3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NG-RAN; F1 application protocol (F1AP) (Release 16)

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Technical Specification

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Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

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y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

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)".

[36] 3GPP TS 23.032:"Technical Specification Group Services and System Aspects; Universal Geographical Area Description (GAD)".

[37] 3GPP TS 38.455: "NG-RAN; NR Positioning protocol A (NRPPa)".

[38] 3GPP TS 38.133: "NR; Requirements for support of radio resource management".

[39] 3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[40] 3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[41] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

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
ARP	Antenna Reference Point
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
DL-PRS	Downlink Positioning Reference Signal
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
LMF	Location Management Function
NID	Network Identifier
NPN	Non-Public Network
NSSAI	Network Slice Selection Assistance Information
posSIB	Positioning SIB
PNI-NPN	Public Network Integrated NPN
RANAC	RAN Area Code
RIM	Remote Interference Management
RIM-RS	RIM Reference Signal
RRC	Radio Resource Control
RSRP	Reference Signal Received Power
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
TRP	Transmission-Reception Point
UL-AoA	Uplink Angle of Arrival
UL-RTOA	Uplink Relative Time of Arrival
UL-SRS	Uplink Sounding Reference Signal
Z-AoA	Zenith Angles of Arrival

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	Unsuccessful Outcome
		Response message	Response message
Reset	RESET	RESET ACKNOWLEDGE	
F1 Setup	F1 SETUP REQUEST	F1 SETUP RESPONSE	F1 SETUP FAILURE
gNB-DU Configuration Update	GNB-DU CONFIGURATION UPDATE	GNB-DU CONFIGURATION UPDATE ACKNOWLEDGE	GNB-DU CONFIGURATION UPDATE FAILURE
gNB-CU Configuration Update	GNB-CU CONFIGURATION UPDATE	GNB-CU CONFIGURATION UPDATE ACKNOWLEDGE	GNB-CU CONFIGURATION UPDATE FAILURE
UE Context Setup	UE CONTEXT SETUP REQUEST	UE CONTEXT SETUP RESPONSE	UE CONTEXT SETUP FAILURE
UE Context Release (gNB-CU initiated)	UE CONTEXT RELEASE COMMAND	UE CONTEXT RELEASE COMPLETE	
UE Context Modification (gNB-CU initiated)	UE CONTEXT MODIFICATION REQUEST	UE CONTEXT MODIFICATION RESPONSE	UE CONTEXT MODIFICATION FAILURE
UE Context Modification Required (gNB-DU initiated)	UE CONTEXT MODIFICATION REQUIRED	UE CONTEXT MODIFICATION CONFIRM	UE CONTEXT MODIFICATION REFUSE
Write-Replace Warning	WRITE-REPLACE WARNING REQUEST	WRITE-REPLACE WARNING RESPONSE	
PWS Cancel	PWS CANCEL REQUEST	PWS CANCEL RESPONSE	
gNB-DU Resource Coordination	GNB-DU RESOURCE COORDINATION REQUEST	GNB-DU RESOURCE COORDINATION RESPONSE	
F1 Removal	F1 REMOVAL REQUEST	F1 REMOVAL RESPONSE	F1 REMOVAL FAILURE
BAP Mapping Configuration	BAP MAPPING CONFIGURATION	BAP MAPPING CONFIGURATION ACKNOWLEDGE	BAP MAPPING CONFIGURATION FAILURE
GNB-DU Resource Configuration	GNB-DU RESOURCE CONFIGURATION	GNB-DU RESOURCE CONFIGURATION ACKNOWLEDGE	GNB-DU RESOURCE CONFIGURATION FAILURE
IAB TNL Address Allocation	IAB TNL ADDRESS REQUEST	IAB TNL ADDRESS RESPONSE	IAB TNL ADDRESS FAILURE
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
Positioning Measurement	POSITIONING MEASUREMENT REQUEST	POSITIONING MEASUREMENT RESPONSE	POSITIONING MEASUREMENT FAILURE
Positioning Information Exchange	POSITIONING INFORMATION REQUEST	POSITIONING INFORMATION RESPONSE	POSITIONING INFORMATION FAILURE
TRP Information Exchange	TRP INFORMATION REQUEST	TRP INFORMATION RESPONSE	TRP INFORMATION FAILURE
Positioning Activation	POSITIONING ACTIVATION REQUEST	POSITIONING ACTIVATION RESPONSE	POSITIONING ACTIVATION FAILURE
E-CID Measurement Initiation	E-CID MEASUREMENT INITIATION REQUEST	E-CID MEASUREMENT INITIATION RESPONSE	E-CID MEASUREMENT INITIATION 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
Positioning Assistance Information Control	POSITIONING ASSISTANCE INFORMATION CONTROL
Positioning Assistance Information Feedback	POSITIONING ASSISTANCE INFORMATION FEEDBACK
Positioning Measurement Report	POSITIONING MEASUREMENT REPORT
Positioning Measurement Abort	POSITIONING MEASUREMENT ABORT
Positioning Measurement Failure Indication	POSITIONING MEASUREMENT FAILURE INDICATION
Positioning Measurement Update	POSITIONING MEASUREMENT UPDATE
Positioning Deactivation	POSITIONING DEACTIVATION
E-CID Measurement Failure Indication	E-CID MEASUREMENT FAILURE INDICATION
E-CID Measurement Report	E-CID MEASUREMENT REPORT
E-CID Measurement Termination	E-CID MEASUREMENT TERMINATION COMMAND
Positioning Information Update	POSITIONING INFORMATION UPDATE

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

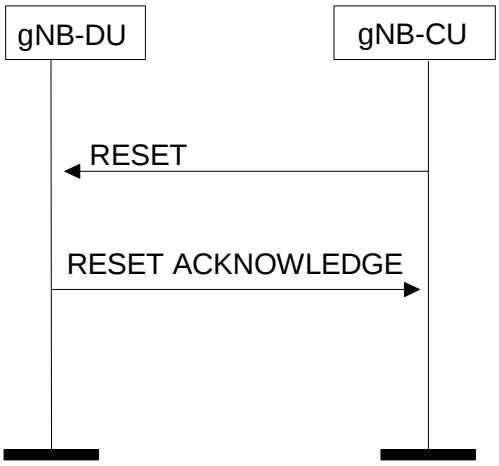

Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU. Successful operation

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

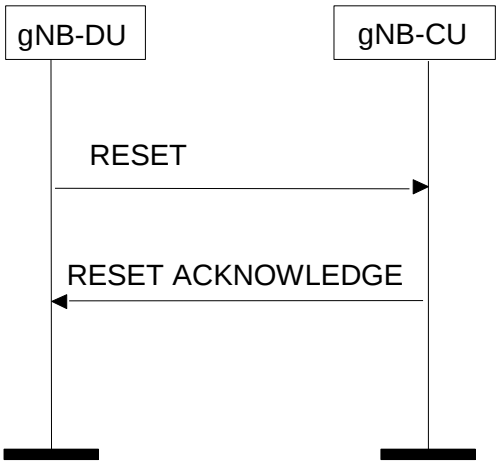

Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-DU. Successful operation

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

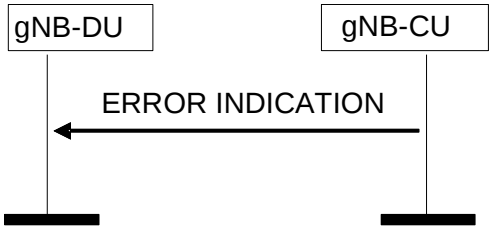

Figure 8.2.2.2-1: Error Indication procedure, gNB-CU originated. Successful operation

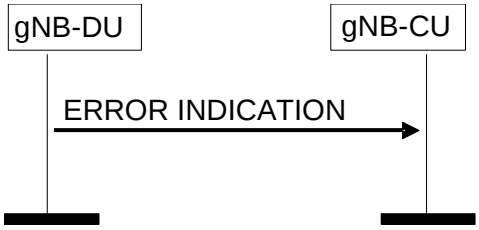

Figure 8.2.2.2-2: Error Indication procedure, gNB-DU originated. Successful operation

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.

NOTE: Exchange of application level configuration data also applies between the gNB-DU and the gNB-CU in case the DU does not broadcast system information other than for radio frame timing and SFN, as specified in the TS 37.340 [8]. How to use this information when this option is used is not explicitly specified.

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

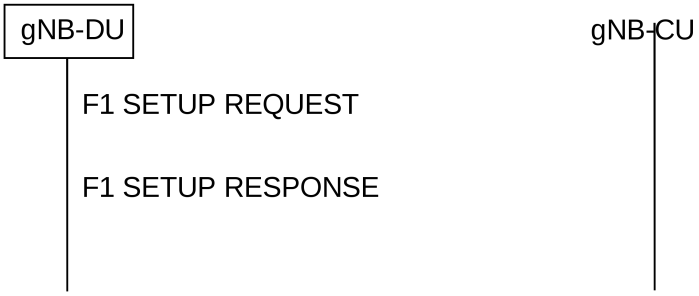

Figure 8.2.3.2-1: F1 Setup procedure: Successful Operation

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 *Extended gNB-DU Name* IE, the gNB-CU may use this IE as a human readable name of the gNB-DU and shall ignore the *gNB-DU Name* IE if included.

If the F1 SETUP RESPONSE message contains the *gNB-CU Name* IE, the gNB-DU may use this IE as a human readable name of the gNB-CU. If the F1 SETUP RESPONSE message contains the *Extended gNB-CU Name* IE, the gNB-DU may use this IE as a human readable name of the gNB-CU and shall ignore the *gNB-CU Name* IE if included.

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.

NOTE: How to identify the IAB-donor-DU is up to gNB-CU implementation.

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

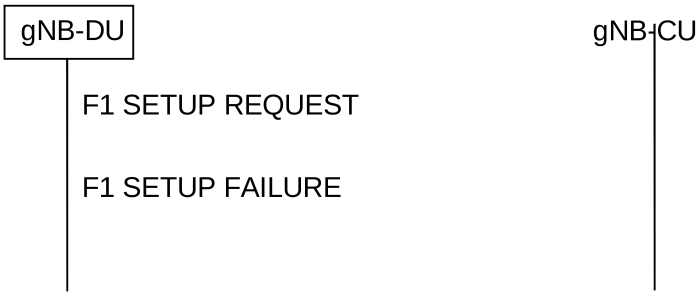

Figure 8.2.3.3-1: F1 Setup procedure: Unsuccessful Operation

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.

NOTE: Update of application level configuration data also applies between the gNB-DU and the gNB-CU in case the DU does not broadcast system information other than for radio frame timing and SFN, as specified in the TS 37.340 [8]. How to use this information when this option is used is not explicitly specified.

8.2.4.2 Successful Operation

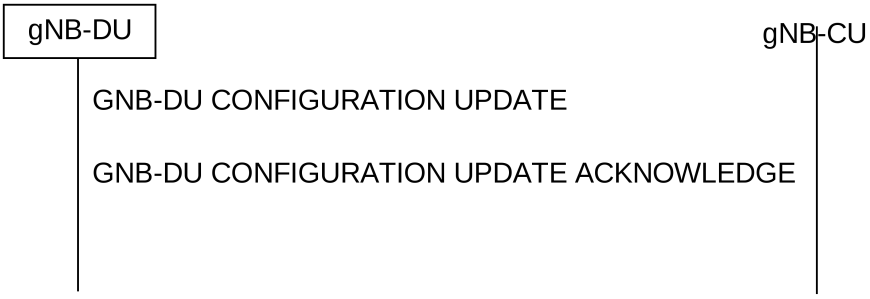

Figure 8.2.4.2-1: gNB-DU Configuration Update procedure: Successful Operation

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 Informati*on 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

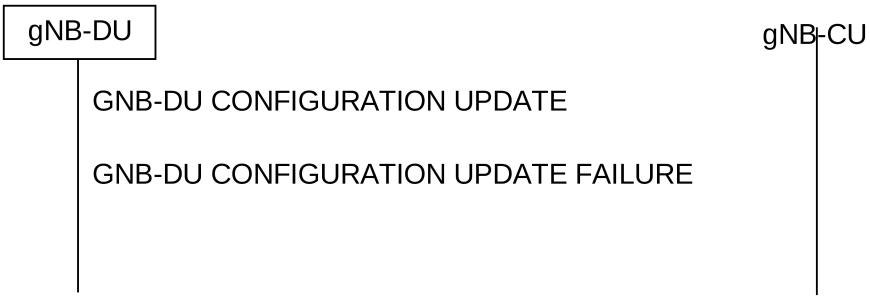

Figure 8.2.4.3-1: gNB-DU Configuration Update procedure: Unsuccessful Operation

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

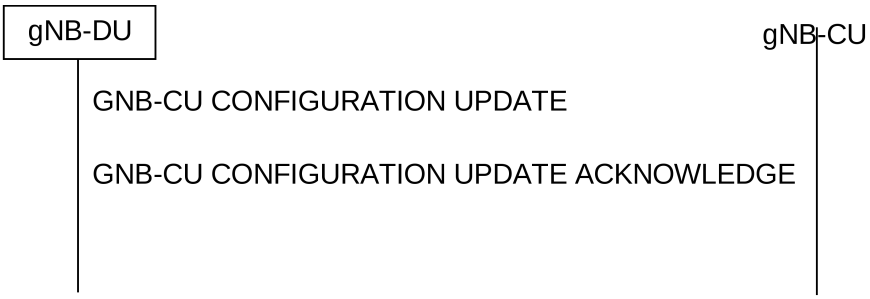

Figure 8.2.5.2-1: gNB-CU Configuration Update procedure: Successful Operation

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

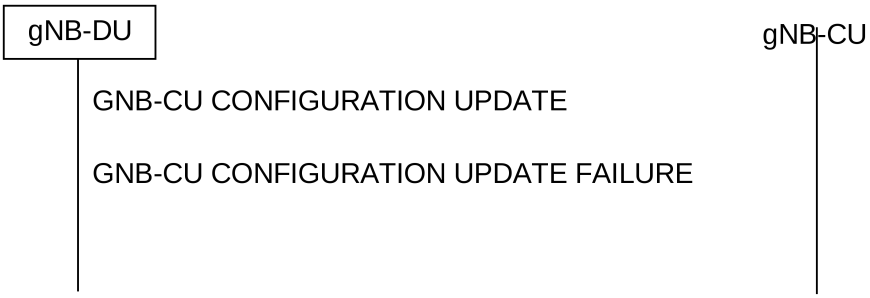

Figure 8.2.5.3-1: gNB-CU Configuration Update: Unsuccessful Operation

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

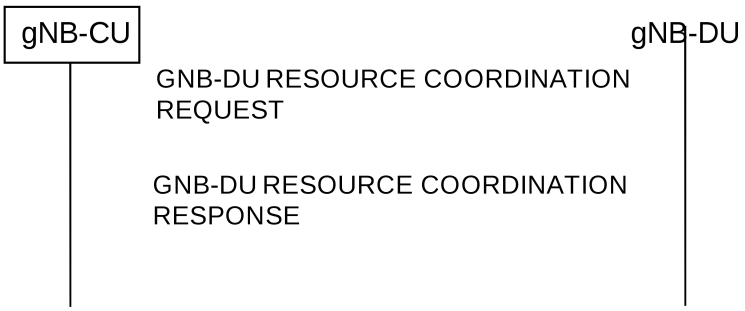

Figure 8.2.6.2-1: gNB-DU Resource Coordination, successful operation

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

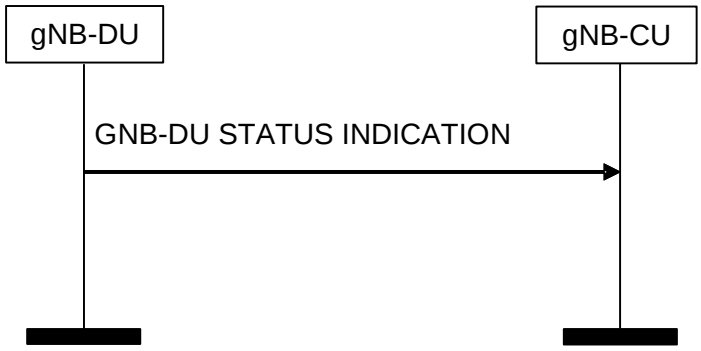

Figure 8.2.7.2-1: gNB-DU Status Indication procedure

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

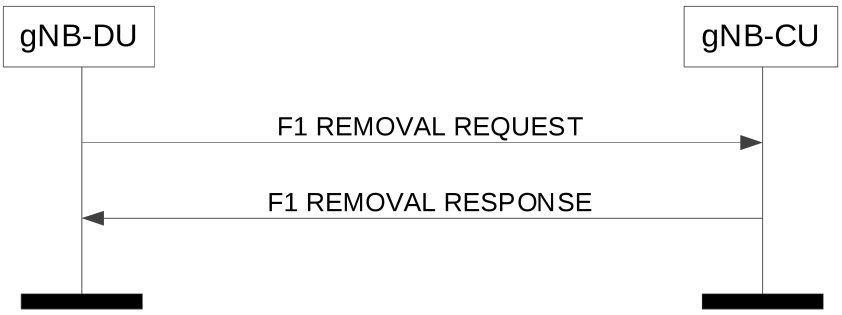

Figure 8.2.8-1: F1 Removal, gNB-DU initiated, successful operation

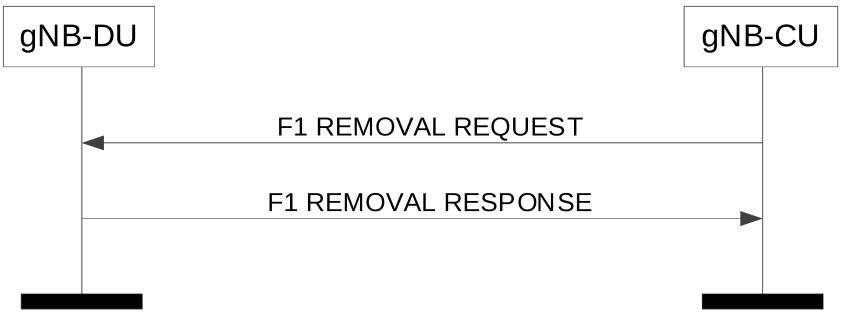

Figure 8.2.8.2-2: F1 Removal, gNB-CU initiated, successful operation

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

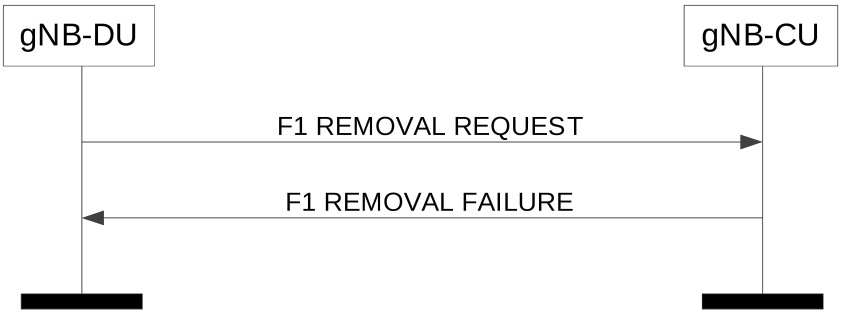

Figure 8.2.8.3-1: F1 Removal, gNB-DU initiated, unsuccessful operation

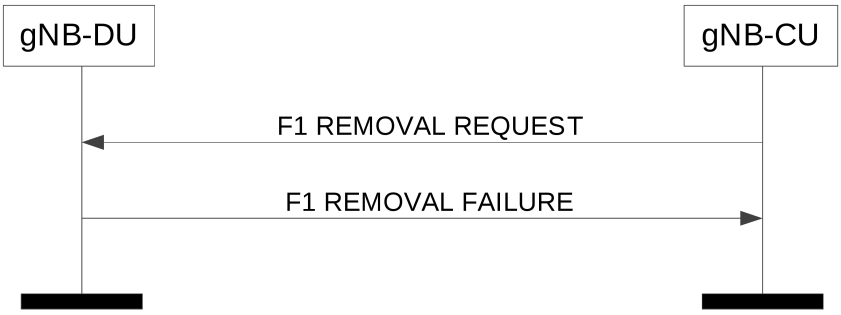

Figure 8.2.8.3-2: F1 Removal, gNB-CU initiated, unsuccessful operation

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

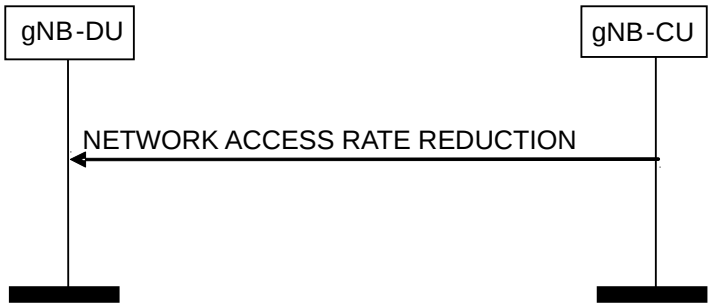

Figure 8.2.9.2-1: Network Access Rate Reduction, Successful operation

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

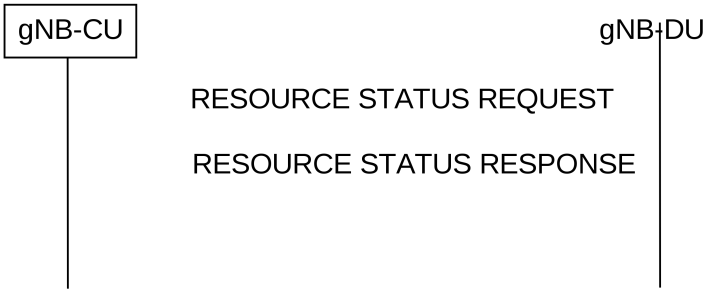

Figure 8.2.10.2-1: Resource Status Reporting Initiation, successful operation

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. The gNB-DU shall report once, unless otherwise requested within the *Reporting Periodicity* IE.

8.2.10.3 Unsuccessful Operation

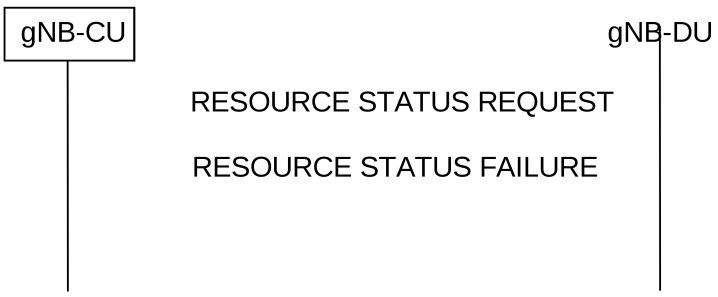

Figure 8.2.10.3-1: Resource Status Reporting Initiation, unsuccessful operation

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

8.2.10.4 Abnormal Conditions

If the initiating gNB-CU does not receive either RESOURCE STATUS RESPONSE message or RESOURCE STATUS FAILURE message, the gNB-CU may reinitiate the Resource Status Reporting Initiation procedure towards the same gNB-DU, provided that the content of the new RESOURCE STATUS REQUEST message is identical to the content of the previously unacknowledged RESOURCE STATUS REQUEST message with the same Transaction ID.

If the *Report Characteristics* IE bitmap is set to "0" (all bits are set to "0") in the RESOURCE STATUS REQUEST message then gNB-DU shall initiate a RESOURCE STATUS FAILURE message with an appropriate cause value.

If the gNB-DU receives a RESOURCE STATUS REQUEST message which includes the *Registration Request* IE set to "start" and the *gNB-CU Measurement ID* IE corresponding to an existing on-going load measurement reporting, for which a different Transaction ID is used, then gNB-DU shall initiate a RESOURCE STATUS FAILURE message with an appropriate cause value.

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

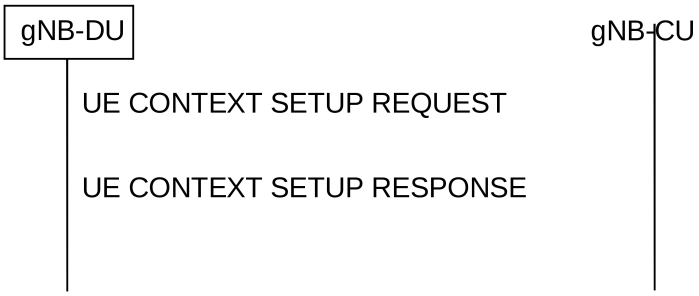

Figure 8.3.1.2-1: UE Context Setup Request procedure: Successful Operation

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.

For each GBR DRB, if the *Alternative QoS Parameters Sets* IE is included in the *GBR QoS Flow Information* IE in the UE CONTEXT SETUP REQUEST message, gNB-DU shall, if supported, behave the same as the NG-RAN node in the PDU Session Resource Setup procedure, specified in TS 38.413 [3].

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 or ingress 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 sublayer, 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, or at least one BH RLC channel is set up for IAB-MT. If the *HandoverPreparationInformation* IE containing the sidelink related UE information 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 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.

If the *MeasConfig* IE is included in the *CU to DU RRC Information* IE in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall deduce that changes to the measurements configuration need to be applied. If the *measObjectToAddModList* IE is included in the *MeasConfig* IE, then the frequencies added in such IE are to be activated. Then the gNB-DU shall decide if measurement gaps are needed or not and, if needed, the gNB-DU shall send the measurement gaps information to the gNB-CU in the *MeasGapConfig* IE of the *DU to CU RRC Information* IE that

is included in the UE CONTEXT SETUP RESPONSE message. If the *measObjectToRemoveList* IE is included in the *MeasConfig* IE, the gNB-DU shall ignore it.

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 38.340 [30].

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 *F1-C Transfer Path* IE is included in UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, take it into account.

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 Aggregate 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 as defined in TS 23.287 [40].

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

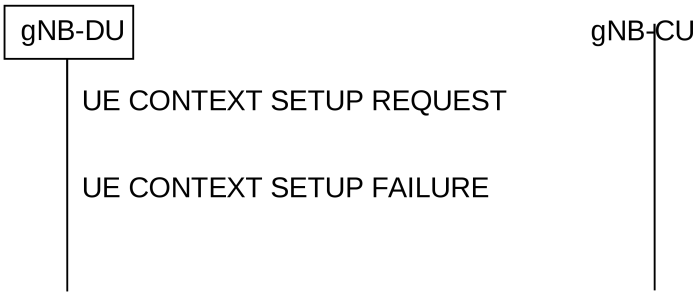

Figure 8.3.1.3-1: UE Context Setup Request procedure: unsuccessful Operation

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

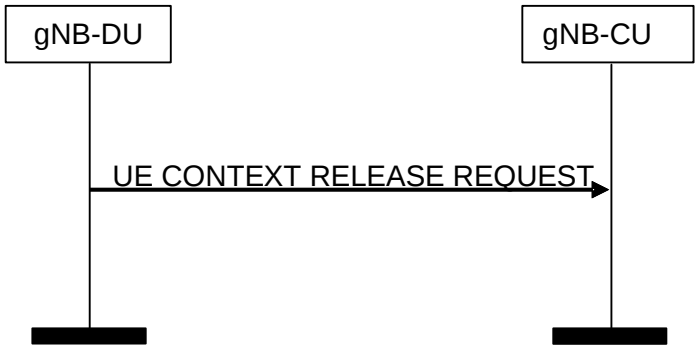

Figure 8.3.2.2-1: UE Context Release (gNB-DU initiated) procedure. Successful operation

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

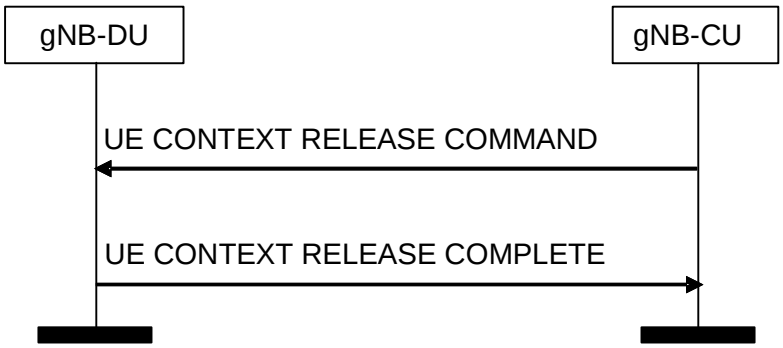

Figure 8.3.3.2-1: UE Context Release (gNB-CU initiated) procedure. Successful operation

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

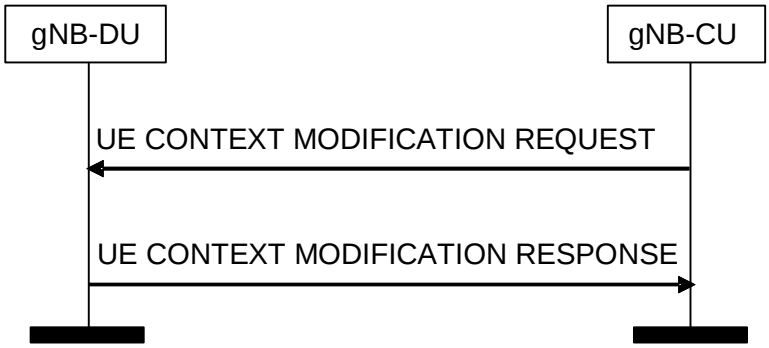

Figure 8.3.4.2-1: UE Context Modification procedure. Successful operation

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 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 *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 SCells to be removed.

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.

If the *MeasConfig* IE is included in the *CU to DU RRC Information* IE in the UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall deduce that changes to the measurements' configuration need to be applied. The gNB-DU shall take the received info, e.g. the *measObjectToAddModList* IE, and/or the *measObjectToRemoveList* IE into account, when generating measurement gap and when deciding if a measurement gap is needed or not.

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.

For each GBR DRB, if the *Alternative QoS Parameters Sets* IE is included in the *GBR QoS Flow Information* IE in the UE CONTEXT MODIFICATION REQUEST message, gNB-DU shall, if supported, behave the same as the NG-RAN node in the PDU Session Resource Setup procedure, specified in TS 38.413 [3].

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.

If the *F1-C Transfer Path* IE is included in UE CONTEXT MODIFICATION REQUEST message, the gNB-DU shall, if supported, take it into account.

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 as defined in TS 23.287 [40].

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

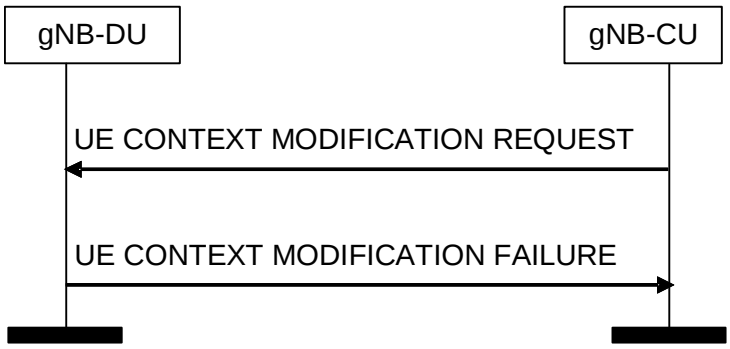

Figure 8.3.4.3-1: UE Context Modification procedure. Unsuccessful operation

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

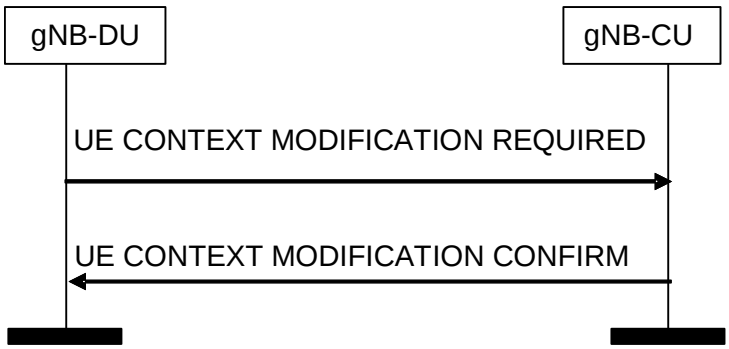

Figure 8.3.5.2-1: UE Context Modification Required procedure. Successful operation

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

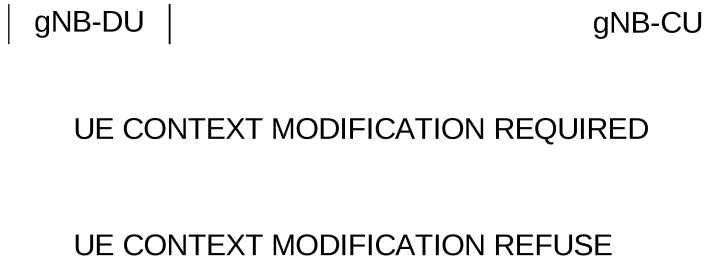

Figure 8.3.5.2A-1: UE Context Modification Required procedure. Unsuccessful operation.

