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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;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- 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 E1 interface. The E1 interface provides means for interconnecting a gNB-CU-CP and a gNB-CU-UP of a gNB within an NG-RAN, or for interconnecting a gNB-CU-CP and a gNB-CU-UP of an en-gNB within an E-UTRAN, or for interconnecting an eNB-CP and an eNB-UP of an eNB within an E-UTRAN, or for interconnecting an ng-eNB-CU-CP and an ng-eNB-CU-UP of an ng-eNB within an NG-RAN. The E1 Application Protocol (E1AP) supports the functions of E1 interface by signalling procedures defined in the present document. E1AP is developed in accordance to the general principles stated in TS 38.401 [2] and TS 37.480 [3].

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 38.401: "NG-RAN; Architecture Description".
- [3] 3GPP TS 37.480: "E1 general aspects and principles".
- [4] 3GPP TS 38.300: "NR; Overall description; Stage-2".
- [5] 3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error".
- [6] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".
- [7] ITU-T Recommendation X.691 (2002-07): "Information technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".
- [8] ITU-T Recommendation X.680 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [9] ITU-T Recommendation X.681 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Information object specification".
- [10] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specificaiton".
- [11] 3GPP TS 23.401: "General Packet Radio Service (GPRS) Enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [12] 3GPP TS 23.203: "Policy and Charging Control Architecture".
- [13] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".
- [14] IETF RFC 5905: "Network Time Protocol Version 4: Protocol and Algorithms Specification".
- [15] 3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)".
- [16] 3GPP TS 38.414: "NG-RAN; NG Data Transport".
- [17] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

- [18] 3GPP TS 37.482: "E1 Signalling Transport".
- [19] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".
- [20] 3GPP TS 23.501: "System Architecture for the 5G System".
- [21] Void
- [22] 3GPP TS 28.552: "Management and orchestration; 5G performance measurements".
- [23] 3GPP TS 23.003: "Numbering, addressing and identification".
- [24] 3GPP TS 32.422: "Trace control and configuration management".
- [25] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".
- [26] 3GPP TS 32.425: "Performance measurements; Evolved Universal Terrestrial Radio Access Network (E-UTRAN)".
- [27] 3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2".
- [28] 3GPP TS 38.474: "NG-RAN; F1 data transport".
- [29] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; Stage 3".
- [30] 3GPP TS 37.470: "W1 interface; General aspects and principles".
- [31] 3GPP TS 36.401: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Architecture description".
- [32] 3GPP TS 33.401: "3GPP System Architecture Evolution (SAE); Security architecture".
- [33] 3GPP TS 36.331: " Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".
- [34] 3GPP TS 36.323: " Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Packet Data Convergence Protocol (PDCP) specification".
- [35] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".
- [36] 3GPP TS 23.527: "5G System; Restoration procedures".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

Elementary Procedure: E1AP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between gNB-CU-CP and gNB-CU-UP, or between eNB-CP and eNB-UP, or between ng-eNB-CU-CP and ng-eNB-CU-UP. 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 E1AP EPs together is specified in stage 2 specifications (e.g., TS 37.480 [3]).

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.

Conditional handover: as defined in TS 38.300 [4].

Conditional PSCell Change: as defined in TS 37.340 [19].

DAPS Handover: as defined in TS 38.300 [4].

eNB-CP: as defined in TS 36.401 [31].

eNB-UP: as defined in TS 36.401 [31].

gNB: as defined in TS 38.300 [4].

gNB-CU: as defined in TS 38.401 [2].

gNB-DU: as defined in TS 38.401 [2].

gNB-CU-CP: as defined in TS 38.401 [2].

gNB-CU-UP: as defined in TS 38.401 [2].

MBS-associated signalling: When E1AP messages associated to one MBS session uses the MBS-associated logical E1-connection for association of the message to the MBS session in gNB-CU-CP and gNB-CU-UP.

MBS-associated logical E1-connection: The MBS-associated logical E1-connection uses the identities *GNB-CU-CP MBS E1AP ID* and *GNB-CU-UP MBS E1AP ID* according to the definition in TS 38.401 [2]. For a received MBS-associated E1AP message the gNB-CU-CP identifies the associated MBS session based on the *GNB-CU-CP MBS E1AP ID* IE and the gNB-CU-UP identifies the associated MBS session based on the *GNB-CU-UP MBS E1AP ID* IE.

MBS session resource: as defined in TS 38.401 [2].

Multicast F1-U Context: as defined in TS 38.401 [2].

ng-eNB-CU: as defined in TS 37.470 [30].

ng-eNB-CU-CP: as defined in TS 38.401 [2].

ng-eNB-CU-UP: as defined in TS 38.401 [2].

ng-eNB-DU: as defined in TS 37.470 [30].

PDU Session Resource: as defined in TS 38.401 [2].

UE-associated signalling: When E1AP messages associated to one UE uses the UE-associated logical E1-connection for association of the message to the UE in gNB-CU-UP and gNB-CU-CP, or in eNB-CP and eNB-UP, or in ng-eNB-CU-CP and ng-eNB-CU-UP.

UE-associated logical E1-connection: The UE-associated logical E1-connection uses the identities *GNB-CU-CP UE E1AP ID* and *GNB-CU-UP UE E1AP ID* according to the definition in TS 38.401 [2]. For a received UE associated E1AP message the gNB-CU-CP or eNB-CP or ng-eNB-CU-CP identifies the associated UE based on the *GNB-CU-CP UE E1AP ID* IE and the gNB-CU-UP or eNB-UP or ng-eNB-CU-UP identifies the associated UE based on the *GNB-CU-UP UE E1AP ID* IE.

Public Network Integrated NPN: as defined in TS 23.501 [20].

Stand-alone Non-Public Network: as defined in TS 23.501 [20].

U2N Remote UE: as defined in TS 38.300 [4].

Subsequent Conditional PSCell Addition or Change (subsequent CPAC): as defined in TS 37.340 [19]

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
CAG	Closed Access Group
CGI	Cell Global Identifier
CHO	Conditional Handover
CN	Core Network
CP	Control Plane
CPA	Conditional PSCell Addition
CPAC	Conditional PSCell Addition or Change
CPC	Conditional PSCell Change
DAPS	Dual Active Protocol Stack
DL	Downlink
EHC	Ethernet Header Compression
EN-DC	E-UTRA-NR Dual Connectivity
EPC	Evolved Packet Core
IAB	Integrated Access and Backhaul
MBS	Multicast/Broadcast Service
MCG	Master Cell Group
MT-SDT	Mobile Terminated Small Data Transmission
NID	Network Identifier
NPN	Non-Public Network
PNI-NPN	Public Network Integrated Non-Public Network
PTP	Point to Point
PTM	Point to Multipoint
NSSAI	Network Slice Selection Assistance Information
RANAC	RAN Area Code
SCG	Secondary Cell Group
SDAP	Service Data Adaptation Protocol
SDT	Small Data Transmission
SNPN	Stand-alone Non-Public Network
S-NSSAI	Single Network Slice Selection Assistance Information
TNLA	Transport Network Layer Association
U2N	UE-to-Network
UDC	Uplink Data Compression

4 General

4.1 Procedure specification principles

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

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

- The procedure text discriminates between:

- 1) Functionality which "shall" be executed.

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

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

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

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

4.2 Forwards and backwards compatibility

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

4.3 Specification notations

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

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

5 E1AP services

E1AP provides the signalling service between the gNB-CU-CP and the gNB-CU-UP, or between the eNB-CP and the eNB-UP, or between the ng-eNB-CU-CP and the ng-eNB-CU-UP that is required to fulfil the E1AP functions described in clause 7. E1AP services are divided into three groups:

- Non UE-associated services: They are related to the whole E1 interface instance between the gNB-CU-CP and gNB-CU-UP, or between the eNB-CP and eNB-UP, or between the ng-eNB-CU-CP and ng-eNB-CU-UP utilising a non UE-associated signalling connection.
- UE-associated services: They are related to one UE. E1AP functions that provide these services are associated with a UE-associated signalling connection that is maintained for the UE in question.
- MBS-associated services: They are related to one MBS session. E1AP functions that provide these services are associated with an MBS-associated signalling connection that is maintained for the MBS session in question.

Unless explicitly indicated in the procedure specification, at any instance in time one protocol endpoint shall have a maximum of one ongoing E1AP procedure related to a certain UE.

Unless explicitly indicated in the procedure specification, at any instance in time one protocol endpoint shall have a maximum of one ongoing E1AP procedure related to a certain MBS session.

6 Services expected from signalling transport

The signalling connection shall provide in sequence delivery of E1AP messages. E1AP shall be notified if the signalling connection breaks.

7 Functions of E1AP

The functions of E1AP are described in TS 37.480 [3].

8 E1AP procedures

NOTE: The procedures listed in this section should also be applied to CP/UP separation for eNB and ng-eNB, except for the IAB UP TNL Address Update procedure, if not stated otherwise. With this understanding, in this section each instance of gNB-CU-CP could be treated as eNB-CP or ng-eNB-CU-CP, and each gNB-CU-UP could be treated as eNB-UP or ng-eNB-CU-UP, for eNB or ng-eNB CP/UP separation respectively.

8.1 List of E1AP 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	
gNB-CU-UP E1 Setup	GNB-CU-UP E1 SETUP REQUEST	GNB-CU-UP E1 SETUP RESPONSE	GNB-CU-UP E1 SETUP FAILURE
gNB-CU-CP E1 Setup	GNB-CU-CP E1 SETUP REQUEST	GNB-CU-CP E1 SETUP RESPONSE	GNB-CU-CP E1 SETUP FAILURE

