279
id-BHInfo                                         ProtocolIE-ID ::= 280
id-BAPAddress                                     ProtocolIE-ID ::= 281
id-ConfiguredBAPAddress                          ProtocolIE-ID ::= 282
id-BH-Routing-Information-Added-List             ProtocolIE-ID ::= 283
id-BH-Routing-Information-Added-List-Item        ProtocolIE-ID ::= 284
id-BH-Routing-Information-Removed-List           ProtocolIE-ID ::= 285
id-BH-Routing-Information-Removed-List-Item      ProtocolIE-ID ::= 286
id-UL-BH-Non-UP-Traffic-Mapping                  ProtocolIE-ID ::= 287
id-Activated-Cells-to-be-Updated-List            ProtocolIE-ID ::= 288
id-Child-Nodes-List                              ProtocolIE-ID ::= 289
id-IAB-Info-IAB-DU                               ProtocolIE-ID ::= 290
id-IAB-Info-IAB-donor-CU                         ProtocolIE-ID ::= 291
id-IAB-TNL-Addresses-To-Remove-List              ProtocolIE-ID ::= 292
id-IAB-TNL-Addresses-To-Remove-Item              ProtocolIE-ID ::= 293
id-IAB-Allocated-TNL-Address-List                ProtocolIE-ID ::= 294
id-IAB-Allocated-TNL-Address-Item                ProtocolIE-ID ::= 295
id-IABIPv6RequestType                            ProtocolIE-ID ::= 296
id-IABv4AddressesRequested                       ProtocolIE-ID ::= 297
id-IAB-Barred                                    ProtocolIE-ID ::= 298
id-TrafficMappingInformation                     ProtocolIE-ID ::= 299
id-UL-UP-TNL-Information-to-Update-List          ProtocolIE-ID ::= 300
id-UL-UP-TNL-Information-to-Update-List-Item     ProtocolIE-ID ::= 301
id-UL-UP-TNL-Address-to-Update-List              ProtocolIE-ID ::= 302
id-UL-UP-TNL-Address-to-Update-List-Item         ProtocolIE-ID ::= 303
id-DL-UP-TNL-Address-to-Update-List              ProtocolIE-ID ::= 304
```

```
id-DL-UP-TNL-Address-to-Update-List-Item             ProtocolIE-ID ::= 305
id-NRV2XServicesAuthorized                           ProtocolIE-ID ::= 306
id-LTEV2XServicesAuthorized                          ProtocolIE-ID ::= 307
id-NRUESidelinkAggregateMaximumBitrate               ProtocolIE-ID ::= 308
id-LTEUESidelinkAggregateMaximumBitrate              ProtocolIE-ID ::= 309
id-SIB12-message                                     ProtocolIE-ID ::= 310
id-SIB13-message                                     ProtocolIE-ID ::= 311
id-SIB14-message                                     ProtocolIE-ID ::= 312
id-SLDRBs-FailedToBeModified-Item                    ProtocolIE-ID ::= 313
id-SLDRBs-FailedToBeModified-List                    ProtocolIE-ID ::= 314
id-SLDRBs-FailedToBeSetup-Item                       ProtocolIE-ID ::= 315
id-SLDRBs-FailedToBeSetup-List                       ProtocolIE-ID ::= 316
id-SLDRBs-Modified-Item                              ProtocolIE-ID ::= 317
id-SLDRBs-Modified-List                              ProtocolIE-ID ::= 318
id-SLDRBs-Required-ToBeModified-Item                 ProtocolIE-ID ::= 319
id-SLDRBs-Required-ToBeModified-List                 ProtocolIE-ID ::= 320
id-SLDRBs-Required-ToBeReleased-Item                 ProtocolIE-ID ::= 321
id-SLDRBs-Required-ToBeReleased-List                 ProtocolIE-ID ::= 322
id-SLDRBs-Setup-Item                                 ProtocolIE-ID ::= 323
id-SLDRBs-Setup-List                                 ProtocolIE-ID ::= 324
id-SLDRBs-ToBeModified-Item                          ProtocolIE-ID ::= 325
id-SLDRBs-ToBeModified-List                          ProtocolIE-ID ::= 326
id-SLDRBs-ToBeReleased-Item                          ProtocolIE-ID ::= 327
id-SLDRBs-ToBeReleased-List                          ProtocolIE-ID ::= 328
id-SLDRBs-ToBeSetup-Item                             ProtocolIE-ID ::= 329
id-SLDRBs-ToBeSetup-List                             ProtocolIE-ID ::= 330
id-SLDRBs-ToBeSetupMod-Item                          ProtocolIE-ID ::= 331
id-SLDRBs-ToBeSetupMod-List                          ProtocolIE-ID ::= 332
id-SLDRBs-SetupMod-List                              ProtocolIE-ID ::= 333
id-SLDRBs-FailedToBeSetupMod-List                    ProtocolIE-ID ::= 334
id-SLDRBs-SetupMod-Item                              ProtocolIE-ID ::= 335
id-SLDRBs-FailedToBeSetupMod-Item                    ProtocolIE-ID ::= 336
id-SLDRBs-ModifiedConf-List                          ProtocolIE-ID ::= 337
id-SLDRBs-ModifiedConf-Item                          ProtocolIE-ID ::= 338
id-UEAssistanceInformationEUTRA                      ProtocolIE-ID ::= 339
id-PC5LinkAMBR                                       ProtocolIE-ID ::= 340
id-SL-PHY-MAC-RLC-Config                             ProtocolIE-ID ::= 341
id-SL-ConfigDedicatedEUTRA                           ProtocolIE-ID ::= 342
id-AlternativeQoSParaSetList                         ProtocolIE-ID ::= 343
id-CurrentQoSParaSetIndex                            ProtocolIE-ID ::= 344
id-gNBCUMeasurementID                                ProtocolIE-ID ::= 345
id-gNBDUMeasurementID                                ProtocolIE-ID ::= 346
id-RegistrationRequest                               ProtocolIE-ID ::= 347
id-ReportCharacteristics                             ProtocolIE-ID ::= 348
id-CellToReportList                                  ProtocolIE-ID ::= 349
id-CellMeasurementResultList                         ProtocolIE-ID ::= 350
id-HardwareLoadIndicator                             ProtocolIE-ID ::= 351
id-ReportingPeriodicity                              ProtocolIE-ID ::= 352
id-TNLCapacityIndicator                              ProtocolIE-ID ::= 353
id-CarrierList                                       ProtocolIE-ID ::= 354
id-ULCarrierList                                     ProtocolIE-ID ::= 355
id-FrequencyShift7p5khz                              ProtocolIE-ID ::= 356
id-SSB-PositionsInBurst                              ProtocolIE-ID ::= 357
id-NRPRACHConfig                                     ProtocolIE-ID ::= 358
```