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

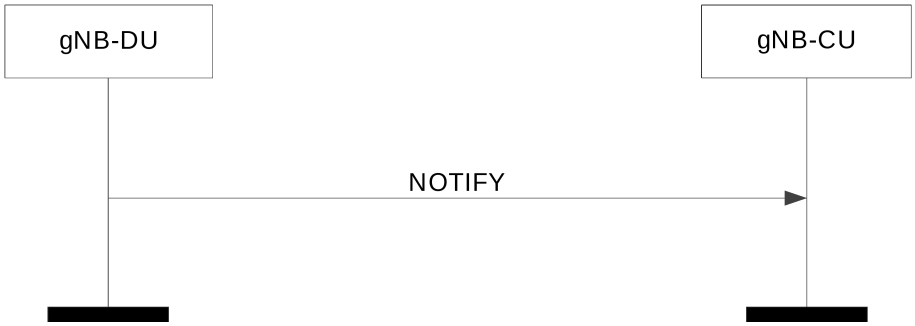

Figure 8.3.7.2-1: Notify procedure. Successful operation.

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 parameters 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 UL RRC MESSAGE 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 containng 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

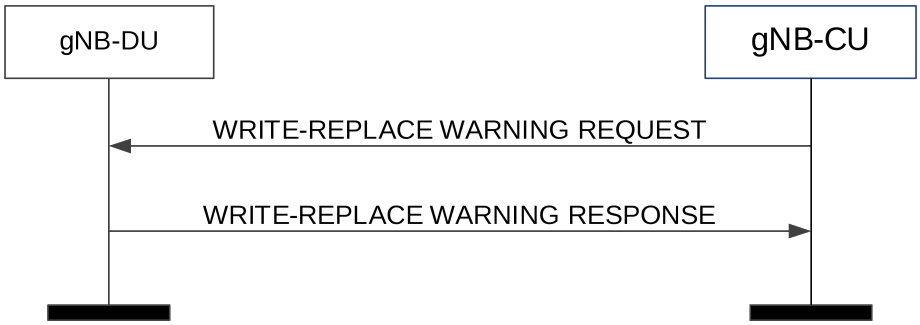

Figure 8.5.1.2-1: Write-Replace Warning procedure: successful operation

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.

Upon reception of the *Notification Information* IE 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 WRITE-REPLACE WARNING REQUEST message which does not include the *Notification Information* IE in the *PWS System 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

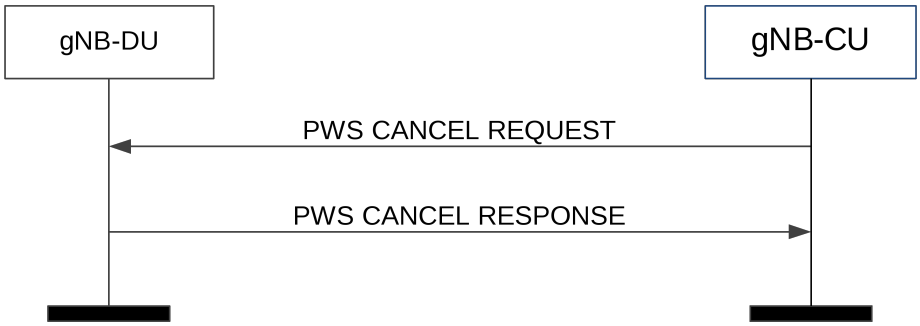

Figure 8.5.2.2-1: PWS Cancel procedure: successful operation

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

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.

8.5.2.4 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

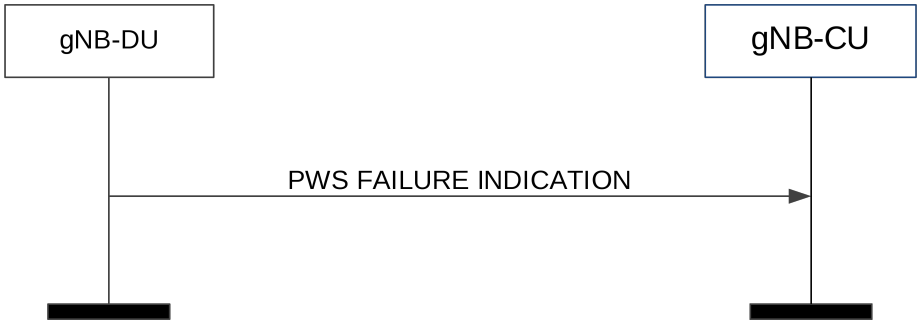

Figure 8.5.4.2-1: PWS failure indication

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

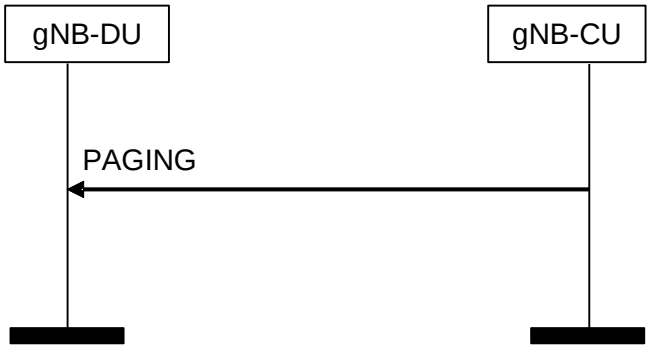

Figure 8.7.1.2-1: Paging procedure. Successful operation.

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

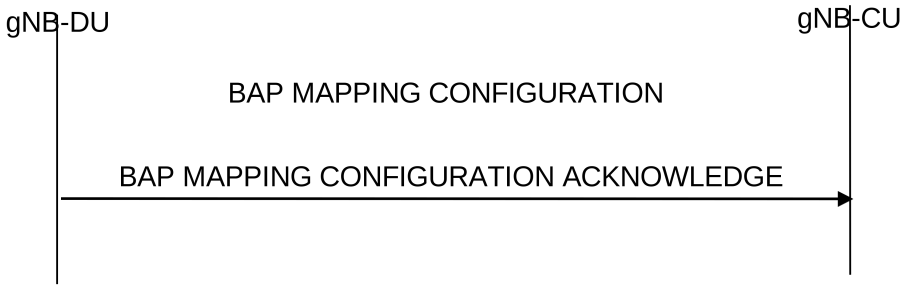

Figure 8.10.1.2-1: BAP Mapping Configuration procedure: Successful Operation

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 sublayer, as specified in TS 38.340 [30].

8.10.1.A Unsuccessful Operation

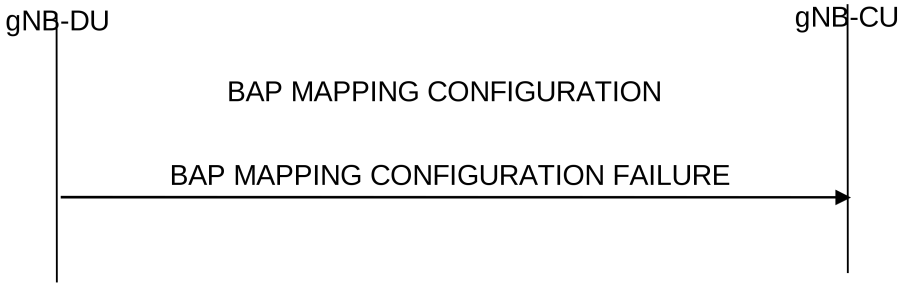

Figure 8.10.1.3-1: BAP Mapping Configuration procedure: Unsuccessful Operation

If the gNB-DU cannot accept the configuration, it shall respond with a BAP MAPPING CONFIGURATION FAILURE and appropriate cause value.

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

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

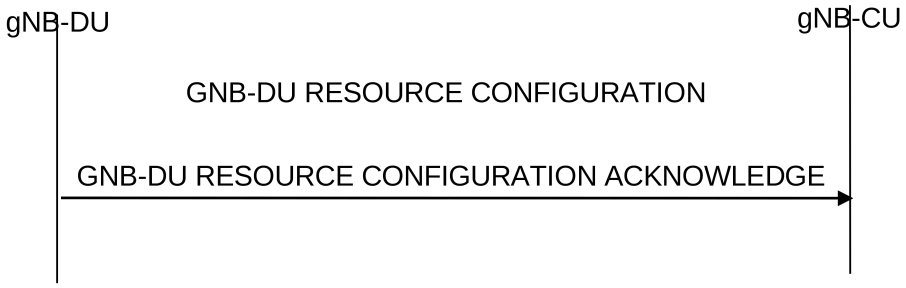

Figure 8.10.2.2-1: gNB-DU Resource Configuration procedure: Successful Operation

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-Mode-Info* 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.B Unsuccessful Operation

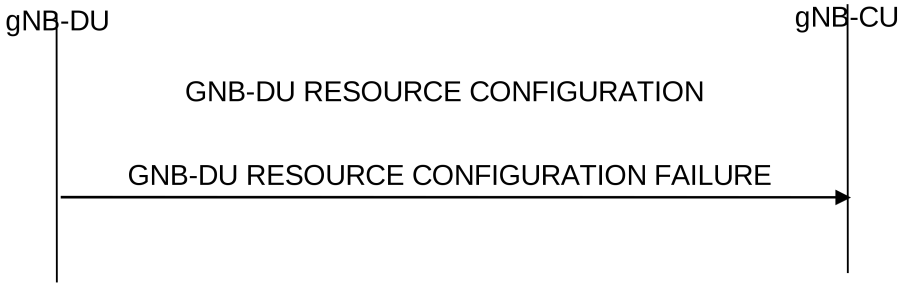

Figure 8.10.2.3-1: gNB-DU Resource Configuration procedure: Unsuccessful Operation

If the gNB-DU cannot accept the configuration, it shall respond with a GNB-DU RESOURCE CONFIGURATION FAILURE and appropriate cause value.

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

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

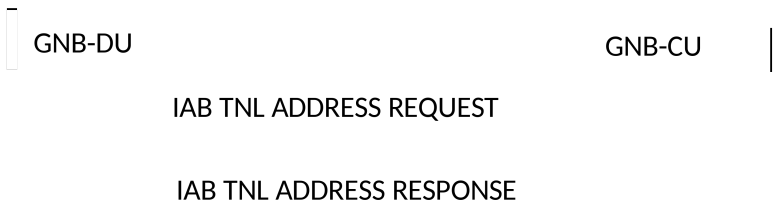

Figure 8.10.3.2-1: IAB TNL Address Allocation procedure: Successful Operation

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.C Unsuccessful Operation

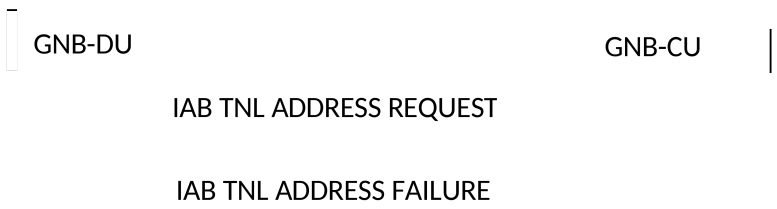

Figure 8.10.3.3-1: IAB TNL Address Allocation procedure: Unsuccessful Operation

If the gNB-DU cannot accept the request, it shall respond with an IAB TNL ADDRESS FAILURE and appropriate cause value.

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

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

gNB-DU gNB-CU

IAB UP CONFIGURATION UPDATE REQUEST

IAB UP CONFIGURATION UPDATE RESPONSE

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

gNB-DU gNB-CU

IAB UP CONFIGURATION UPDATE REQUEST

IAB UP CONFIGURATION UPDATE FAILURE

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

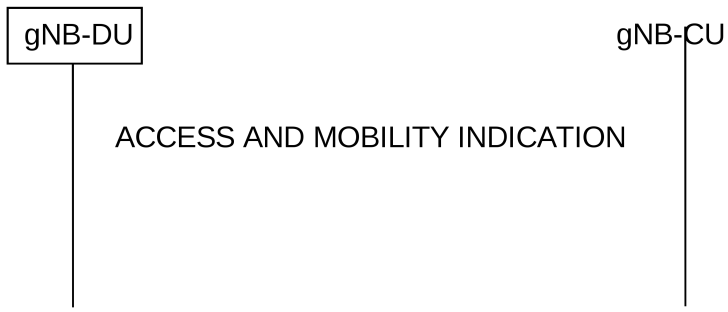

Figure 8.11.1.2-1: Access and Mobility Indication procedure. Successful operation

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.

8.13 Positioning Procedures

8.13.1 Positioning Assistance Information Control

8.13.1.1 General

The purpose of the Positioning Assistance Information Control procedure is to allow the gNB-CU to signal positioning assistance information to the gNB-DU for positioning assistance information broadcasting. The procedure uses non-UE-associated signalling.

8.13.1.2 Successful Operation

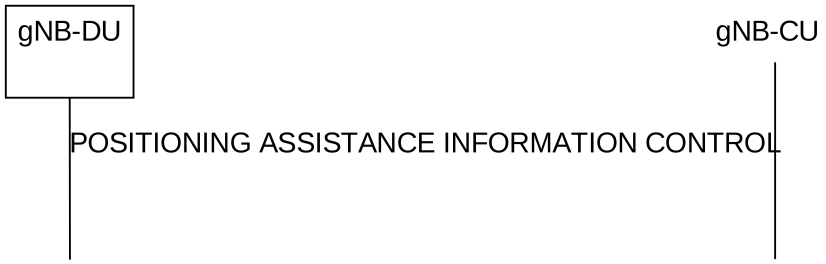

Figure 8.13.1.2-1: Positioning Assistance Information Control procedure

The gNB-CU initiates the procedure by sending a POSITIONING ASSISTANCE INFORMATION CONTROL message.

If the *Positioning Assistance Information* IE is included in the POSITIONING ASSISTANCE INFORMATION CONTROL message, the gNB-DU shall, if supported, replace any previously stored positioning assistance information and use the received information to configure positioning assistance information broadcasting as specified in TS 38.455 [37].

If the *Broadcast* IE is included in the POSITIONING ASSISTANCE INFORMATION CONTROL message and set to "start", the gNB-DU may start broadcasting the positioning assistance information. If the *Broadcast* IE is included in the POSITIONING ASSISTANCE INFORMATION CONTROL message and set to "stop", the gNB-DU may stop broadcasting the positioning assistance information.

If the *Positioning Broadcast Cells* IE is included in the POSITIONING ASSISTANCE INFORMATION CONTROL message, the gNB-DU shall, if supported, consider that the received assistance information is applicable to the cells in this IE.

Interaction with the Positioning Assistance Information Feedback procedure:

If the *Routing ID* IE is included in the POSITIONING ASSISTANCE INFORMATION CONTROL message, the gNB-DU shall, if supported, store this information and include it in any future POSITIONING ASSISTANCE INFORMATION FEEDBACK messages associated to the requested positioning assistance information broadcasting.

8.13.1.3 Abnormal Conditions

If the *Broadcast* IE is included in the POSITIONING ASSISTANCE INFORMATION CONTROL message and set to "start", and no positioning assistance information is available, the gNB-DU shall consider the procedure as failed.

If neither the *Positioning Assistance Information* IE nor the *Broadcast* IE are included in the POSITIONING ASSISTANCE INFORMATION CONTROL message, the gNB-DU shall consider the procedure as failed.

8.13.2 Positioning Assistance Information Feedback

8.13.2.1 General

The purpose of the Positioning Assistance Information Feedback procedure is to allow the gNB-DU to give feedback to the gNB-CU on positioning assistance information broadcasting. The procedure uses non-UE-associated signalling.

8.13.2.2 Successful Operation

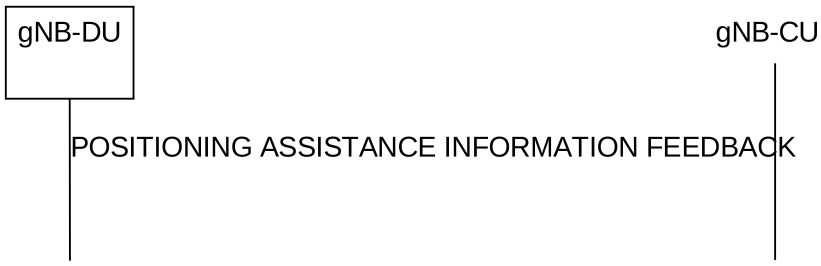

Figure 8.13.2.2-1: Positioning Assistance Information Feedback procedure

If the *Positioning Assistance Information Failure List* IE is included in the POSITIONING ASSISTANCE INFORMATION FEEDBACK message, the gNB-CU shall consider that positioning assistance information broadcasting could not be configured for the relevant information.

If the *Positioning Broadcast Cells* IE is included in the POSITIONING ASSISTANCE INFORMATION FEEDBACK message, the gNB-CU shall consider that the feedback provided is applicable to the cells in this IE.

If the *Routing ID* IE is included in the POSITIONING ASSISTANCE INFORMATION FEEDBACK message, the gNB-CU may use this information to identify the positioning assistance information broadcasting for which feedback is provided.

8.13.2.3 Abnormal Conditions

Void.

8.13.3 Positioning Measurement

8.13.3.1 General

The purpose of the Positioning Measurement procedure is to allow the gNB-CU to request one or more TRPs in the gNB-DU to perform and report positioning measurements. The procedure uses non-UE-associated signalling.

8.13.3.2 Successful Operation

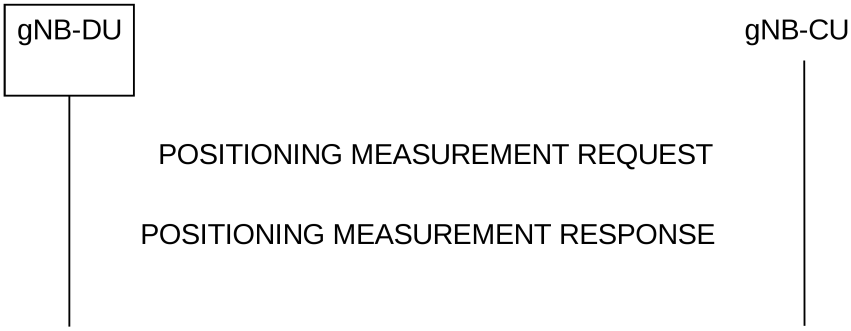

Figure 8.13.3.2-1: Positioning Measurement procedure: successful operation

The gNB-CU initiates the procedure by sending a POSITIONING MEASUREMENT REQUEST message to the gNB-DU, indicating in the *TRP Measurement Request List* IE the TRP(s) from which measurements are requested. The gNB-DU node shall use the included information to configure positioning measurements by the indicated TRP(s). If at least one of the requested measurements has been successful for at least one of the TRPs, the gNB-DU shall reply with the POSITIONING MEASUREMENT RESPONSE message including the *Positioning Measurement Response List* IE..

If the *Positioning Report Characteristics* IE is set to "OnDemand", the gNB-DU shall return the corresponding measurement results in the *Positioning Measurement Result List* IE in the POSITIONING MEASUREMENT RESPONSE message, and the gNB-CU shall consider that this reporting has been terminated by the gNB-DU.

If the *Measurement Beam Information Request* IE is included in the POSITIONING MEASUREMENT REQUEST message, the gNB-DU node shall include the *Measurement Beam Information* IE in the *Positioning Measurement Result* IE of the POSITIONING MEASUREMENT RESPONSE message.

If the *Measurement Quality* IE is included in the *Measurement Result* IE in the POSITIONING MEASUREMENT RESPONSE message, the gNB-CU may use it for further signalling. If the *Measurement Quality* IE includes the *Zenith Quality* IE, the gNB-CU may use it for further signalling.

Interaction with the Positioning Measurement Report procedure:

If the *Positioning Report Characteristics* IE is set to "Periodic", the gNB-DU shall initiate the corresponding measurements, and it shall reply with the POSITIONING MEASUREMENT RESPONSE message without including any measurement results in the message. The gNB-DU shall then periodically initiate the Positioning Measurement Report procedure for the corresponding measurements, with the requested reporting periodicity.

8.13.3.3 Unsuccessful Operation

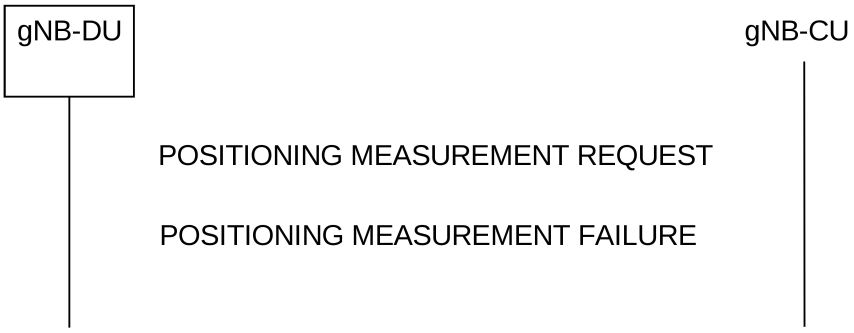

Figure 8.13.3.3-1: Positioning Measurement procedure: unsuccessful operation

If the gNB-DU is unable to configure any of the requested positioning measurements for any of the TRPs in the *TRP Measurement Request List* IE of the POSITIONING MEASUREMENT REQUEST message, it shall respond with a POSITIONING MEASUREMENT FAILURE message.

8.13.3.4 Abnormal Conditions

If the gNB-DU receives a POSITIONING MEASUREMENT REQUEST message containing an LMF Measurement ID corresponding to an ongoing positioning measurement, it shall consider the procedure as failed and initiate local error handling.

8.13.4 Positioning Measurement Report

8.13.4.1 General

The purpose of the Positioning Measurement Report procedure is for the gNB-DU to report positioning measurements to the gNB-CU. The procedure uses non-UE-associated signalling.

8.13.4.2 Successful Operation

Figure 8.13.4.2-1: Positioning Measurement Report procedure: successful operation

The gNB-DU initiates the procedure by sending a POSITIONING MEASUREMENT REPORT message. The POSITIONING MEASUREMENT REPORT message contains the positioning measurement results according to the associated measurement configuration.

8.13.4.3 Unsuccessful Operation

Not applicable.

8.13.4.4 Abnormal Conditions

Not applicable.

8.13.5 Positioning Measurement Abort

8.13.5.1 General

The purpose of the Positioning Measurement Abort procedure is to enable the gNB-CU to abort an on-going measurement. The procedure uses non-UE-associated signalling.

8.13.5.2 Successful Operation

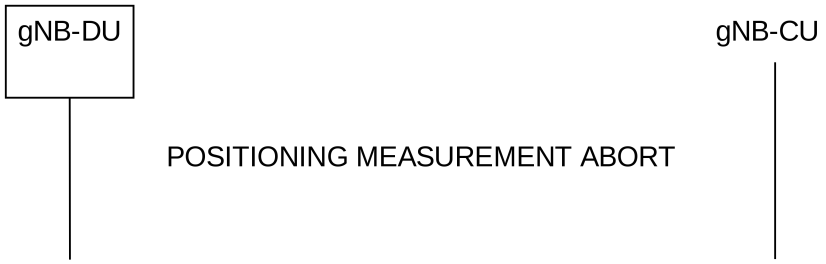

Figure 8.13.5.2-1: Positioning Measurement Abort procedure: successful operation

The gNB-CU initiates the procedure by generating a POSITIONING MEASUREMENT ABORT message. Upon receiving this message, the gNB-DU shall terminate the on-going measurement identified by the *RAN Measurement ID* IE and may release any resources previously allocated for the same measurement.

8.13.5.3 Unsuccessful Operation

Not applicable.

8.13.5.4 Abnormal Conditions

If the gNB-DU cannot identify the previously requested measurement to be aborted, it shall ignore the POSITIONING MEASUREMENT ABORT message.

8.13.6 Positioning Measurement Failure Indication

8.13.6.1 General

The purpose of the Positioning Measurement Failure Indication procedure is for the gNB-DU to notify the gNB-CU that the positioning measurements previously requested with the Positioning Measurement procedure can no longer be reported. The procedure uses non-UE-associated signalling.

8.13.6.2 Successful Operation

Figure 8.13.6.2-1: Positioning Measurement Failure Indication procedure: successful operation

Upon reception of the POSITIONING MEASUREMENT FAILURE INDICATION message, the gNB-CU shall consider that the indicated positioning measurements have been terminated by the gNB-DU.

8.13.6.3 Unsuccessful Operation

Not applicable.

8.13.6.4 Abnormal Conditions

Not applicable.

8.13.7 Positioning Measurement Update

8.13.7.1 General

The purpose of the Positioning Measurement Update procedure is to modify one or more periodic positioning measurements performed by the gNB-DU. The procedure uses non-UE-associated signalling.

8.13.7.2 Successful Operation

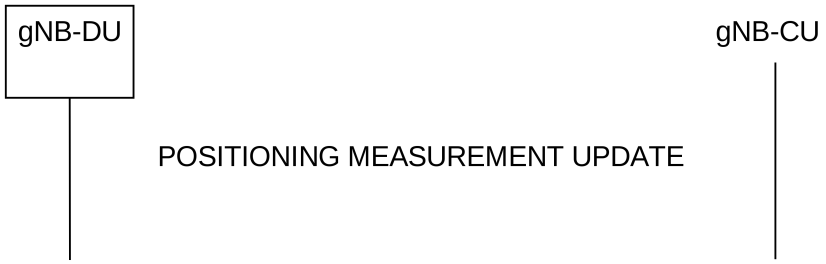

Figure 8.13.7.2-1: Positioning Measurement Update procedure: successful operation

The gNB-CU initiates the procedure by generating a POSITIONING MEASUREMENT UPDATE message. Upon receiving the message, the gNB-DU shall overwrite the previously received measurement configuration for the corresponding measurements.

8.13.7.3 Unsuccessful Operation

Not applicable.

8.13.7.4 Abnormal Conditions

If the gNB-DU cannot identify the given positioning measurements, it shall regard the procedure as failed and initiate local error handling.

8.13.8 TRP Information Exchange

8.13.8.1 General

The purpose of the TRP Information Exchange procedure is to allow the gNB-CU to request the gNB-DU to provide detailed information for TRPs hosted by the gNB-DU. The procedure uses non-UE-associated signalling.

8.13.8.2 Successful Operation

Figure 8.13.8.2-1: TRP Information Exchange procedure, successful operation

The gNB-CU initiates the procedure by sending a TRP INFORMATION REQUEST message. The gNB-DU responds with a TRP INFORMATION RESPONSE message that contains the requested TRP information.

If the *TRP List* IE is included in the TRP INFORMATION REQUEST message, the gNB-DU should include in the TRP INFORMATION RESPONSE message, the requested information for all TRPs included in the *TRP List* IE.

If the *TRP List* IE is not included in the TRP INFORMATION REQUEST message, the gNB-DU should include the requested information for all TRPs hosted by the gNB-DU in the TRP INFORMATION RESPONSE message.

If the *PRS Muting* IE is included in the *PRS Configuration* IE in the TRP INFORMATION RESPONSE message, the gNB-CU may use it for further signaling.

If the *QCL Info* IE is included in the *PRS Configuration* IE in the TRP INFORMATION RESPONSE message, the gNB-CU may use it for further signaling.

If the *DL-PRS Resource Coordinates* IE is included in the *Geographical Coordinates* IE in the *TRP Information* IE in the TRP INFORMATION RESPONSE message, the gNB-CU may use it for further signaling.

8.13.8.3 Unsuccessful Operation

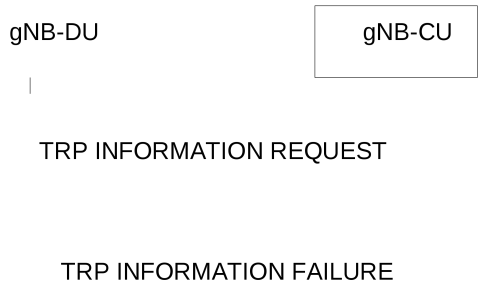

Figure 8.13.8.3-1: TRP Information Exchange procedure, unsuccessful operation

If the gNB-DU cannot provide any of the requested information, the gNB-DU shall respond with a TRP INFORMATION FAILURE message.

8.13.9 Positioning Information Exchange

8.13.9.1 General

The Positioning Information Exchange procedure is initiated by the gNB-CU to indicate to the gNB-DU the need to configure the UE to transmit SRS signals and to retrieve the SRS configuration from the gNB-DU. The procedure uses UE-associated signalling.

8.13.9.2 Successful Operation

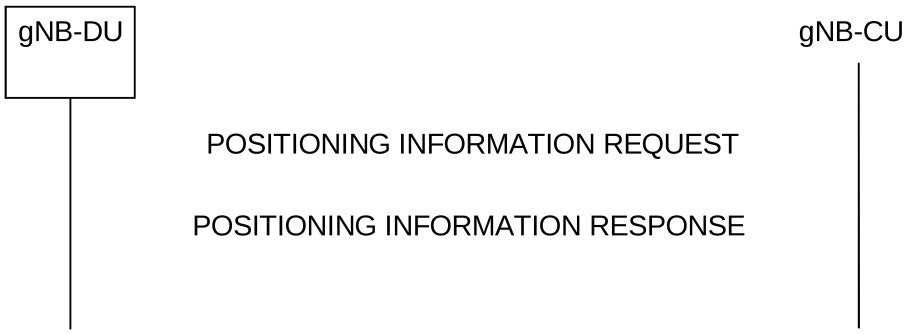

Figure 8.13.9.2-1: Positioning Information Exchange procedure, successful operation

The gNB-CU initiates the procedure by sending a POSITIONING INFORMATION REQUEST message to the gNB-DU.

If the *Requested SRS Transmission Characteristics* IE is included in the POSITIONING INFORMATION REQUEST message, the gNB-DU may take this information into account when configuring SRS transmissions for the UE, and it shall include the *SRS Configuration* IE and the *SFN Initialisation Time* IE in the POSITIONING INFORMATION RESPONSE message.

8.13.9.3 Unsuccessful Operation

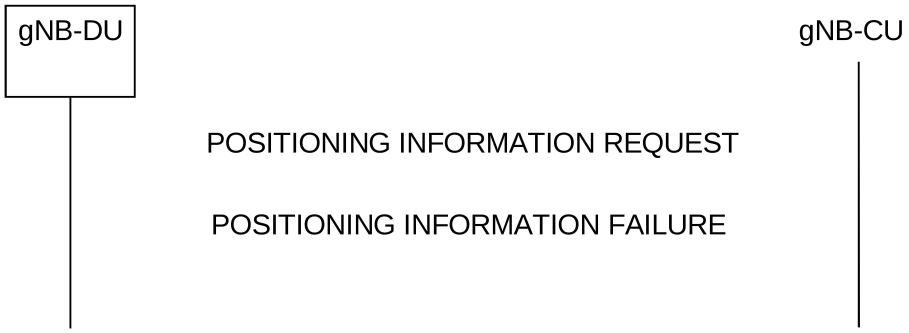

Figure 8.13.9.3-1: Positioning Information Exchange procedure, unsuccessful operation

If the *Requested SRS Transmission Characteristics* IE is included in the POSITIONING INFORMATION REQUEST message and the gNB-DU is unable to configure any SRS transmissions for the UE, the gNB-DU shall respond with a POSITIONING INFORMATION FAILURE message.

8.13.10 Positioning Activation

8.13.10.1 General

The Positioning Activation procedure is initiated by the gNB-CU to request the gNB-DU to activate semi-persistent or trigger aperiodic UL SRS transmission by the UE. The procedure uses UE-associated signalling.

8.13.10.2 Successful Operation

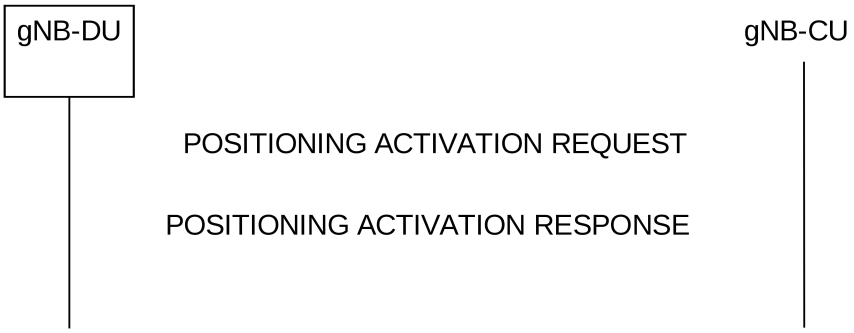

Figure 8.13.10.2-1: Positioning Activation procedure, successful operation

The gNB-CU initiates the procedure by sending a POSITIONING ACTIVATION REQUEST message to the gNB-DU.