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
gNB-CU-UP Configuration Update	GNB-CU-UP CONFIGURATION UPDATE	GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE	GNB-CU-UP CONFIGURATION UPDATE FAILURE
gNB-CU-CP Configuration Update	GNB-CU-CP CONFIGURATION UPDATE	GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE	GNB-CU-CP CONFIGURATION UPDATE FAILURE
E1 Release	E1 RELEASE REQUEST	E1 RELEASE RESPONSE	
Bearer Context Setup	BEARER CONTEXT SETUP REQUEST	BEARER CONTEXT SETUP RESPONSE	BEARER CONTEXT SETUP FAILURE
Bearer Context Modification (gNB-CU-CP initiated)	BEARER CONTEXT MODIFICATION REQUEST	BEARER CONTEXT MODIFICATION RESPONSE	BEARER CONTEXT MODIFICATION FAILURE
Bearer Context Modification Required (gNB-CU-UP initiated)	BEARER CONTEXT MODIFICATION REQUIRED	BEARER CONTEXT MODIFICATION CONFIRM	
Bearer Context Release (gNB-CU-CP initiated)	BEARER CONTEXT RELEASE COMMAND	BEARER CONTEXT RELEASE COMPLETE	
Resource Status Reporting Initiation	RESOURCE STATUS REQUEST	RESOURCE STATUS RESPONSE	RESOURCE STATUS FAILURE
IAB UP TNL Address Update	IAB UP TNL ADDRESS UPDATE	IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE	IAB UP TNL ADDRESS UPDATE FAILURE
BC Bearer Context Setup	BC BEARER CONTEXT SETUP REQUEST	BC BEARER CONTEXT SETUP RESPONSE	BC BEARER CONTEXT SETUP FAILURE
BC Bearer Context Modification (gNB-CU-CP initiated)	BC BEARER CONTEXT MODIFICATION REQUEST	BC BEARER CONTEXT MODIFICATION RESPONSE	BC BEARER CONTEXT MODIFICATION FAILURE
BC Bearer Context Modification Required (gNB-CU-UP initiated)	BC BEARER CONTEXT MODIFICATION REQUIRED	BC BEARER CONTEXT MODIFICATION CONFIRM	
BC Bearer Context Release (gNB-CU-CP initiated)	BC BEARER CONTEXT RELEASE COMMAND	BC BEARER CONTEXT RELEASE COMPLETE	
MC Bearer Context Setup	MC BEARER CONTEXT SETUP REQUEST	MC BEARER CONTEXT SETUP RESPONSE	MC BEARER CONTEXT SETUP FAILURE
MC Bearer Context Modification (gNB-CU-CP initiated)	MC BEARER CONTEXT MODIFICATION REQUEST	MC BEARER CONTEXT MODIFICATION RESPONSE	MC BEARER CONTEXT MODIFICATION FAILURE
MC Bearer Context Modification Required (gNB-CU-UP initiated)	MC BEARER CONTEXT MODIFICATION REQUIRED	MC BEARER CONTEXT MODIFICATION CONFIRM	
MC Bearer Context Release (gNB-CU-CP initiated)	MC BEARER CONTEXT RELEASE COMMAND	MC BEARER CONTEXT RELEASE COMPLETE	

Table 2: Class 2 procedures

Elementary Procedure	Message
Error Indication	ERROR INDICATION
Bearer Context Release Request (gNB-CU-UP initiated)	BEARER CONTEXT RELEASE REQUEST
Bearer Context Inactivity Notification	BEARER CONTEXT INACTIVITY NOTIFICATION
DL Data Notification	DL DATA NOTIFICATION
UL Data Notification	UL DATA NOTIFICATION
Data Usage Report	DATA USAGE REPORT
gNB-CU-UP Counter Check	GNB-CU-UP COUNTER CHECK REQUEST
gNB-CU-UP Status Indication	GNB-CU-UP STATUS INDICATION
MR-DC Data Usage Report	MR-DC DATA USAGE REPORT
Trace Start	TRACE START
Deactivate Trace	DEACTIVATE TRACE
Cell Traffic Trace	CELL TRAFFIC TRACE
Resource Status Reporting	RESOURCE STATUS UPDATE
Early Forwarding SN Transfer	EARLY FORWARDING SN TRANSFER
GNB-CU-CP Measurement Results Information	GNB-CU-CP MEASUREMENT RESULTS INFORMATION
IAB PSK Notification	IAB PSK NOTIFICATION
BC Bearer Context Release (gNB-CU-UP initiated)	BC BEARER CONTEXT RELEASE REQUEST
MC Bearer Context Release (gNB-CU-UP initiated)	MC BEARER CONTEXT RELEASE REQUEST
MC Bearer Notification	MC BEARER NOTIFICATION

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 E1AP UE-related contexts, in the event of a failure in the gNB-CU-CP or gNB-CU-UP. This procedure does not affect the application level configuration data exchanged during, e.g., the E1 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-CP

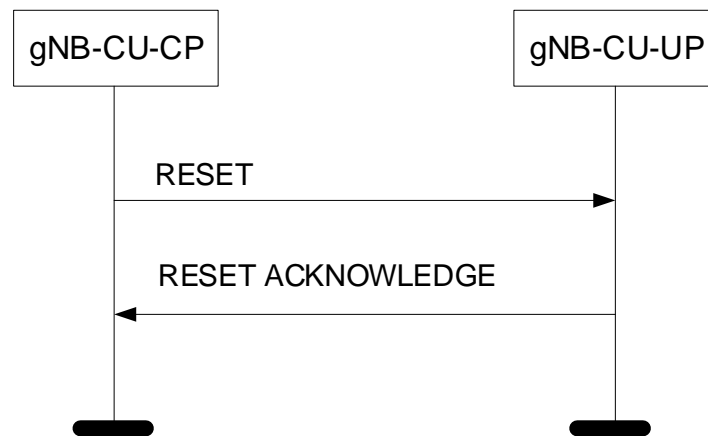


Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU-CP. Successful operation.

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

At reception of the RESET message the gNB-CU-UP shall release all allocated resources on E1 related to the UE association(s) indicated explicitly or implicitly in the RESET message and remove the indicated bearer contexts including E1AP ID.

After the gNB-CU-UP has released all assigned E1 resources and the UE E1AP IDs for all indicated UE associations which can be used for new UE-associated logical E1-connections over the E1 interface, the gNB-CU-UP shall respond with the RESET ACKNOWLEDGE message. The gNB-CU-UP does not need to wait for the release of bearer resources to be completed before returning the RESET ACKNOWLEDGE message.

If the RESET message contains the *UE-associated logical E1-connection list* IE, then:

- The gNB-CU-UP shall use the *gNB-CU-CP UE E1AP ID* IE and/or the *gNB-CU-UP UE E1AP ID* IE to explicitly identify the UE association(s) to be reset.
- The gNB-CU-UP shall include in the RESET ACKNOWLEDGE message, for each UE association to be reset, the *UE-associated logical E1-connection Item* IE in the *UE-associated logical E1-connection list* IE. The *UE-associated logical E1-connection Item* IEs shall be in the same order as received in the RESET message and shall include also unknown UE-associated logical E1-connections. Empty *UE-associated logical E1-connection Item* IEs, received in the RESET message, may be omitted in the RESET ACKNOWLEDGE message.
- If the *gNB-CU-CP UE E1AP ID* IE is included in the *UE-associated logical E1-connection Item* IE for a UE association, the gNB-CU-UP shall include the *gNB-CU-CP UE E1AP ID* IE in the corresponding *UE-associated logical E1-connection Item* IE in the RESET ACKNOWLEDGE message.
- If the *gNB-CU-UP UE E1AP ID* IE is included in the *UE-associated logical E1-connection Item* IE for a UE association, the gNB-CU-UP shall include the *gNB-CU-UP UE E1AP ID* IE in the corresponding *UE-associated logical E1-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 E1 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-CU-UP

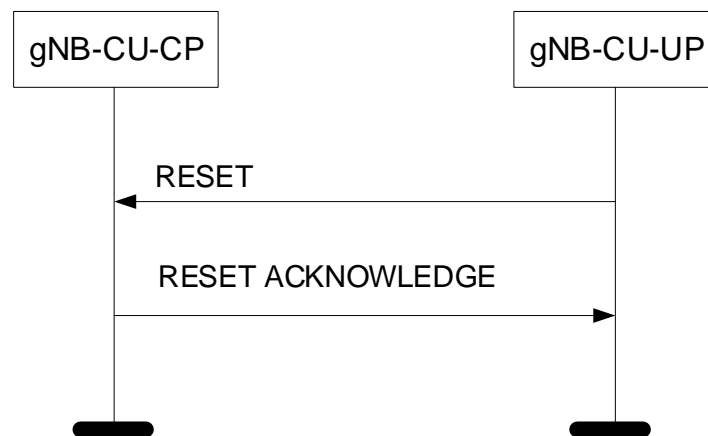


Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-CU-UP. Successful operation.

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

At reception of the RESET message the gNB-CU-CP shall release all allocated resources on E1 related to the UE association(s) indicated explicitly or implicitly in the RESET message and remove the E1AP ID for the indicated UE associations.

After the gNB-CU-CP has released all assigned E1 resources and the UE E1AP IDs for all indicated UE associations which can be used for new UE-associated logical E1-connections over the E1 interface, the gNB-CU-CP shall respond with the RESET ACKNOWLEDGE message. The gNB-CU-CP does not need to wait for the release of bearer resources to be completed before returning the RESET ACKNOWLEDGE message.

If the RESET message contains the *UE-associated logical E1-connection list* IE, then:

- The gNB-CU-CP shall use the *gNB-CU-CP UE E1AP ID* IE and/or the *gNB-CU-UP UE E1AP ID* IE to explicitly identify the UE association(s) to be reset.
- The gNB-CU-CP shall in the RESET ACKNOWLEDGE message include, for each UE association to be reset, the *UE-associated logical E1-connection Item* IE in the *UE-associated logical E1-connection list* IE. The *UE-associated logical E1-connection Item* IEs shall be in the same order as received in the RESET message and shall include also unknown UE-associated logical E1-connections. Empty *UE-associated logical E1-connection Item* IEs, received in the RESET message, may be omitted in the RESET ACKNOWLEDGE message.
- If the *gNB-CU-CP UE E1AP ID* IE is included in the *UE-associated logical E1-connection Item* IE for a UE association, the gNB-CU-CP shall include the *gNB-CU-CP UE E1AP ID* IE in the corresponding *UE-associated logical E1-connection Item* IE in the RESET ACKNOWLEDGE message.
- If the *gNB-CU-UP UE E1AP ID* IE is included in a *UE-associated logical E1-connection Item* IE for a UE association, the gNB-CU-CP shall include the *gNB-CU-UP UE E1AP ID* IE in the corresponding *UE-associated logical E1-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 E1 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

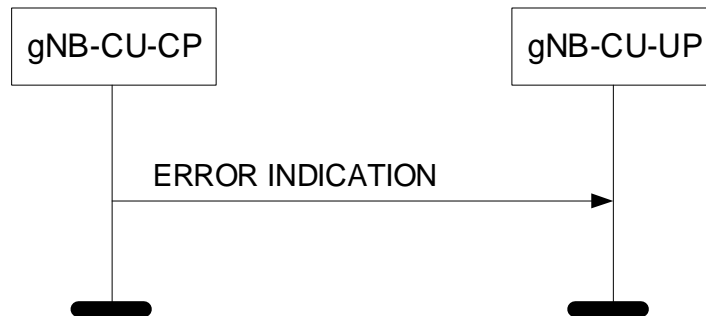


Figure 8.2.2.2-1: Error Indication procedure, gNB-CU-CP originated. Successful operation.