```
id-RACHReportInformationList                        ProtocolIE-ID ::= 359
id-RLFReportInformationList                         ProtocolIE-ID ::= 360
id-TDD-UL-DLConfigCommonNR                          ProtocolIE-ID ::= 361
id-CNPacketDelayBudgetDownlink                      ProtocolIE-ID ::= 362
id-ExtendedPacketDelayBudget                        ProtocolIE-ID ::= 363
id-TSCTrafficCharacteristics                        ProtocolIE-ID ::= 364
id-ReportingRequestType                             ProtocolIE-ID ::= 365
id-TimeReferenceInformation                         ProtocolIE-ID ::= 366
id-ReferenceTimeInformationReport                   ProtocolIE-ID ::= 367
id-ReferenceTimeInformationReportingControl         ProtocolIE-ID ::= 368
id-CNPacketDelayBudgetUplink                        ProtocolIE-ID ::= 369
id-AdditionalPDCPDuplicationTNL-List                ProtocolIE-ID ::= 370
id-RLCDuplicationInformation                        ProtocolIE-ID ::= 371
id-AdditionalDuplicationIndication                  ProtocolIE-ID ::= 372
id-ConditionalInterDUMobilityInformation            ProtocolIE-ID ::= 373
id-ConditionalIntraDUMobilityInformation            ProtocolIE-ID ::= 374
id-targetCellsToCancel                              ProtocolIE-ID ::= 375
id-requestedTargetCellGlobalID                      ProtocolIE-ID ::= 376
id-ManagementBasedMDTPLMNList                       ProtocolIE-ID ::= 377
id-TraceCollectionEntityIPAddress                   ProtocolIE-ID ::= 378
id-PrivacyIndicator                                 ProtocolIE-ID ::= 379
id-TraceCollectionEntityURI                         ProtocolIE-ID ::= 380
id-mdtConfiguration                                 ProtocolIE-ID ::= 381
id-ServingNID                                       ProtocolIE-ID ::= 382
id-NPNBroadcastInformation                          ProtocolIE-ID ::= 383
id-NPNSupportInfo                                   ProtocolIE-ID ::= 384
id-NID                                              ProtocolIE-ID ::= 385
id-AvailableSNPN-ID-List                            ProtocolIE-ID ::= 386
id-SIB10-message                                    ProtocolIE-ID ::= 387
id-DLCarrierList                                    ProtocolIE-ID ::= 389
    id-ExtendedTAISliceSupportList                  ProtocolIE-ID ::= 390

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
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History

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