For semi-persistent UL SRS, the POSITIONING ACTIVATION REQUEST message includes an indication of the UL SRS resource set to be activated, and may include the spatial relation for the semi-persistent UL SRS resource to be activated. For aperiodic UL SRS, if the *SRS Resource Trigger* IE is included in the POSITIONING ACTIVATION REQUEST message, the gNB-DU shall take the value of this IE into account when triggering aperiodic SRS transmission by the UE.

If the *Activation Time* IE is included in the POSITIONING ACTIVATION REQUEST message, the gNB-DU shall take the indicated value as the requested time for activation of the UE's SRS transmission.

Following successful activation of UL SRS transmission in the UE, the gNB-DU shall respond with a POSITIONING ACTIVATION RESPONSE message. If the POSITIONING ACTIVATION RESPONSE message includes the *System Frame Number* and/or the *Slot Number* IEs, the gNB-CU shall consider that the respective information indicates the activation time of SRS transmission by the UE.

8.13.10.3 Unsuccessful Operation

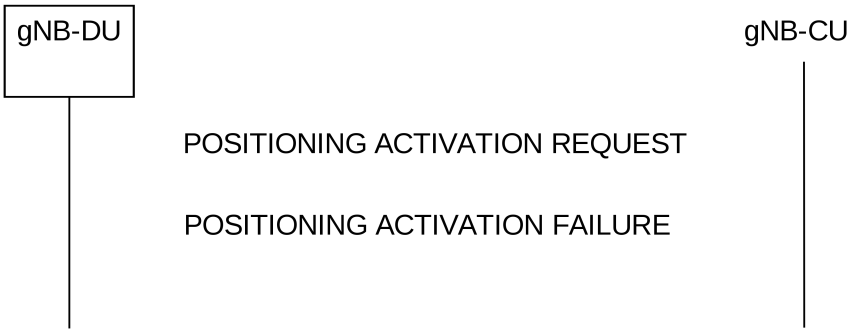

Figure 8.13.10.3-1: Positioning Activation procedure, unsuccessful operation

If the gNB-DU is unable to activate UL SRS transmission in the UE, it shall respond with a POSITIONING ACTIVATION FAILURE message.

If the gNB-DU is unable to trigger the aperiodic SRS transmission with the indicated *SRS Resource Trigger* IE, it shall respond with a POSITIONING ACTIVATION FAILURE message with an appropriate cause value

8.13.10.4 Abnormal Conditions

Void.

8.13.11 Positioning Deactivation

8.13.11.1 General

The Positioning Deactivation procedure is initiated by the gNB-CU to indicate to the gNB-DU node that UL SRS transmission should be deactivated in the UE. The procedure uses UE-associated signalling.

8.13.11.2 Successful Operation

Figure 8.13.11.2-1: Positioning Deactivation procedure, successful operation

The gNB-CU initiates the procedure by sending a POSITIONING DEACTIVATION message to the gNB-DU, including an indication of the UL SRS resources to be deactivated.

8.13.11.3 Unsuccessful Operation

Not Applicable.

8.13.11.4 Abnormal Conditions

Void.

8.13.12 E-CID Measurement Initiation

8.13.12.1 General

The purpose of E-CID Measurement Initiation procedure is to allow the gNB-CU to request the gNB-DU to report E-CID measurements used by LMF to compute the location of the UE. The procedure uses UE-associated signalling.

8.13.12.2 Successful Operation

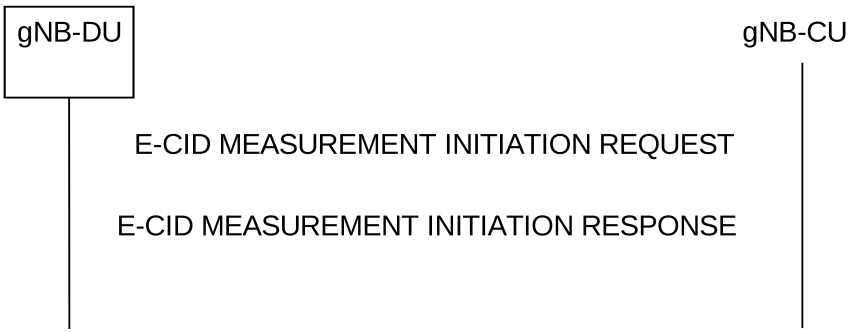

Figure 8.13.12.2-1: E-CID Measurement Initiation procedure, successful operation

The gNB-CU initiates the procedure by sending an E-CID MEASUREMENT INITIATION REQUEST message. If the gNB-DU is able to initiate the requested E-CID measurements, it shall reply with the E-CID MEASUREMENT INITIATION RESPONSE message.

If the *E-CID Report Characteristics* IE is set to "OnDemand", the gNB-DU shall return the result of the measurement in the E-CID MEASUREMENT INITIATION RESPONSE message including, if available, the *Geographical Coordinates* IE in the *E-CID Measurement Result* IE and the *Cell Portion ID* IE, and the gNB-CU shall consider that the E-CID measurements for the UE have been terminated by the gNB-DU. The *Measured Results List* IE shall be included in the *E-CID Measurement Result* IE of the E-CID MEASUREMENT INITIATION RESPONSE message when measurement quantities other than "Default" have been requested.

Interaction with the E-CID Measurement Report procedure:

If the *E-CID Report Characteristics* IE is set to "Periodic", the gNB-DU shall initiate the requested measurements and shall reply with the E-CID MEASUREMENT INITIATION RESPONSE message without including either the *E-CID Measurement Result* IE or the *Cell Portion ID* IE in this message. The gNB-DU shall then periodically initiate the E-CID Measurement Report procedure for the measurements, with the requested reporting periodicity.

8.13.12.3 Unsuccessful Operation

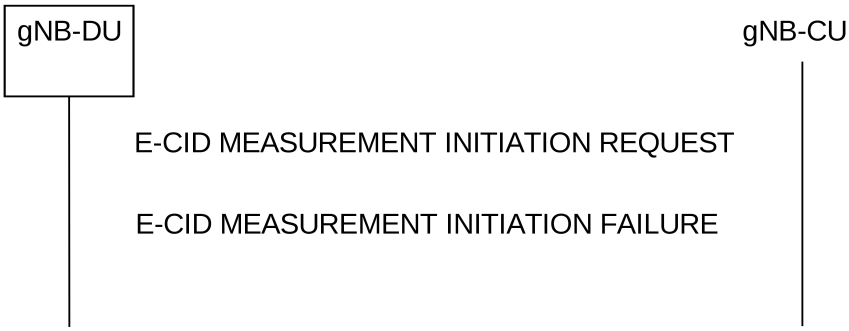

Figure 8.13.12.3-1: E-CID Measurement Initiation procedure, unsuccessful operation

If the gNB-DU is not able to initiate at least one of the requested E-CID measurements, the gNB-DU shall respond with an E-CID MEASUREMENT INITIATION FAILURE message.

8.13.13 E-CID Measurement Failure Indication

8.13.13.1 General

The purpose of the E-CID Measurement Failure Indication procedure is for the gNB-DU to notify the gNB-CU that the E-CID measurements previously requested with the E-CID Measurement Initiation procedure can no longer be reported. The procedure uses UE-associated signalling.

8.13.13.2 Successful Operation

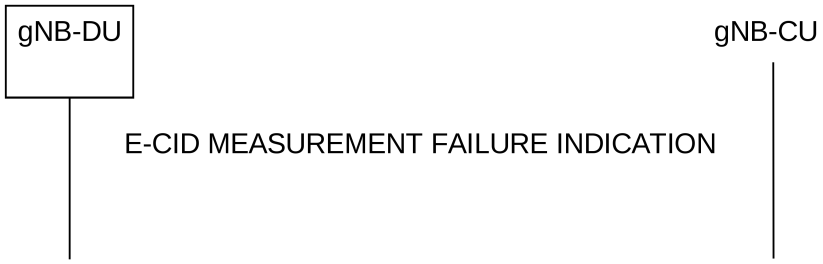

Figure 8.13.13.2-1: E-CID Measurement Failure Indication, successful operation

Upon reception of the E-CID MEASUREMENT FAILURE INDICATION message, the gNB-CU shall consider that the E-CID measurements for the UE have been terminated by the gNB-DU.

8.13.13.3 Unsuccessful Operation

Not applicable.

8.13.14 E-CID Measurement Report

8.13.14.1 General

The purpose of E-CID Measurement Report procedure is for the gNB-DU to provide the E-CID measurements for the UE to the gNB-CU. The procedure uses UE-associated signalling.

8.13.14.2 Successful Operation

Figure 8.13.14.2-1: E-CID Measurement Report procedure, successful operation

The gNB-DU initiates the procedure by sending an E-CID MEASUREMENT REPORT message. The E-CID MEASUREMENT REPORT message contains the E-CID measurement results according to the measurement configuration in the respective E-CID MEASUREMENT INITIATION REQUEST message.

The *Measured Results List* IE shall be included in the *E-CID Measurement Result* IE of the E-CID MEASUREMENT REPORT message when measurement quantities other than "Default" have been requested.

If available, the gNB-DU shall include the *Geographical Coordinates* IE in the *E-CID Measurement Result* IE in the E-CID MEASUREMENT REPORT message.

If available, the gNB-DU shall include the *Cell Portion ID* IE in the E-CID MEASUREMENT REPORT message.

8.13.14.3 Unsuccessful Operation

Not applicable.

8.13.15 E-CID Measurement Termination

8.13.15.1 General

The purpose of E-CID Measurement Termination procedure is to terminate periodical E-CID measurements for the UE performed by the gNB-DU. The procedure uses UE-associated signalling.

8.13.15.2 Successful Operation

Figure 8.13.15.2-1: E-CID Measurement Termination procedure, successful operation

The gNB-CU initiates the procedure by generating an E-CID MEASUREMENT TERMINATION COMMAND message.

8.13.15.3 Unsuccessful Operation

Not applicable.

8.13.16 Positioning Information Update

8.13.16.1 General

The Positioning Information Update procedure is initiated by the gNB-DU to indicate to the gNB-CU that a change has occurred in the SRS configuration. The procedure uses UE-associated signalling.

8.13.16.2 Successful Operation

Figure 8.13.16.2-1: Positioning Information Update procedure, successful operation

The gNB-DU initiates the procedure by sending a POSITIONING INFORMATION UPDATE message to the gNB-CU.

If the SRS Configuration IE is included in the POSITIONING INFORMATION UPDATE message, the gNB-CU shall consider this information as the updated SRS Configuration for the UE. If the SFN Initialisation Time IE is included in the POSITIONING INFORMATION UPDATE message, the gNB-CU shall consider this information as the SFN Initialisation Time associated to the SRS Configuration.

8.13.16.3 Unsuccessful Operation

Not Applicable.

8.13.16.4 Abnormal Conditions

Void.

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
Extended gNB-DU Name	O		9.3.1.205		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
Extended gNB-CU Name	O		9.3.1.206		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	O		9.3.1.65		YES	ignore

List						
>>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
Cells to be Deactivated List		*0..1*		List of cells to be deactivated	YES	reject
>Cells to be Deactivated List Item		*1..<maxCellingNBDU>*			EACH	reject
>> NR CGI	M		9.3.1.12		-	
gNB-CU TNL Association To Add List		*0..1*			YES	ignore
>gNB-CU TNL Association To Add Item IEs		*1..<maxnoofTNLAssociations>*			EACH	ignore
>>TNL Association Transport Layer Information	M		CP Transport Layer Address 9.3.2.4	Transport Layer Address of the gNB-CU.	-	
>>TNL Association Usage	M		ENUMERATED (ue, non-ue, both, ...)	Indicates whether the TNL association is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 38.472	-	

				[22].		
gNB-CU TNL Association To Remove List		*0..1*			YES	ignore
>gNB-CU TNL Association To Remove Item IEs		*1..<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	M		INTEGER	Indicates the	-	

Group ID			(1.. maxCellineNB)	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 .. <maxCellingNBDU>*			EACH	ignore
>>NR CGI	M		9.3.1.12		-	
>>Intended TDD DL-UL Configuration	O		9.3.1.89		-	
Transport Layer Address Info	O		9.3.2.5		YES	ignore
Uplink BH Non-UP Traffic Mapping	O		9.3.1.103		YES	reject

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

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		-	

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		-	
>>Duplication Indication	O		ENUMERATED (true, ..., false)	If included, it should be set to true. This IE is ignored if the *Additional Duplication*	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				Indication IE is present.		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>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		YES	ignore
>>RLC Mode	M		9.3.1.27		-	
>>UL Configuration	O		UL Configuraiton 9.3.1.31	Information about UL usage in gNB-DU.	-	
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication. This IE is ignored if the *RLC Duplication Information* IE is present.	-	
>> DC Based Duplication Configured	O		ENUMERATED (true, ...,	Indication on whether DC based	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			false)	PDCP duplication is configured or not. If included, it should be set to true.		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>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		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
Inactivity Monitoring Request	O		ENUMERATED (true, ...)		YES	reject
RAT-Frequency Priority Information	O		9.3.1.34		YES	reject
RRC-Container	O		9.3.1.6	Includes the *DL-DCCH-Message* IE as defined in subclause 6.2 of TS 38.331 [8], encapsulated in a PDCP PDU.	YES	ignore
Masked IMEISV	O		9.3.1.55		YES	ignore
Serving PLMN	O		PLMN ID 9.3.1.14	Indicates the PLMN serving the UE.	YES	ignore
gNB-DU UE Aggregate Maximum Bit Rate Uplink	C-ifDRBSetup		Bit Rate 9.3.1.22	The gNB-DU UE Aggregate Maximum Bit Rate Uplink is to be enforced by the gNB-DU.	YES	ignore
RRC Delivery Status Request	O		ENUMERATED (true, …)	Indicates whether RRC DELIVERY REPORT procedure is requested for the RRC message.	YES	ignore
Resource Coordination Transfer Information	O		9.3.1.73		YES	ignore
servingCellMO	O		INTEGER (1..64, ...)		YES	ignore
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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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 .. <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		-	
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 Aggregate 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			9.3.1.121		-	
>>RLC mode	M		9.3.1.27		-	
Conditional Inter-DU Mobility Information	O				YES	reject
>CHO Trigger	M		ENUMERAT		-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			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
F1-C Transfer Path	O		9.3.1.207		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
>>>Additional PDCP Duplication TNL		*1 .. <maxnoofAdditio*			EACH	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Items		*nalPDCPDuplicationTNL>*				
>>>>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.	-	
>>Current QoS Parameters Set Index	O		Alternative QoS Parameters Set Index 9.3.1.123	Index to the currently fulfilled alternative QoS parameters set.	YES	ignore
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 8.

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 8.

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.. <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
SCell To Be Removed List		*0..1*			YES	ignore
>SCell to Be Removed Item IEs		*1 .. <maxnoofSCells>*			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..<maxnoofSRBs>*			EACH	reject
>>SRB ID	M		9.3.1.7		-	
>>Duplication Indication	O		ENUMERATED (true, ..., false)	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		YES	ignore
>>RLC Mode	M		9.3.1.27		-	
>>UL Configuration	O		UL Configuration 9.3.1.31	Information about UL usage in gNB-DU.	-	
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				based UL PDCP duplication. This IE is ignored if the *RLC Duplication Information* IE is present.		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>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 Information* 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		-	
>>>>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	O		9.3.1.141	Traffic pattern	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Characteristics				information associated with the QFI. Details in TS 23.501 [21].		
>> 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		YES	ignore
>>UL Configuration	O		UL Configuration 9.3.1.31	Information about UL usage in gNB-DU.	-	
>>DL PDCP SN length	O		ENUMERATED(12bits,18bits , ...)		YES	ignore
>>UL PDCP SN length	O		ENUMERATED (12bits, 18bits, ...)		YES	ignore
>>Bearer Type Change	O		ENUMERATED (true, …)		YES	ignore
>> RLC Mode	O		9.3.1.27		YES	ignore
>>Duplication Activation	O		9.3.1.36	Information on the initial state of CA based UL PDCP duplication. This IE is ignored if the *RLC Duplication Information* IE is present.	YES	reject
>> DC Based Duplication Configured	O		ENUMERATED (true, …, false)	Indication on whether DC based PDCP duplication is configured or not.	YES	reject
>>DC Based Duplication Activation	O		9.3.1.36	Information on the initial state of DC based UL PDCP duplication. This IE is ignored if the *RLC Duplication Information* 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	M		UP Transport	gNB-CU endpoint of the F1 transport	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Information			Layer Information 9.3.2.1	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
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		*0..1*			YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Setup List						
>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		-	
>>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 Aggregate Bit	O		Bit Rate	Only applies for	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Rate			9.3.1.22	non-GBR and unicast QoS Flows.		
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
>SL DRB to Be Released Item IEs		*1 .. <maxnoofSLDRBs>*			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 .. <maxnoofCellsinCHO>*			-	-
>>Target Cell ID	M		NR CGI 9.3.1.12		-	-
F1-C Transfer Path	O		9.3.1.207		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 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 8.

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
>>>>Additional PDCP Duplication UP TNL Information	M		UP Transport Layer Information	gNB-DU endpoint of the F1 transport	-	

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>Current QoS Parameters Set Index	O		Alternative QoS Parameters Set Index 9.3.1.123	Index to the currently fulfilled alternative QoS parameters set.	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		-	
>>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.	-	
>>Current QoS Parameters Set Index	O		Alternative QoS Parameters Set Index 9.3.1.123	Index to the currently fulfilled alternative QoS parameters set.	YES	ignore
SRB Failed to be Setup List		*0..1*		The List of SRBs which are failed to be	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				established.		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>SRB Failed to be Setup Item IEs		*1 .. <maxnoofSRBs>*			EACH	ignore
>>SRB ID	M		9.3.1.7		-	
>>Cause	O		9.3.1.2		-	
DRB Failed to be Setup List		*0..1*		The List of DRBs which are failed to be setup.	YES	ignore
>DRB Failed to be Setup Item IEs		*1 .. <maxnoofDRBs>*			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>Cause	O		9.3.1.2		-	
SCell Failed To Setup List		*0..1*			YES	ignore
>SCell Failed to Setup Item		*1 .. <maxnoofSCells>*			EACH	ignore
>>SCell ID	M		NR CGI 9.3.1.12	SCell Identifier in gNB	-	
>>Cause	O		9.3.1.2		-	
DRB Failed to be Modified List		0..1		The List of DRBs which are failed to be modified.	YES	ignore
>DRB Failed to be Modified Item IEs		*1 .. <maxnoofDRBs>*			EACH	ignore
>>DRB ID	M		9.3.1.8		-	
>>Cause	O		9.3.1.2		-	
Inactivity Monitoring Response	O		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	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				established.		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>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		-	
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 .. <maxnoofSLD*			EACH	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
		RBs>				
>>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 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
>DRB Required to be Released List Item IEs		*1 .. <maxnoofD*			EACH	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
		RBs>				
>>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 8.

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 .. <maxnoofSLDRBs>*			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 .. <maxnoofDRBs>*			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>DRB Activity	O		ENUMERATED (Active, Not active)		-	

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

9.2.2.13 NOTIFY

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

Direction: gNB-DU → gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
DRB Notify List		*1*			YES	reject
>DRB Notify Item IEs		*<1 .. maxnoofDRBs>*			EACH	reject
>>DRB ID	M		9.3.1.8		-	
>>Notification Cause	M		ENUMERATED (Fulfilled, Not-Fulfilled, ...)		-	
>>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.. <maxCellingNBDU>*			EACH	reject
>>NR CGI	M		9.3.1.12		-	
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Dedicated SI Delivery Needed UE List		*0..1*		List of UEs unable to receive system information from broadcast	YES	ignore
>Dedicated SI Delivery Needed UE Item		*1 .. <maxnoofUEIDs>*			EACH	ignore
>>gNB-CU UE F1AP ID	M		9.3.1.4		-	
>>NR CGI	M		9.3.1.12		-	

Range bound	Explanation
maxCellingNBDU	Maximum no. cells that can be served by a gNB-DU. Value is 512.
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.. <maxCellingNBDU>*			EACH	reject
>>NR CGI	M		9.3.1.12		-	
>>Number of Broadcasts	M		INTEGER (0..65535)	This IE is set to '0' if valid results are not known or not available. It is set to 65535 if the counter results have overflowed.	-	
Criticality Diagnostics	O		9.3.1.3		YES	ignore

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

9.2.4.5 PWS RESTART INDICATION

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

Direction: gNB-DU →gNB-CU

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Transaction ID	M		9.3.1.23		YES	reject
NR CGI List for Restart List		*1*			YES	reject
>NR CGI List for Restart Item IEs		*1..<maxCellingNBDU>*			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 .. <maxnoof PagingCells>*			EACH	ignore
>>NR CGI	M		9.3.1.12		-	
Paging Origin	O		9.3.1.79		YES	ignore

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

9.2.7 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 → 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 → 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	YES	ignore

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		YES	ignore

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

9.2.9.2A BAP MAPPING CONFIGURATION FAILURE

This message is sent by the gNB-DU to indicate a BAP Mapping 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

9.2.9.3 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	M		gNB-DU Cell	Contains	-	

Resource Configuration-FDD-UL			Resource Configuration 9.3.1.107	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-ConfigCommon* 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-ConfigCommonIAB-r16* 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 *SchedulingRequestResourceConfig* 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 *subCarrierSpacingCommon* 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

9.2.9.4A GNB-DU RESOURCE CONFIGURATION FAILURE

This message is sent by the gNB-DU to indicate a gNB-DU Resource 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

9.2.9.5 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..<maxnoofTLAsIAB>*			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..<maxnoofTLAsIAB>*			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.

9.2.9.6A IAB TNL ADDRESS FAILURE

This message is sent by the gNB-DU to indicate an IAB TNL Address Allocation 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

9.2.9.7 IAB UP CONFIGURATION 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.. < maxnoofULUPTNLInformationforIAB>*			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.. < maxnoofUPTNLAddresses>*			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 → 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.. < maxnoofUPTNLAddresses>*			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 .. <maxnoofRACHReports>*			-	
>>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 .. <maxnoofRLFReports>*			-	
>>NR UE RLF Report Container	M		OCTET STRING	*nr-RLF-Report-r16* IE contained in the *UEInformationResponse* 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

9.2.12 Messages for Positioning Procedures

9.2.12.1 POSITIONING ASSISTANCE INFORMATION CONTROL

This message is sent by the gNB-CU to transfer positioning assistance 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
Positioning Assistance Information	O		OCTET STRING	Contains the *Assistance Information* IE as defined in TS 38.455 [37].	YES	reject
Broadcast	O		ENUMERATED (start, stop, ...)		YES	reject
Positioning Broadcast Cells	O		9.3.1.191	The cell(s) that are requested to broadcast posSIB(s) according to the *Positioning Assistance Information* IE.	YES	reject
Routing ID	O		OCTET STRING		YES	reject

9.2.12.2 POSITIONING ASSISTANCE INFORMATION FEEDBACK

This message is sent by the gNB-DU to give feedback on positioning assistance information broadcasting.

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
Positioning Assistance Information Failure List	O		OCTET STRING	Contains the *Assistance Information* IE as defined in TS 38.455 [37].	YES	reject
Positioning Broadcast Cells	O		9.3.1.191	The cells associated to the feedback provided in the *Positioning Assistance Information Failure List* IE.	YES	reject
Routing ID	O		OCTET STRING		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.3 POSITIONING MEASUREMENT REQUEST

This message is sent by the gNB-CU to request the gNB-DU to configure a positioning measurement.

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
LMF Measurement ID	M		INTEGER (1..65536, …)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536, …)		YES	reject
TRP Measurement Request List		1			YES	reject
>TRP Measurement Request Item		1..<maxnoof MeasTRPs>				
>>TRP ID	M		9.3.1.197			
>>Search Window Information	O		9.3.1.204			
>>NR CGI	O		9.3.1.12	The Cell ID of the TRP identified by the *TRP ID* IE.	YES	ignore
Positioning Report Characteristics	M		ENUMERATED (OnDemand, Periodic, …)		YES	reject
Positioning Measurement Periodicity	C-ifReportCharacteristicsPeriodic		ENUMERATED (120ms, 240ms, 480ms, 640ms, 1024ms, 2048ms, 5120ms, 10240ms, 1min, 6min, 12min, 30min, …, 20480ms, 40960ms)		YES	reject
Positioning Measurement Quantities		*1*			YES	reject
> Positioning Measurement Quantities Item		*1..<maxnoof PosMeas>*			EACH	
>> Positioning Measurement Type	M		ENUMERATED (gNB RX-TX, UL-SRS-RSRP, UL AoA, UL RTOA, …)			-
>>Timing Reporting Granularity Factor	O		INTEGER (0..5)	TS 38.133 [38]		
SFN Initialisation Time	O		9.3.1.183	If this IE is not present, the TRP may assume that the value is same as its own SFN initialisation time.	YES	ignore
SRS Configuration	O		9.3.1.192		YES	ignore
Measurement Beam Information Request	O		ENUMERATED (true, ...)		YES	ignore
System Frame Number	O		INTEGER(0..1023)		YES	ignore
Slot Number	O		INTEGER(0..79)		YES	ignore

Range bound	Explanation
maxnoofPosMeas	Maximum no. of measured quantities that can be configured and reported with one message. Value is 16384.
maxnoofMeasTRPs	Maximum no. of TRPs that can be included within one measurement message. Value is 64.

Condition	Explanation
ifReportCharacteristicsPeriodic	This IE shall be present if the *Positioning Report Characteristics* IE is set to the value "Periodic".

9.2.12.4 POSITIONING MEASUREMENT RESPONSE

This message is sent by the gNB-DU to report positioning measurements for the target UE.

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
LMF Measurement ID	M		INTEGER (1..65536, …)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536, …)		YES	reject
Positioning Measurement Result List		0..1			YES	reject
>**Positioning Measurement Result List Item**		1..< maxnoofMeasTRPs>				
>>Positioning Measurement Result	M		9.3.1.166		-	-
>>TRP ID	M		9.3.1.197			
>>NR CGI	O		9.3.1.12	The Cell ID of the TRP identified by the *TRP ID* IE.	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofMeasTRPs	Maximum no. of TRP measurements that can be included within one message. Value is 64.

9.2.12.5 POSITIONING MEASUREMENT FAILURE

This message is sent by the gNB-DU to report measurement 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
LMF Measurement ID	M		INTEGER (1..65536, …)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536, …)		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.6 POSITIONING MEASUREMENT REPORT

This message is sent by the gNB-DU to report positioning measurements for the target UE.

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
LMF Measurement ID	M		INTEGER (1..65536, …)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536, …)		YES	reject
Positioning Measurement Result List		*1*			YES	reject
>Positioning Measurement Result List Item		*1..<maxnoof MeasTRPs>*			EACH	
>>Positioning Measurement Result	M		9.3.1.166		-	-
>>TRP ID	M		9.3.1.197		-	-
>>NR CGI	O		9.3.1.12	The Cell ID of the TRP identified by the *TRP ID* IE.	YES	ignore

Range bound	Explanation
maxnoofMeasTRPs	Maximum no. of TRP measurements that can be included within one message. Value is 64.

9.2.12.7 POSITIONING MEASUREMENT ABORT

This message is sent by the gNB-CU to request the gNB-DU to abort a positioning measurement.

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
LMF Measurement ID	M		INTEGER (1.. 65536, …)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536, …)		YES	reject

9.2.12.8 POSITIONING MEASUREMENT FAILURE INDICATION

This message is sent by the gNB-DU to indicate that the previously requested positioning measurements can no longer be reported.

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
LMF Measurement ID	M		INTEGER (1..65536,…)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536,…)		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.12.9 POSITIONING MEASUREMENT UPDATE

This message is sent by the gNB-CU to update a previously configured measurement.

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
LMF Measurement ID	M		INTEGER (1..65536,…)		YES	reject
RAN Measurement ID	M		INTEGER (1..65536,…)		YES	reject
SRS Configuration	O		9.3.1.192		YES	ignore

9.2.12.10 TRP INFORMATION REQUEST

This message is sent by a gNB-CU to request information for TRPs hosted by a 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
TRP list		*0..1*			YES	ignore
>TRP list Item		1..<maxnoofTRPs>			EACH	ignore
>>TRP ID	M		9.3.1.197		-	
TRP Information Type List		*1*			YES	reject
>TRP Information Type Item		*1 .. <maxnoofTRPInfoTypes>*			EACH	reject
>>TRP Information Type Item	M		ENUMERATED (nr pci, ng-ran cgi, nr arfcn, prs config, ssb config, sfn init time, spatial direction info, geo-coordinates, …)		-	

Range bound	Explanation
maxnoofTRPInfoTypes	Maximum no of TRP information types that can be requested and reported with one message. Value is 64.
maxnoofTRPs	Maximum no. of TRPs in a NG-RAN node. Value is 65535.

9.2.12.11 TRP INFORMATION RESPONSE

This message is sent by a gNB-DU to convey TRP information to a gNB-CU.

Direction: gNB-DU → gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.23		YES	reject
TRP Information List		*1*			YES	ignore
>TRP Information Item		*1 .. <maxnoofTRPs>*			EACH	ignore
>>TRP Information	M		9.3.1.176			
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofTRPs	Maximum no. of TRPs in a gNB-DU. Value is 65535.

9.2.12.12 TRP INFORMATION FAILURE

This message is sent by a gNB-DU node to indicate that the requested TRP information cannot be provided to a gNB-CU.

Direction: gNB-DU → gNB-CU.

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

9.2.12.13 POSITIONING INFORMATION REQUEST

This message is sent by the gNB-CU to indicate to the gNB-DU the need to configure the UE to transmit SRS signals for uplink positioning measurement.

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
Requested SRS Transmission Characteristics	O		9.3.1.175		YES	ignore

9.2.12.14 POSITIONING INFORMATION RESPONSE

This message is sent by the gNB-DU to provide the configured SRS 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	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
SRS Configuration	O		9.3.1.192		YES	ignore
SFN Initialisation Time	O		9.3.1.183		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.15 POSITIONING INFORMATION FAILURE

This message is sent by the gNB-DU to indicate that no SRS transmissions could be configured for the UE for uplink positioning measurement.

Direction: gNB-DU → gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.16 POSITIONING ACTIVATION REQUEST

This message is sent by the gNB-CU to cause the gNB-DU to activate/trigger UL SRS transmission by the UE.

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
CHOICE *SRS type*	M				YES	reject
>Semi-persistent						
>>SRS Resource Set ID	M		9.3.1.180		-	-
>>SRS Spatial Relation	O		Spatial Relation Information 9.3.1.181		-	-
>Aperiodic						
>>Aperiodic	M		ENUMERATED (true, …)		-	-
>>SRS Resource Trigger	O		9.3.1.182		-	-
Activation Time	O		SFN Initialisation Time 9.3.1.183	Indicates the start time when the SRS activation is requested	YES	ignore

9.2.12.17 POSITIONING ACTIVATION RESPONSE

This message is sent by the gNB-DU to confirm successful UL SRS activation in the UE.

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
System Frame Number	O		INTEGER(0..1023)		YES	ignore
Slot Number	O		INTEGER(0..79)		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.18 POSITIONING ACTIVATION FAILURE

This message is sent by the gNB-DU to indicate that activation of UL SRS transmission in the UE 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	M		9.3.1.5		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.19 POSITIONING DEACTIVATION

This message is sent by the gNB-CU to cause the NG RAN node to deactivate UL SRS transmission or release all the transmission by the UE.

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
CHOICE *Abort Transmission*	M				YES	ignore
>SRS Resource Set ID deactivation						
>>SRS Resource Set ID	M		9.3.1.180		-	
>Release ALL			NULL			

9.2.12.20 E-CID MEASUREMENT INITIATION REQUEST

This message is sent by gNB-CU to initiate E-CID measurements.

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
LMF UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
RAN UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
E-CID Report Characteristics	M		ENUMERATED (OnDemand, Periodic, …)		YES	reject
E-CID Measurement Periodicity	C-ifReportCharacteristicsPeriodic		ENUMERATED (120ms, 240ms, 480ms, 640ms, 1024ms, 2048ms, 5120ms, 10240ms, 1min, 6min, 12min, 30min, …, 20480ms, 40960ms)		YES	reject
E-CID Measurement Quantities		*1 .. <maxnoof MeasE-CID>*			EACH	reject
>E-CID Measurement Quantities Item	M		ENUMERATED (Default, NR Angle of Arrival, …)	If “Default” is the only requested measurement quantity, it indicates that the *Measured Results List* IE need not be included in response or reporting messages.	-	

Range bound	Explanation
maxnoofMeasE-CID	Maximum no. of E-CID measured quantities that can be configured and reported with one message. Value is 64.