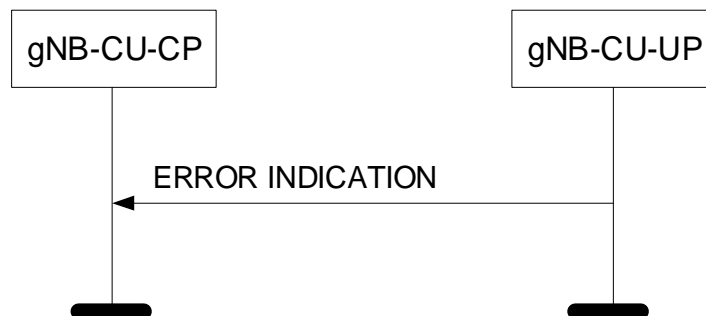


Figure 8.2.2.2-2: Error Indication procedure, gNB-CU-UP originated. Successful operation.

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-CP UE E1AP ID* IE and *gNB-CU-UP UE E1AP ID* IE shall be included in the ERROR INDICATION message. If one or both of the *gNB-CU-CP UE E1AP ID* IE and the *gNB-CU-UP UE E1AP ID* IE are not correct, the cause shall be set to appropriate value, e.g., "Unknown or already allocated gNB-CU-CP UE E1AP ID", "Unknown or already allocated gNB-CU-UP UE E1AP ID" or "Unknown or inconsistent pair of UE E1AP ID".

8.2.2.3 Abnormal Conditions

Not applicable.

8.2.3 gNB-CU-UP E1 Setup

8.2.3.1 General

The purpose of the gNB-CU-UP E1 Setup procedure is to exchange application level data needed for the gNB-CU-UP and the gNB-CU-CP to correctly interoperate on the E1 interface. If the gNB-CU-UP initiates the first TNL association, it shall also initiate the gNB-CU-UP E1 Setup procedure. 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 E1AP 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

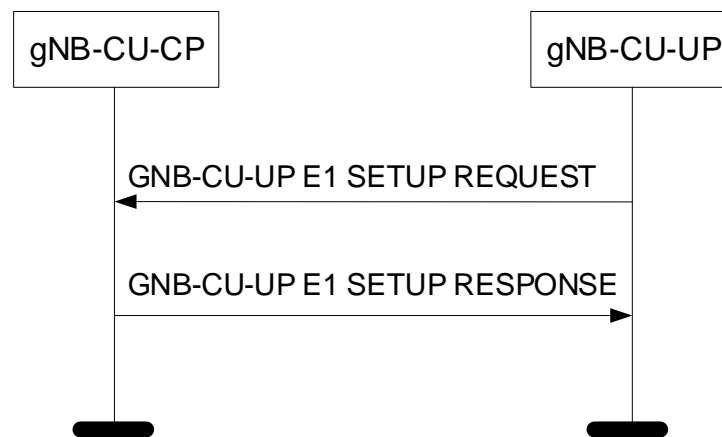


Figure 8.2.3.2-1: gNB-CU-UP E1 Setup procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending a GNB-CU-UP E1 SETUP REQUEST message including the appropriate data to the gNB-CU-CP. The gNB-CU-CP responds with a GNB-CU-UP E1 SETUP RESPONSE message including the appropriate data.

If the GNB-CU-UP E1 SETUP REQUEST message contains the *gNB-CU-UP Name* IE the gNB-CU-CP may use this IE as a human readable name of the gNB-CU-UP. If the GNB-CU-UP E1 SETUP REQUEST message contains the *Extended gNB-CU-UP Name* IE, the gNB-CU-CP may use this IE as a human readable name of the gNB-CU-UP and shall ignore the *gNB-CU-UP Name* IE if included.

If the GNB-CU-UP E1 SETUP RESPONSE message contains the *gNB-CU-CP Name* IE, the gNB-CU-UP may use this IE as a human readable name of the gNB-CU-CP. If the GNB-CU-UP E1 SETUP RESPONSE message contains the *Extended gNB-CU-CP Name* IE, the GNB-CU-UP may use this IE as a human readable name of the gNB-CU-CP and shall ignore the *gNB-CU-CP Name* IE if included.

If the *Slice Support List* IE is contained in the GNB-CU-UP E1 SETUP REQUEST message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

If the *NR CGI Support List* or the *Extended NR CGI Support List* IE is contained in the GNB-CU-UP E1 SETUP REQUEST message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

If the *ECGI Support List* IE is contained in the GNB-CU-UP E1 SETUP REQUEST message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

If the *QoS Parameters Support List* IE is contained in the GNB-CU-UP E1 SETUP REQUEST message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

If the *NPN Support Information* IE is contained in the GNB-CU-UP E1 SETUP REQUEST message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

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 E1 interface is operational and other E1 messages can be exchanged.

If the *gNB-CU-UP Capacity* IE is contained in the GNB-CU-UP E1 SETUP REQUEST message, the gNB-CU-CP shall take this IE into account.

If the GNB-CU-UP E1 SETUP REQUEST message includes the *Transport Network Layer Address Info* IE, the gNB-CU-CP shall, if supported, take this IE into account for IPsec tunnel establishment.

If the GNB-CU-UP E1 SETUP RESPONSE message includes the *Transport Network Layer Address Info* IE, the gNB-CU-UP shall, if supported, take this IE into account for IPsec tunnel establishment.

8.2.3.3 Unsuccessful Operation

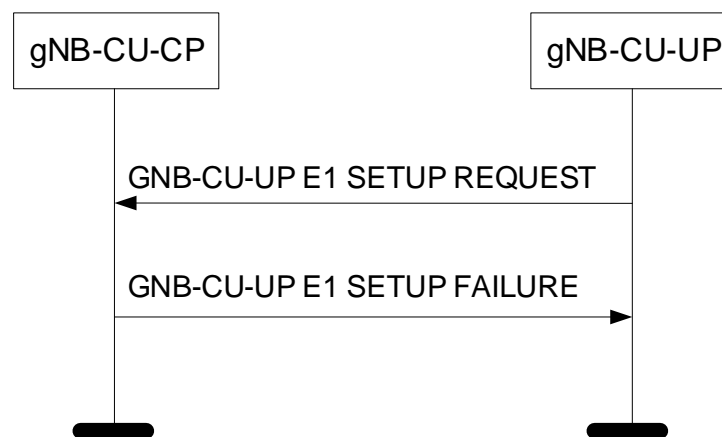


Figure 8.2.3.3-1: gNB-CU-UP E1 Setup procedure: Unsuccessful Operation.

If the gNB-CU-CP cannot accept the setup, it shall respond with a GNB-CU-UP E1 SETUP FAILURE and appropriate cause value.

If the GNB-CU-UP E1 SETUP FAILURE message includes the *Time To Wait* IE, the gNB-CU-UP shall wait at least for the indicated time before reinitiating the E1 setup towards the same gNB-CU-CP.

8.2.3.4 Abnormal Conditions

If the first message received for a specific TNL association is not a GNB-CU-CP E1 SETUP REQUEST, GNB-CU-UP E1 SETUP RESPONSE, or GNB-CU-UP E1 SETUP FAILURE message then this shall be treated as a logical error.

If the gNB-CU-UP does not receive either GNB-CU-UP E1 SETUP RESPONSE message or GNB-CU-UP E1 SETUP FAILURE message, the gNB-CU-UP may reinitiate the gNB-CU-UP E1 Setup procedure towards the same gNB-CU-CP, provided that the content of the new GNB-CU-UP E1 SETUP REQUEST message is identical to the content of the previously unacknowledged GNB-CU-UP E1 SETUP REQUEST message.

If the gNB-CU-UP receives a GNB-CU-CP E1 SETUP REQUEST message from the peer entity on the same E1 interface:

- In case the gNB-CU-UP answers with a GNB-CU-CP E1 SETUP RESPONSE message and receives a subsequent GNB-CU-UP E1 SETUP FAILURE message, the gNB-CU-UP shall consider the E1 interface as non operational and the procedure as unsuccessfully terminated according to sub clause 8.2.3.3.
- In case the gNB-CU-UP answers with a GNB-CU-CP E1 SETUP FAILURE message and receives a subsequent GNB-CU-UP E1 SETUP RESPONSE message, the gNB-CU-UP shall ignore the GNB-CU-UP E1 SETUP RESPONSE message and consider the E1 interface as non operational.

8.2.4 gNB-CU-CP E1 Setup

8.2.4.1 General

The purpose of the gNB-CU-CP E1 Setup procedure is to exchange application level data needed for the gNB-CU-CP and the gNB-CU-UP to correctly interoperate on the E1 interface. If the gNB-CU-CP initiates the first TNL association, it shall also initiate the gNB-CU-CP E1 Setup procedure. 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 E1AP UE-related contexts (if any) and erases all related signalling connections in the two nodes like a Reset procedure would do.

8.2.4.2 Successful Operation

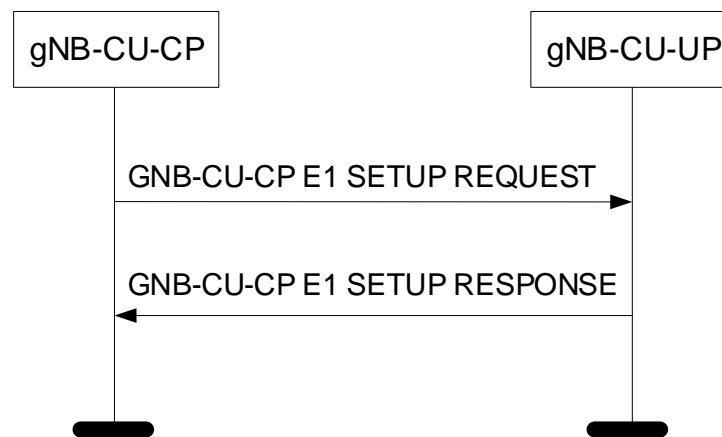


Figure 8.2.4.2-1: gNB-CU-CP E1 Setup procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending a GNB-CU-CP E1 SETUP REQUEST message including the appropriate data to the gNB-CU-UP. The gNB-CU-UP responds with a GNB-CU-CP E1 SETUP RESPONSE message including the appropriate data.

If the GNB-CU-CP E1 SETUP REQUEST message contains the *gNB-CU-CP Name* IE the gNB-CU-UP may use this IE as a human readable name of the gNB-CU-CP. If the GNB-CU-CP E1 SETUP REQUEST message contains the *Extended gNB-CU-CP Name* IE, the gNB-CU-UP may use this IE as a human readable name of the gNB-CU-CP and shall ignore the *gNB-CU-CP Name* IE if included.

If the GNB-CU-CP E1 SETUP RESPONSE message contains the *gNB-CU-UP Name* IE, the gNB-CU-CP may use this IE as a human readable name of the gNB-CU-UP. If the GNB-CU-CP E1 SETUP RESPONSE message contains the *Extended gNB-CU-UP Name* IE, the GNB-CU-CP may use this IE as a human readable name of the gNB-CU-UP and shall ignore the *gNB-CU-UP Name* IE if included.