Condition	Explanation
ifReportCharacteristicsPeriodic	This IE shall be present if the *E-CID Report Characteristics* IE is set to the value "Periodic".

9.2.12.21 E-CID MEASUREMENT INITIATION RESPONSE

This message is sent by gNB-DU to indicate that the requested E-CID 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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
LMF UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
RAN UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
E-CID Measurement Result	O		9.3.1.199		YES	ignore
Cell Portion ID	O		9.3.1.200		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.22 E-CID MEASUREMENT INITIATION FAILURE

This message is sent by gNB-DU to indicate that the requested E-CID 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
gNB-CU UE F1AP ID	M		9.3.1.4		YES	reject
gNB-DU UE F1AP ID	M		9.3.1.5		YES	reject
LMF UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
RAN UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.12.23 E-CID MEASUREMENT FAILURE INDICATION

This message is sent by gNB-DU to indicate that the previously requested E-CID measurement can no longer be reported.

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
LMF UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
RAN UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.12.24 E-CID MEASUREMENT REPORT

This message is sent by gNB-DU to report the results of the requested E-CID measurement.

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
LMF UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
RAN UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
E-CID Measurement Result	M		9.3.1.199		YES	ignore
Cell Portion ID	O		9.3.1.200		YES	ignore

9.2.12.25 E-CID MEASUREMENT TERMINATION COMMAND

This message is sent by the gNB-CU to terminate the requested E-CID measurement.

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
LMF UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject
RAN UE Measurement ID	M		INTEGER (1.. 256, …)		YES	reject

9.2.12.26 POSITIONING INFORMATION UPDATE

This message is sent by the gNB-DU to indicate that a change in the SRS configuration has occurred.

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
SRS configuration	O		9.3.1.192		YES	ignore
SFN Initialisation Time	O		9.3.1.183		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 BH RLC CH ID, CHO-CPC resources to be changed, NPN not supported, NPN access denied, gNB-CU Cell Capacity Exceeded, Report Characteristics Empty, Existing Measurement ID, Measurement Temporarily not Available, Measurement not Supported For The Object, Unknown BAP address, Unknown BAP routing ID)	
>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.
gNB-CU Cell Capacity Exceeded	The number of cells requested to be added was exceeding maximum cell capacity in the gNB-CU.
Report Characteristics Empty	The action failed because there is no measurement object in the report characteristics.
Existing Measurement ID	The action failed because the measurement ID is already used.
Measurement Temporarily not Available	The gNB-DU can temporarily not provide the requested measurement object.
Measurement not Supported For The Object	At least one of the concerned object(s) does not support the requested measurement.
Unknown BAP address	The action failed because the BAP address is unknown. This cause value is only applicable to IAB.
Unknown BAP routing ID	The action failed because the BAP routing ID is unknown. This cause value is only applicable to IAB.

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..<maxnoofBPLMNs>*		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 9.3.1.137	If included, the *DL 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-ConfigurationCommon* 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.	YES	reject
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		-	
>Configured TAC Indication	O		9.3.1.87a	NOTE: This IE is associated with the 5GS TAC in the *Broadcast PLMN Identity Info List* IE	YES	ignore
>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
Configured TAC Indication	O		9.3.1.87a	NOTE: This IE is associated with the	YES	ignore

				5GS TAC on top-level of the *Served Cell Information* IE		
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..<maxnoofNrCellBands>*			–	
>>NR Frequency Band	M		INTEGER (1.. 1024, ...)	Operating Band as defined in TS 38.104 [17] section 5.4.2.3. The value 1 corresponds to NR operating band n1, value 2 corresponds to NR operating band n2, etc.	–	
>>Supported SUL band List		*0..<maxnoofNrCellBands>*			–	
>>>Supported SUL band Item	M		INTEGER (1.. 1024, ...)	Supplementary NR Operating Band as defined in TS 38.104 [17] section 5.4.2.3 that can be used for SUL duplex mode as per TS 38.101-1 [26] table 5.2.-1. The value 80 corresponds to NR operating band n80, value 81 corresponds to NR operating band n81, etc.	–	
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(shall 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	UEAssistanceInformation, as defined in TS 36.331 [41].	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	YES	ignore

				defined in TS 38.331 [8]. This IE is used between the SgNB-DU and the SgNB-CU.		
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-Info	O		OCTET STRING	SL-ConfigDedicatedEUTRA-Info 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..<maxnoofSliceItems>*		
>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... <maxnoof SIBTypes>*				
>>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. If the RRC protocol is not supported in the gNB-DU, this IE is set to all '0's.	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
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..<maxnoofUAC perPLMN>*		
>>>>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. In this version of specification, value 99 indicates the highest desired rate reduction.

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, …)	

9.3.1.87a Configured TAC Indication

This IE indicates that the TAC with which this IE is associated, is only configured for the cell, but not broadcast.

NOTE: This IE is defined in accordance to the possibility foreseen in TS 38.331 [8] to not broadcast the TAC if the NR cell only supports PSCell/SCell functionality.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Configured TAC Indication	M		ENUMERATED (true, ...)	

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	Criticality	Assigned Criticality
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, minimumWithoutVendorSpecificExtension, mediumWithoutVendorSpecificExtension, maximumWithoutVendorSpecificExtension, …)	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		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	YES	ignore

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..5119)	
>>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 5120.

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 sublayer.

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		*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/FDD 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/FDD slot configuration.	YES	reject
DUF Transmission Periodicity	O		ENUMERATED (ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, …)		YES	reject
DUF Slot Configuration List		*0..1*				
>**DUF Slot Configuration Item**		*1..<maxnoofDUFSlots>*		The *maxNrofSlots* in TS 38.331 [8].	-	
>>CHOICE *DUF Slot Configuration*	M				-	
>>>Explicit Format					-	
>>>>Permutation	M		ENUMERATED (DFU, UFD, …)		-	
>>>>Number of Downlink Symbols	O		INTEGER (0..14)		-	
>>>>Number of Uplink Symbols	O		INTEGER (0..14)		-	
>>>Implicit Format						
>>>>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..*<maxnoofHSNASlots>*				
>>HSNA Downlink	O		ENUMERATED (HARD, SOFT, NOTAVAILABLE)	HSNA value for downlink symbols in a slot.	-	
>>HSNA Uplink	O		ENUMERATED (HARD, SOFT, NOTAVAILABLE)	HSNA value for uplink symbols in a slot.	-	
>>HSNA Flexible	O		ENUMERATED (HARD, SOFT, NOTAVAILABLE)	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		*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		*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	M		BIT STRING (SIZE (4))	
>>>Medium Bitmap	M		BIT STRING (SIZE (8))	
>>>Long Bitmap	M		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 or subclause 6.3.2 of TS 38.331 [8], *or the iab-donor-DU-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 in the link between IAB-MT of the IAB-node and IAB-DU of the parent IAB-node or 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 Parameters 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 Parameters 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 9.3.1.22	
>Guaranteed Flow Bit Rate Uplink	O		Bit Rate 9.3.1.22	
>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..<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.

9.3.1.138 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-ifEventTypeisPeriodic		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
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..<maxnoofMDTPLMNs>*		
>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(uplink, 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(uplink, downlink, 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(downlink, …)	

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 Void

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.

9.3.1.166 Positioning Measurement Result

The purpose of this information element is to provide the measurement result(s).

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Positioning Measured Result Item		1 .. <maxnoofPosMeas>		
>CHOICE Measured Results Value	M			
>>UL Angle of Arrival	M		9.3.1.167	
>>UL SRS-RSRP	M		INTEGER (0..126)	
>>UL RTOA	M		UL RTOA Measurement 9.3.1.168	
>>gNB Rx-Tx Time Difference	M		9.3.1.170	
>Time Stamp	M		9.3.1.171	
>Measurement Quality	O		TRP Measurement Quality 9.3.1.172	
>Measurement Beam Information	O		9.3.1.173	

Range bound	Explanation
maxnoofPosMeas	Maximum no. of measured quantities that can be configured and reported with one message. Value is 16384.

9.3.1.167 UL Angle of Arrival

This information element contains the uplink Angle of Arrival measurement.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Azimuth Angle of Arrival	M		INTEGER(0..3599)	TS 38.133 [38]
Zenith Angle of Arrival	O		INTEGER(0..1799)	TS 38.133 [38]
LCS to GCS Translation		*0..1*		If absent, the azimuth and zenith are provided in GCS.
>Alpha	M		INTEGER (0..3599)	
>Beta	M		INTEGER (0..3599)	
>Gamma	M		INTEGER (0..3599)	

9.3.1.168 UL RTOA Measurement

This information element contains the uplink RTOA measurement.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *UL RTOA Measurement*	M			
>k0	M		INTEGER (0.. 1970049)	TS 38.133 [38]
>k1	M		INTEGER (0.. 985025)	TS 38.133 [38]
>k2	M		INTEGER (0.. 492513)	TS 38.133 [38]
>k3	M		INTEGER (0.. 246257)	TS 38.133 [38]
>k4	M		INTEGER (0.. 123129)	TS 38.133 [38]
>k5	M		INTEGER (0.. 61565)	TS 38.133 [38]
Additional Path List	O		9.3.1.169	

9.3.1.169 Additional Path List

This information element contains the additional path results of time measurement.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Additional Path Item		1..<maxno*of*Path>		
>CHOICE *Relative Path Delay*	M			
>>k0	M		INTEGER(0..16351)	
>>k1	M		INTEGER(0..8176)	
>>k2	M		INTEGER(0..4088)	
>>k3	M		INTEGER(0..2044)	
>>k4	M		INTEGER(0..1022)	
>>k5	M		INTEGER(0..511)	
>Path Quality	O		TRP Measurement Quality 9.3.1.172	

Range bound	Explanation
maxnoofPath	Maximum no. of additional path measurements. Value is 2.

9.3.1.170 gNB Rx-Tx Time Difference

This information element contains the gNB Rx-Tx Time Difference measurement.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *gNB Rx-Tx Time Difference Measurement*	M			
>k0	M		INTEGER (0.. 1970049)	TS 38.133 [38]
>k1	M		INTEGER (0.. 985025)	TS 38.133 [38]
>k2	M		INTEGER (0.. 492513)	TS 38.133 [38]
>k3	M		INTEGER (0.. 246257)	TS 38.133 [38]
>k4	M		INTEGER (0.. 123129)	TS 38.133 [38]
>k5	M		INTEGER (0.. 61565)	TS 38.133 [38]
Additional Path List	O		9.3.1.169	

9.3.1.171 Time Stamp

This information element contains the time stamp associated with the measurement.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
System Frame Number	M		INTEGER(0..1023)	
CHOICE *Slot Index*	M			
>SCS-15	M		INTEGER(0..9)	
>SCS-30	M,		INTEGER(0..19)	
>SCS-60	M		INTEGER(0..39)	
>SCS-120	M		INTEGER(0..79)	
Measurement Time	O		SFN Initialisation Time 9.3.1.183	

9.3.1.172 TRP Measurement Quality

This information element contains the TRP's best estimate of the quality of the measurement.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *TRP Measurement Quality*	M			
>*Timing Measurement Quality*				
>>Measurement Quality	M		INTEGER(0..31)	TS 37.355 [39]
>>Resolution	M		ENUMERATED(0.1m , 1m, 10m, 30m, …)	TS 37.355 [39]
>*Angle Measurement Quality*				
>> Azimuth Quality	M		INTEGER(0..255)	
>> Zenith Quality	O		INTEGER(0..255)	
>>Resolution	M		ENUMERATED (0.1deg, …)	

9.3.1.173 Measurement Beam Information

This information element contains the receiving beam information when measuring UL signals.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
PRS Resource ID	O		INTEGER(0..63)	
PRS Resource Set ID	O		INTEGER(0..7)	
SSB Index	O		INTEGER(0..63)	

9.3.1.174 NG-RAN Access Point Position

This IE is used to identify the geographical position of an NG-RAN Access Point / TRP / TRP Antenna Reference Points. It is expressed as ellipsoid point with altitude and uncertainty ellipsoid according to TS 23.032 [36].

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Latitude Sign	M		ENUMERATED (North, South)	
Degrees Of Latitude	M		INTEGER ($0..2^{23}-1$)	The IE value (N) is derived by this formula: $N \leq 2^{23}$ X /90 < N+1 X being the latitude in degrees (0°.. 90°).
Degrees Of Longitude	M		INTEGER ($-2^{23}..2^{23}-1$)	The IE value (N) is derived by this formula: $N \leq 2^{24}$ X /360 < N+1 X being the longitude in degrees (-180°..+180°).
Direction of Altitude	M		ENUMERATED (Height, Depth)	
Altitude	M		INTEGER ($0..2^{15}-1$)	The relation between the value (N) and the altitude (a) in meters it describes is N ≤ a < N+1, except for $N=2^{15}-1$ for which the range is extended to include all greater values of (a).
Uncertainty semi-major	M		INTEGER (0..127)	The uncertainty "r" is derived from the "uncertainty code" k by $r = 10x(1.1^k-1)$.
Uncertainty semi-minor	M		INTEGER (0..127)	The uncertainty "r" is derived from the "uncertainty code" k by $r = 10x(1.1^k-1)$.
Orientation of major axis	M		INTEGER (0..179)	
Uncertainty Altitude	M		INTEGER (0..127)	The uncertainty altitude "h" expressed in metres is derived from the "uncertainty code" k, by: $h=45x(1.025^k-1)$.
Confidence	M		INTEGER (0..100)	In percentage

9.3.1.175 Requested SRS Transmission Characteristics

This IE contains the requested SRS configuration for the UE for positioning purposes.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Number Of Periodic Transmissions	C-ifResourceTypePeriodic		INTEGER (0..500,…)	The number of periodic SRS transmissions requested. The value of '0' represents an infinite number of SRS transmissions.
Resource Type	M		ENUMERATED (periodic, semi-persistent, aperiodic, …)	
CHOICE *Bandwidth SRS*	M			
>*FR1*				
>>FR1 Bandwidth	M		ENUMERATED (5, 10, 20, 40, 50, 80, 100, ...)	
>*FR2*				
>>FR2 Bandwidth	M		ENUMERATED (50, 100, 200, 400,…)	
SRS Resource Set List		*0.. 1*		
>SRS Resource Set Item		*1..< maxnoSRS-ResourceSets>*		
>>Number of SRS Resources Per Set	O		INTEGER (1..16,...)	The number of SRS Resources per resource set for SRS transmission.
>>**Periodicity List**		*0.. 1*		
>>>Periodicity List Item		1..*<maxnoSRS-ResourcePerSet>*		
>>>>PeriodicitySRS	M		ENUMERATED (0.125, 0.25, 0.5, 0.625, 1, 1.25, 2, 2.5, 4, 5, 8, 10, 16, 20, 32, 40, 64, 80, 160, 320, 640, 1280, 2560, 5120, 10240, …)	Milli-seconds
>>Spatial Relation Information	O		9.3.1.181	
>>Pathloss Reference Information	O		9.3.1.201	
SSB Information	O		9.3.1.202	

Condition	Explanation
ifResourceTypePeriodic	This IE shall be present if the *Resource Type* IE is set to the value "Periodic".
Range bound	**Explanation**
maxnoSRS-ResourceSets	Maximum no of requested SRS Resource Sets for SRS transmission. Value is 16.
maxnoSRS-ResourcePerSet	Maximum no of SRS Resources per set. Value is 16.

9.3.1.176 TRP Information

The *TRP Information* IE contains information for one TRP within a gNB-DU.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
TRP ID	M		9.3.1.197	
TRP Information Type Response List		*1*		
>TRP Information Type Response Item		*1 .. <maxnoofTRPInfoTypes>*		
>>CHOICE *TRP Information Type Response Item*	M			
>>>NR PCI	M		INTEGER (0..1007)	NR Physical Cell ID
>>>NR CGI			9.3.1.12	
>>>NR ARFCN	M		INTEGER (0..3279165)	
>>>PRS Configuration	M		9.3.1.177	
>>>SSB Information	M		9.3.1.202	
>>>SFN Initialisation Time	M		9.3.1.183	
>>>Spatial Direction Information	M		9.3.1.179	
>>>Geographical Coordinates	M		9.3.1.184	

Range bound	Explanation
maxnoofTRPInfoTypes	Maximum no of TRP information types that can be requested and reported with one message. Value is 64.

9.3.1.177 PRS Configuration

This information element contains the DL PRS configuration for the TRP.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
PRS Resource Set List	M	1..<maxnoofPRS resourceSets>		
>PRS Resource Set ID	M		INTEGER(0..7)	
>Subcarrier Spacing	M		ENUMERATED(kHz15, kHz30, kHz60, kHz120, …)	
>PRS bandwidth	M		INTEGER(1..63)	24,28,…,272 PRBs
>Start PRB	M		INTEGER(0..2176)	Starting PRB to Point A
>Point A	M		INTEGER (0..3279165)	NR ARFCN
>Comb Size	M		ENUMERATED(2, 4, 6, 12, …)	
>CP Type	M		ENUMERATED(normal, extended, …)	
>Resource Set Periodicity	M		ENUMERATED(4,5,8,10,16,20,32,40,64,80,160,320,640,1280,2560,5120,10240,20480,40960,81920, …)	
>Resource Set Slot Offset	M		INTEGER(0..81919, …)	
>Resource Repetition Factor	M		ENUMERATED(rf1, rf2,rf4,rf6,rf8,rf16,rf32,…)	
>Resource Time Gap	M		ENUMERATED(tg1, tg2,tg4,tg8,tg16,tg32,…)	
>Resource Number of Symbols	M		ENUMERATED(n2, n4,n6,n12,…)	
>PRS Muting	O			
>>Option1	O			
>>>Muting Pattern	M		DL-PRS Muting Pattern 9.3.1.178	Muting pattern option 1 is used to mute the whole PRS resource set (within a period)
>>>Muting Bit Repetition Factor	M		ENUMERATED(rf1, rf2,rf4,rf8,…)	
>>Option2	O			
>>>Muting Pattern	M		DL-PRS Muting Pattern 9.3.1.178	Muting pattern option 2 is used to mute the selected repetition of the resource set (within the period)
>PRS Resource Transmit Power	M		INTEGER(-60..50)	
>PRS Resource List	M	1..<maxnoofPRS resources>		*NR-DL-PRS-Resource-r16* as defined in TS 37.355 [39]
>>PRS Resource ID	M		INTEGER(0..63)	
>>Sequence ID	M		INTEGER(0..4095)	
>>RE Offset	M		INTEGER(0..11, …)	
>>Resource Slot Offset	M		INTEGER(0..511)	
>>Resource Symbol Offset	M		INTEGER(0..12)	
>>CHOICE *QCL Info*	O			
>>>*SSB*				
>>>>PCI	M		INTEGER (0..1007)	
>>>>SSB Index	O		INTEGER(0..63)	
>>>*DL-PRS*	O			
>>>>QCL Source PRS Resource Set ID	M		INTEGER(0..7)	
>>>>QCL Source PRS Resource ID	O		INTEGER(0..63)	If absent, the QCL source PRS resource ID is the same as the PRS resource ID

Range bound	Explanation
maxnoofPRSresourceSets	Maximum no of PRS resource sets. Value is 8.
maxnoofPRSresources	Maximum no of PRS resources per PRS resource set. Value is 64.

9.3.1.178 DL-PRS Muting Pattern

This information element contains the DL-PRS muting pattern.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE DL-*PRS Muting Pattern*	M			
>Two	M		BIT STRING (SIZE(2))	
>Four	M		BIT STRING (SIZE(4))	
>Six	M		BIT STRING (SIZE(6))	
>Eight	M		BIT STRING (SIZE(8))	
>Sixteen	M		BIT STRING (SIZE(16))	
>Thirty-two	M		BIT STRING (SIZE(32))	

9.3.1.179 Spatial Direction Information

This information element contains the spatial direction information of the DL PRS resources for the TRP.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR-PRS Beam Information	M		9.3.1.198	The spatial directions of DL-PRS Resources for TRP

9.3.1.180 SRS Resource Set ID

This information element indicates a resource set in the UE for UL SRS transmission.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SRS Resource Set ID	M		INTEGER (0..15)	According to TS 38.331 [8]

9.3.1.181 Spatial Relation Information

This information element indicates a spatial relation for transmission of UL SRS by a UE.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Spatial Relation for Resource ID		*1*		According to TS 38.321 [16] and and TS 38.331 [8]
>Spatial Relation for Resource ID Item		*1..<maxnoSpatialRelations>*		
>>CHOICE *Reference Signal*	M			
>>>NZP CSI-RS				
>>>>NZP CSI-RS Resource ID	M		INTEGER (0..191)	
>>>SSB				
>>>>PCI	M		INTEGER (0..1007)	
>>>>SSB Index	O		INTEGER (0..63)	
>>>SRS				
>>>>SRS Resource ID	M		INTEGER (0..63)	
>>>Positioning SRS				
>>>> Positioning SRS Resource ID	M		INTEGER (0..63)	
>>>DL-PRS				
>>>>DL-PRS ID	M		INTEGER (0..255)	
>>>>DL-PRS Resource Set ID	M		INTEGER (0..7)	
>>>>DL PRS Resource ID	O		INTEGER (0..63)	

Range bound	Explanation
maxnoSpatialRelations	Maximum no. of Spatial Relations that can be configured. Value is 64.

9.3.1.182 SRS Resource Trigger

This information element indicates a DCI code point according to a SRS resource set configuration.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Aperiodic SRS Resource Trigger List		*1..<maxnoSRS-TriggerStates>*		According to TS 38.331 [8]
>Aperiodic SRS Resource Trigger			INTEGER (1..3)	

Range bound	Explanation
maxnoSRS-TriggerStates	Maximum no. of SRS trigger states. Value is 3.

9.3.1.183 SFN Initialisation Time

This information element indicates the SFN Initialisation Time.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SFN Initialisation Time	M		BIT STRING (SIZE(64))	Time in seconds relative to 00:00:00 on 1 January 1900 (calculated as continuous time without leap seconds and traceable to a common time reference) where binary encoding of the integer part is in the first 32 bits and binary encoding of the fraction part in the last 32 bits. The fraction part is expressed with a granularity of 1 /2**32 second

9.3.1.184 Geographical Coordinates

This information element contains the geographical coordinates for the TRP.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *TRP Position Definition Type*	M			
>Direct				
>>CHOICE *Accuracy*	M			
>>>normal accuracy				
>>>>TRP Position	M		NG-RAN Access Point Position 9.3.1.174	The configured estimated geographical position of the antenna of the cell/TRP.
>>>high accuracy				
>>>>TRP High Accuracy Access Position	M		NG-RAN High Accuracy Access Point Position 9.3.1.190	The configured estimated geographical high accuracy position of the antenna of the cell/TRP.
>Referenced				
>>Reference Point	M		9.3.1.188	The reference point is used to derive the TRP position
>>CHOICE *Type*	M			
>>>Geodetic				
>>>>TRP Position Relative Geodetic	M		Relative Geodetic Location 9.3.1.186	The configured estimated relative geodetic coordinate of the antenna of the cell/TRP
>>>Cartesian				
>>>>TRP Position Relative Cartesian	M		Relative Cartesian Location 9.3.1.187	The configured estimated relative Cartesian coordinate of the antenna of the cell/TRP
DL-PRS Resource Coordinates	O		9.3.1.185	DL-PRS Resource Coordinates relative to the TRP coordinate

9.3.1.185 DL-PRS Resource Coordinates

This information element contains the geographical coordinates of the antenna reference points (ARP) for the DL-PRS Resources of a TRP.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
DL-PRS Resource Set ARP List	M	*1..<maxnoofPRS-ResourceSets>*		
>DL-PRS Resource Set ID	M		INTEGER (0..7)	
>CHOICE *DL-PRS Resource Set ARP Location*	M			Relative to the geographical coordinates for the TRP. If this IE is absent, the Relative Location is zero for the indicated DL-PRS Resource Set ID.
>>Geodetic				
>>>Relative Geodetic Location	M		Relative Geodetic Location 9.3.1.186	
>>Cartesian				
>>>Relative Cartesian Location	M		Relative Cartesian Location 9.3.1.187	
>DL-PRS Resource ARP List	M	*1..<maxnoofPRS-ResourcesPerSet>*		
>>DL-PRS Resource ID	M		INTEGER (0..63)	
>>CHOICE *DL-PRS Resource ARP Location*	M			Relative to the DL-PRS Resource Set ARP Location. If this IE is absent, the Relative Location is zero for the indicated DL-PRS Resource ID.
>>Geodetic				
>>>Relative Geodetic Location	O		Relative Geodetic Location 9.3.1.186	
>>Cartesian				
>>>Relative Cartesian Location	O		Relative Cartesian Location 9.3.1.187	

Range bound	Explanation
maxnoofPRS-ResourceSets	Maximum no of DL-PRS resource sets per TRP. Value is 2.
maxnoofPRS-ResourcesPerSet	Maximum no of DL-PRS resources of the DL-PRS resource set of the TRP. Value is 64.

9.3.1.186 Relative Geodetic Location

This information element provides a location relative to some known reference location in a relative geodetic coordinate system.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Milli-Arc-Second Units	M		ENUMERATED (0.03, 0.3, 3, ...)	Units and scale factor for the delta-latitude and delta-longitude fields, TS 37.355 [39].
Height Units	M		ENUMERATED (mm, cm, m, ...)	Units and scale factor for the delta-height field, TS 37.355 [39].
Delta Latitude	M		INTEGER (-1024..1023)	Delta value in latitude in the unit provided in Milli-Arc-Second Units, TS 37.355 [39].
Delta Longitude	M		INTEGER (-1024..1023)	Delta value in longitude in the unit provided in Milli-Arc-Second Units, TS 37.355 [39].
Delta Height	M		INTEGER (-1024..1023)	Delta value in ellipsoidal height in the unit provided in Height Units, TS 37.355 [39].
Location uncertainty	M		9.3.1.189	

9.3.1.187 Relative Cartesian Location

This information element provides a location relative to some known reference location in a relative Cartesian coordinate.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
XYZ unit	M		ENUMERATED (mm, cm, dm,..)	
X value	M		INTEGER (-2^{16}.. 2^{16}-1)	Positive value represents northing from reference point, in units of *XYZ Unit* IE.
Y value	M		INTEGER (-2^{16}.. 2^{16}-1)	Positive value represents easting from reference point in units of *XYZ Unit* IE.
Z value	M		INTEGER (-2^{15}.. 2^{15}-1)	Positive value represents height above reference point in units of *XYZ Unit* IE.
Location uncertainty	M		9.3.1.189	

9.3.1.188 Reference Point

This information element provides a reference point location information.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *ReferencePoint*	M			Reference point to which relative location information is related to
>Coordinate ID				
>>Coordinate ID	M		INTEGER(0.. 2^9-1,..)	Referential ID mapped via OAM
>Reference Point Coordinates				
>>Reference Point Position	M		NG-RAN Access Point Position 9.3.1.174	
>Reference Point Coordinates High Accuracy				
>>Reference Point High Accuracy Access Position	M		NG-RAN High Accuracy Access Point Position 9.3.1.190	

9.3.1.189 Location Uncertainty

This information element provides the location uncertainty information.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Horizontal Uncertainty	M		INTEGER (0..255)	Horizontal uncertainty of the ARP latitude/longitude. Corresponds to the encoded high accuracy uncertainty as defined in TS 23.032 [36]
Horizontal Confidence	M		INTEGER (0..100)	Corresponds to confidence as defined in TS 23.032 [36].
Vertical Uncertainty	M		INTEGER (0..255)	Vertical uncertainty of the ARP altitude. Corresponds to the encoded high accuracy uncertainty as defined in TS 23.032 [36]
Vertical Confidence	M		INTEGER (0..100)	Corresponds to confidence as defined in TS 23.032 [36].

9.3.1.190 NG-RAN High Accuracy Access Point Position

The *NG-RAN High Accuracy Access Point Position* IE is used to identify the geographical position of an NG-RAN Access Point. It is expressed as High Accuracy Ellipsoid point with altitude and uncertainty ellipsoid according to TS 23.032 [36].

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Degrees of Latitude	M		INTEGER(-2147483648..2147483647)	
Degrees of Longitude	M		INTEGER(-2147483648..2147483647)	
Altitude	M		INTEGER(-64000..1280000)	
Uncertainty Semi Major	M		INTEGER (0..255)	
Uncertainty Semi Minor	M		INTEGER (0..255)	
Orientation Major Axis	M		INTEGER (0..179)	
Horizontal Confidence	M		INTEGER (0..100)	
Uncertainty Altitude	M		INTEGER (0..255)	
Vertical Confidence	M		INTEGER (0..100)	

9.3.1.191 Positioning Broadcast Cells

This IE is used to indicate the cells that are requested to broadcast, or failed to broadcast, the associated posSIB(s).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Positioning Broadcast Cells		*1 .. <maxnoBcastCell>*		
>NR CGI	M		9.3.1.12	

Range bound	Explanation
maxnoBcastCells	Maximum no. of cells broadcasting a posSIB in a NB-DU. Value is 16384.

9.3.1.192 SRS Configuration

This information element contains the SRS configuration configured by the gNB-CU for the UE.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SRS Carrier List		*1..<maxnoSRS-Carriers>*		
>Point A	M		INTEGER (0..3279165)	NR ARFCN
>Uplink Channel BW-PerSCS-List		*1..<maxnoSCSs>*		SCS-SpecificCarrier TS 38.331 [8]
>>Offset To Carrier	M		INTEGER(0..2199, …)	First usable RB to Point A in the number of PRBs
>>Subcarrier Spacing	M		ENUMERATED(kHz15, kHz30, kHz60, kHz120,…)	
>>Carrier Bandwidth	M		INTEGER(1..275, …)	
>Active UL BWP	M			Only the configuration in the active UL BWP is needed.
>>Location And Bandwidth	M		INTEGER(0..37949, …)	BWP TS 38.331 [8]
>>Subcarrier Spacing	M		ENUMERATED(kHz15, kHz30, kHz60, kHz120,…)	
>>Cyclic Prefix	M		ENUMERATED(Normal, Extended)	
>>Tx Direct Current Location	M		INTEGER(0..3301, …)	
>>Shift7dot5kHz	O		ENUMERATED(true,…)	
>>SRS Config	M			*SRS-Config* as defined in TS 38.331 [8]
>>>SRS Resource List		*0..<maxnoSRS-Resources>*		
>>>>SRS Resource	M		9.3.1.193	*SRS-Resource* as defined in TS 38.331 [8]
>>>Positioning SRS Resource List		*0..<maxnoSRS-PosResources>*		
>>>>Positioning SRS Resource	M		9.3.1.194	*SRS-PosResource-r16* as defined in TS 38.331 [8]
>>>SRS Resource Set List		*0..<maxnoSRS-ResourceSets>*		
>>>>SRS Resource Set	M		9.3.1.195	*SRS-ResourceSet* as defined in TS 38.331 [8]
>>>Positioning SRS Resource Set List		*0..<maxnoSRS-PosResourceSets>*		
>>>>Positioning SRS Resource Set	M		9.3.1.196	*SRS-PosResourceSet-r16* as defined in TS 38.331 [8]
>PCI	O		INTEGER (0..1007)	Physical Cell ID of the cell that contains the SRS carrier

Range bound	Explanation
maxnoSRS-Carriers	Maximum no of carriers for SRS. Value is 32.
maxnoSCSs	Maximum no of SCS spacings for a carrier. Value is 5.
maxnoSRS-Resources	Maximum no of SRS resources per UL BWP. Value is 64.
maxnoSRS-PosResources	Maximum no of positioning SRS resources per UL BWP. Value is 64.
maxnoSRS-ResourceSets	Maximum no of SRS resource sets. Value is 16.
maxnoSRS-PosResourceSets	Maximum no of positioning SRS resource sets per UL BWP. Value is 16.

9.3.1.193 SRS Resource

This information element contains the SRS resource.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SRS Resource ID	M		INTEGER (0..63, ...)	
Number of Ports	M		ENUMERATED(ports 1, ports2, ports4)	
CHOICE *Transmission Comb*	M			
>Comb Two				
>>Comb Offset	M		INTEGER(0..1)	
>>Cyclic Shift	M		INTEGER(0..7)	
>Comb Four				
>>Comb Offset	M		INTEGER(0..3)	
>>Cyclic Shift	M		INTEGER(0..11)	
Start Position	M		INTEGER(0..13)	
Number of Symbols	M		ENUMERATED(1,2,4)	
Repetition Factor	M		ENUMERATED(1,2,4)	
Frequency Domain Position	M		INTEGER(0..67)	
Frequency Domain Shift	M		INTEGER(0..268)	
C-SRS	M		INTEGER(0..63)	
B-SRS	M		INTEGER(0..3)	
B-Hop	M		INTEGER(0..3)	
Group or Sequence Hopping	M		ENUMERATED(Neither, groupHopping, sequenceHopping)	
CHOICE *Resource Type*	M			
>Periodic				
>>Periodicity	M		ENUMERATED(slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320, slot640, slot1280, slot2560, …)	
>>Offset	M		INTEGER(0..2559, …)	
>Semi-persistent				
>>Periodicity	M		ENUMERATED(slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320, slot640, slot1280, slot2560, …)	
>>Offset	M		INTEGER(0..2559, …)	
>Aperiodic				
>>Aperiodic Resource Type	M		ENUMERATED(true, …)	
Sequence ID	M		INTEGER(0..1023)	

9.3.1.194 Positioning SRS Resource

This information element contains the SRS resource for positioning.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Positioning SRS Resource ID	M		INTEGER (0..63)	
CHOICE *Transmission Comb Positioning*	M			
>Comb Two				
>>Comb Offset	M		INTEGER(0..1)	
>>Cyclic Shift	M		INTEGER(0..7)	
>Comb Four				
>>Comb Offset	M		INTEGER(0..3)	
>>Cyclic Shift	M		INTEGER(0..11)	
>Comb Eight				
>>Comb Offset	M		INTEGER(0..7)	
>>Cyclic Shift	M		INTEGER(0..5)	
Start Position	M		INTEGER(0..13)	
Number of Symbols	M		ENUMERATED(1,2,4,8,12)	
Frequency Domain Shift	M		INTEGER(0..268)	
C-SRS	M		INTEGER(0..63)	
Group or Sequence Hopping	M		ENUMERATED(Neither, groupHopping, sequenceHopping)	
CHOICE *Resource Type Positioning*	M			
>Periodic				
>>Periodicity	M		ENUMERATED(slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320, slot640, slot1280, slot2560, slot5120, slot10240, slot40960, slot81920,…)	
>>Offset	M		INTEGER(0..81919, …)	
>Semi-persistent				
>>Periodicity	M		ENUMERATED(slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320, slot640, slot1280, slot2560, slot5120, slot10240, slot20480, slot40960, slot81920, …)	
>>Offset	M		INTEGER(0..81919, …)	
>Aperiodic				
>>Slot offset	M		INTEGER(0..32)	
Sequence ID	M		INTEGER(0..65535)	
CHOICE *Spatial Relation Positioning*	O			
>SSB				
>>PCI	M		INTEGER (0..1007)	
>>SSB index	O		INTEGER(0..63)	
>PRS				
>>PRS ID	M		INTEGER(0..255)	
>>PRS Resource Set ID	M		INTEGER(0..7)	
>>PRS Resource ID	O		INTEGER(0..63)	

9.3.1.195 SRS Resource Set

This information element indicates a SRS resource set in the UE for UL SRS transmission.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SRS Resource Set ID	M		INTEGER(0..15)	
SRS Resource ID List		1..*<maxnoSRS-ResourcePerSet>*		
>SRS Resource ID	M		INTEGER (0..63, ...)	
CHOICE *Resource Set Type*	M			
>Periodic				
>>PeriodicSet	M		ENUMERATED(true, …)	
>Semi-persistent				
>>Semi-persistentSet	M		ENUMERATED(true, …)	
>Aperiodic				
>>SRS Resource Trigger List	M		INTEGER(1..3)	
>>Slot offset	M		INTEGER(0..32)	

Range bound	Explanation
maxnoSRS-ResourcePerSet	Maximum no of SRS resources per SRS resource set. Value is 16.

9.3.1.196 Positioning SRS Resource Set

This information element indicates a positioning SRS resource set in the UE for UL SRS transmission.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Positioning SRS Resource Set ID	M		INTEGER(0..15)	
Positioning SRS Resource ID List		1..*<maxnoSRS-PosResourcePerSet>*		
>Positioning SRS Resource ID	M		INTEGER (0..63, ...)	
CHOICE *Resource Type*	M			
>Periodic				
>>PosperiodicSet	M		ENUMERATED(true, …)	
>Semi-persistent				
>>Possemi-persistentSet	M		ENUMERATED(true, …)	
>Aperiodic				
>>SRS Resource Trigger List	M		INTEGER(1..3)	

Range bound	Explanation
maxnoSRS-PosResourcePerSet	Maximum no of positioning SRS resources per positioning SRS resource set. Value is 16.

9.3.1.197 TRP ID

The *TRP ID* IE is used to identify a TRP uniquely within a gNB-CU.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
TRP Identifier	M		INTEGER (1..65535,…)	Identifies a TRP within an gNB-CU

9.3.1.198 NR-PRS Beam Information

This IE contains spatial direction information of the DL-PRS Resources.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
NR-PRS Beam Information List		*1*		
>NR-PRS Beam Information Item		*1 .. < maxnoofPRS-ResourceSets >*		
>>PRS Resource Set ID	M		INTEGER (0..7)	The resource set in which the resources are associated with the angle.
>>PRS Angle List		*1*		
>>>PRS Angle Item		*1..< maxnoofPRS-ResourcesPerSet >*		
>>>>NR PRS Azimuth	M		INTEGER (0..359)	
>>>>NR PRS Azimuth fine	O		INTEGER (0..9)	Fine angles
>>>>NR PRS Elevation	O		INTEGER (0..180)	
>>>>NR PRS Elevation fine	O		INTEGER (0..9)	Fine angles
LCS to GCS Translation List		*0..1*		If absent, the azimuth and elevation are provided in GCS.
>LCS to GCS Translation		*1 .. <maxnooflcs-gcs-translation>*		
>>Alpha	M		INTEGER (0..359)	
>>Alpha-fine	O		INTEGER (0..9)	Fine angles
>>Beta	M		INTEGER (0..359)	
>>Beta-fine	O		INTEGER (0..9)	Fine angles
>>Gamma	M		INTEGER (0..359)	
>>Gamma-fine	O		INTEGER (0..9)	Fine angles

Range bound	Explanation
maxnoofPRS-ResourceSets	Maximum no of DL-PRS resource sets per TRP. Value is 2.
maxnoofPRS-ResourcesPerSet	Maximum no of DL-PRS resources of the DL-PRS resource set of the TRP. Value is 64.
maxnooflcs-gcs-translation	Maximum no. of LCS-GS-Translation-Parameters that can reported with one message. Value is 3. The current version of the specification supports 1.

9.3.1.199 E-CID Measurement Result

The purpose of this IE is to provide the E-CID measurement result.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Geographical Coordinates	O		9.3.1.184	The configured estimated geographical position of the antenna of the cell.
Measured Results List		*0..1*		
>E-CID Measured Results Item		*1 .. <maxnoMeasE-CID>*		
>>CHOICE *Measured Results Value*	M			
>>>Value Angle of Arrival NR	M		UL Angle of Arrival 9.3.1.167	

Range bound	Explanation
maxnoMeasE-CID	Maximum no. of measured quantities that can be configured and reported with one message. Value is 64.

9.3.1.200 Cell Portion ID

This IE gives the current Cell Portion associated with the target UE. The Cell Portion ID is the unique identifier for a cell portion within a cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Cell Portion ID	M		INTEGER (0..4095, …)	

9.3.1.201 Pathloss Reference Information

This information element indicates a pathloss reference for transmission of UL SRS by a UE.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *Pathloss Reference Signal*	M			
>SSB				
>>PCI	M		INTEGER (0..1007)	
>>SSB Index	O		INTEGER (0..63)	
>DL-PRS				
>>DL-PRS ID	M		INTEGER (0..255)	
>>DL-PRS Resource Set ID	M		INTEGER (0..7)	
>>DL PRS Resource ID	O		INTEGER (0..63)	

9.3.1.202 SSB Information

This information element contains the SSB time/frequency information for the TRPs.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SSB Information List		1		
>SSB Information Item		1… <maxNoSSBs>		
>SSB Configuration	M		SSB Time/Frequency Configuration 9.3.1.203	
>PCI	M		INTEGER (0..1007)	

Range bound	Explanation
maxNoSSBs	Maximum no of SSBs for which the configuration can be provided. Value is 255.

9.3.1.203 SSB Time/Frequency Configuration

This information element contains the time and frequency configuration of an SSB.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SSB frequency	M		INTEGER (0..3279165)	ARFCN
SSB subcarrier spacing	M		ENUMERATED(kHz15, kHz30, kHz60, kHz120, kHz240,...)	
SSB Transmit power	M		INTEGER (-60..50)	EPRE of SSS
SSB periodicity	M		ENUMERATED(ms5, ms10, ms20, ms40, ms80, ms160, …)	
SSB half frame index	M		INTEGER(0..1)	
SSB SFN offset	M		INTEGER(0..15)	
CHOICE *SSB Position in Burst*	O			
>Short				
>>Short Bitmap			BIT STRING (SIZE(4))	
>Medium				
>>Medium Bitmap			BIT STRING (SIZE(8))	
>Long				
>>Long Bitmap			BIT STRING (SIZE(64))	
SFN Initialisation Time	O		9.3.1.183	

9.3.1.204 Search Window Information

This information element contains search window information for the TRP.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Expected Propagation Delay	M		INTEGER (-3841..3841,…)	Indicates when the SRS is expected to arrive in time at the TRP relative to the UL RTOA Reference Time. The UL RTOA Reference Time for a target SRS is defined as $T_0 + t_{SRS}$, where - T_0 is the SFN Initialisation Time - $t_{SRS} = (10n_f + n_{sf}) \times 10^{-3}$, where n_f and n_{sf} are the system frame number and the subframe number of the SRS, respectively. Granularity 4Ts, where Ts=1/(15·10^3 ·2048) seconds. Centre of the search window.
Delay Uncertainty	M		INTEGER (1..246,…)	Indicates the uncertainty of the expected SRS arrival time at the TRP Granularity 4Ts, where Ts=1/(15·10^3·2048) seconds. Single-sided search window.

9.3.1.205 Extended gNB-DU Name

This IE provides extended human readable name of the gNB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-DU Name Visible	O		VisibleString (SIZE(1..150, …))	
gNB-DU Name UTF8	O		UTF8String (SIZE(1..150, …))	

9.3.1.206 Extended gNB-CU Name

This IE provides extended human readable name of the gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU Name Visible	O		VisibleString (SIZE(1..150, …))	
gNB-CU Name UTF8	O		UTF8String (SIZE(1..150, …))	

9.3.1.207 F1-C Transfer Path

This IE indicates the transmission path of the F1-C traffic.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
F1-C Path NSA	M		ENUMERATED (lte, nr, both)	This IE indicates the transmission path of the F1-C traffic in EN-DC.

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,
    BAPMappingConfigurationFailure,
    GNBDUResourceConfiguration,
    GNBDUResourceConfigurationAcknowledge,
    GNBDUResourceConfigurationFailure,
    IABTNLAddressRequest,
    IABTNLAddressResponse,
    IABTNLAddressFailure,
    IABUPConfigurationUpdateRequest,
    IABUPConfigurationUpdateResponse,
    IABUPConfigurationUpdateFailure,
    ResourceStatusRequest,
    ResourceStatusResponse,
    ResourceStatusFailure,
    ResourceStatusUpdate,
    AccessAndMobilityIndication,
    ReferenceTimeInformationReportingControl,
    ReferenceTimeInformationReport,
    AccessSuccess,
    CellTrafficTrace,
    PositioningMeasurementRequest,
    PositioningMeasurementResponse,
    PositioningMeasurementFailure,
    PositioningAssistanceInformationControl,
    PositioningAssistanceInformationFeedback,
    PositioningMeasurementReport,
    PositioningMeasurementAbort,
    PositioningMeasurementFailureIndication,
```

```
    PositioningMeasurementUpdate,
    TRPInformationRequest,
    TRPInformationResponse,
    TRPInformationFailure,
    PositioningInformationRequest,
    PositioningInformationResponse,
    PositioningInformationFailure,
    PositioningActivationRequest,
    PositioningActivationResponse,
    PositioningActivationFailure,
    PositioningDeactivation,
    PositioningInformationUpdate,
    E-CIDMeasurementInitiationRequest,
    E-CIDMeasurementInitiationResponse,
    E-CIDMeasurementInitiationFailure,
    E-CIDMeasurementFailureIndication,
    E-CIDMeasurementReport,
    E-CIDMeasurementTerminationCommand


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,
    id-PositioningMeasurementExchange,
    id-PositioningAssistanceInformationControl,
    id-PositioningAssistanceInformationFeedback,
    id-PositioningMeasurementReport,
    id-PositioningMeasurementAbort,
    id-PositioningMeasurementFailureIndication,
    id-PositioningMeasurementUpdate,
    id-TRPInformationExchange,
    id-PositioningInformationExchange,
    id-PositioningActivation,
    id-PositioningDeactivation,
    id-PositioningInformationUpdate,
    id-E-CIDMeasurementInitiation,
    id-E-CIDMeasurementFailureIndication,
    id-E-CIDMeasurementReport,
    id-E-CIDMeasurementTermination


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   |
    positioningMeasurementExchange  |
    tRPInformationExchange          |
    positioningInformationExchange  |
    positioningActivation           |
    e-CIDMeasurementInitiation,
    ...
}

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                       |
    positioningAssistanceInformationControl     |
    positioningAssistanceInformationFeedback    |
    positioningMeasurementReport                |
    positioningMeasurementAbort                 |
    positioningMeasurementFailureIndication     |
```

```
    positioningMeasurementUpdate                |
    positioningDeactivation                     |
    e-CIDMeasurementFailureIndication           |
    e-CIDMeasurementReport                      |
    e-CIDMeasurementTermination                 |
    positioningInformationUpdate,
    ...
}
-- ************************************************************
--
-- 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
    UNSUCCESSFUL OUTCOME    BAPMappingConfigurationFailure
    PROCEDURE CODE          id-BAPMappingConfiguration
    CRITICALITY             reject
}

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

iABTNLAddressAllocation F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      IABTNLAddressRequest
    SUCCESSFUL OUTCOME      IABTNLAddressResponse
    UNSUCCESSFUL OUTCOME    IABTNLAddressFailure
    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
}

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
}

positioningAssistanceInformationControl F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningAssistanceInformationControl
    PROCEDURE CODE          id-PositioningAssistanceInformationControl
    CRITICALITY             ignore
}

positioningAssistanceInformationFeedback F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningAssistanceInformationFeedback
    PROCEDURE CODE          id-PositioningAssistanceInformationFeedback
    CRITICALITY             ignore
}

positioningMeasurementExchange F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningMeasurementRequest
    SUCCESSFUL OUTCOME      PositioningMeasurementResponse
    UNSUCCESSFUL OUTCOME    PositioningMeasurementFailure
    PROCEDURE CODE          id-PositioningMeasurementExchange
    CRITICALITY             reject
}

positioningMeasurementReport F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningMeasurementReport
    PROCEDURE CODE          id-PositioningMeasurementReport
    CRITICALITY             ignore
```

```
}

positioningMeasurementAbort F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningMeasurementAbort
    PROCEDURE CODE          id-PositioningMeasurementAbort
    CRITICALITY             ignore
}

positioningMeasurementFailureIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningMeasurementFailureIndication
    PROCEDURE CODE          id-PositioningMeasurementFailureIndication
    CRITICALITY             ignore
}

positioningMeasurementUpdate F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningMeasurementUpdate
    PROCEDURE CODE          id-PositioningMeasurementUpdate
    CRITICALITY             ignore
}


tRPInformationExchange F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      TRPInformationRequest
    SUCCESSFUL OUTCOME      TRPInformationResponse
    UNSUCCESSFUL OUTCOME    TRPInformationFailure
    PROCEDURE CODE          id-TRPInformationExchange
    CRITICALITY             reject
}

positioningInformationExchange F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningInformationRequest
    SUCCESSFUL OUTCOME      PositioningInformationResponse
    UNSUCCESSFUL OUTCOME    PositioningInformationFailure
    PROCEDURE CODE          id-PositioningInformationExchange
    CRITICALITY             reject
}

positioningActivation F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningActivationRequest
    SUCCESSFUL OUTCOME      PositioningActivationResponse
    UNSUCCESSFUL OUTCOME    PositioningActivationFailure
    PROCEDURE CODE          id-PositioningActivation
    CRITICALITY             reject
}

positioningDeactivation F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningDeactivation
    PROCEDURE CODE          id-PositioningDeactivation
    CRITICALITY             ignore
}

e-CIDMeasurementInitiation F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      E-CIDMeasurementInitiationRequest
    SUCCESSFUL OUTCOME      E-CIDMeasurementInitiationResponse
```

```
    UNSUCCESSFUL OUTCOME    E-CIDMeasurementInitiationFailure
    PROCEDURE CODE          id-E-CIDMeasurementInitiation
    CRITICALITY             reject
}

e-CIDMeasurementFailureIndication F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      E-CIDMeasurementFailureIndication
    PROCEDURE CODE          id-E-CIDMeasurementFailureIndication
    CRITICALITY             ignore
}

e-CIDMeasurementReport F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      E-CIDMeasurementReport
    PROCEDURE CODE          id-E-CIDMeasurementReport
    CRITICALITY             ignore
}

e-CIDMeasurementTermination F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      E-CIDMeasurementTerminationCommand
    PROCEDURE CODE          id-E-CIDMeasurementTermination
    CRITICALITY             ignore
}

positioningInformationUpdate F1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PositioningInformationUpdate
    PROCEDURE CODE          id-PositioningInformationUpdate
    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,
    RequestedSRSTransmissionCharacteristics,
    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,
    Served-Cells-To-Delete-Item,
    Served-Cells-To-Modify-Item,
    ServingCellMO,
    SRBID,
    SRBs-FailedToBeSetup-Item,
    SRBs-FailedToBeSetupMod-Item,
    SRBs-Required-ToBeReleased-Item,
    SRBs-ToBeReleased-Item,
    SRBs-ToBeSetup-Item,
    SRBs-ToBeSetupMod-Item,
    SRBs-Modified-Item,
    SRBs-Setup-Item,
    SRBs-SetupMod-Item,
    TimeToWait,
    TransactionID,
    TransmissionActionIndicator,
    UE-associatedLogicalF1-ConnectionItem,
    DUtoCURRCContainer,
    PagingCell-Item,
    SItype-List,
    UEIdentityIndexValue,
    GNB-CU-TNL-Association-Setup-Item,
    GNB-CU-TNL-Association-Failed-To-Setup-Item,
    GNB-CU-TNL-Association-To-Add-Item,
    GNB-CU-TNL-Association-To-Remove-Item,
    GNB-CU-TNL-Association-To-Update-Item,
    MaskedIMEISV,
    PagingDRX,
    PagingPriority,
    PagingIdentity,
    Cells-to-be-Barred-Item,
    PWSSystemInformation,
    Broadcast-To-Be-Cancelled-Item,
    Cells-Broadcast-Cancelled-Item,
    NR-CGI-List-For-Restart-Item,
    PWS-Failed-NR-CGI-Item,
    RepetitionPeriod,
    NumberofBroadcastRequest,
    Cells-To-Be-Broadcast-Item,
    Cells-Broadcast-Completed-Item,
    Cancel-all-Warning-Messages-Indicator,
    EUTRA-NR-CellResourceCoordinationReq-Container,
```

```
EUTRA-NR-CellResourceCoordinationReqAck-Container,
RequestType,
PLMN-Identity,
RLCFailureIndication,
UplinkTxDirectCurrentListInformation,
SULAccessIndication,
Protected-EUTRA-Resources-Item,
GNB-DUConfigurationQuery,
BitRate,
RRC-Version,
GNBDUOverloadInformation,
RRCDeliveryStatusRequest,
NeedforGap,
RRCDeliveryStatus,
ResourceCoordinationTransferInformation,
Dedicated-SIDelivery-NeededUE-Item,
Associated-SCell-Item,
IgnoreResourceCoordinationContainer,
PagingOrigin,
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,
    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,
    PosAssistance-Information,
    PosBroadcast,
    PositioningBroadcastCells,
    RoutingID,
```

```
    PosAssistanceInformationFailureList,
    PosMeasurementQuantities,
    PosMeasurementResultList,
    PosReportCharacteristics,
    TRPInformationTypeItem,
    TRPInformationItem,
    LMF-MeasurementID,
    RAN-MeasurementID,
    SRSResourceSetID,
    SRSSpatialRelation,
    SRSResourceTrigger,
    SRSConfiguration,
    TRPList,
    E-CID-MeasurementQuantities,
    MeasurementPeriodicity,
    E-CID-MeasurementResult,
    Cell-Portion-ID,
    LMF-UE-MeasurementID,
    RAN-UE-MeasurementID,
    SFNInitialisationTime,
    SystemFrameNumber,
    SlotNumber,
    AbortTransmission,
    TRP-MeasurementRequestList,
    MeasurementBeamInfoRequest,
    E-CID-ReportCharacteristics,
    Extended-GNB-CU-Name,
    Extended-GNB-DU-Name,
    F1CTransferPath



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-Extended-GNB-CU-Name,
    id-Extended-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-RequestedSRSTransmissionCharacteristics,
    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,
    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,
    id-PosAssistance-Information,
    id-PosBroadcast,
    id-PositioningBroadcastCells,
    id-RoutingID,
    id-PosAssistanceInformationFailureList,
    id-PosMeasurementQuantities,
    id-PosMeasurementResultList,
    id-PosMeasurementPeriodicity,
    id-PosReportCharacteristics,
    id-TRPInformationTypeListTRPReq,
    id-TRPInformationTypeItem,
    id-TRPInformationListTRPResp,
    id-TRPInformationItem,
    id-LMF-MeasurementID,
    id-RAN-MeasurementID,
    id-SRSType,
    id-ActivationTime,
    id-AbortTransmission,
    id-SRSConfiguration,
    id-TRPList,
    id-E-CID-MeasurementQuantities,
    id-E-CID-MeasurementPeriodicity,
    id-E-CID-MeasurementResult,
    id-Cell-Portion-ID,
    id-LMF-UE-MeasurementID,
    id-RAN-UE-MeasurementID,
    id-SFNInitialisationTime,
    id-SystemFrameNumber,
    id-SlotNumber,
    id-TRP-MeasurementRequestList,
    id-MeasurementBeamInfoRequest,
    id-E-CID-ReportCharacteristics,
    id-F1CTransferPath,
    maxCellingNBDU,
    maxnoofCandidateSpCells,
    maxnoofDRBs,
```

```
    maxnoofErrors,
    maxnoofIndividualF1ConnectionsToReset,
    maxnoofPotentialSpCells,
    maxnoofSCells,
    maxnoofSRBs,
    maxnoofPagingCells,
    maxnoofTNLAssociations,
    maxCellineNB,
    maxnoofUEIDs,
    maxnoofBHRLCChannels,
    maxnoofRoutingEntries,
    maxnoofChildIABNodes,
    maxnoofServedCellsIAB,
    maxnoofTLAsIAB,
    maxnoofULUPTNLInformationforIAB,
    maxnoofUPTNLAddresses,
    maxnoofSLDRBs,
    maxnoofTRPInfoTypes,
    maxnoofTRPs


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} },
    ...
}

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 }|
    { ID id-Extended-GNB-CU-Name            CRITICALITY ignore  TYPE Extended-GNB-CU-Name           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 }|
    { ID id-Extended-GNB-DU-Name            CRITICALITY ignore  TYPE Extended-GNB-DU-Name            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-List PRESENCE optional }|
    { ID id-Dedicated-SIDelivery-NeededUE-List         CRITICALITY ignore  TYPE Dedicated-SIDelivery-NeededUE-List         PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info               CRITICALITY ignore  TYPE Transport-Layer-Address-Info               PRESENCE optional },
    ...
}

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 }|
    { 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 }|
    { ID id-F1CTransferPath                         CRITICALITY reject  TYPE F1CTransferPath                         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 }|
    { 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 }|
    { 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}|
    { ID id-F1CTransferPath                         CRITICALITY reject  TYPE F1CTransferPath                         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},
    ...
}

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

BAPMappingConfigurationFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { { BAPMappingConfigurationFailureIEs} },
    ...
}

BAPMappingConfigurationFailureIEs 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 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},
    ...
}



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

```
--
-- 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 },
    ...
}

-- **************************************************************
--
-- GNB-DU RESOURCE CONFIGURATION FAILURE
--
-- **************************************************************

GNBDUResourceConfigurationFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container        { { GNBDUResourceConfigurationFailureIEs} },
    ...
}

GNBDUResourceConfigurationFailureIEs 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 },
    ...
}


-- **************************************************************
--
-- 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 TNL ADDRESS FAILURE
--
-- ***************************************************************

IABTNLAddressFailure ::= SEQUENCE {
```

```
    protocolIEs         ProtocolIE-Container        { { IABTNLAddressFailureIEs} },
    ...
}

IABTNLAddressFailureIEs 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 },
    ...
}

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


-- ************************************************************
--
-- POSITIONING ASSISTANCE INFORMATION CONTROL ELEMENTARY PROCEDURE
--
-- ************************************************************

-- ************************************************************
--
-- Positioning Assistance Information Control
--
-- ************************************************************

PositioningAssistanceInformationControl ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{ PositioningAssistanceInformationControlIEs}},
    ...
}

PositioningAssistanceInformationControlIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                   CRITICALITY reject  TYPE TransactionID                PRESENCE mandatory   }|
    { ID id-PosAssistance-Information       CRITICALITY reject  TYPE PosAssistance-Information    PRESENCE optional}|
    { ID id-PosBroadcast                    CRITICALITY reject  TYPE PosBroadcast                 PRESENCE optional}|
    { ID id-PositioningBroadcastCells       CRITICALITY reject  TYPE PositioningBroadcastCells    PRESENCE optional}|
    { ID id-RoutingID                       CRITICALITY reject  TYPE RoutingID                    PRESENCE optional},
    ...
}

-- ************************************************************
--
-- POSITIONING ASSISTANCE INFORMATION FEEDBACK ELEMENTARY PROCEDURE
--
-- ************************************************************

-- ************************************************************
--
-- Positioning Assistance Information Feedback
--
-- ************************************************************

PositioningAssistanceInformationFeedback ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{ PositioningAssistanceInformationFeedbackIEs}},
    ...
}

PositioningAssistanceInformationFeedbackIEs F1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID                         CRITICALITY reject  TYPE TransactionID                        PRESENCE mandatory   }|
  { ID id-PosAssistanceInformationFailureList   CRITICALITY reject  TYPE PosAssistanceInformationFailureList  PRESENCE optional}|
  { ID id-PositioningBroadcastCells             CRITICALITY reject  TYPE PositioningBroadcastCells            PRESENCE optional}|
  { ID id-RoutingID                             CRITICALITY reject  TYPE RoutingID                            PRESENCE optional}|
  { ID id-CriticalityDiagnostics                CRITICALITY ignore  TYPE CriticalityDiagnostics               PRESENCE optional},
```

```
    ...
}

-- ************************************************************
--
-- POSITONING MEASUREMENT EXCHANGE ELEMENTARY PROCEDURE
--
-- ************************************************************

-- ************************************************************
--
-- Positioning Measurement Request
--
-- ************************************************************

PositioningMeasurementRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningMeasurementRequestIEs} },
    ...
}

PositioningMeasurementRequestIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                          CRITICALITY reject  TYPE TransactionID                        PRESENCE mandatory}|
    { ID id-LMF-MeasurementID                      CRITICALITY reject  TYPE LMF-MeasurementID                    PRESENCE mandatory}|
    { ID id-RAN-MeasurementID                      CRITICALITY reject  TYPE RAN-MeasurementID                    PRESENCE mandatory}|
    { ID id-TRP-MeasurementRequestList             CRITICALITY reject  TYPE TRP-MeasurementRequestList           PRESENCE mandatory}|
    { ID id-PosReportCharacteristics               CRITICALITY reject  TYPE PosReportCharacteristics           PRESENCE mandatory}|
    { ID id-PosMeasurementPeriodicity              CRITICALITY reject  TYPE MeasurementPeriodicity             PRESENCE conditional }|
    -- The above IE shall be present if the PosReportCharacteristics IE is set to “periodic” --
    { ID id-PosMeasurementQuantities               CRITICALITY reject  TYPE PosMeasurementQuantities             PRESENCE mandatory}|
    { ID id-SFNInitialisationTime                  CRITICALITY ignore  TYPE SFNInitialisationTime                PRESENCE optional }|
    { ID id-SRSConfiguration                       CRITICALITY ignore  TYPE SRSConfiguration                     PRESENCE optional}|
    { ID id-MeasurementBeamInfoRequest             CRITICALITY ignore  TYPE MeasurementBeamInfoRequest           PRESENCE optional }|
    { ID id-SystemFrameNumber                      CRITICALITY ignore  TYPE SystemFrameNumber                    PRESENCE optional}|
    { ID id-SlotNumber                             CRITICALITY ignore  TYPE SlotNumber                           PRESENCE optional},
    ...
}


-- ************************************************************
--
-- Positioning Measurement Response
--
-- ************************************************************

PositioningMeasurementResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningMeasurementResponseIEs} },
    ...
}


PositioningMeasurementResponseIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                          CRITICALITY reject  TYPE TransactionID                        PRESENCE mandatory}|
    { ID id-LMF-MeasurementID                      CRITICALITY reject  TYPE LMF-MeasurementID                    PRESENCE mandatory}|
    { ID id-RAN-MeasurementID                      CRITICALITY reject  TYPE RAN-MeasurementID                    PRESENCE mandatory}|
```

```
    { ID id-PosMeasurementResultList               CRITICALITY reject  TYPE PosMeasurementResultList              PRESENCE optional }|
    { ID id-CriticalityDiagnostics                 CRITICALITY ignore  TYPE CriticalityDiagnostics                PRESENCE optional },
    ...
}


-- ************************************************************
--
-- Positioning Measurement Failure
--
-- ************************************************************

PositioningMeasurementFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningMeasurementFailureIEs} },
    ...
}

PositioningMeasurementFailureIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                  CRITICALITY reject  TYPE TransactionID              PRESENCE mandatory }|
    { ID id-LMF-MeasurementID              CRITICALITY reject  TYPE LMF-MeasurementID          PRESENCE mandatory }|
    { ID id-RAN-MeasurementID              CRITICALITY reject  TYPE RAN-MeasurementID            PRESENCE mandatory   }|
    { ID id-Cause                          CRITICALITY ignore  TYPE Cause                        PRESENCE mandatory   }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional },
    ...
}


-- ************************************************************
--
-- POSITIONING MEASUREMENT REPORT ELEMENTARY PROCEDURE
--
-- ************************************************************

-- ************************************************************
--
-- Positioning Measurement Report
--
-- ************************************************************

PositioningMeasurementReport ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { PositioningMeasurementReportIEs} },
    ...
}

PositioningMeasurementReportIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID              CRITICALITY reject  TYPE TransactionID              PRESENCE mandatory  }|
    { ID id-LMF-MeasurementID          CRITICALITY reject  TYPE LMF-MeasurementID          PRESENCE mandatory  }|
    { ID id-RAN-MeasurementID          CRITICALITY reject  TYPE RAN-MeasurementID          PRESENCE mandatory  }|
    { ID id-PosMeasurementResultList   CRITICALITY reject  TYPE PosMeasurementResultList   PRESENCE mandatory  },
    ...
}

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

```
-- POSITIONING MEASUREMENT ABORT ELEMENTARY PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- Positioning Measurement Abort
--
-- ***************************************************************

PositioningMeasurementAbort ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { PositioningMeasurementAbortIEs} },
    ...
}

PositioningMeasurementAbortIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                   CRITICALITY reject  TYPE TransactionID                PRESENCE mandatory   }|
    { ID id-LMF-MeasurementID               CRITICALITY reject  TYPE LMF-MeasurementID            PRESENCE mandatory   }|
    { ID id-RAN-MeasurementID               CRITICALITY reject  TYPE RAN-MeasurementID            PRESENCE mandatory   },
    ...
}

-- ***************************************************************
--
-- POSITIONING MEASUREMENT FAILURE INDICATION ELEMENTARY PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- Positioning Measurement Failure Indication
--
-- ***************************************************************

PositioningMeasurementFailureIndication ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { PositioningMeasurementFailureIndicationIEs} },
    ...
}

PositioningMeasurementFailureIndicationIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID               CRITICALITY reject  TYPE TransactionID                  PRESENCE mandatory }|
    { ID id-LMF-MeasurementID           CRITICALITY reject  TYPE LMF-MeasurementID              PRESENCE mandatory }|
    { ID id-RAN-MeasurementID           CRITICALITY reject  TYPE RAN-MeasurementID              PRESENCE mandatory }|
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                          PRESENCE mandatory },
    ...
}

-- ***************************************************************
--
-- POSITIONING MEASUREMENT UPDATE ELEMENTARY PROCEDURE
--
-- ***************************************************************

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

```
--
-- Positioning Measurement Update
--
-- ***************************************************************

PositioningMeasurementUpdate ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { PositioningMeasurementUpdateIEs} },
    ...
}

PositioningMeasurementUpdateIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID               CRITICALITY reject  TYPE TransactionID              PRESENCE mandatory  }|
    { ID id-LMF-MeasurementID           CRITICALITY reject  TYPE LMF-MeasurementID          PRESENCE mandatory  }|
    { ID id-RAN-MeasurementID           CRITICALITY reject  TYPE RAN-MeasurementID          PRESENCE mandatory  }|
    { ID id-SRSConfiguration            CRITICALITY ignore  TYPE SRSConfiguration           PRESENCE optional},
    ...
}


-- ***************************************************************
--
-- TRP INFORMATION EXCHANGE ELEMENTARY PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- TRP Information Request
--
-- ***************************************************************

TRPInformationRequest ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { TRPInformationRequestIEs} },
    ...
}

TRPInformationRequestIEs F1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                       CRITICALITY reject  TYPE TransactionID                      PRESENCE mandatory   }|
    { ID id-TRPList                             CRITICALITY ignore  TYPE TRPList                            PRESENCE optional }|
    { ID id-TRPInformationTypeListTRPReq        CRITICALITY reject  TYPE TRPInformationTypeListTRPReq       PRESENCE mandatory   },
    ...
}

TRPInformationTypeListTRPReq ::= SEQUENCE (SIZE(1.. maxnoofTRPInfoTypes)) OF ProtocolIE-SingleContainer { { TRPInformationTypeItemTRPReq } }

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


-- ***************************************************************
--
-- TRP Information Response
```

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

TRPInformationResponse ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { TRPInformationResponseIEs} },
    ...
}

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

TRPInformationListTRPResp ::= SEQUENCE (SIZE(1.. maxnoofTRPs)) OF ProtocolIE-SingleContainer { { TRPInformationItemTRPResp } }

TRPInformationItemTRPResp   F1AP-PROTOCOL-IES ::= {
    { ID id-TRPInformationItem   CRITICALITY ignore     TYPE TRPInformationItem     PRESENCE mandatory },
    ...
}


-- ***************************************************************
--
-- TRP Information Failure
--
-- ***************************************************************

TRPInformationFailure ::= SEQUENCE {
    protocolIEs     ProtocolIE-Container        { { TRPInformationFailureIEs} },
    ...
}

TRPInformationFailureIEs 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 },
    ...
}


-- ***************************************************************
--
-- POSITIONING INFORMATION EXCHANGE ELEMENTARY PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- Positioning Information Request
--
-- ***************************************************************
```

```
PositioningInformationRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningInformationRequestIEs} },
    ...
}

PositioningInformationRequestIEs 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-RequestedSRSTransmissionCharacteristics CRITICALITY ignore  TYPE RequestedSRSTransmissionCharacteristics  PRESENCE optional},
    ...
}


-- ***************************************************************
--
-- Positioning Information Response
--
-- ***************************************************************

PositioningInformationResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningInformationResponseIEs} },
    ...
}


PositioningInformationResponseIEs 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-SRSConfiguration            CRITICALITY ignore  TYPE SRSConfiguration           PRESENCE optional}|
    { ID id-SFNInitialisationTime       CRITICALITY ignore  TYPE SFNInitialisationTime      PRESENCE optional}|
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional },
    ...
}


-- ***************************************************************
--
-- Positioning Information Failure
--
-- ***************************************************************

PositioningInformationFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningInformationFailureIEs} },
    ...
}

PositioningInformationFailureIEs 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 },
    ...
}
```

```
-- ***************************************************************
--
-- POSITIONING ACTIVATION PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- Positioning Activation Request
--
-- ***************************************************************

PositioningActivationRequest ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningActivationRequestIEs} },
    ...
}

PositioningActivationRequestIEs 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-SRSType                 CRITICALITY reject  TYPE SRSType                    PRESENCE mandatory }|
    { ID id-ActivationTime          CRITICALITY ignore  TYPE SFNInitialisationTime      PRESENCE optional  },
    ...
}

SRSType ::= CHOICE {
    semipersistentSRS               SemipersistentSRS,
    aperiodicSRS                    AperiodicSRS,
    choice-extension                ProtocolIE-SingleContainer { { SRSType-ExtIEs} }
}

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

SemipersistentSRS ::= SEQUENCE {
    sRSResourceSetID            SRSResourceSetID,
    sRSSpatialRelation          SRSSpatialRelation  OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { {SemipersistentSRS-ExtIEs} } OPTIONAL,
    ...
}

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

AperiodicSRS ::= SEQUENCE {
    aperiodic                   ENUMERATED {true, ...},
    sRSResourceTrigger          SRSResourceTrigger      OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { {AperiodicSRS-ExtIEs} } OPTIONAL,
    ...
}
```

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


-- ***************************************************************
--
-- Positioning Activation Response
--
-- ***************************************************************

PositioningActivationResponse ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningActivationResponseIEs} },
    ...
}


PositioningActivationResponseIEs 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-SystemFrameNumber       CRITICALITY ignore  TYPE SystemFrameNumber          PRESENCE optional }|
    { ID id-SlotNumber              CRITICALITY ignore  TYPE SlotNumber                 PRESENCE optional }|
    { ID id-CriticalityDiagnostics  CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional },
    ...
}




-- ***************************************************************
--
-- Positioning Activation Failure
--
-- ***************************************************************

PositioningActivationFailure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningActivationFailureIEs} },
    ...
}

PositioningActivationFailureIEs 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 },
    ...
}


-- ***************************************************************
--
-- POSITIONING DEACTIVATION PROCEDURE
--
```

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

-- ***************************************************************
--
-- Positioning Deactivation
--
-- ***************************************************************

PositioningDeactivation ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningDeactivationIEs} },
    ...
}

PositioningDeactivationIEs 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-AbortTransmission       CRITICALITY ignore  TYPE AbortTransmission          PRESENCE mandatory },
    ...
}

-- ***************************************************************
--
-- POSITIONING INFORMATION UPDATE PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- Positioning Information Update
--
-- ***************************************************************

PositioningInformationUpdate ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { PositioningInformationUpdateIEs} },
    ...
}


PositioningInformationUpdateIEs 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-SRSConfiguration        CRITICALITY ignore  TYPE SRSConfiguration           PRESENCE optional}|
    { ID id-SFNInitialisationTime   CRITICALITY ignore  TYPE SFNInitialisationTime      PRESENCE optional},
    ...
}

-- ***************************************************************
--
-- E-CID MEASUREMENT PROCEDURE
--
-- ***************************************************************

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

```
-- E-CID Measurement Initiation Request
--
-- ***************************************************************

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

E-CIDMeasurementInitiationRequest-IEs 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-LMF-UE-MeasurementID            CRITICALITY reject  TYPE LMF-UE-MeasurementID           PRESENCE mandatory   }|
    { ID id-RAN-UE-MeasurementID            CRITICALITY reject  TYPE RAN-UE-MeasurementID           PRESENCE mandatory   }|
    { ID id-E-CID-ReportCharacteristics     CRITICALITY reject  TYPE E-CID-ReportCharacteristics    PRESENCE mandatory   }|
    { ID id-E-CID-MeasurementPeriodicity    CRITICALITY reject  TYPE MeasurementPeriodicity     PRESENCE conditional  }|
-- The above IE shall be present if the E-CID-ReportCharacteristics IE is set to “periodic” --
    { ID id-E-CID-MeasurementQuantities     CRITICALITY reject  TYPE E-CID-MeasurementQuantities    PRESENCE mandatory},
    ...
}

-- ***************************************************************
--
-- E-CID Measurement Initiation Response
--
-- ***************************************************************

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

E-CIDMeasurementInitiationResponse-IEs 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-LMF-UE-MeasurementID        CRITICALITY reject  TYPE LMF-UE-MeasurementID             PRESENCE mandatory   }|
    { ID id-RAN-UE-MeasurementID        CRITICALITY reject  TYPE RAN-UE-MeasurementID             PRESENCE mandatory   }|
    { ID id-E-CID-MeasurementResult     CRITICALITY ignore  TYPE E-CID-MeasurementResult        PRESENCE optional}|
    { ID id-Cell-Portion-ID             CRITICALITY ignore  TYPE Cell-Portion-ID                PRESENCE optional}|
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics     PRESENCE optional},
    ...
}

-- ***************************************************************
--
-- E-CID Measurement Initiation Failure
--
-- ***************************************************************

E-CIDMeasurementInitiationFailure ::= SEQUENCE {
    protocolIEs                     ProtocolIE-Container        {{E-CIDMeasurementInitiationFailure-IEs}},
    ...
}
```

```
E-CIDMeasurementInitiationFailure-IEs 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-LMF-UE-MeasurementID        CRITICALITY reject  TYPE LMF-UE-MeasurementID           PRESENCE mandatory }|
    { ID id-RAN-UE-MeasurementID        CRITICALITY reject  TYPE RAN-UE-MeasurementID           PRESENCE mandatory }|
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics      CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional},
    ...
}

-- ***************************************************************
--
-- E-CID MEASUREMENT FAILURE INDICATION PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- E-CID Measurement Failure Indication
--
-- ***************************************************************

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


E-CIDMeasurementFailureIndication-IEs 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-LMF-UE-MeasurementID        CRITICALITY reject  TYPE LMF-UE-MeasurementID       PRESENCE mandatory  }|
    { ID id-RAN-UE-MeasurementID        CRITICALITY reject  TYPE RAN-UE-MeasurementID       PRESENCE mandatory  }|
    { ID id-Cause                       CRITICALITY ignore  TYPE Cause                      PRESENCE mandatory},
    ...
}

-- ***************************************************************
--
-- E-CID MEASUREMENT REPORT PROCEDURE
--
-- ***************************************************************

-- ***************************************************************
--
-- E-CID Measurement Report
--
-- ***************************************************************

E-CIDMeasurementReport ::= SEQUENCE {
    protocolIEs                     ProtocolIE-Container        {{E-CIDMeasurementReport-IEs}},
    ...
}
```

```
E-CIDMeasurementReport-IEs 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-LMF-UE-MeasurementID        CRITICALITY reject  TYPE LMF-UE-MeasurementID            PRESENCE mandatory  }|
    { ID id-RAN-UE-MeasurementID        CRITICALITY reject  TYPE RAN-UE-MeasurementID            PRESENCE mandatory  }|
    { ID id-E-CID-MeasurementResult     CRITICALITY ignore  TYPE E-CID-MeasurementResult        PRESENCE mandatory }|
    { ID id-Cell-Portion-ID             CRITICALITY ignore  TYPE Cell-Portion-ID                PRESENCE optional},

    ...
}

-- ************************************************************
--
-- E-CID MEASUREMENT TERMINATION PROCEDURE
--
-- ************************************************************

-- ************************************************************
--
-- E-CID Measurement Termination Command
--
-- ************************************************************


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


E-CIDMeasurementTerminationCommand-IEs 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-LMF-UE-MeasurementID        CRITICALITY reject  TYPE LMF-UE-MeasurementID            PRESENCE mandatory  }|
    { ID id-RAN-UE-MeasurementID        CRITICALITY reject  TYPE RAN-UE-MeasurementID            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-Info,
    id-AlternativeQoSParaSetList,
    id-CurrentQoSParaSetIndex,
    id-CarrierList,
    id-ULCarrierList,
    id-FrequencyShift7p5khz,
    id-SSB-PositionsInBurst,
    id-NRPRACHConfig,
    id-TDD-UL-DLConfigCommonNR,
    id-CNPacketDelayBudgetDownlink,
    id-CNPacketDelayBudgetUplink,
    id-ExtendedPacketDelayBudget,
    id-TSCTrafficCharacteristics,
    id-AdditionalPDCPDuplicationTNL-List,
    id-RLCDuplicationInformation,
    id-AdditionalDuplicationIndication,
    id-mdtConfiguration,
    id-TraceCollectionEntityURI,
    id-NID,
    id-NPNSupportInfo,
    id-NPNBroadcastInformation,
    id-AvailableSNPN-ID-List,
    id-SIB10-message,
    id-RequestedP-MaxFR2,
    id-DLCarrierList,
    id-ExtendedTAISliceSupportList,
    id-E-CID-MeasurementQuantities-Item,
    id-ConfiguredTACIndication,
    id-NRCGI,
    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,
    maxnoofNRSCSs,
    maxnoofPhysicalResourceBlocks,
    maxnoofPhysicalResourceBlocks-1,
    maxnoofPRACHconfigs,
    maxnoofRACHReports,
    maxnoofRLFReports,
    maxnoofAdditionalPDCPDuplicationTNL,
    maxnoofRLCDuplicationState,
    maxnoofCHOcells,
    maxnoofMDTPLMNs,
    maxnoofCAGsupported,
    maxnoofNIDsupported,
    maxnoofExtSliceItems,
    maxnoofPosMeas,
    maxnoofTRPInfoTypes,
    maxnoofSRSTriggerStates,
    maxnoofSpatialRelations,
    maxnoBcastCell,
    maxnoofTRPs,
    maxnoofAngleInfo,
    maxnooflcs-gcs-translation,
    maxnoofPath,
    maxnoofMeasE-CID,
    maxnoofSSBs,
    maxnoSRS-ResourceSets,
    maxnoSRS-ResourcePerSet,
    maxnoSRS-Carriers,
    maxnoSCSs,
    maxnoSRS-Resources,
    maxnoSRS-PosResources,
```

```
    maxnoSRS-PosResourceSets,
    maxnoSRS-PosResourcePerSet,
    maxnoofPRS-ResourceSets,
    maxnoofPRS-ResourcesPerSet,
    maxNoOfMeasTRPs,
    maxnoofPRSresourceSets,
    maxnoofPRSresources



FROM F1AP-Constants

    Criticality,
    ProcedureCode,
    ProtocolIE-ID,
    TriggeringMessage

FROM F1AP-CommonDataTypes

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

FROM F1AP-Containers;

-- A

AbortTransmission ::= CHOICE {
    sRSResourceSetID        SRSResourceSetID,
    releaseALL              NULL,
    choice-extension        ProtocolIE-SingleContainer { { AbortTransmission-ExtIEs } }
}

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

AccessPointPosition ::= SEQUENCE {
    latitudeSign                ENUMERATED {north, south},
    latitude                    INTEGER (0..8388607),
    longitude                   INTEGER (-8388608..8388607),
    directionOfAltitude         ENUMERATED {height, depth},
    altitude                    INTEGER (0..32767),
    uncertaintySemi-major       INTEGER (0..127),
    uncertaintySemi-minor       INTEGER (0..127),
    orientationOfMajorAxis      INTEGER (0..179),
    uncertaintyAltitude         INTEGER (0..127),
    confidence                  INTEGER (0..100),
    iE-Extensions               ProtocolExtensionContainer { { AccessPointPosition-ExtIEs} } OPTIONAL
}

AccessPointPosition-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

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 ::= {
    ...
}

ActiveULBWP  ::= SEQUENCE {
    locationAndBandwidth        INTEGER (0..37949,...),
    subcarrierSpacing           ENUMERATED {kHz15, kHz30, kHz60, kHz120,...},
    cyclicPrefix                ENUMERATED {normal, extended},
    txDirectCurrentLocation     INTEGER (0..3301,...),
    shift7dot5kHz               ENUMERATED {true, ...} OPTIONAL,
    sRSConfig                   SRSConfig,
    iE-Extensions                   ProtocolExtensionContainer { { ActiveULBWP-ExtIEs} } OPTIONAL
}

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

AdditionalDuplicationIndication ::= ENUMERATED {
    three,
    four,
    ...
}


AdditionalPath-List::= SEQUENCE (SIZE(1..maxnoofPath)) OF AdditionalPath-Item

AdditionalPath-Item ::=SEQUENCE {
    relativePathDelay   RelativePathDelay,
    pathQuality         TRPMeasurementQuality   OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { { AdditionalPath-Item-ExtIEs } }   OPTIONAL
}

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


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 ::= {
    ...
}


AngleMeasurementQuality ::= SEQUENCE {
    azimuthQuality  INTEGER(0..255),
    zenithQuality   INTEGER(0..255) OPTIONAL,
    resolution      ENUMERATED{deg0dot1,...},
    iE-Extensions   ProtocolExtensionContainer { { AngleMeasurementQuality-ExtIEs } }   OPTIONAL
}

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


AperiodicSRSResourceTriggerList ::= SEQUENCE (SIZE(1..maxnoofSRSTriggerStates)) OF AperiodicSRSResourceTrigger

AperiodicSRSResourceTrigger ::= INTEGER (1..3)

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

BandwidthSRS ::= CHOICE {
    fR1                             FR1-Bandwidth,
    fR2                             FR2-Bandwidth,
    choice-extension                ProtocolIE-SingleContainer {{ BandwidthSRS-ExtIEs }}
}

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


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-ConfiguredTACIndication       CRITICALITY ignore  EXTENSION ConfiguredTACIndication    PRESENCE optional }|
    {   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,
    ...
}

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,
    gNB-CU-Cell-Capacity-Exceeded,
```

```
    report-characteristics-empty,
    existing-measurement-ID,
    measurement-temporarily-not-available,
    measurement-not-supported-for-the-object,
    unknown-bh-address,
    unknown-bap-routing-id

}

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

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

Cell-Portion-ID ::= INTEGER (0..4095,...)

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

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

Cells-Status-Item ::= SEQUENCE {
    nRCGI           NRCGI,
    service-status      Service-Status,
```

```
    iE-Extensions               ProtocolExtensionContainer { { Cells-Status-ItemExtIEs } }  OPTIONAL,
    ...
}

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

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

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

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

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

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

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


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

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

Cells-to-be-Activated-List-Item ::= SEQUENCE {
    nRCGI       NRCGI,
    nRPCI       NRPCI       OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { Cells-to-be-Activated-List-ItemExtIEs} } OPTIONAL,
```

```
    ...
}

Cells-to-be-Activated-List-ItemExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-gNB-CUSystemInformation         CRITICALITY reject  EXTENSION GNB-CUSystemInformation      PRESENCE optional }|
    { ID id-AvailablePLMNList               CRITICALITY ignore  EXTENSION AvailablePLMNList             PRESENCE optional }|
    { ID id-ExtendedAvailablePLMN-List      CRITICALITY ignore  EXTENSION ExtendedAvailablePLMN-List    PRESENCE optional }|
    { 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  OPTIONAL,
    iAB-STC-Info                         IAB-STC-Info    OPTIONAL,
    rACH-Config-Common                   RACH-Config-Common  OPTIONAL,
    rACH-Config-Common-IAB               RACH-Config-Common-IAB  OPTIONAL,
    cSI-RS-Configuration                 OCTET STRING    OPTIONAL,
    sR-Configuration                     OCTET STRING    OPTIONAL,
    pDCCH-ConfigSIB1                     OCTET STRING    OPTIONAL,
    sCS-Common                           OCTET STRING    OPTIONAL,
    multiplexingInfo                     MultiplexingInfo    OPTIONAL,
    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{
    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   OPTIONAL,
    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 ::={
    ...
}
```

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


CoordinateID ::= INTEGER (0..511, ...)

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,
    iE-Extensions                           ProtocolExtensionContainer { { DedicatedSIDeliveryNeededUE-Item-ExtIEs} } OPTIONAL,
    ...
}

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


DL-PRS ::= SEQUENCE {
    prsid                   INTEGER (0..255),
    dl-PRSResourceSetID     PRS-Resource-Set-ID,
    dl-PRSResourceID        PRS-Resource-ID OPTIONAL,
```

```
    iE-Extensions           ProtocolExtensionContainer { {DL-PRS-ExtIEs} }  OPTIONAL
}

DL-PRS-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DL-PRSMutingPattern ::= CHOICE {
    two                 BIT STRING (SIZE(2)),
    four                BIT STRING (SIZE(4)),
    six                 BIT STRING (SIZE(6)),
    eight               BIT STRING (SIZE(8)),
    sixteen             BIT STRING (SIZE(16)),
    thirty-two          BIT STRING (SIZE(32)),
    choice-extension                            ProtocolIE-SingleContainer { { DL-PRSMutingPattern-ExtIEs } }
}

DL-PRSMutingPattern-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

DLPRSResourceCoordinates ::= SEQUENCE {
    listofDL-PRSResourceSetARP      SEQUENCE (SIZE(1.. maxnoofPRS-ResourceSets)) OF DLPRSResourceSetARP,
    iE-Extensions                   ProtocolExtensionContainer { { DLPRSResourceCoordinates-ExtIEs } } OPTIONAL
}

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

DLPRSResourceSetARP ::= SEQUENCE {
    dl-PRSResourceSetID             PRS-Resource-Set-ID,
    dL-PRSResourceSetARPLocation    DL-PRSResourceSetARPLocation,
    listofDL-PRSResourceARP         SEQUENCE (SIZE(1.. maxnoofPRS-ResourcesPerSet)) OF DLPRSResourceARP,
    iE-Extensions                   ProtocolExtensionContainer { { DLPRSResourceSetARP-ExtIEs } } OPTIONAL
}

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


DL-PRSResourceSetARPLocation ::= CHOICE {
    relativeGeodeticLocation            RelativeGeodeticLocation,
    relativeCartesianLocation           RelativeCartesianLocation,
    choice-Extension                    ProtocolIE-SingleContainer { { DL-PRSResourceSetARPLocation-ExtIEs } }
}

DL-PRSResourceSetARPLocation-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}


DLPRSResourceARP ::= SEQUENCE {
```

```
    dl-PRSResourceID            PRS-Resource-ID,
    dL-PRSResourceARPLocation   DL-PRSResourceARPLocation,
    iE-Extensions               ProtocolExtensionContainer { { DLPRSResourceARP-ExtIEs } } OPTIONAL
}

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

DL-PRSResourceARPLocation ::= CHOICE {
    relativeGeodeticLocation            RelativeGeodeticLocation,
    relativeCartesianLocation           RelativeCartesianLocation,
    choice-Extension                    ProtocolIE-SingleContainer { { DL-PRSResourceARPLocation-ExtIEs } }
}

DL-PRSResourceARPLocation-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

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 }|
    { ID id-CurrentQoSParaSetIndex              CRITICALITY ignore  EXTENSION QoSParaSetIndex                     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-CurrentQoSParaSetIndex              CRITICALITY ignore  EXTENSION QoSParaSetIndex                        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 }|
    { ID id-CurrentQoSParaSetIndex              CRITICALITY ignore  EXTENSION QoSParaSetIndex                        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 }|
    { ID id-RLCDuplicationInformation           CRITICALITY ignore  EXTENSION RLCDuplicationInformation               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-Info                CRITICALITY ignore  EXTENSION SL-ConfigDedicatedEUTRA-Info          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


E-CID-MeasurementQuantities ::= SEQUENCE (SIZE (1.. maxnoofMeasE-CID)) OF ProtocolIE-SingleContainer { {E-CID-MeasurementQuantities-ItemIEs} }

E-CID-MeasurementQuantities-ItemIEs F1AP-PROTOCOL-IES ::= {
    { ID id-E-CID-MeasurementQuantities-Item    CRITICALITY reject  TYPE E-CID-MeasurementQuantities-Item    PRESENCE mandatory}
}

E-CID-MeasurementQuantities-Item ::= SEQUENCE {
    e-CIDmeasurementQuantitiesValue             E-CID-MeasurementQuantitiesValue,
    iE-Extensions                               ProtocolExtensionContainer { { E-CID-MeasurementQuantitiesValue-ExtIEs} } OPTIONAL
}

E-CID-MeasurementQuantitiesValue-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

E-CID-MeasurementQuantitiesValue ::= ENUMERATED {
    default,
    angleOfArrivalNR,
    ...
}

E-CID-MeasurementResult ::= SEQUENCE {
```

```
    geographicalCoordinates     GeographicalCoordinates     OPTIONAL,
    measuredResults-List        E-CID-MeasuredResults-List  OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { E-CID-MeasurementResult-ExtIEs} } OPTIONAL
}

E-CID-MeasurementResult-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

E-CID-MeasuredResults-List ::= SEQUENCE (SIZE(1..maxnoofMeasE-CID)) OF E-CID-MeasuredResults-Item

E-CID-MeasuredResults-Item ::= SEQUENCE {
    e-CID-MeasuredResults-Value     E-CID-MeasuredResults-Value,
    iE-Extensions           ProtocolExtensionContainer {{ E-CID-MeasuredResults-Item-ExtIEs }}   OPTIONAL
}

E-CID-MeasuredResults-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

E-CID-MeasuredResults-Value ::= CHOICE {
    valueAngleofArrivalNR   UL-AoA,
    choice-extension        ProtocolIE-SingleContainer { { E-CID-MeasuredResults-Value-ExtIEs} }
}

E-CID-MeasuredResults-Value-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

E-CID-ReportCharacteristics ::= ENUMERATED {
    onDemand,
    periodic,
    ...
}

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     OPTIONAL,
    noofUplinkSymbols   NoofUplinkSymbols       OPTIONAL,
    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 ::= {
    ...
}

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

EUTRA-Coex-TDD-Info ::= SEQUENCE {
    eARFCN                          ExtendedEARFCN,
    transmission-Bandwidth          EUTRA-Transmission-Bandwidth,
    subframeAssignment              EUTRA-SubframeAssignment,
    specialSubframe-Info            EUTRA-SpecialSubframe-Info,
    iE-Extensions                   ProtocolExtensionContainer { {EUTRA-Coex-TDD-Info-ExtIEs} } OPTIONAL,
    ...
}
EUTRA-Coex-TDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
EUTRA-CyclicPrefixDL ::= ENUMERATED {
    normal,
    extended,
    ...
}

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

EUTRA-PRACH-Configuration ::= SEQUENCE {
    rootSequenceIndex                       INTEGER (0..837),
    zeroCorrelationIndex                    INTEGER (0..15),
    highSpeedFlag                           BOOLEAN,
    prach-FreqOffset                        INTEGER (0..94),
    prach-ConfigIndex                       INTEGER (0..63)     OPTIONAL,
    -- 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

F1CPathNSA ::= ENUMERATED {lte, nr, both}

F1CTransferPath ::= SEQUENCE {
    f1CPathNSA                      F1CPathNSA,
    iE-Extensions                   ProtocolExtensionContainer { { F1CTransferPath-ExtIEs} } OPTIONAL,
    ...
}

F1CTransferPath-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

FDD-Info ::= SEQUENCE {
    uL-NRFreqInfo                       NRFreqInfo,
    dL-NRFreqInfo                       NRFreqInfo,
    uL-Transmission-Bandwidth       Transmission-Bandwidth,
    dL-Transmission-Bandwidth       Transmission-Bandwidth,
    iE-Extensions                   ProtocolExtensionContainer { {FDD-Info-ExtIEs} } OPTIONAL,
    ...
}

FDD-Info-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-ULCarrierList               CRITICALITY ignore  EXTENSION NRCarrierList             PRESENCE optional }|
    { ID id-DLCarrierList               CRITICALITY ignore EXTENSION NRCarrierList              PRESENCE optional },
    ...
}


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},
    ...
}

FR1-Bandwidth ::= ENUMERATED {bw5, bw10, bw20, bw40, bw50, bw80, bw100, ...}
```

```
FR2-Bandwidth ::= ENUMERATED {bw50, bw100, bw200, bw400, ...}

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

GeographicalCoordinates ::= SEQUENCE {
    tRPPositionDefinitionType   TRPPositionDefinitionType,
    dLPRSResourceCoordinates    DLPRSResourceCoordinates    OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { GeographicalCoordinates-ExtIEs } } OPTIONAL
}

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

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  OPTIONAL,
    dUF-Slot-Config-List            DUF-Slot-Config-List    OPTIONAL,
    hSNATransmissionPeriodicity     HSNATransmissionPeriodicity,
    hNSASlotConfigList              HSNASlotConfigList  OPTIONAL,
    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,...))

Extended-GNB-CU-Name     ::= SEQUENCE {
    gNB-CU-NameVisibleString        GNB-CU-NameVisibleString                    OPTIONAL,
    gNB-CU-NameUTF8String           GNB-CU-NameUTF8String                       OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { Extended-GNB-CU-Name-ExtIEs } } OPTIONAL,
    ...
}

Extended-GNB-CU-Name-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-NameVisibleString ::= VisibleString(SIZE(1..150,...))

GNB-CU-NameUTF8String ::= UTF8String(SIZE(1..150,...))

Extended-GNB-DU-Name     ::= SEQUENCE {
    gNB-DU-NameVisibleString        GNB-DU-NameVisibleString                    OPTIONAL,
    gNB-DU-NameUTF8String           GNB-DU-NameUTF8String                       OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { Extended-GNB-DU-Name-ExtIEs } } OPTIONAL,
    ...
}

Extended-GNB-DU-Name-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-DU-NameVisibleString ::= VisibleString(SIZE(1..150,...))

GNB-DU-NameUTF8String ::= UTF8String(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 ::= {
    ...
}

GNB-RxTxTimeDiff ::= SEQUENCE {
    rxTxTimeDiff            GNBRxTxTimeDiffMeas,
    additionalPath-List     AdditionalPath-List     OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { GNB-RxTxTimeDiff-ExtIEs} }  OPTIONAL
}

GNB-RxTxTimeDiff-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

    ...
}

GNBRxTxTimeDiffMeas ::= CHOICE {
    k0        INTEGER (0.. 1970049),
    k1        INTEGER (0.. 985025),
    k2        INTEGER (0.. 492513),
    k3        INTEGER (0.. 246257),
    k4        INTEGER (0.. 123129),
    k5        INTEGER (0.. 61565),
    choice-extension        ProtocolIE-SingleContainer { { GNBRxTxTimeDiffMeas-ExtIEs } }
}

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

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    OPTIONAL,
    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    OPTIONAL,
    iAB-STC-Info        IAB-STC-Info    OPTIONAL,
    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,
    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   OPTIONAL,
    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, ...)


LCS-to-GCS-TranslationAoA::= SEQUENCE {
    alpha               INTEGER (0..3599),
    beta                INTEGER (0..3599),
    gamma               INTEGER (0..3599),
    iE-Extensions       ProtocolExtensionContainer { { LCS-to-GCS-TranslationAoA-ExtIEs} } OPTIONAL,
    ...
}
```

```
LCS-to-GCS-TranslationAoA-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

LCStoGCSTranslationList ::= SEQUENCE (SIZE (1.. maxnooflcs-gcs-translation)) OF LCStoGCSTranslation

LCStoGCSTranslation ::= SEQUENCE {
    alpha           INTEGER (0..359),
    alpha-fine      INTEGER (0..9)      OPTIONAL,
    beta            INTEGER (0..359),
    beta-fine       INTEGER (0..9)      OPTIONAL,
    gamma           INTEGER (0..359),
    gamma-fine      INTEGER (0..9)      OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { {LCStoGCSTranslation-ExtIEs} } OPTIONAL
}

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

LMF-MeasurementID ::= INTEGER (1.. 65536, ...)

LMF-UE-MeasurementID ::= INTEGER (1.. 256, ...)