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 E1 interface is operational and other E1 messages can be exchanged.

If the *gNB-CU-UP Capacity* IE is contained in the GNB-CU-CP E1 SETUP RESPONSE message, the gNB-CU-CP shall take this IE into account.

If the GNB-CU-CP E1 SETUP REQUEST message includes the *Transport Network Layer Address Info* IE, the gNB-CU-UP shall, if supported, take this IE into account for IPsec tunnel establishment.

If the GNB-CU-CP E1 SETUP RESPONSE message includes the *Transport Network Layer Address Info* IE, the gNB-CU-CP shall, if supported, take this IE into account for IPsec tunnel establishment.

If the NPN Support Information IE is contained in the GNB-CU-CP E1 SETUP RESPONSE message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

If the *NR CGI Support List* or the *Extended NR CGI Support List* IE is contained in the GNB-CU-CP E1 SETUP RESPONSE message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

If the *ECGI Support List* IE is contained in the GNB-CU-CP E1 SETUP RESPONSE message, the gNB-CU-CP shall store the corresponding information and it may take it into account for bearer context establishment.

8.2.4.3 Unsuccessful Operation

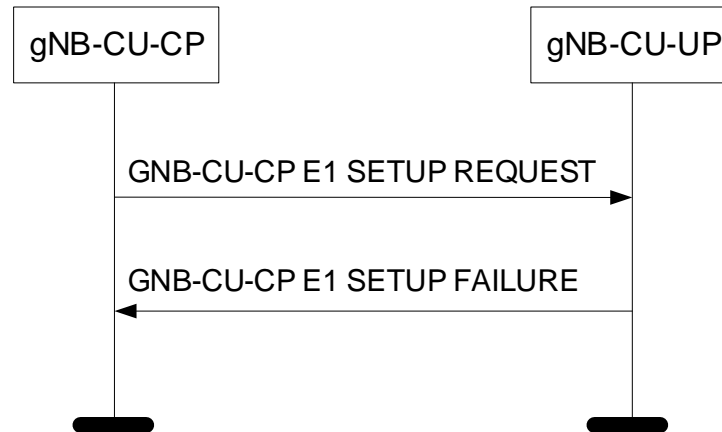


Figure 8.2.4.3-1: gNB-CU-CP E1 Setup procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot accept the setup, it shall respond with a GNB-CU-CP E1 SETUP FAILURE and appropriate cause value.

If the GNB-CU-CP E1 SETUP FAILURE message includes the *Time To Wait* IE, the gNB-CU-CP shall wait at least for the indicated time before reinitiating the E1 setup towards the same gNB-CU-UP.

8.2.4.4 Abnormal Conditions

If the first message received for a specific TNL association is not a GNB-CU-UP E1 SETUP REQUEST, GNB-CU-CP E1 SETUP RESPONSE, or GNB-CU-CP E1 SETUP FAILURE message then this shall be treated as a logical error.

If the gNB-CU-CP does not receive either GNB-CU-CP E1 SETUP RESPONSE message or GNB-CU-CP E1 SETUP FAILURE message, the gNB-CU-CP may reinitiate the gNB-CU-CP E1 Setup procedure towards the same gNB-CU-UP, provided that the content of the new GNB-CU-CP E1 SETUP REQUEST message is identical to the content of the previously unacknowledged GNB-CU-CP E1 SETUP REQUEST message.

If the gNB-CU-CP receives a GNB-CU-UP E1 SETUP REQUEST message from the peer entity on the same E1 interface:

- In case the gNB-CU-CP answers with a GNB-CU-UP E1 SETUP RESPONSE message and receives a subsequent GNB-CU-CP E1 SETUP FAILURE message, the gNB-CU-CP shall consider the E1 interface as non operational and the procedure as unsuccessfully terminated according to sub clause 8.2.4.3.
- In case the gNB-CU-CP answers with a GNB-CU-UP E1 SETUP FAILURE message and receives a subsequent GNB-CU-CP E1 SETUP RESPONSE message, the gNB-CU-CP shall ignore the GNB-CU-CP E1 SETUP RESPONSE message and consider the E1 interface as non operational.

8.2.5 gNB-CU-UP Configuration Update

8.2.5.1 General

The purpose of the gNB-CU-UP Configuration Update procedure is to update application level configuration data needed for the gNB-CU-UP and the gNB-CU-CP to interoperate correctly on the E1 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

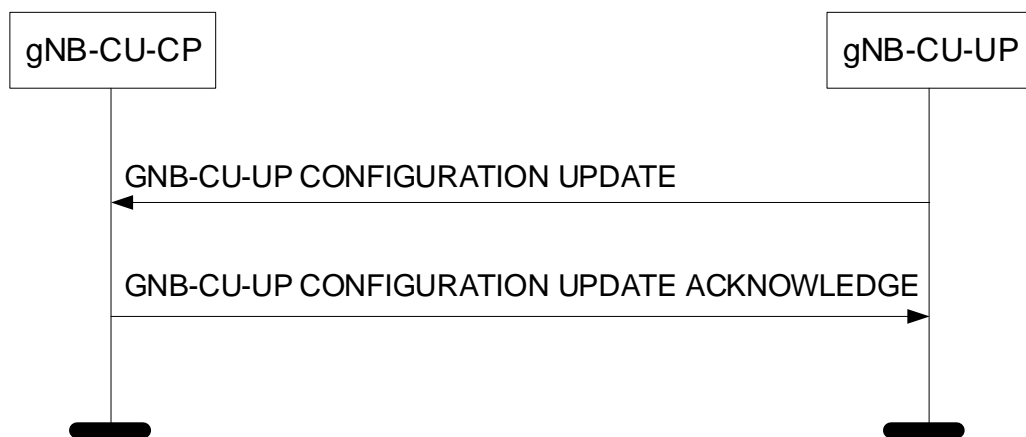


Figure 8.2.5.2-1: gNB-CU-UP Configuration Update procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending a GNB-CU-UP CONFIGURATION UPDATE message to the gNB-CU-CP including an appropriate set of updated configuration data that it has just taken into operational use. The gNB-CU-CP responds with GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data. If an information element is not included in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall interpret that the corresponding configuration data is not changed and shall continue to operate with the existing related configuration data.

If the *Supported PLMNs* IE is included in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall overwrite the whole list of information and store the corresponding information.

- If the *Slice Support List* IE is contained in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall store the corresponding information and replace any existing information.
- If the *NR CGI Support List* or the *Extended NR CGI Extended Support List* IE is contained in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall store the corresponding information and replace any existing information.
- If the *ECGI Support List* IE is contained in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall store the corresponding information and replace any existing information.
- If the *QoS Parameters Support List* IE is contained in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall store the corresponding information and replace any existing information.
- If the *NPN Support Information* IE is contained in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall store the corresponding information and replace any existing information.

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 the *gNB-CU-UP Capacity* IE is contained in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall take this IE into account.

If the *gNB-CU-UP ID* IE is included in the GNB-CU-UP CONFIGURATION UPDATE message, the gNB-CU-CP shall associate the TNLA to the E1 interface instance using the gNB-CU-UP ID.

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

If the GNB-CU-UP CONFIGURATION UPDATE message includes *gNB-CU-UP TNLA To Remove List* IE, the gNB-CU-CP shall, if supported, initiate removal of the TNL association(s) indicated by gNB-CU-CP TNL endpoint(s) and gNB-CU-UP TNL endpoint(s) if the *TNLA Transport Layer Address gNB-CU-CP* IE is present, or the TNL

association(s) indicated by gNB-CU-UP TNL endpoint(s) if the *TNLA Transport Layer Address gNB-CU-CP* IE is absent:

- if the received *TNLA Transport Layer Address* IE includes the *Port Number* IE, the gNB-CU-UP TNL endpoint is identified by the *Endpoint IP Address* IE and the *Port Number* IE. Otherwise, the gNB-CU-UP TNL endpoints correspond to all gNB-CU-UP TNL endpoints identified by the *Endpoint IP Address* IE and any Port Number(s).
- if the received *TNLA Transport Layer Address gNB-CU-CP* IE includes the *Port Number* IE, the gNB-CU-CP TNL endpoint is identified by the *Endpoint IP Address* IE and the *Port Number* IE. Otherwise, the gNB-CU-CP TNL endpoints correspond to all gNB-CU-CP TNL endpoints identified by the *Endpoint IP Address* IE and any Port Number(s).

If the GNB-CU-UP CONFIGURATION UPDATE message includes the *Transport Network Layer Address Info* IE, the gNB-CU-CP shall, if supported, take this IE into account for IPsec tunnel establishment.

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

8.2.5.3 Unsuccessful Operation

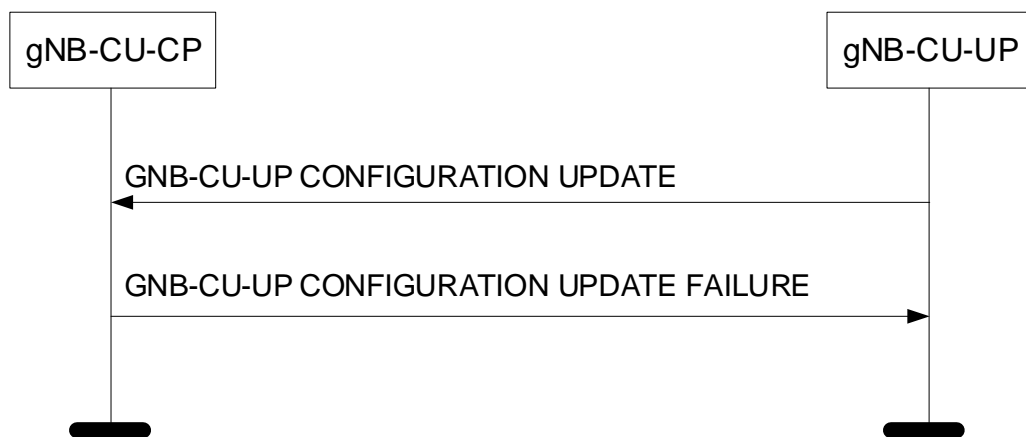


Figure 8.2.5.3-1: gNB-CU-UP Configuration Update procedure: Unsuccessful Operation.

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

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

8.2.5.4 Abnormal Conditions

Not applicable.

8.2.6 gNB-CU-CP Configuration Update

8.2.6.1 General

The purpose of the gNB-CU-CP Configuration Update procedure is to update application level configuration data needed for the gNB-CU-CP and the gNB-CU-UP to interoperate correctly on the E1 interface. This procedure does not affect existing UE-related contexts, if any. The procedure uses non-UE associated signalling.

8.2.6.2 Successful Operation

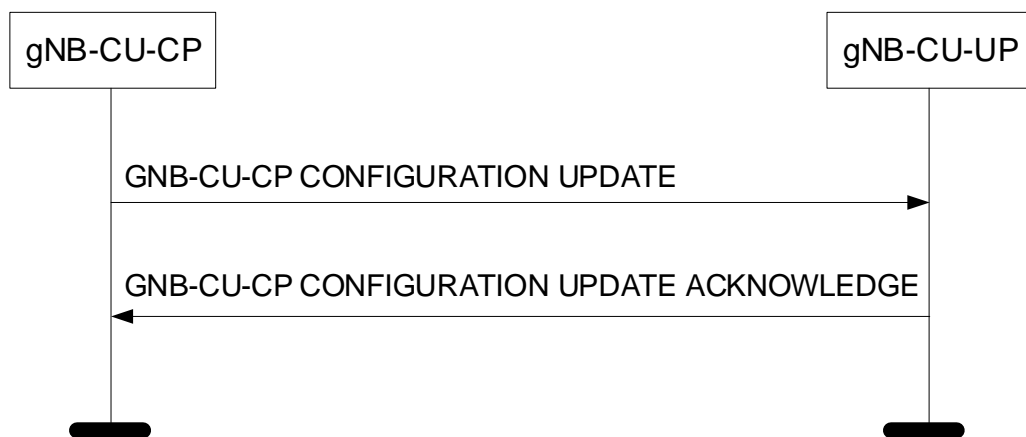


Figure 8.2.6.2-1: gNB-CU-CP Configuration Update procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending a GNB-CU-CP CONFIGURATION UPDATE message to the gNB-CU-UP including an appropriate set of updated configuration data that it has just taken into operational use. The gNB-CU-UP responds with GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE message to acknowledge that it successfully updated the configuration data. If an information element is not included in the GNB-CU-CP CONFIGURATION UPDATE message, the gNB-CU-UP shall interpret that the corresponding configuration data is not changed and shall continue to operate 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 the *gNB-CU-CP Name* IE is included in the GNB-CU-CP CONFIGURATION UPDATE message, the gNB-CU-UP may store it or update this IE value if already stored, and use it as a human readable name of the gNB-CU-CP. If the *Extended gNB-CU-CP Name* IE is included in the GNB-CU-CP CONFIGURATION UPDATE message, the gNB-CU-UP may store it or update this IE value if already stored, and use it as a human readable name of the gNB-CU-CP and shall ignore the *gNB-CU-CP Name* IE if also included.

If the *gNB-CU-CP TNLA To Add List* IE is contained in the gNB-CU-CP CONFIGURATION UPDATE message, the gNB-CU-UP shall, if supported, use it to establish the TNL association(s) with the gNB-CU-CP. If the *gNB-CU-CP TNLA To Add List* IE is included in the gNB-CU-CP CONFIGURATION UPDATE message, and if the *gNB-CU-CP TNLA To Add List* IE does not include the *Port Number* IE, the gNB-CU-UP shall assume that port number value 38462 is used for the endpoint. The gNB-CU-UP shall report to the gNB-CU-CP, in the GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE message, the successful establishment of the TNL association(s) with the gNB-CU-CP as follows:

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

If the GNB-CU-CP CONFIGURATION UPDATE message includes *gNB-CU-CP TNLA To Remove List* IE, the gNB-CU-UP shall, if supported, initiate removal of the TNL association(s) indicated by gNB-CU-UP TNL endpoint(s) and gNB-CU-CP TNL endpoint(s) if the *TNLA Transport Layer Address gNB-CU-UP* IE is present, or the TNL association(s) indicated by gNB-CU-CP TNL endpoint(s) if the *TNLA Transport Layer Address gNB-CU-UP* IE is absent:

- if the received *TNLA Transport Layer Address* IE includes the *Port Number* IE, the gNB-CU-CP TNL endpoint is identified by the *Endpoint IP Address* IE and the *Port Number* IE. Otherwise, the gNB-CU-CP TNL endpoints correspond to all gNB-CU-CP TNL endpoints identified by the *Endpoint IP Address* IE and any *Port Number*(s).
- if the received *TNLA Transport Layer Address gNB-CU-UP* IE includes the *Port Number* IE, the gNB-CU-UP TNL endpoint is identified by the *Endpoint IP Address* IE and the *Port Number* IE. Otherwise, the gNB-CU-UP TNL endpoints correspond to all gNB-CU-UP TNL endpoints identified by the *Endpoint IP Address* IE and any *Port Number*(s). If the *gNB-CU-CP TNLA To Update List* IE is contained in the gNB-CU-CP

CONFIGURATION UPDATE message the gNB-CU-UP shall, if supported, overwrite the previously stored information for the related TNL association.

- If the received *TNLA Transport Layer Address* IE includes the *Port Number* IE, the gNB-CU-CP TNL endpoint is identified by the *Endpoint IP Address* IE and the *Port Number* IE. Otherwise, the gNB-CU-CP TNL endpoints correspond to all gNB-CU-CP TNL endpoints identified by the *Endpoint IP Address* IE and any Port Number(s).

If the *TNLA Usage* IE is included in the *gNB-CU-CP TNLA To Add List* IE or the *gNB-CU-CP TNLA To Update List* IE in the gNB-CU-CP CONFIGURATION UPDATE message, the gNB-CU-UP shall, if supported, use it as described in TS 37.482 [18].

If the GNB-CU-CP CONFIGURATION UPDATE message includes the *Transport Network Layer Address Info* IE, the gNB-CU-UP shall, if supported, take this IE into account for IPsec tunnel establishment.

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

8.2.6.3 Unsuccessful Operation

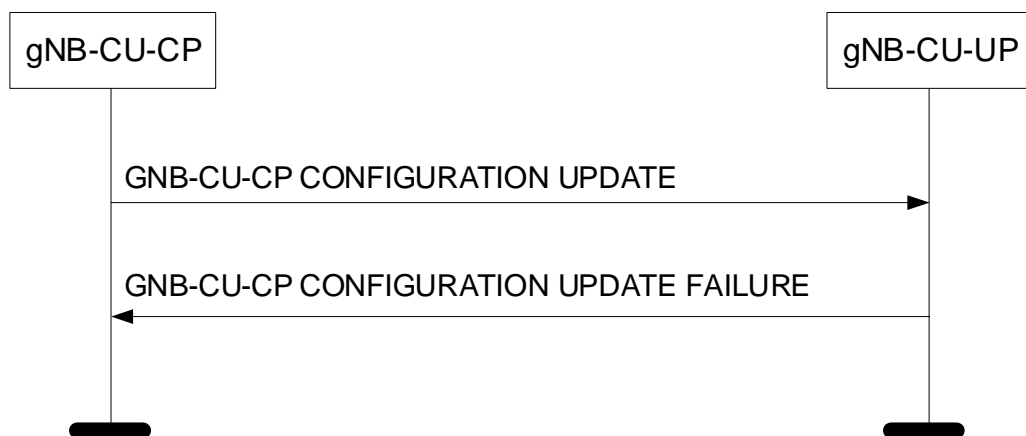


Figure 8.2.6.3-1: gNB-CU-CP Configuration Update procedure: Unsuccessful Operation.

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

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

8.2.6.4 Abnormal Conditions

Not applicable.

8.2.7 E1 Release

8.2.7.1 General

The purpose of the E1 Release procedure is to release all existing signalling connections and related application level data. This procedure does not affect existing UE-related contexts, if any. The procedure uses non-UE associated signalling.

8.2.7.2 Successful Operation

8.2.7.2.1 E1 Release Procedure Initiated from the gNB-CU-CP

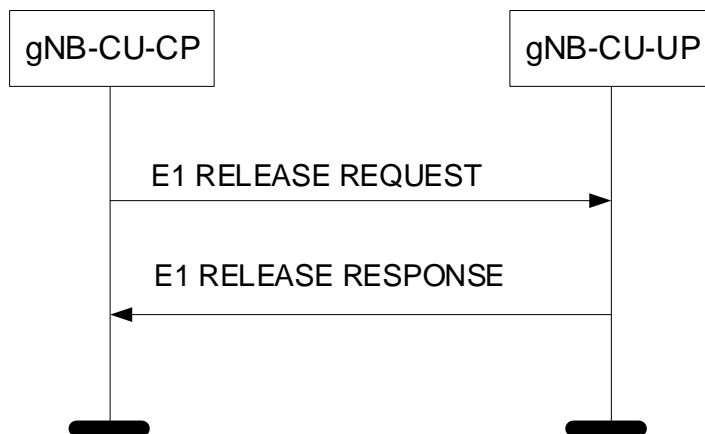


Figure 8.2.7.2.1-1: E1 Release procedure initiated from the gNB-CU-CP. Successful operation.

The gNB-CU-CP initiates the procedure by sending the E1 RELEASE REQUEST message to the gNB-CU-UP.

Upon reception of the E1 RELEASE REQUEST message, the gNB-CU-UP shall release any existing resources related to the E1 interface. The gNB-CU-UP shall respond with a E1 RELEASE RESPONSE message to confirm that it has initiated the release of the resources, if existing, and that the signalling connection for the E1AP application protocol is released.

8.2.7.2.2 E1 Release Procedure Initiated from the gNB-CU-UP

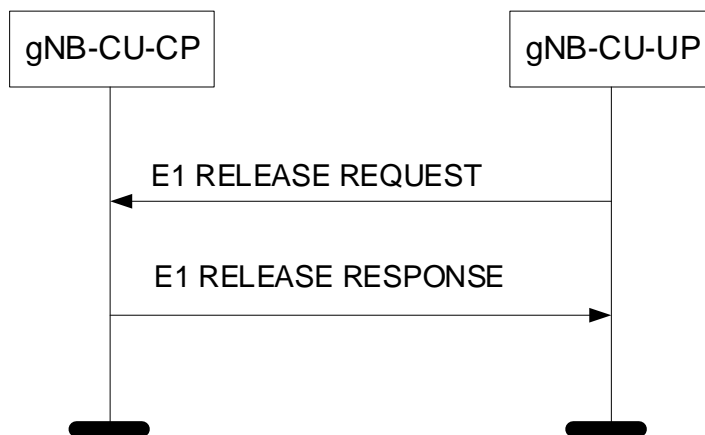


Figure 8.2.7.2.2-1: E1 Release procedure initiated from the gNB-CU-UP. Successful operation.

The gNB-CU-UP initiates the procedure by sending the E1 RELEASE REQUEST message to the gNB-CU-CP.

Upon reception of the E1 RELEASE REQUEST message, the gNB-CU-CP shall release any existing resources related to the E1 interface. The gNB-CU-CP shall respond with a E1 RELEASE RESPONSE message to confirm that it has initiated the release of the resources, if existing, and that the signalling connection for the E1AP application protocol is released.

8.2.7.3 Abnormal Conditions

Not applicable.