LocationUncertainty ::= SEQUENCE {
    horizontalUncertainty       INTEGER (0..255),
    horizontalConfidence        INTEGER (0..100),
    verticalUncertainty         INTEGER (0..255),
    verticalConfidence          INTEGER (0..100),
    iE-Extensions               ProtocolExtensionContainer { { LocationUncertainty-ExtIEs} } OPTIONAL
}

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

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

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

MeasurementBeamInfo  ::= SEQUENCE {
    pRS-Resource-ID             PRS-Resource-ID     OPTIONAL,
    pRS-Resource-Set-ID         PRS-Resource-Set-ID OPTIONAL,
    sSB-Index                   SSB-Index           OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { MeasurementBeamInfo-ExtIEs} } OPTIONAL
}

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


MeasurementTimingConfiguration ::= OCTET STRING

MessageIdentifier ::= BIT STRING (SIZE (16))

MultiplexingInfo    ::= SEQUENCE{
    iAB-MT-Cell-List    IAB-MT-Cell-List,
    iE-Extensions       ProtocolExtensionContainer { {MultiplexingInfo-ExtIEs} } OPTIONAL
}

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


MeasuredResultsValue ::= CHOICE {
    uL-AngleOfArrival   UL-AoA,
    uL-SRS-RSRP         UL-SRS-RSRP,
    uL-RTOA             UL-RTOA-Measurement,
    gNB-RxTxTimeDiff    GNB-RxTxTimeDiff,
    choice-extension    ProtocolIE-SingleContainer { { MeasuredResultsValue-ExtIEs } }
}

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

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 ::= {
    ...
}


NGRANHighAccuracyAccessPointPosition ::= SEQUENCE {
    latitude                    INTEGER (-2147483648.. 2147483647),
    longitude                   INTEGER (-2147483648.. 2147483647),
    altitude                    INTEGER (-64000..1280000),
    uncertaintySemi-major       INTEGER (0..255),
    uncertaintySemi-minor       INTEGER (0..255),
    orientationOfMajorAxis      INTEGER (0..179),
    horizontalConfidence        INTEGER (0..100),
    uncertaintyAltitude         INTEGER (0..255),
    verticalConfidence          INTEGER (0..100),

    iE-Extensions               ProtocolExtensionContainer { { NGRANHighAccuracyAccessPointPosition-ExtIEs} } OPTIONAL
}

NGRANHighAccuracyAccessPointPosition-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 ::= {
    ...
}

NR-PRSBeamInformation ::= SEQUENCE {
    nR-PRSBeamInformationList       NR-PRSBeamInformationList,
    lCStoGCSTranslationList         LCStoGCSTranslationList     OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { NR-PRSBeamInformation-ExtIEs } } OPTIONAL
}

NR-PRSBeamInformation-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
NR-PRSBeamInformationList ::= SEQUENCE (SIZE(1.. maxnoofPRS-ResourceSets)) OF NR-PRSBeamInformationItem

NR-PRSBeamInformationItem ::= SEQUENCE {
    pRSResourceSetID    PRS-Resource-Set-ID,
    pRSAngleList        PRSAngleList,
    iE-Extensions   ProtocolExtensionContainer { { NR-PRSBeamInformationItem-ExtIEs } } OPTIONAL
}

NR-PRSBeamInformationItem-ExtIEs 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 ::= {
    ...
}

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 ::= {
    ...
}

NZP-CSI-RS-ResourceID::= INTEGER  (0..191)


-- 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 {
```

```
    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,...}


RelativePathDelay ::= CHOICE {
    k0                  INTEGER (0..16351),
    k1                  INTEGER (0..8176),
    k2                  INTEGER (0..4088),
    k3                  INTEGER (0..2044),
    k4                  INTEGER (0..1022),
    k5                  INTEGER (0..511),
    choice-extension            ProtocolIE-SingleContainer { { RelativePathDelay-ExtIEs } }
}

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

PathlossReferenceInfo ::= SEQUENCE {
    pathlossReferenceSignal         PathlossReferenceSignal,
    iE-Extensions                   ProtocolExtensionContainer { {PathlossReferenceInfo-ExtIEs} } OPTIONAL
}

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

PathlossReferenceSignal ::= CHOICE {
    sSB                                     SSB,
    dL-PRS                                  DL-PRS,
    choice-extension                        ProtocolIE-SingleContainer {{PathlossReferenceSignal-ExtIEs }}
}

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

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, ...)

PeriodicitySRS ::= ENUMERATED { ms0p125, ms0p25, ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms4, ms5, ms8, ms10, ms16, ms20, ms32, ms40, ms64, ms80,
ms160, ms320, ms640, ms1280, ms2560, ms5120, ms10240, ...}

PeriodicityList ::= SEQUENCE (SIZE(1.. maxnoSRS-ResourcePerSet)) OF PeriodicityList-Item

PeriodicityList-Item ::= SEQUENCE {
    periodicitySRS              PeriodicitySRS,
    iE-Extensions               ProtocolExtensionContainer { { PeriodicityList-ItemExtIEs} } OPTIONAL
}

PeriodicityList-ItemExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
Permutation ::= ENUMERATED {dfu, ufd, ...}

Ph-InfoMCG  ::= OCTET STRING

Ph-InfoSCG  ::= OCTET STRING

PLMN-Identity ::= OCTET STRING (SIZE(3))

PortNumber ::= BIT STRING (SIZE (16))


PosAssistance-Information ::= OCTET STRING

PosAssistanceInformationFailureList ::= OCTET STRING

PosBroadcast ::= ENUMERATED {
    start,
    stop,
    ...
}

PositioningBroadcastCells ::= SEQUENCE (SIZE (1..maxnoBcastCell)) OF NRCGI

MeasurementPeriodicity ::= ENUMERATED
{ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, min1, min6, min12, min30, ..., ms20480, ms40960}


PosMeasurementQuantities ::= SEQUENCE (SIZE(1.. maxnoofPosMeas)) OF PosMeasurementQuantities-Item

PosMeasurementQuantities-Item ::= SEQUENCE {
    posMeasurementType                  PosMeasurementType,
    timingReportingGranularityFactor    INTEGER (0..5) OPTIONAL,
    iE-Extensions                       ProtocolExtensionContainer { { PosMeasurementQuantities-ItemExtIEs} } OPTIONAL
}

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

PosMeasurementResult ::= SEQUENCE (SIZE (1.. maxnoofPosMeas)) OF PosMeasurementResultItem

PosMeasurementResultItem ::= SEQUENCE {
    measuredResultsValue                MeasuredResultsValue,
    timeStamp                           TimeStamp,
    measurementQuality                  TRPMeasurementQuality   OPTIONAL,
    measurementBeamInfo                 MeasurementBeamInfo     OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { PosMeasurementResultItemExtIEs } }   OPTIONAL
}

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

```
PosMeasurementResultList ::= SEQUENCE (SIZE(1.. maxNoOfMeasTRPs)) OF PosMeasurementResultList-Item

PosMeasurementResultList-Item ::= SEQUENCE {
    posMeasurementResult            PosMeasurementResult,
    tRPID                           TRPID,
    iE-Extensions                   ProtocolExtensionContainer { { PosMeasurementResultList-ItemExtIEs} } OPTIONAL
}

PosMeasurementResultList-ItemExtIEs     F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-NRCGI   CRITICALITY ignore EXTENSION NRCGI      PRESENCE optional },
    ...
}

PosMeasurementType ::= ENUMERATED {
    gnb-rx-tx,
    ul-srs-rsrp,
    ul-aoa,
    ul-rtoa,
    ...
}

PosReportCharacteristics ::= ENUMERATED {
    ondemand,
    periodic,
    ...
}

PosResourceSetType  ::= CHOICE {
    periodic            PosResourceSetTypePR,
    semi-persistent     PosResourceSetTypeSP,
    aperiodic           PosResourceSetTypeAP,
    choice-extension    ProtocolIE-SingleContainer {{ PosResourceSetType-ExtIEs }}
}

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

PosResourceSetTypePR ::= SEQUENCE {
    posperiodicSet      ENUMERATED{true, ...},
    iE-Extensions       ProtocolExtensionContainer { { PosResourceSetTypePR-ExtIEs} }   OPTIONAL
}

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

PosResourceSetTypeSP ::= SEQUENCE {
    possemi-persistentSet       ENUMERATED{true, ...},
    iE-Extensions       ProtocolExtensionContainer { { PosResourceSetTypeSP-ExtIEs} }   OPTIONAL
}

PosResourceSetTypeSP-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

PosResourceSetTypeAP ::= SEQUENCE {
    sRSResourceTrigger-List     INTEGER(1..3),
    iE-Extensions       ProtocolExtensionContainer { { PosResourceSetTypeAP-ExtIEs} }   OPTIONAL
}

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

PosSRSResourceID-List ::= SEQUENCE (SIZE (1..maxnoSRS-PosResourcePerSet)) OF SRSPosResourceID

PosSRSResource-Item ::= SEQUENCE {
    srs-PosResourceId               SRSPosResourceID,
    transmissionCombPos             TransmissionCombPos,
    startPosition                   INTEGER (0..13),
    nrofSymbols                     ENUMERATED {n1, n2, n4, n8, n12},
    freqDomainShift                 INTEGER (0..268),
    c-SRS                           INTEGER (0..63),
    groupOrSequenceHopping          ENUMERATED { neither, groupHopping, sequenceHopping },
    resourceTypePos                 ResourceTypePos,
    sequenceId                      INTEGER (0.. 65535),
    spatialRelationPos              SpatialRelationPos  OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { PosSRSResource-Item-ExtIEs} }  OPTIONAL
}

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

PosSRSResource-List ::= SEQUENCE (SIZE (1..maxnoSRS-PosResources)) OF PosSRSResource-Item

PosSRSResourceSet-Item ::= SEQUENCE {
    possrsResourceSetID             INTEGER(0..15),
    possRSResourceID-List           PosSRSResourceID-List,
    posresourceSetType              PosResourceSetType,
    iE-Extensions       ProtocolExtensionContainer { { PosSRSResourceSet-Item-ExtIEs} } OPTIONAL
}

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

PosSRSResourceSet-List ::= SEQUENCE (SIZE (1..maxnoSRS-PosResourceSets)) OF PosSRSResourceSet-Item

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 ::= {
    ...
}

PRSConfiguration ::= SEQUENCE {
    pRSResourceSet-List         PRSResourceSet-List,
    iE-Extensions   ProtocolExtensionContainer { { PRSConfiguration-ExtIEs } }  OPTIONAL
}

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

PRSInformationPos  ::= SEQUENCE {
    pRS-IDPos                   INTEGER(0..255),
    pRS-Resource-Set-IDPos      INTEGER(0..7),
    pRS-Resource-IDPos          INTEGER(0..63)  OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { PRSInformationPos-ExtIEs} } OPTIONAL
}

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

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

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


PRSAngleList ::= SEQUENCE (SIZE(1.. maxnoofPRS-ResourcesPerSet)) OF PRSAngleItem
```

```
PRSAngleItem ::= SEQUENCE {
    nR-PRS-Azimuth          INTEGER (0..359),
    nR-PRS-Azimuth-fine     INTEGER (0..9),
    nR-PRS-Elevation        INTEGER (0..180),
    nR-PRS-Elevation-fine   INTEGER (0..9),
    iE-Extensions       ProtocolExtensionContainer { { PRSAngleItem-ItemExtIEs } }  OPTIONAL
}

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

PRSMuting::= SEQUENCE {
    pRSMutingOption1            PRSMutingOption1,
    pRSMutingOption2            PRSMutingOption2,
    iE-Extensions                   ProtocolExtensionContainer { { PRSMuting-ExtIEs} } OPTIONAL
}

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

PRSMutingOption1 ::= SEQUENCE {
    mutingPattern                   DL-PRSMutingPattern,
    mutingBitRepetitionFactor       ENUMERATED{rf1,rf2,rf4,rf8,...},
    iE-Extensions                   ProtocolExtensionContainer { { PRSMutingOption1-ExtIEs} } OPTIONAL
}

PRSMutingOption1-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PRSMutingOption2 ::= SEQUENCE {
    mutingPattern                   DL-PRSMutingPattern,
    iE-Extensions                   ProtocolExtensionContainer { { PRSMutingOption2-ExtIEs} } OPTIONAL
}

PRSMutingOption2-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PRS-Resource-ID ::= INTEGER (0..63)

PRSResource-List::= SEQUENCE (SIZE (1..maxnoofPRSresources)) OF PRSResource-Item

PRSResource-Item  ::= SEQUENCE {
    pRSResourceID           PRS-Resource-ID,
    sequenceID              INTEGER(0..4095),
    rEOffset                INTEGER(0..11,...),
    resourceSlotOffset      INTEGER(0..511),
    resourceSymbolOffset    INTEGER(0..12),
    qCLInfo                 PRSResource-QCLInfo     OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { PRSResource-Item-ExtIEs} } OPTIONAL
```

```
}

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

PRSResource-QCLInfo  ::= CHOICE {
    qCLSourceSSB        PRSResource-QCLSourceSSB,
    qCLSourcePRS        PRSResource-QCLSourcePRS,
    choice-extension        ProtocolIE-SingleContainer { { PRSResource-QCLInfo-ExtIEs } }
}
PRSResource-QCLInfo-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

PRSResource-QCLSourceSSB ::= SEQUENCE {
    pCI-NR              INTEGER(0..1007),
    sSB-Index           SSB-Index OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { { PRSResource-QCLSourceSSB-ExtIEs} } OPTIONAL,
    ...
}

PRSResource-QCLSourceSSB-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PRSResource-QCLSourcePRS ::= SEQUENCE {
    qCLSourcePRSResourceSetID       PRS-Resource-Set-ID,
    qCLSourcePRSResourceID          PRS-Resource-ID OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { PRSResource-QCLSourcePRS-ExtIEs} } OPTIONAL
}

PRSResource-QCLSourcePRS-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PRS-Resource-Set-ID ::= INTEGER(0..7)

PRSResourceSet-List ::= SEQUENCE (SIZE (1.. maxnoofPRSresourceSets)) OF PRSResourceSet-Item
PRSResourceSet-Item ::= SEQUENCE {
    pRSResourceSetID                PRS-Resource-Set-ID,
    subcarrierSpacing               ENUMERATED{kHz15, kHz30, kHz60, kHz120, ...},
    pRSbandwidth                    INTEGER(1..63),
    startPRB                        INTEGER(0..2176),
    pointA                          INTEGER (0..3279165),
    combSize                        ENUMERATED{n2, n4, n6, n12, ...},
    cPType                          ENUMERATED{normal, extended, ...},
    resourceSetPeriodicity          ENUMERATED{n4,n5,n8,n10,n16,n20,n32,n40,n64,n80,n160,n320,n640,n1280,n2560,n5120,n10240,n20480,n40960,
n81920,...},
    resourceSetSlotOffset           INTEGER(0..81919,...),
    resourceRepetitionFactor        ENUMERATED{rf1,rf2,rf4,rf6,rf8,rf16,rf32,...},
    resourceTimeGap                 ENUMERATED{tg1,tg2,tg4,tg8,tg16,tg32,...},
    resourceNumberofSymbols         ENUMERATED{n2,n4,n6,n12,...},
    pRSMuting                       PRSMuting       OPTIONAL,
```

```
    pRSResourceTransmitPower        INTEGER(-60..50),
    pRSResource-List                PRSResource-List,
    iE-Extensions                   ProtocolExtensionContainer { { PRSResourceSet-Item-ExtIEs} } OPTIONAL
}

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

PWS-Failed-NR-CGI-Item ::= SEQUENCE {
    nRCGI               NRCGI,
    numberOfBroadcasts  NumberOfBroadcasts,
    iE-Extensions       ProtocolExtensionContainer { { PWS-Failed-NR-CGI-ItemExtIEs } } OPTIONAL,
    ...
}

PWS-Failed-NR-CGI-ItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PWSSystemInformation ::= SEQUENCE {
    sIBtype                 SIBType-PWS,
    sIBmessage          OCTET STRING,
    iE-Extensions       ProtocolExtensionContainer { { PWSSystemInformationExtIEs } }   OPTIONAL,
    ...
}

PWSSystemInformationExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    {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)

RAN-MeasurementID ::= INTEGER (1.. 65536, ...)

RAN-UE-MeasurementID ::= INTEGER (1.. 256, ...)

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,
    ...
}

ReferencePoint ::= CHOICE {
    coordinateID                    CoordinateID,
    referencePointCoordinate        AccessPointPosition,
    referencePointCoordinateHA      NGRANHighAccuracyAccessPointPosition,
    choice-Extension                ProtocolIE-SingleContainer { { ReferencePoint-ExtIEs} }
}

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

ReferenceSFN ::= INTEGER (0..1023)
```

```
ReferenceSignal ::= CHOICE {
    nZP-CSI-RS                          NZP-CSI-RS-ResourceID,
    sSB                                 SSB,
    sRS                                 SRSResourceID,
    positioningSRS                      SRSPosResourceID,
    dL-PRS                              DL-PRS,
    choice-extension                    ProtocolIE-SingleContainer {{ReferenceSignal-ExtIEs }}
}

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

RelativeCartesianLocation ::= SEQUENCE {
    xYZunit                     ENUMERATED {mm, cm, dm, ...},
    xvalue                      INTEGER (-65536..65535),
    yvalue                      INTEGER (-65536..65535),
    zvalue                      INTEGER (-32768..32767),
    locationUncertainty         LocationUncertainty,
    iE-Extensions               ProtocolExtensionContainer { { RelativeCartesianLocation-ExtIEs} } OPTIONAL
}

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

RelativeGeodeticLocation ::= SEQUENCE {
    milli-Arc-SecondUnits       ENUMERATED {zerodot03, zerodot3, three, ...},
    heightUnits                 ENUMERATED {mm, cm, m, ...},
    deltaLatitude               INTEGER (-1024.. 1023),
    deltaLongitude              INTEGER (-1024.. 1023),
    deltaHeight                 INTEGER (-1024.. 1023),
    locationUncertainty         LocationUncertainty,
    iE-extensions               ProtocolExtensionContainer {{RelativeGeodeticLocation-ExtIEs }} OPTIONAL
}

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

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


RequestedSRSTransmissionCharacteristics ::= SEQUENCE {
    numberOfTransmissions       INTEGER (0..500, ...)       OPTIONAL,
-- The IE shall be present if the Resource Type IE is set to “periodic” --
    resourceType                ENUMERATED  {periodic, semi-persistent, aperiodic,...},
    bandwidthSRS                BandwidthSRS,
    sRSResourceSetList          SRSResourceSetList              OPTIONAL,
    sSBInformation              SSBInformation              OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { RequestedSRSTransmissionCharacteristics-ExtIEs} } OPTIONAL
}

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

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

ResourceSetType  ::= CHOICE {
    periodic            ResourceSetTypePeriodic,
    semi-persistent     ResourceSetTypeSemi-persistent,
    aperiodic           ResourceSetTypeAperiodic,
    choice-extension                ProtocolIE-SingleContainer {{ ResourceSetType-ExtIEs }}
}

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

```
ResourceSetTypePeriodic ::= SEQUENCE {
    periodicSet         ENUMERATED{true, ...},
    iE-Extensions       ProtocolExtensionContainer { { ResourceSetTypePeriodic-ExtIEs} }    OPTIONAL
}

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

ResourceSetTypeSemi-persistent ::= SEQUENCE {
    semi-persistentSet  ENUMERATED{true, ...},
    iE-Extensions       ProtocolExtensionContainer { { ResourceSetTypeSemi-persistent-ExtIEs} } OPTIONAL
}

ResourceSetTypeSemi-persistent-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ResourceSetTypeAperiodic ::= SEQUENCE {
    sRSResourceTrigger-List     INTEGER(1..3),
    slotoffset                  INTEGER(0..32),
    iE-Extensions       ProtocolExtensionContainer { { ResourceSetTypeAperiodic-ExtIEs} }   OPTIONAL
}

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

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 ::= {
    ...
}

ResourceType ::= CHOICE {
    periodic            ResourceTypePeriodic,
    semi-persistent     ResourceTypeSemi-persistent,
    aperiodic           ResourceTypeAperiodic,
    choice-extension                ProtocolIE-SingleContainer {{ ResourceType-ExtIEs }}
}

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

ResourceTypePeriodic ::= SEQUENCE {
```

```
    periodicity        ENUMERATED{slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320,
slot640, slot1280, slot2560, ...},
    offset              INTEGER(0..2559, ...),
    iE-Extensions       ProtocolExtensionContainer { { ResourceTypePeriodic-ExtIEs} }   OPTIONAL
}

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

ResourceTypeSemi-persistent ::= SEQUENCE {
    periodicity        ENUMERATED{slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320,
slot640, slot1280, slot2560, ...},
    offset              INTEGER(0..2559, ...),
    iE-Extensions       ProtocolExtensionContainer { { ResourceTypeSemi-persistent-ExtIEs} }    OPTIONAL
}

ResourceTypeSemi-persistent-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ResourceTypeAperiodic ::= SEQUENCE {
    aperiodicResourceType      ENUMERATED{true, ...},
    iE-Extensions       ProtocolExtensionContainer { { ResourceTypeAperiodic-ExtIEs} }  OPTIONAL
}

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

ResourceTypePos ::= CHOICE {
    periodic            ResourceTypePeriodicPos,
    semi-persistent     ResourceTypeSemi-persistentPos,
    aperiodic           ResourceTypeAperiodicPos,
    choice-extension    ProtocolIE-SingleContainer {{ ResourceTypePos-ExtIEs }}
}

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

ResourceTypePeriodicPos ::= SEQUENCE {
    periodicity        ENUMERATED{slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320,
slot640, slot1280, slot2560, slot5120, slot10240, slot40960, slot81920, ...},
    offset              INTEGER(0..81919, ...),
    iE-Extensions       ProtocolExtensionContainer { { ResourceTypePeriodicPos-ExtIEs} }    OPTIONAL
}

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

ResourceTypeSemi-persistentPos ::= SEQUENCE {
```

```
    periodicity        ENUMERATED{slot1, slot2, slot4, slot5, slot8, slot10, slot16, slot20, slot32, slot40, slot64, slot80, slot160, slot320,
slot640, slot1280, slot2560, slot5120, slot10240, slot40960, slot81920, ...},
    offset              INTEGER(0..81919, ...),
    iE-Extensions       ProtocolExtensionContainer { { ResourceTypeSemi-persistentPos-ExtIEs} } OPTIONAL
}

ResourceTypeSemi-persistentPos-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

ResourceTypeAperiodicPos ::= SEQUENCE {
    slotOffset          INTEGER (0..32),
    iE-Extensions       ProtocolExtensionContainer { { ResourceTypeAperiodicPos-ExtIEs} }   OPTIONAL
}

ResourceTypeAperiodicPos-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}

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 },
    ...
}

RoutingID ::= OCTET STRING

-- S

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

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

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

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

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

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

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

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

```
}

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

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

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

SCS-SpecificCarrier ::=            SEQUENCE {
    offsetToCarrier                     INTEGER (0..2199,...),
    subcarrierSpacing                   ENUMERATED {kHz15, kHz30, kHz60, kHz120,...},
    carrierBandwidth                    INTEGER (1..275,...),
    iE-Extensions                       ProtocolExtensionContainer { { SCS-SpecificCarrier-ExtIEs } } OPTIONAL
}

SCS-SpecificCarrier-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Search-window-information ::= SEQUENCE {
    expectedPropagationDelay        INTEGER (-3841..3841,...),
    delayUncertainty                INTEGER (1..246,...),
    iE-Extensions                   ProtocolExtensionContainer { { Search-window-information-ExtIEs } } OPTIONAL
}

Search-window-information-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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-ConfiguredTACIndication       CRITICALITY ignore  EXTENSION ConfiguredTACIndication    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 ::= {
    ...
}


SFNInitialisationTime ::=   BIT STRING (SIZE (64))

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
}

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-Info ::= 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 ::= {
    ...
```

```
}

SlotNumber ::= INTEGER (0..79)

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..5119, ...),
    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 ::= {
    ...
}

SpatialDirectionInformation ::= SEQUENCE {
    nR-PRSBeamInformation           NR-PRSBeamInformation,
    iE-Extensions                   ProtocolExtensionContainer { { SpatialDirectionInformation-ExtIEs } } OPTIONAL
}

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

SpatialRelationInfo ::= SEQUENCE {
    spatialRelationforResourceID                    SpatialRelationforResourceID,
    iE-Extensions       ProtocolExtensionContainer { {SpatialRelationInfo-ExtIEs} } OPTIONAL
}

SpatialRelationInfo-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

SpatialRelationforResourceID ::= SEQUENCE (SIZE(1..maxnoofSpatialRelations)) OF SpatialRelationforResourceIDItem

SpatialRelationforResourceIDItem ::= SEQUENCE {
    referenceSignal     ReferenceSignal,
    iE-Extensions       ProtocolExtensionContainer { {SpatialRelationforResourceIDItem-ExtIEs} }  OPTIONAL
}

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

SpatialRelationPos ::= CHOICE {
    sSBPos                  SSB,
    pRSInformationPos       PRSInformationPos,
    choice-extension        ProtocolIE-SingleContainer {{ SpatialInformationPos-ExtIEs }}
}

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

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 },
    ...
}

SRSCarrier-List ::= SEQUENCE (SIZE(1.. maxnoSRS-Carriers)) OF SRSCarrier-List-Item

SRSCarrier-List-Item ::= SEQUENCE {
    pointA                          INTEGER (0..3279165),
    uplinkChannelBW-PerSCS-List     UplinkChannelBW-PerSCS-List,
    activeULBWP                     ActiveULBWP,
    pci                             NRPCI,
    iE-Extensions                   ProtocolExtensionContainer { { SRSCarrier-List-Item-ExtIEs } } OPTIONAL
}

SRSCarrier-List-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SRSConfig  ::= SEQUENCE {
    sRSResource-List            SRSResource-List        OPTIONAL,
    posSRSResource-List         PosSRSResource-List     OPTIONAL,
    sRSResourceSet-List         SRSResourceSet-List     OPTIONAL,
    posSRSResourceSet-List      PosSRSResourceSet-List  OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { SRSConfig-ExtIEs } } OPTIONAL
}

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

SRSConfiguration ::= SEQUENCE {
    sRSCarrier-List     SRSCarrier-List,
    iE-Extensions       ProtocolExtensionContainer { { SRSConfiguration-ExtIEs } } OPTIONAL
}

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

SRSPosResourceID ::= INTEGER (0..63)
```

```
SRSResource::= SEQUENCE {
    sRSResourceID                   SRSResourceID,
    nrofSRS-Ports                   ENUMERATED {port1, ports2, ports4},
    transmissionComb                TransmissionComb,
    startPosition                   INTEGER (0..13),
    nrofSymbols                     ENUMERATED {n1, n2, n4},
    repetitionFactor                ENUMERATED {n1, n2, n4},
    freqDomainPosition              INTEGER (0..67),
    freqDomainShift                 INTEGER (0..268),
    c-SRS                           INTEGER (0..63),
    b-SRS                           INTEGER (0..3),
    b-hop                           INTEGER (0..3),
    groupOrSequenceHopping          ENUMERATED { neither, groupHopping, sequenceHopping },
    resourceType                    ResourceType,
    sequenceId                      INTEGER (0..1023),
    iE-Extensions                   ProtocolExtensionContainer { { SRSResource-ExtIEs } } OPTIONAL
}

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

SRSResourceID ::= INTEGER (0..63)

SRSResourceID-List::= SEQUENCE (SIZE (1..maxnoSRS-ResourcePerSet)) OF SRSResourceID

SRSResource-List ::= SEQUENCE (SIZE (1..maxnoSRS-Resources)) OF SRSResource

SRSResourceSet::= SEQUENCE {
    sRSResourceSetID                SRSResourceSetID,
    sRSResourceID-List              SRSResourceID-List,
    resourceSetType                 ResourceSetType,
    iE-Extensions                   ProtocolExtensionContainer { { SRSResourceSet-ExtIEs } } OPTIONAL
}

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

SRSResourceSetID ::= INTEGER (0..15, ...)

SRSResourceSetList ::= SEQUENCE (SIZE(1.. maxnoSRS-ResourceSets)) OF SRSResourceSetItem

SRSResourceSetItem ::= SEQUENCE {
    numSRSresourcesperset       INTEGER (1..16, ...)    OPTIONAL,
    periodicityList             PeriodicityList         OPTIONAL,
    spatialRelationInfo         SpatialRelationInfo     OPTIONAL,
    pathlossReferenceInfo       PathlossReferenceInfo   OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { { SRSResourceSetItemExtIEs } } OPTIONAL
}

SRSResourceSetItemExtIEs    F1AP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

SRSResourceSet-List ::= SEQUENCE (SIZE (1..maxnoSRS-ResourceSets)) OF SRSResourceSet

SRSResourceTrigger ::= SEQUENCE {
    aperiodicSRSResourceTriggerList                 AperiodicSRSResourceTriggerList,
    iE-Extensions       ProtocolExtensionContainer { {SRSResourceTrigger-ExtIEs} }  OPTIONAL
}

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

SRSSpatialRelation ::= SEQUENCE {
    spatialRelationforResourceID                SpatialRelationforResourceID,
    iE-Extensions       ProtocolExtensionContainer { {SRSSpatialRelation-ExtIEs} }  OPTIONAL
}

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

SSB ::= SEQUENCE {
    pCI-NR              NRPCI,
    ssb-index           SSB-Index   OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {SSB-ExtIEs} } OPTIONAL
}

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

SSB-freqInfo ::= INTEGER (0..maxNRARFCN)

SSB-Index ::= INTEGER(0..63)

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 ::= {
    ...
}

SSBInformation ::= SEQUENCE {
    sSBInformationList  SSBInformationList,
    iE-Extensions   ProtocolExtensionContainer { { SSBInformation-ExtIEs } }    OPTIONAL
}

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

SSBInformationList ::= SEQUENCE (SIZE(1.. maxnoofSSBs)) OF SSBInformationItem

SSBInformationItem ::= SEQUENCE {
    sSB-Configuration   SSB-TF-Configuration,
    pCI-NR              NRPCI,
    iE-Extensions   ProtocolExtensionContainer { { SSBInformationItem-ExtIEs } }    OPTIONAL
}

SSBInformationItem-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 ::= {
    ...
}

SSB-TF-Configuration ::= SEQUENCE {
    sSB-frequency               INTEGER (0..3279165),
    sSB-subcarrier-spacing      ENUMERATED {kHz15, kHz30, kHz60, kHz120, kHz240, ...},
    sSB-Transmit-power          INTEGER (-60..50),
    sSB-periodicity             ENUMERATED {ms5, ms10, ms20, ms40, ms80, ms160, ...},
    sSB-half-frame-offset       INTEGER(0..1),
    sSB-SFN-offset              INTEGER(0..15),
    sSB-position-in-burst       SSB-PositionsInBurst        OPTIONAL,
    sFNInitialisationTime       SFNInitialisationTime       OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { SSB-TF-Configuration-ExtIEs} } OPTIONAL
}

SSB-TF-Configuration-ExtIEs     F1AP-PROTOCOL-EXTENSION ::= {
    ...
}


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 ::= {
    ...
}

SystemFrameNumber ::= INTEGER (0..1023)

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 }|
```

```
    {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}

TimeStamp ::= SEQUENCE {
    systemFrameNumber       SystemFrameNumber,
    slotIndex               TimeStampSlotIndex,
    measurementTime         SFNInitialisationTime   OPTIONAL,
    iE-Extension            ProtocolExtensionContainer { { TimeStamp-ExtIEs} }  OPTIONAL
}

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

TimeStampSlotIndex ::= CHOICE {
    sCS-15          INTEGER(0..9),
    sCS-30          INTEGER(0..19),
    sCS-60          INTEGER(0..39),
    sCS-120         INTEGER(0..79),
    choice-extension        ProtocolIE-SingleContainer { { TimeStampSlotIndex-ExtIEs} }
}

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

TimeToWait ::= ENUMERATED {v1s, v2s, v5s, v10s, v20s, v60s, ...}

TimingMeasurementQuality ::= SEQUENCE {
    measurementQuality      INTEGER(0..31),
    resolution              ENUMERATED{m0dot1, m1, m10, m30, ...},
    iE-Extensions       ProtocolExtensionContainer { { TimingMeasurementQuality-ExtIEs} }   OPTIONAL
}

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

```
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 ::= {
    ...
}

TransmissionComb ::= CHOICE {
    n2    SEQUENCE {
            combOffset-n2             INTEGER (0..1),
            cyclicShift-n2            INTEGER (0..7)
        },
    n4    SEQUENCE {
            combOffset-n4             INTEGER (0..3),
            cyclicShift-n4            INTEGER (0..11)
        },
    choice-extension                ProtocolIE-SingleContainer { { TransmissionComb-ExtIEs} }
}
TransmissionComb-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

TransmissionCombPos ::= CHOICE {
    n2    SEQUENCE {
            combOffset-n2             INTEGER (0..1),
            cyclicShift-n2            INTEGER (0..7)
        },
    n4    SEQUENCE {
            combOffset-n4             INTEGER (0..3),
            cyclicShift-n4            INTEGER (0..11)
        },
    n8    SEQUENCE {
            combOffset-n8             INTEGER (0..7),
            cyclicShift-n8            INTEGER (0..5)
        },

    choice-extension                ProtocolIE-SingleContainer { { TransmissionCombPos-ExtIEs} }
}
TransmissionCombPos-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

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 }

TRPID ::= INTEGER (0.. maxnoofTRPs, ...)