8.2.8 gNB-CU-UP Status Indication

8.2.8.1 General

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

8.2.8.2 Successful Operation

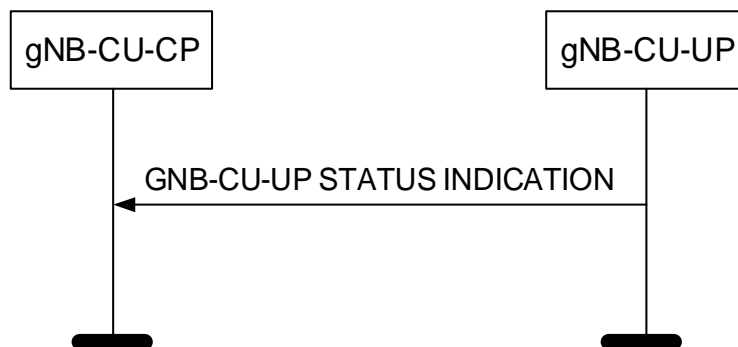


Figure 8.2.8.2-1: gNB-CU-UP Status Indication procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the GNB-CU-UP STATUS INDICATION message to the gNB-CU-CP.

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

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

8.2.8.3 Abnormal Conditions

Not applicable.

8.2.9 Resource Status Reporting Initiation

8.2.9.1 General

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

The procedure uses non UE-associated signalling.

8.2.9.2 Successful Operation

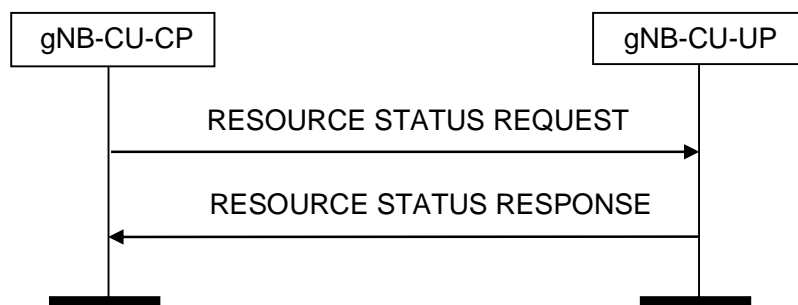


Figure 8.2.9.2-1: Resource Status Reporting Initiation, successful operation

The procedure is initiated with a RESOURCE STATUS REQUEST message sent from gNB-CU-CP to gNB-CU-UP to start a measurement or stop a measurements.

If gNB-CU-UP is capable to provide all requested resource status information, it shall initiate the measurement as requested by gNB-CU-CP, 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-CU-UP shall perform measurements on. The gNB-CU-UP shall include in the RESOURCE STATUS UPDATE message:

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

If the *Reporting Periodicity* IE is included in the RESOURCE STATUS REQUEST message, this indicates the periodicity for the reporting of periodic measurements. The gNB-CU-UP shall report only once, unless otherwise requested within the *Reporting Periodicity* IE.

8.2.9.3 Unsuccessful Operation

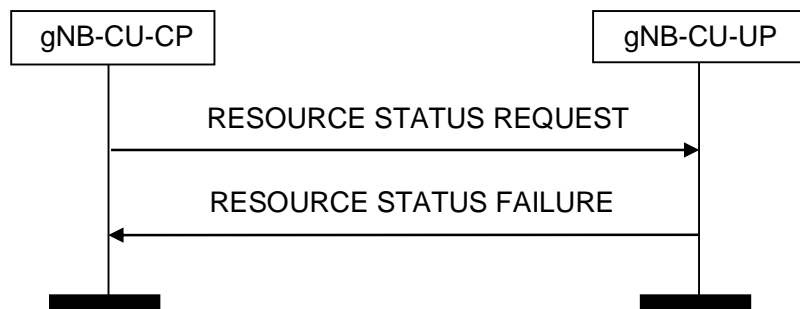


Figure 8.2.9.3-1: Resource Status Reporting Initiation, unsuccessful operation

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

8.2.9.4 Abnormal Conditions

If the initiating gNB-CU-CP does not receive either RESOURCE STATUS RESPONSE message or RESOURCE STATUS FAILURE message, the gNB-CU-CP may reinitiate the Resource Status Reporting Initiation procedure towards the same gNB-CU-UP, 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-CU-UP shall initiate a RESOURCE STATUS FAILURE message with an appropriate cause value.

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

8.2.10 Resource Status Reporting

8.2.10.1 General

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

The procedure uses non UE-associated signalling.

8.2.10.2 Successful Operation



Figure 8.2.10.2-1: Resource Status Reporting, successful operation

The gNB-CU-UP 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.

8.2.10.3 Unsuccessful Operation

Not applicable.

8.2.10.4 Abnormal Conditions

Void.

8.3 Bearer Context Management procedures

8.3.1 Bearer Context Setup

8.3.1.1 General

The purpose of the Bearer Context Setup procedure is to allow the gNB-CU-CP to establish a bearer context in the gNB-CU-UP. The procedure uses UE-associated signalling.

8.3.1.2 Successful Operation

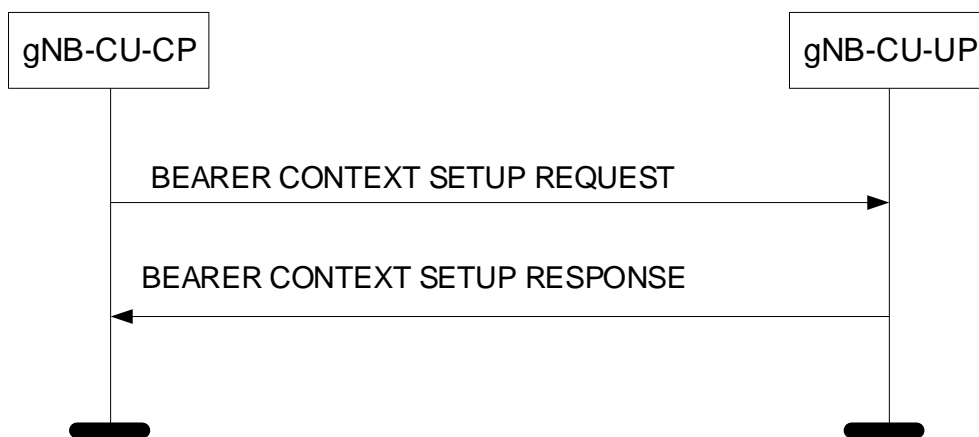


Figure 8.3.1.2-1: Bearer Context Setup procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BEARER CONTEXT SETUP REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to establish the requested resources, it replies to the gNB-CU-CP with the BEARER CONTEXT SETUP RESPONSE message.

The gNB-CU-UP shall report to the gNB-CU-CP, in the BEARER CONTEXT SETUP RESPONSE message, the result for all the requested resources in the following way:

For E-UTRAN:

- 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 List IE*;

For NG-RAN:

- A list of PDU Session Resources which are successfully established shall be included in the *PDU Session Resource Setup List IE*;
- A list of PDU Session Resources which failed to be established shall be included in the *PDU Session Resource Failed List IE*;
- For each established PDU Session Resource, a list of DRBs which are successfully established shall be included in the *DRB Setup List IE*;
- For each established PDU Session Resource, a list of DRBs which failed to be established shall be included in the *DRB Failed List IE*;
- For each established DRB, a list of QoS Flows which are successfully established shall be included in the *Flow Setup List IE*;
- For each established DRB, a list of QoS Flows which failed to be established shall be included in the *Flow Failed List IE*;

When the gNB-CU-UP reports the unsuccessful establishment of a PDU Session Resource, DRB or QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If the *Existing Allocated NG DL UP Transport Layer Information IE* is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may re-use the indicated resources already allocated for this bearer context. If the gNB-CU-UP decides to re-use the indicated resources, it shall include the *NG DL UP Unchanged IE* in the BEARER CONTEXT SETUP RESPONSE message.

If the *PDU Session Resource DL Aggregate Maximum Bit Rate IE* is contained in the *PDU Session Resource To Setup List IE* in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store and use the information for the down link traffic policing for the Non-GBR QoS flows for the concerned UE as specified in TS 23.501 [20].

If the *Data Forwarding Information Request IE*, *PDU Session Data Forwarding Information Request IE* or the *DRB Data Forwarding Information Request IE* are included in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall include the requested forwarding information in the *Data Forwarding Information Response IE*, *PDU Session Data Forwarding Information Response IE* or the *DRB Data Forwarding Information Response IE* in the BEARER CONTEXT SETUP RESPONSE message.

If the *DL UP Parameters IE* is contained in the *DRB To Setup List IE* in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall configure the corresponding information.

For each PDU session for which the *Security Indication IE* is included in the *PDU Session Resource To Setup List IE* of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication IE* or *Confidentiality Protection Indication IE* is set to "preferred", then the gNB-CU-UP should, if supported, perform user plane integrity protection or ciphering, respectively, for the concerned PDU session and shall notify whether it performed the user plane integrity protection or ciphering by including the *Integrity Protection Result IE* or *Confidentiality Protection Result IE*, respectively, in the *PDU Session Resource Setup List IE* of the BEARER CONTEXT SETUP RESPONSE message.

For each PDU session for which the *Security Indication IE* is included in the *PDU Session Resource To Setup List IE* of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication IE* or *Confidentiality Protection Indication IE* is set to "required", then the gNB-CU-UP shall perform user plane integrity protection or

ciphering, respectively, for the concerned PDU Session. If the gNB-CU-UP cannot perform the user plane integrity protection or ciphering, it shall reject the setup of the PDU Session Resources with an appropriate cause value.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message:

- if the *Integrity Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane integrity protection for the concerned PDU session;
- if the *Confidentiality Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane ciphering for the concerned PDU session.

For E-UTRAN:

- For each DRB for which the *Security Indication* IE is included in the *DRB To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication* IE is set to "preferred", then the gNB-CU-UP should, if supported, perform user plane integrity protection for the concerned DRB and notify whether it performed the user plane integrity protection by including the *Integrity Protection Result* IE, in the *DRB Setup List* IE of the BEARER CONTEXT SETUP RESPONSE message.
- For each DRB for which the *Security Indication* IE is included in the *DRB To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication* IE is set to "required", then the gNB-CU-UP shall, if supported, perform user plane integrity protection for the concerned DRB. If the gNB-CU-UP cannot perform the user plane integrity protection, it shall reject the setup of the DRB with an appropriate cause value.
- For each DRB for which the *Security Indication* IE is included in the *DRB To Setup List* IE of the BEARER CONTEXT SETUP REQUEST message, and the *Integrity Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane integrity protection for the concerned DRB.

If the *UE DL Maximum Integrity Protected Data Rate* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall use this value when enforcing the maximum integrity protected data rate for the UE.

If the *Bearer Context Status Change* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall consider the UE RRC state and act as specified in TS 38.401 [2]. If the *Bearer Context Status Change* IE is set to "ResumeForSDT", the gNB-CU-UP shall, if supported, consider that DRBs not configured with SDT are suspended after being established.

For each requested DRB, if the *PDCP Duplication* IE is included in the *PDCP Configuration* IE contained in the BEARER CONTEXT SETUP REQUEST message, then the gNB-CU-UP shall include two *UP Transport Layer Information* IEs in the BEARER CONTEXT SETUP RESPONSE message to support packet duplication. If only one cell group is included in the *Cell Group Information* IE for the concerned DRB, then the gNB-CU-UP shall consider that the first *UP Transport Layer Information* IE of the two *UP Transport Layer Information* IEs is for the primary path.

For each requested DRB, if the *Additional PDCP duplication Information* IE is included in the *PDCP Configuration* IE contained in the BEARER CONTEXT SETUP REQUEST message, then the gNB-CU-UP shall, if supported, include the same number of *UP Transport Layer Information* IEs indicated by the *Additional PDCP duplication Information* IE in the BEARER CONTEXT SETUP RESPONSE message to support packet duplication. If only one cell group is included in the *Cell Group Information* IE for the concerned DRB, then the gNB-CU-UP shall consider that the first *UP Transport Layer Information* IE of these *UP Transport Layer Information* IEs is for the primary path. If more than one cell group is included in the *Cell Group Information* IE, then the gNB-CU-UP shall consider that the number of duplication tunnels for each cell group is indicated by the *Number of tunnels* IE, and that the first *UP Transport Layer Information* IE for each cell group is for the primary path or the split secondary path.

If the *PDCP SN Status Information* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall take it into account and act as specified in TS 38.401 [2].

If the *QoS Flow Mapping Indication* IE is contained in the *QoS Flows Information To Be Setup* IE within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may take it into account that only the uplink or downlink QoS flow is mapped to the DRB.

If the *QoS Flows Remapping* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message for a DRB and set to "update", the gNB-CU-UP shall, if supported, consider that QoS flows mapped for the DRB is updated to the QoS flow(s) included in the *QoS Flows Information To Be Setup* IE after

finishing handling forwarded PDCP SDUs during an intra-system handover procedure. If the *QoS Flows Remapping* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message for a DRB and set to "source configuration", the gNB-CU-UP shall, if supported, consider that no QoS flow is mapped to the DRB after finishing handling forwarded PDCP SDUs over that DRB during an intra-system handover procedure and ignore the information included in the *QoS Flows Information To Be Setup* IE for the concerned DRB.

For each PDU Session Resource, if the *Network Instance* IE is included in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message and the *Common Network Instance* IE is not included, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

For each PDU session, if the *Common Network Instance* IE is included in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

For each PDU session, if the *Redundant NG UL UP Transport Layer Information* IE is included in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, use it as the uplink termination point of the redundant tunnel for the user plane data of those QoS flows in this PDU session which need redundant transmission as described in TS 23.501 [20], and it shall include the *Redundant NG DL UP Transport Layer Information* IE in the *PDU Session Resource Setup List* IE in the BEARER CONTEXT SETUP RESPONSE message.

For each PDU Session Resource, if the *Redundant Common Network Instance* IE is included in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, use it when selecting transport network resource for the redundant transmission as specified in TS 23.501 [20].

For each PDU session, if the *Redundant QoS Flow Indicator* IE is included in the *QoS Flow QoS Parameters List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, consider it for the redundant transmission.

For each PDU session, if the *Redundant PDU Session Information* IE is included in the *PDU Session Resource To Setup List* IE contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, set up the redundant user plane resources, as specified in TS 23.501 [20] and include, if supported, the *Used Redundant PDU Session Information* IE in the *PDU Session Resource Setup List* IE in the BEARER CONTEXT SETUP RESPONSE message. If the *PDU Session Pair ID* IE is included in the *Redundant PDU Session Information* IE, the gNB-CU-UP may use it to identify the paired PDU Sessions.

If the *Special Triggering Purpose* IE is included in *PDU Session Resource To Setup List* IE contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may store the bearer context information and consider that the setup of the DRB or the PDU session for which the IE is included is for the purpose of indirect data forwarding.

If *UE Inactivity Timer* IE or *PDU session Inactivity Timer* IE or *DRB Inactivity Timer* IE is contained in BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall take it into account when perform inactivity monitoring.

If the *DRB QoS* IE is contained within the *DRB To Setup List* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, take it into account as specified in TS 28.552 [22].

If the *gNB-DU-ID* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store the information received.

If the *RAN UE ID* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store the information received.

For each successfully established DRB, the gNB-CU-UP shall provide, in the respective *UL UP Parameters* IE of the BEARER CONTEXT SETUP RESPONSE, one UL UP Transport Layer Information Item per cell group entry contained in the respective *Cell Group Information* IE of the BEARER CONTEXT SETUP REQUEST message.

If the *Trace Activation* IE is included in the BEARER CONTEXT SETUP REQUEST message the gNB-CU-UP shall, if supported, initiate the requested trace function as described in TS 32.422 [24]. In particular, the gNB-CU-UP shall, if supported:

- if the *MDT Activation* IE is set to "Immediate MDT Only", initiate the requested MDT session as described in TS 32.422 [24] and the gNB-CU-UP shall ignore *Interfaces To Trace* IE, and *Trace Depth* IE;

- if the *MDT Activation IE* is set to "Immediate MDT and Trace", initiate the requested trace session and MDT session as described in TS 32.422 [24];

If the *Management Based MDT PLMN List IE* is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, store the received information, and use this information to allow subsequent selection of the UE for management based MDT defined in TS 32.422 [24].

For EN-DC, if the *Subscriber Profile ID for RAT/Frequency priority IE* is included in the BEARER CONTEXT SETUP REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25]. If the *Additional RRM Policy Index IE* is included in the BEARER CONTEXT SETUP REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25].

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

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 BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [20]. If the *QoS Monitoring Reporting Frequency IE* was included in the *QoS Flow Level QoS Parameters IE* contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall store this information, and, if supported, use it for RAN part delay reporting.

For each QoS flow whose DRB has been successfully established in the gNB-CU-UP, if the *ECN Marking or Congestion Information Reporting Request IE* is included in the *PDU Session Resource To Setup List IE* contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, use it accordingly for the specific QoS flow. If the *ECN Marking or Congestion Information Reporting Status IE* is included in the *Flow Setup List IE* contained in the *PDU Session Resource Setup List IE* of the BEARER CONTEXT SETUP RESPONSE message, the gNB-CU-CP shall, if supported, use it to deduce if ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active.

If the BEARER CONTEXT SETUP REQUEST message contains the *NPN Context Information IE* the gNB-CU-UP shall, if supported, take it into account when allocating UP resources for the bearer context.

For each requested DRB, if the *EHC Parameters IE* is included in the *PDCP Configuration IE*, the gNB-CU-CP shall, if supported, also include *ROHC Parameters IE* in the *PDCP Configuration IE* in the BEARER CONTEXT SETUP REQUEST message, to enable the gNB-CU-UP to perform appropriate header compression.

If the *EHC parameters IE* is included in the *PDCP Configuration IE* contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may take these parameters into account to perform appropriate header compression for the concerned DRB. If the *EHC Downlink IE* is included in the *EHC parameters IE* and the value of *drb-ContinueEHC-DL IE* is set to 'true', the gNB-CU-UP shall, if supported, configure Ethernet header compression for downlink and continue the downlink EHC header compression protocol as specified in TS 38.331 [10]. If the *EHC Downlink IE* is included in the *EHC parameters IE* and the value of *drb-ContinueEHC-DL IE* is set to 'false', the gNB-CU-UP shall, if supported, configure Ethernet header compression for downlink and reset the downlink EHC header compression protocol during PDCP re-establishment as specified in TS 38.331 [10]. If the *EHC Uplink IE* is included in the *EHC parameters IE* and the value of *drb-ContinueEHC-UL IE* is set to 'true', the gNB-CU-UP shall, if supported, configure Ethernet header compression for uplink and continue the uplink EHC header compression protocol as specified in TS 38.331 [10]. If the *EHC Uplink IE* is included in the *EHC parameters IE* and the value of *drb-ContinueEHC-UL IE* is set to 'false', the gNB-CU-UP shall, if supported, configure Ethernet header compression for uplink and resets the uplink EHC header compression protocol during PDCP re-establishment as specified in TS 38.331 [10].

If the *DAPS Request Information IE* is included for a DRB to be setup in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall consider that the request concerns a DAPS handover for that DRB and, if admitted, act as specified in TS 38.300 [4].

If the *CHO Initiation IE* is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall consider that the request concerns conditional handover or conditional PSCell change or conditional PSCell addition or subsequent CPAC and act as specified in TS 38.401 [2].

If the *MCG Offered GBR QoS Flow Information IE* is contained in the *QoS Flows Information To Be Setup IE* within the *DRB To Setup List IE* in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may take it into account when two cell groups are served by the gNB-CU-UP.

If the *Additional Handover Information* IE is included in the BEARER CONTEXT SETUP REQUEST message and set to "Discard PDCP SN", the gNB-CU-UP shall, if supported, remove the forwarded PDCP SNs if received in the forwarded GTP-U packets, and deliver the forwarded PDCP SDUs to the UE, as specified in TS 38.300 [4].

If the *Ignore Mapping Rule Indication* IE is contained within the *DRB To Setup List* IE for a DRB in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, ignore the QoS flow mapping information indicated by the *QoS Flows Information To Be Setup* IE for the concerned DRB.

If the *Direct Forwarding Path Availability* IE set to "inter-system direct path available" is included in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, assign the UP Transport Layer Information for inter-system direct data forwarding from the appropriate address space, if applicable.

If the *Direct Forwarding Path Availability* IE set to "intra-system direct path available" is included in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, assign the UP Transport Layer Information for intra-system direct data forwarding from the appropriate address space, if applicable.

If the *gNB-CU-UP UE E1AP ID* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP may use it to identify the UE context as specified in TS 38.401 [2].

If the *Data Forwarding Source IP Address* IE is included in the *DRB To Setup List E-UTRAN* IE or in the *QoS Flow Level QoS Parameters* IE contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, store this information in the UE context and use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If the *Data Forwarding Source IP Address* IE is included in the *DRB Setup List E-UTRAN* IE or in the *Flow Setup List* IE within the *DRB Setup List* IE in the *PDU Session Resource Setup List* IE of the BEARER CONTEXT SETUP RESPONSE message, the gNB-CU-CP shall, if supported, store this information in the UE context and use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If the *MDT Polluted Measurement Indicator* IE is included in the BEARER CONTEXT SETUP REQUEST, the gNB-CU-UP shall take this information into account as specified in TS 38.401 [2].