TRPInformation ::= SEQUENCE {
    tRPID                           TRPID,
    tRPInformationTypeResponseList  TRPInformationTypeResponseList,
    iE-Extensions                   ProtocolExtensionContainer { { TRPInformation-ExtIEs } }      OPTIONAL
}

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

TRPInformationItem ::= SEQUENCE {
    tRPInformation                  TRPInformation,
    iE-Extensions                   ProtocolExtensionContainer { { TRPInformationItem-ExtIEs } }  OPTIONAL
}

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

TRPInformationTypeItem ::= ENUMERATED {
        nrPCI,
        nG-RAN-CGI,
        arfcn,
        pRSConfig,
        sSBConfig,
        sFNInitTime,
        spatialDirectInfo,
        geoCoord,
```

```
...}


TRPInformationTypeResponseList ::= SEQUENCE (SIZE(1.. maxnoofTRPInfoTypes)) OF TRPInformationTypeResponseItem

TRPInformationTypeResponseItem ::= CHOICE {
    pCI-NR                              NRPCI,
    nG-RAN-CGI                          NRCGI,
    nRARFCN                             INTEGER (0..maxNRARFCN),
    pRSConfiguration                    PRSConfiguration,
    sSBinformation                      SSBInformation,
    sFNInitialisationTime               SFNInitialisationTime,
    spatialDirectionInformation         SpatialDirectionInformation,
    geographicalCoordinates             GeographicalCoordinates,
    choice-extension                    ProtocolIE-SingleContainer { { TRPInformationTypeResponseItem-ExtIEs} }
}

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


TRPList ::= SEQUENCE (SIZE(1.. maxnoofTRPs)) OF TRPListItem

TRPListItem ::= SEQUENCE {
    tRPID                           TRPID,
    iE-Extensions                   ProtocolExtensionContainer { { TRPListItem-ExtIEs } }   OPTIONAL
}

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

TRPMeasurementQuality ::= SEQUENCE {
    tRPmeasurementQuality-Item  TRPMeasurementQuality-Item,
    iE-Extensions               ProtocolExtensionContainer { {TRPMeasurementQuality-ExtIEs} } OPTIONAL
}

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

TRPMeasurementQuality-Item ::= CHOICE {
    timingMeasurementQuality    TimingMeasurementQuality,
    angleMeasurementQuality     AngleMeasurementQuality,
    choice-extension            ProtocolIE-SingleContainer { { TRPMeasurementQuality-Item-ExtIEs } }
}

TRPMeasurementQuality-Item-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

TRP-MeasurementRequestList ::= SEQUENCE (SIZE (1..maxNoOfMeasTRPs)) OF TRP-MeasurementRequestItem
```

```
TRP-MeasurementRequestItem ::= SEQUENCE {
    tRPID                           TRPID,
    search-window-information       Search-window-information   OPTIONAL,
    iE-extensions       ProtocolExtensionContainer { { TRP-MeasurementRequestItem-ExtIEs } } OPTIONAL
}

TRP-MeasurementRequestItem-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    { ID id-NRCGI   CRITICALITY ignore EXTENSION NRCGI      PRESENCE optional },
    ...
}

TRPPositionDefinitionType ::= CHOICE {
    direct      TRPPositionDirect,
    referenced  TRPPositionReferenced,
    choice-extension                            ProtocolIE-SingleContainer { { TRPPositionDefinitionType-ExtIEs } }
}

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

TRPPositionDirect ::= SEQUENCE {
    accuracy    TRPPositionDirectAccuracy,
    iE-extensions       ProtocolExtensionContainer { { TRPPositionDirect-ExtIEs } } OPTIONAL
}

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

TRPPositionDirectAccuracy ::= CHOICE {
    tRPPosition             AccessPointPosition,
    tRPHAposition           NGRANHighAccuracyAccessPointPosition,
    choice-extension        ProtocolIE-SingleContainer { { TRPPositionDirectAccuracy-ExtIEs } }
}

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

TRPPositionReferenced ::= SEQUENCE {
    referencePoint                  ReferencePoint,
    referencePointType              TRPReferencePointType,
    iE-extensions                   ProtocolExtensionContainer { { TRPPositionReferenced-ExtIEs } }  OPTIONAL
}

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

TRPReferencePointType ::= CHOICE {
    tRPPositionRelativeGeodetic         RelativeGeodeticLocation,
    tRPPositionRelativeCartesian        RelativeCartesianLocation,
    choice-extension                    ProtocolIE-SingleContainer { { TRPReferencePointType-ExtIEs } }
```

```
}

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

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,
    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-AoA ::= SEQUENCE {
    azimuthAoA                  INTEGER (0..3599),
    zenithAoA                   INTEGER (0..1799)   OPTIONAL,
    lCS-to-GCS-TranslationAoA   LCS-to-GCS-TranslationAoA       OPTIONAL,
    iE-extensions           ProtocolExtensionContainer { { UL-AoA-ExtIEs } }
}

UL-AoA-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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 ::= {
    ...
}

ULConfiguration ::= SEQUENCE    {
    uLUEConfiguration       ULUEConfiguration,
    iE-Extensions   ProtocolExtensionContainer { { ULConfigurationExtIEs } }    OPTIONAL,
    ...
}
ULConfigurationExtIEs   F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UL-RTOA-Measurement ::= SEQUENCE {
    uL-RTOA-MeasurementItem     UL-RTOA-MeasurementItem,
    additionalPath-List         AdditionalPath-List OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { UL-RTOA-Measurement-ExtIEs } }   OPTIONAL
}

UL-RTOA-Measurement-ExtIEs  F1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UL-RTOA-MeasurementItem ::= CHOICE {
    k0                  INTEGER (0..1970049),
    k1                  INTEGER (0..985025),
    k2                  INTEGER (0..492513),
    k3                  INTEGER (0..246257),
    k4                  INTEGER (0..123129),
    k5                  INTEGER (0..61565),
    choice-extension            ProtocolIE-SingleContainer { { UL-RTOA-MeasurementItem-ExtIEs } }
}

UL-RTOA-MeasurementItem-ExtIEs F1AP-PROTOCOL-IES ::= {
    ...
}

UL-SRS-RSRP ::= INTEGER (0..126)

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, ...)

UplinkChannelBW-PerSCS-List ::= SEQUENCE (SIZE (1..maxnoSCSs)) OF SCS-SpecificCarrier

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
id-PositioningMeasurementExchange           ProcedureCode ::= 41
id-PositioningAssistanceInformationControl  ProcedureCode ::= 42
id-PositioningAssistanceInformationFeedback ProcedureCode ::= 43
id-PositioningMeasurementReport             ProcedureCode ::= 44
id-PositioningMeasurementAbort              ProcedureCode ::= 45
id-PositioningMeasurementFailureIndication  ProcedureCode ::= 46
id-PositioningMeasurementUpdate             ProcedureCode ::= 47
id-TRPInformationExchange                   ProcedureCode ::= 48
id-PositioningInformationExchange           ProcedureCode ::= 49
id-PositioningActivation                    ProcedureCode ::= 50
id-PositioningDeactivation                  ProcedureCode ::= 51
id-E-CIDMeasurementInitiation               ProcedureCode ::= 52
id-E-CIDMeasurementFailureIndication        ProcedureCode ::= 53
id-E-CIDMeasurementReport                   ProcedureCode ::= 54
id-E-CIDMeasurementTermination              ProcedureCode ::= 55
id-PositioningInformationUpdate             ProcedureCode ::= 56
id-ReferenceTimeInformationReport           ProcedureCode ::= 57
id-ReferenceTimeInformationReportingControl ProcedureCode ::= 58


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

```
--
-- 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 ::= 5120
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 ::= 8
maxnoofMDTPLMNs                         INTEGER ::= 16
maxnoofCAGsupported                     INTEGER ::= 12
maxnoofNIDsupported                     INTEGER ::= 12
maxnoofNRSCSs                           INTEGER ::= 5
maxnoofExtSliceItems                    INTEGER ::= 65535
maxnoofPosMeas                          INTEGER ::= 16384
maxnoofTRPInfoTypes                     INTEGER ::= 64
maxnoofTRPs                             INTEGER ::= 65535
maxnoofSRSTriggerStates                 INTEGER ::= 3
maxnoofSpatialRelations                 INTEGER ::= 64
maxnoBcastCell                          INTEGER ::= 16384
maxnoofAngleInfo                        INTEGER ::= 65535
maxnooflcs-gcs-translation              INTEGER ::= 3
maxnoofPath                             INTEGER ::= 2
maxnoofMeasE-CID                        INTEGER ::= 64
maxnoofSSBs                             INTEGER ::= 255
maxnoSRS-ResourceSets                   INTEGER ::= 16
maxnoSRS-ResourcePerSet                 INTEGER ::= 16
maxnoSRS-Carriers                       INTEGER ::= 32
maxnoSCSs                               INTEGER ::= 5
maxnoSRS-Resources                      INTEGER ::= 64
maxnoSRS-PosResources                   INTEGER ::= 64
maxnoSRS-PosResourceSets                INTEGER ::= 16
maxnoSRS-PosResourcePerSet              INTEGER ::= 16
maxnoofPRS-ResourceSets                 INTEGER ::= 2
maxnoofPRS-ResourcesPerSet              INTEGER ::= 64
maxNoOfMeasTRPs                         INTEGER ::= 64
maxnoofPRSresourceSets                  INTEGER ::= 8
maxnoofPRSresources                     INTEGER ::= 64


-- ************************************************************
--
-- 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-Info                     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-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
```

```
id-RequestedSRSTransmissionCharacteristics          ProtocolIE-ID ::= 391
id-PosAssistance-Information                        ProtocolIE-ID ::= 392
id-PosBroadcast                                     ProtocolIE-ID ::= 393
id-RoutingID                                        ProtocolIE-ID ::= 394
id-PosAssistanceInformationFailureList              ProtocolIE-ID ::= 395
id-PosMeasurementQuantities                         ProtocolIE-ID ::= 396
id-PosMeasurementResultList                         ProtocolIE-ID ::= 397
id-TRPInformationTypeListTRPReq                     ProtocolIE-ID ::= 398
id-TRPInformationTypeItem                           ProtocolIE-ID ::= 399
id-TRPInformationListTRPResp                        ProtocolIE-ID ::= 400
id-TRPInformationItem                               ProtocolIE-ID ::= 401
id-LMF-MeasurementID                                ProtocolIE-ID ::= 402
id-SRSType                                          ProtocolIE-ID ::= 403
id-ActivationTime                                   ProtocolIE-ID ::= 404
id-AbortTransmission                                ProtocolIE-ID ::= 405
id-PositioningBroadcastCells                        ProtocolIE-ID ::= 406
id-SRSConfiguration                                 ProtocolIE-ID ::= 407
id-PosReportCharacteristics                     ProtocolIE-ID ::= 408
id-PosMeasurementPeriodicity                        ProtocolIE-ID ::= 409
id-TRPList                                          ProtocolIE-ID ::= 410
id-RAN-MeasurementID                                ProtocolIE-ID ::= 411
id-LMF-UE-MeasurementID                             ProtocolIE-ID ::= 412
id-RAN-UE-MeasurementID                             ProtocolIE-ID ::= 413
id-E-CID-MeasurementQuantities                      ProtocolIE-ID ::= 414
id-E-CID-MeasurementQuantities-Item                 ProtocolIE-ID ::= 415
id-E-CID-MeasurementPeriodicity                     ProtocolIE-ID ::= 416
id-E-CID-MeasurementResult                          ProtocolIE-ID ::= 417
id-Cell-Portion-ID                                  ProtocolIE-ID ::= 418
id-SFNInitialisationTime                            ProtocolIE-ID ::= 419
id-SystemFrameNumber                                ProtocolIE-ID ::= 420
id-SlotNumber                                       ProtocolIE-ID ::= 421
id-TRP-MeasurementRequestList                       ProtocolIE-ID ::= 422
id-MeasurementBeamInfoRequest                       ProtocolIE-ID ::= 423
id-E-CID-ReportCharacteristics                      ProtocolIE-ID ::= 424
id-ConfiguredTACIndication                          ProtocolIE-ID ::= 425
id-Extended-GNB-DU-Name                             ProtocolIE-ID ::= 426
id-Extended-GNB-CU-Name                             ProtocolIE-ID ::= 427
id-F1CTransferPath                                  ProtocolIE-ID ::= 428


END
-- ASN1STOP
```

9.4.8 Container Definitions

```
-- ASN1START
-- **************************************************************
--
-- Container definitions
--
-- **************************************************************

F1AP-Containers {
```

```
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) f1ap (3) version1 (1) f1ap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

FROM F1AP-CommonDataTypes
    maxPrivateIEs,
    maxProtocolExtensions,
    maxProtocolIEs

FROM F1AP-Constants;

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

F1AP-PROTOCOL-IES ::= CLASS {
    &id             ProtocolIE-ID                   UNIQUE,
    &criticality    Criticality,
    &Value,
    &presence       Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY     &criticality
    TYPE            &Value
    PRESENCE        &presence
}

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

F1AP-PROTOCOL-IES-PAIR ::= CLASS {
    &id                 ProtocolIE-ID               UNIQUE,
```

```
    &firstCriticality   Criticality,
    &FirstValue,
    &secondCriticality  Criticality,
    &SecondValue,
    &presence           Presence
}
WITH SYNTAX {
    ID              &id
    FIRST CRITICALITY       &firstCriticality
    FIRST TYPE              &FirstValue
    SECOND CRITICALITY      &secondCriticality
    SECOND TYPE             &SecondValue
    PRESENCE                &presence
}

-- ***************************************************************
--
-- Class Definition for Protocol Extensions
--
-- ***************************************************************

F1AP-PROTOCOL-EXTENSION ::= CLASS {
    &id             ProtocolExtensionID         UNIQUE,
    &criticality    Criticality,
    &Extension,
    &presence       Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY     &criticality
    EXTENSION       &Extension
    PRESENCE        &presence
}

-- ***************************************************************
--
-- Class Definition for Private IEs
--
-- ***************************************************************

F1AP-PRIVATE-IES ::= CLASS {
    &id             PrivateIE-ID,
    &criticality    Criticality,
    &Value,
    &presence       Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY     &criticality
    TYPE            &Value
    PRESENCE        &presence
}

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

```
--
-- Container for Protocol IEs
--
-- ************************************************************

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

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

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

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

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

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

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

ProtocolExtensionContainer {F1AP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
    SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
    ProtocolExtensionField {{ExtensionSetParam}}

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

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

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

PrivateIE-Container {F1AP-PRIVATE-IES : IEsSetParam } ::=
    SEQUENCE (SIZE (1.. maxPrivateIEs)) OF
    PrivateIE-Field {{IEsSetParam}}

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

END
-- ASN1STOP
```

9.5 Message Transfer Syntax

F1AP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax, as specified in ITU-T Recommendation X.691 [5].

9.6 Timers

10 Handling of unknown, unforeseen and erroneous protocol data

Clause 10 of TS 38.413 [3] is applicable for the purposes of the present document, with the following additions for non-UE-associated procedures:

- In case of Abstract Syntax Error, when reporting the *Criticality Diagnostics* IE for not comprehended IE/IEgroups or missing IE/IE groups, the *Transaction ID* IE shall also be included;
- In case of Logical Error, when reporting the *Criticality Diagnostics* IE, the *Transaction ID* IE shall also be included;
- In case of Logical Error in a response message of a Class 1 procedure, or failure to comprehend *Transaction ID* IE from a received message, the procedure shall be considered as unsuccessfully terminated or not terminated (e.g., transaction ID unknown in response message), and local error handling shall be initiated.

Annex A (informative): Change History

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2017-06	R3 NR#2	R3-172493	-	-	-	First version	0.1.0
2017-07	R3 NR#2	R3-172640	-	-	-	Incorporated agreed TPs from R3 NR#2 Adhoc	0.2.0
2017-08	R3#97	R3-173451	-	-	-	Incorporated agreed TPs from R3#97	0.3.0
2017-10	R3#97b	R3-174247	-	-	-	Incorporated agreed TPs from R3#97b	0.4.0
2017-12	R3#98	R3-175062	-	-	-	Incorporated agreed TPs from R3#98	0.5.0
2017-12	RAN#78	RP-172287				Submitted for approval to RAN	1.0.0
2017-12	RAN#78					TR approved by RAN plenary	15.0.0
2018-03	RP-79	RP-180468	0001	2	B	Baseline CR for March version of TS 38.473 covering agreements of RAN3#99	15.1.0
2018-04						Editorial correction to ASN.1 (correction to id-TimeToWait ProtocolIE-ID)	15.1.1
2018-06	RP-80	RP-181237	0011	6	B	Introduction of SA NR (38.473 Baseline CR covering RAN3 agreements)	15.2.0
2018-06	RP-80	RP-181239	0043	3	F	Essential corrections of EN-DC for NSA NR (38.473 Baseline CR covering RAN3 agreements)	15.2.0
2018-06	RP-80	RP-181237	0045	-	B	F1 support for LTE - NR coexistence	15.2.0
2018-06	RP-80					Correction to ASN.1 and to Change History table	15.2.1
2018-09	RP-81	RP-181920	0055	2	F	Introduction of DU Configuration Query	15.3.0
2018-09	RP-81	RP-181921	0056	4	F	CR to 38.473 on further clarifications on System information transfer over F1	15.3.0
2018-09	RP-81	RP-181921	0058	4	F	CR to 38.473 on corrections to System information delivery	15.3.0
2018-09	RP-81	RP-181920	0059	1	F	CR to 38.473 on corrections to PWS transfer over F1	15.3.0
2018-09	RP-81	RP-181921	0063	3	F	CR to 38.473 on PDCP SN over F1 interface	15.3.0
2018-09	RP-81	RP-181922	0064	3	F	NR Corrections (38.473 Baseline CR covering RAN3-101 agreements)	15.3.0
2018-09	RP-81	RP-181997	0068	-	F	Introduction of UL AMBR on F1	15.3.0
2018-09	RP-81	RP-181921	0072	3	F	Correction on cell management	15.3.0
2018-09	RP-81	RP-181921	0073	2	F	RLC Mode Indication over F1	15.3.0
2018-09	RP-81	RP-181921	0076	3	F	CR to 38.473 on UE Identity Index value	15.3.0
2018-09	RP-81	RP-181920	0077	1	F	Correction for UE Context Modification on presence of ServCellIndex IE	15.3.0
2018-09	RP-81	RP-181920	0078	-	F	Executing duplication for RRC-container	15.3.0
2018-09	RP-81	RP-181921	0079	1	F	Indication of RLC re-establishment at the gNB-DU	15.3.0
2018-09	RP-81	RP-181920	0080	-	F	Exchange of SMTC over F1	15.3.0
2018-09	RP-81	RP-181920	0081	-	F	Solving remaining issues with QoS parameters – TS 38.473	15.3.0
2018-09	RP-81	RP-181921	0090		F	Correction of 5GS TAC	15.3.0
2018-09	RP-81	RP-181921	0095	1	F	Extend the RANAC size to 8bits	15.3.0
2018-09	RP-81	RP-181921	0097	-	F	Corrections of Choice	15.3.0
2018-09	RP-81	RP-181921	0098	1	F	Correction of TNL criticality	15.3.0
2018-09	RP-81	RP-181921	0099	1	F	Corrections of usage of single container	15.3.0
2018-09	RP-81	RP-181921	0105	2	B	RRC version handling	15.3.0
2018-09	RP-81	RP-181921	0106	1	B	Introduction of Overload Handling in F1-C	15.3.0
2018-09	RP-81	RP-181921	0113	-	F	CR to 38.473 on presence of QoS information	15.3.0
2018-09	RP-81	RP-181921	0114	1	F	Correction C-RNTI format	15.3.0
2018-09	RP-81	RP-181921	0115	-	F	Correction of QoS Parameters	15.3.0
2018-09	RP-81	RP-181921	0116	1	F	Correction on F1 Setup Request	15.3.0
2018-12	RP-82	RP-182446	0070	3	F	RRC Delivery Indication	15.4.0
2018-12	RP-82	RP-182446	0117	1	F	Correction of AMBR Enforcement	15.4.0
2018-12	RP-82	RP-182446	0138	-	F	CR for correction on Initial UL RRC message transfer	15.4.0
2018-12	RP-82	RP-182446	0140	1	F	CR to 38.473 on bearer type change indication	15.4.0
2018-12	RP-82	RP-182446	0142	1	F	CR to 38.473 on correction to PWS System Information	15.4.0
2018-12	RP-82	RP-182446	0144	2	F	CR to 38.473 on asymmetric mapping for UL and DL QoS flow	15.4.0
2018-12	RP-82	RP-182447	0145	4	F	Corrections on UE-associated LTE/NR resource coordination	15.4.0
2018-12	RP-82	RP-182446	0147	2	F	CR for F1 Cell Management	15.4.0
2018-12	RP-82	RP-182447	0150	1	F	Missing Transaction ID in non-UE-associated procedures	15.4.0
2018-12	RP-82	RP-182446	0157	1	F	CR to 38.473 on mapping of servingCellMO and Serving Cell	15.4.0
2018-12	RP-82	RP-182446	0160	1	F	CR to 38.473 on UE context modification required procedure	15.4.0
2018-12	RP-82	RP-182447	0165	1	F	Addition of the RLC Mode information for bearer modification	15.4.0
2018-12	RP-82	RP-182448	0167	2	F	Rapporteur CR to align tabular	15.4.0
2018-12	RP-82	RP-182448	0168	2	F	Rapporteur CR to align ASN.1	15.4.0
2018-12	RP-82	RP-182447	0169	2	F	Correction of MaxnoofBPLMNs	15.4.0
2018-12	RP-82	RP-182351	0174	2	F	Correction on PDCP SN length on F1	15.4.0
2018-12	RP-82	RP-182447	0178	2	F	CR for TS 38.473 for MR-DC coordination	15.4.0
2018-12	RP-82	RP-182447	0179	2	F	Support of system information update for active UE without CSS	15.4.0
2018-12	RP-82	RP-182447	0187	1	F	CR to 38.473 on clarification to the presence of UE AMBR	15.4.0
2018-12	RP-82	RP-182506	0195	2	F	CR on Scell release for RLC failure	15.4.0
2018-12	RP-82	RP-182447	0205	1	F	About bandcombinationindex and featureSetEntryIndex	15.4.0
2018-12	RP-82	RP-182447	0211	1	F	CR to 38.473 on DRB PDCP duplication	15.4.0
2018-12	RP-82	RP-182447	0216	1	F	CR to 38.473 on clarifications on system information update over F1	15.4.0

2018-12	RP-82	RP-182448	0219	-	F	Correction of RRC version handling and UE inactivity notification	15.4.0
2019-01	RP-82					- correction to ASN.1: addiming a missing change to "WriteReplaceWarningResponseIEs F1AP-PROTOCOL-IES ::= {"	15.4.1
2019-03	RP-83	RP-190555	0202	2	F	Indication that cells are only UL or DL on F1	15.5.0
2019-03	RP-83	RP-190554	0204	1	F	AMF intitiated UE Context Release failure cause	15.5.0
2019-03	RP-83	RP-190554	0220	1	F	Correction to reconfiguration with sync for gNB-DU	15.5.0
2019-03	RP-83	RP-190554	0225	1	F	Introduction of PH-InforSCG in DU to CU RRC Information	15.5.0
2019-03	RP-83	RP-190554	0226	1	F	CR to 38.473 on Measurement gap coordination	15.5.0
2019-03	RP-83	RP-190554	0228	1	F	CR for TS 38.473 for MR-DC coordination	15.5.0
2019-03	RP-83	RP-190554	0229	2	F	Condition for inclusion of the Dedicated SI Delivery Needed UE List IE	15.5.0
2019-03	RP-83	RP-190554	0230	1	F	Correction of the Transmission stop/restart indication	15.5.0
2019-03	RP-83	RP-190554	0231	-	F	Corrections on gNB-CU/gNB-DU Configuration Update	15.5.0
2019-03	RP-83	RP-190556	0236	2	F	Correction of QoS Flow Mapping Indication	15.5.0
2019-03	RP-83	RP-190554	0244	-	F	Release due to pre-emption	15.5.0
2019-03	RP-83	RP-190554	0245	2	F	CR on RRC container in UE context modification request message	15.5.0
2019-03	RP-83	RP-190554	0246	2	F	CR on UE context modification refuse	15.5.0
2019-03	RP-83	RP-190554	0247	-	F	Transaction ID in Error Indication procedure	15.5.0
2019-03	RP-83	RP-190554	0249	2	F	Cells to be deactivated over F1	15.5.0
2019-03	RP-83	RP-190554	0251	1	F	CR to 38.473 on SRB duplication and LCID	15.5.0
2019-03	RP-83	RP-190554	0258	-	F	CR to 38.473 on corrections for removal of PDCP duplication for SRB	15.5.0
2019-03	RP-83	RP-190554	0263	1	F	CR to 38.473 on transfering UEAssistanceInformation over F1	15.5.0
2019-03	RP-83	RP-190554	0265	-	F	Rapporteur updates	15.5.0
2019-03	RP-83	RP-190554	0266	1	F	Correction on gNB-DU Resource Coordination	15.5.0
2019-03	RP-83	RP-190554	0267	1	F	Endpoint IP address and port	15.5.0
2019-03	RP-83	RP-190554	0268	1	F	Correction to add paging origin IE	15.5.0
2019-03	RP-83	RP-190555	0269	2	F	Multiple SCTP associations over F1AP	15.5.0
2019-03	RP-83	RP-190554	0272	1	F	About Cells Failed to be Activated IE in gNB-CU Configuration Update Ack	15.5.0
2019-03	RP-83	RP-190556	0273	1	F	gNB-DU UE Aggregate Maximum Bit Rate Uplink correction	15.5.0
2019-03	RP-83	RP-190554	0276	1	F	RRC Reconfiguration failure	15.5.0
2019-03	RP-83	RP-190554	0278	1	F	Node behaviour at reception of DU to CU RRC Information	15.5.0
2019-03	RP-83	RP-190554	0281	-	F	Addition of Transaction ID to Initial UL RRC Message Transfer	15.5.0
2019-07	RP-84	RP-191397	0200	5	F	RAN sharing with multiple Cell ID broadcast	15.6.0
2019-07	RP-84	RP-191397	0270	5	F	Addition of Network Access Rate Reduction message	15.6.0
2019-07	RP-84	RP-191397	0271	3	F	RAN UE ID for F1	15.6.0
2019-07	RP-84	RP-191396	0283	2	F	MR-DC resource coordination in F1	15.6.0
2019-07	RP-84	RP-191396	0316	2	F	Full configuration indication from gNB-CU to gNB-DU.	15.6.0
2019-07	RP-84	RP-191396	0322	2	F	CR to 38.473 on clarification to RRC reconfigure complete indicator	15.6.0
2019-07	RP-84	RP-191394	0326	2	F	CR to 38.473 on deconfiguring CA based PDCP duplication for DRB	15.6.0
2019-07	RP-84	RP-191395	0330	3	F	CR to 38.473 on Removal of Multiple TNLAs	15.6.0
2019-07	RP-84	RP-191396	0348	-	F	Full configuration in UE Context Setup	15.6.0
2019-07	RP-84	RP-191396	0351	2	F	CR on PWS segmentation over F1	15.6.0
2019-07	RP-84	RP-191396	0352	1	F	CR on cell type over F1	15.6.0
2019-07	RP-84	RP-191396	0357	-	F	Rapporteur updates: Alignment and editorials	15.5.0
2019-07	RP-84	RP-191396	0358	-	F	Rapporteur update: Correction of Presence for DRB information	15.6.0
2019-07	RP-84	RP-191396	0359	-	F	Rapporteur updates: Correction of Presence for E-UTRA PRACH Configuration	15.6.0
2019-07	RP-84	RP-191396	0370	-	F	Full configuration IE included in the UE Context Modification Response.	15.6.0
2019-07	RP-84	RP-191396	0376		F	CR to 38.473 on clarification for UP TNL Information IE over F1	15.6.0
2019-07	RP-84	RP-191396	0377	2	F	Procedure description on optional IEs in CU to DU RRC information IE.	15.6.0
2019-09	RP-85	RP-192166	0343	3	F	CR on MR-DC low layer coordination with an MgNB-DU	15.7.0
2019-09	RP-85	RP-192166	0344	2	F	CR on MCG PHR format in MgNB-DU	15.7.0
2019-09	RP-85	RP-192166	0388		F	CR on DC Coordination for PDCCH Blind Detection	15.7.0
2019-09	RP-85	RP-192167	0393	1	F	Rapporteur update - clarification of semantics	15.7.0
2019-09	RP-85	RP-192166	0399	1	F	Clarification for TNLA removal	15.7.0
2019-12	RP-86	RP-192915	0318	5	F	Correction about gNB-CU System Information IE	15.8.0
2019-12	RP-86	RP-192915	0447	1	F	On CellGroupConfig handling	15.8.0
2019-12	RP-86	RP-192915	0458	1	F	Correction of S-NSSAI coding	15.8.0
2019-12	RP-86	RP-192915	0459	1	F	Removal of Requested P-MaxFR2	15.8.0
2019-12	RP-86	RP-192915	0479	2	F	Addition of Message Identifier and Serial Number to PWS Cancel Request	15.8.0
2019-12	RP-86	RP-192916	0482	2	F	Clarifications on SCell lists	15.8.0
2019-12	RP-86	RP-192916	0494	-	F	RRC Container in Modification Procedure	15.8.0
2019-12	RP-86	RP-192916	0508	0	F	CR to 38.473 on applicability of the IE Selected BandCombinationIndex and Selected FeatureSetEntryIndex	15.8.0

2019-12	RP-86	RP-192916	0509	1	F	CR to 38.473 on MeasGapSharingConfig and gNB-CU System Information	15.8.0
2019-12	RP-86	RP-192916	0510	1	F	CR to 38.473 on cause values over F1	15.8.0
2019-12	RP-86	RP-192916	0515	2	F	Clarification on Initial UL RRC Message Transfer procedure	15.8.0
2019-12	RP-86	RP-192913	0280	7	F	Trace function support for F1AP	16.0.0
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2019-12	RP-86	RP-192913	0314	5	B	Introduction of Additional RRM Policy Index (ARPI)	16.0.0
2019-12	RP-86	RP-192908	0339	6	B	CR to F1-AP for RIM new message	16.0.0
2019-12	RP-86	RP-192915	0460		F	Removal of unused IEs	16.0.0
2019-12	RP-86	RP-192913	0463	1	C	Extending the MDBV Range	16.0.0
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2019-12	RP-86	RP-192914	0518	2	F	Support for setting up IPSec a priori in F1	16.0.0
2020-03	RP-87-e	RP-200428	0522	1	A	Correction of PWS Failure Indication	16.1.0
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2020-07	RP-88-e	RP-201079	0477	8	B	Introduction of NR_IIOT support to TS 38.473	16.2.0
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2020-09	RP-89-e	RP-201956	0557	2	A	Support of PSCell/SCell-only operation mode	16.3.0
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2020-09	RP-89-e	RP-201956	0639	1	F	Rapporteur Corrections	16.3.0
2020-09	RP-89-e	RP-201949	0640	-	F	Correction of procedure ID	16.3.0
2020-09	RP-89-e	RP-201956	0642	-	A	Correction of PWS cancel	16.3.0
2020-09	RP-89-e	RP-201949	0643	1	F	Corrections on PC5 Link Aggregated Bit Rate	16.3.0
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2020-09	RP-89-e	RP-201956	0663	1	F	Corrections to 38.473 on node name type	16.3.0
2020-09	RP-89-e	RP-201947	0664	1	F	Correction on IAB-DU configuration	16.3.0
2020-09	RP-89-e	RP-201982	0671		F	Correction on IAB-DU configuration	16.3.0
2020-09	RP-89-e					Correct wrong numbering of protocolIE-ID in clause 9.4.7	16.3.1
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2020-12	RP-90-e	RP-202310	0666	1	F	Correction on the identification of IAB-donor-DU	16.4.0
2020-12	RP-90-e	RP-202310	0667	2	F	Correction on the Context Setup procedure for IAB node	16.4.0
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2020-12	RP-90-e	RP-202310	0672	1	F	CR on F1-C transfer for Rel-16 IAB	16.4.0
2020-12	RP-90-e	RP-202311	0677	-	F	Correction of F1AP positioning procedures	16.4.0
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2020-12	RP-90-e	RP-202313	0683	-	F	Removal of duplicated imports	16.4.0
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2020-12	RP-90-e	RP-202311	0689	1	F	RRC alignement and various correction including ASN.1	16.4.0
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2020-12	RP-90-e	RP-202311	0709	1	F	Coupling TRP ID and Cell ID in Measurement procedures	16.4.0