If the *UE Slice Maximum Bit Rate List* IE is included in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, store and use the information for the downlink traffic policing for each concerned slice as specified in TS 23.501 [20].

If the *UDC parameters* IE is included in the *PDCP Configuration* IE in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, take these parameters into account to perform appropriate uplink data compression for the concerned DRB.

If the *SCG Activation Status* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall take it into account when handling DL data transfer as specified in TS 37.340 [19].

If the *PDU Set QoS Parameters* IE is contained in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, store it and use the information as specified in TS 23.501 [20].

Interactions with DL Data Notification procedure:

If the *MT-SDT Information Request* IE is included in the BEARER CONTEXT SETUP REQUEST message and the value is set to 'true', the gNB-CU-UP shall, if supported, store it and report the *MT-SDT Information* IE in the DL DATA NOTIFICATION message as specified in TS 38.401 [2].

If the *SDT Data Size Threshold* IE is included in the BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, store it and act as specified in TS 38.401 [2].

8.3.1.3 Unsuccessful Operation

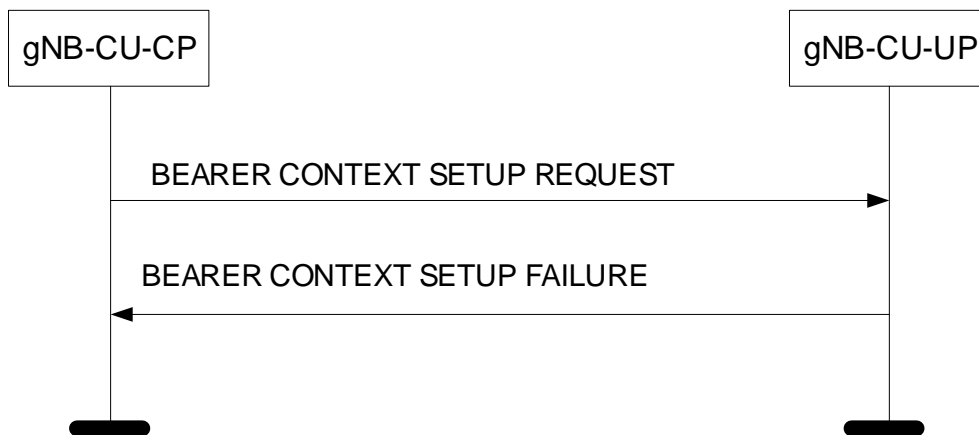


Figure 8.3.1.3-1: Bearer Context Setup procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot establish the requested bearer context, or cannot even establish one bearer, or cannot handle SCG with the indicated activated or deactivated status it shall consider the procedure as failed and respond with a BEARER CONTEXT SETUP FAILURE message and appropriate cause value.

8.3.1.4 Abnormal Conditions

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

If the gNB-CU-UP receives a BEARER CONTEXT SETUP REQUEST message containing a *QoS Flow Level QoS Parameters* IE in the *PDU Session Resource To Setup List* IE for a GBR QoS Flow but where the *GBR QoS Flow Information* IE is not present, the gNB-CU-UP shall report the establishment of the corresponding QoS Flow as failed in the corresponding *Flow Failed List* IE of the BEARER CONTEXT SETUP RESPONSE message with an appropriate cause value.

8.3.2 Bearer Context Modification (gNB-CU-CP initiated)

8.3.2.1 General

The purpose of the Bearer Context Modification procedure is to allow the gNB-CU-CP to modify a bearer context in the gNB-CU-UP. The procedure uses UE-associated signalling.

8.3.2.2 Successful Operation

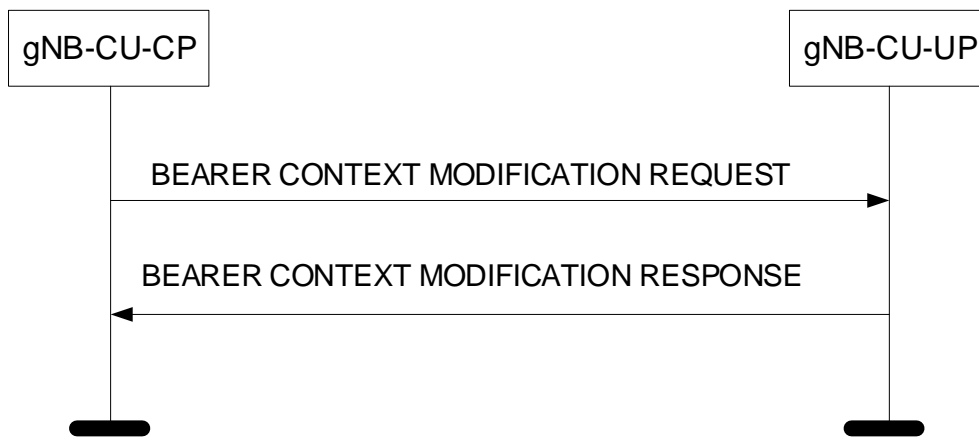


Figure 8.3.2.2-1: Bearer Context Modification procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BEARER CONTEXT MODIFICATION REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to modify the bearer context, it replies to the gNB-CU-CP with the BEARER CONTEXT MODIFICATION RESPONSE message.

The gNB-CU-UP shall report to the gNB-CU-CP, in the BEARER CONTEXT MODIFICATION RESPONSE message, the result for all the requested resources in the following way:

For E-UTRAN:

- 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 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 Modify List IE*;

For NG-RAN:

- A list of PDU Session Resources which are successfully established shall be included in the *PDU Session Resource Setup List IE*;
- A list of PDU Session Resources which failed to be established shall be included in the *PDU Session Resource Failed List IE*;
- A list of PDU Session Resources which are successfully modified shall be included in the *PDU Session Resource Modified List IE*;
- A list of PDU Session Resources which failed to be modified shall be included in the *PDU Session Resource Failed To Modify List IE*;
- For each successfully established or modified PDU Session Resource, a list of DRBs which are successfully established shall be included in the *DRB Setup List IE*;
- For each successfully established or modified PDU Session Resource, a list of DRBs which failed to be established shall be included in the *DRB Failed List IE*;
- For each successfully modified PDU Session Resource, a list of DRBs which are successfully modified shall be included in the *DRB Modified List IE*;
- For each successfully modified PDU Session Resource, a list of DRBs which failed to be modified shall be included in the *DRB Failed To Modify List IE*;
- For each successfully established or modified DRB, a list of QoS Flows which are successfully established shall be included in the *Flow Setup List IE*;

- For each successfully established or modified DRB, a list of QoS Flows which failed to be established shall be included in the *Flow Failed List IE*;

When the gNB-CU-UP reports the unsuccessful establishment of a PDU Session Resource, DRB or QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If the *Security Information IE* is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *UE DL Aggregate Maximum Bit Rate IE* is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *UE DL Maximum Integrity Protected Data Rate IE* is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *Bearer Context Status Change IE* is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall consider the UE RRC state and act as specified in TS 38.401 [2]. If the *Bearer Context Status Change IE* is set to "ResumeForSDT", the gNB-CU-UP shall consider that DRBs configured with SDT are resumed only and the other DRBs remain suspended.

If *SDT Continue ROHC IE* is contained in the BEARER CONTEXT MODIFICATION REQUEST message and the value is set to "true", the gNB-CU-UP shall, if supported, continue the ROHC for the SDT bearers for the UE.

If the *Data Forwarding Information Request IE*, *PDU Session Data Forwarding Information Request IE* or the *DRB Data Forwarding Information Request IE* are included in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall include the requested forwarding information in the *Data Forwarding Information Response IE*, *PDU Session Data Forwarding Information Response IE* or the *DRB Data Forwarding Information Response IE* in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *PDU Session Data Forwarding Information IE* is included in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, consider that data forwarding is applicable for the indicated QoS flows for the concerned PDU session.

If the *Secondary PDU Session Data Forwarding Information IE* is included in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, consider that data forwarding is applicable for the indicated QoS flows for the concerned PDU session.

If the *PDCP Configuration IE* is contained in the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information, except for the *PDCP SN UL Size IE*, the *PDCP SN DL Size IE* and the *RLC mode IE* which shall be ignored.

If the *E-UTRAN QoS IE* is contained in the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *PDCP SN Status Request IE* is contained in the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall act as specified in TS 38.401 [2] and include the *UL COUNT Value IE* and the *DL COUNT Value IE* in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *PDCP SN Status Information IE* is contained in the *DRB To Setup List IE* or the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account and act as specified in TS 38.401 [2].

If the *DL UP Parameters IE* is contained in the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information. If the *Indirect Path Indication IE* is contained in the *DL UP Parameters IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, act as specified in TS 38.401 [2].

If the *PDCP COUNT Reset IE* is contained within the *DRB To Modify List IE* for a DRB of the *PDU Session Resource To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, reset the PDCP COUNT value for this DRB (i.e. its HFN and PDCP-SN to value "0").

If the *Cell Group To Add IE* or the *Cell Group To Modify IE* or the *Cell Group To Remove IE* is contained in the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall add or modify or remove the corresponding cell group.

If the *PDU Session Resource DL Aggregate Maximum Bit Rate* IE is contained in the *PDU Session Resource To Setup List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall replace the information in the UE context and use it when enforcing downlink traffic policing for the non GBR QoS flows for the concerned UE, as specified in TS 23.501 [20].

If the *PDU Session Resource DL Aggregate Maximum Bit Rate* IE is contained in the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *SDAP Configuration* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

If the *Flow Mapping Information* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the corresponding information.

For each requested DRB, if the *PDCP Duplication* IE or *Additional PDCP duplication Information* IE is included in the *PDCP Configuration* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, then the gNB-CU-CP shall include two or more *UP Transport Layer Information* IEs in the BEARER CONTEXT MODIFICATION REQUEST message, and the gNB-CU-UP shall, if supported, also include two or more *UP Transport Layer Information* IEs in the BEARER CONTEXT MODIFICATION RESPONSE message to support packet duplication. If only one cell group is included in the *Cell Group Information* IE for the concerned DRB, then the gNB-CU-UP shall consider that the first *UP Transport Layer Information* IE of these *UP Transport Layer Information* IEs is for the primary path. If more than one cell group is included in the *Cell Group Information* IE, then the gNB-CU-UP shall consider that the number of duplication tunnels for each cell group is indicated by the *Number of tunnels* IE, and that the first *UP Transport Layer Information* IE for each cell group is for the primary path or the split secondary path.

For a certain DRB which was allocated with two or more GTP-U tunnels, if such DRB is modified and given one GTP-U tunnel via the Bearer Context Modification (gNB-CU-CP initiated) procedure, i.e. only one UP Transport Layer Information per Cell Group ID is present in *DL UP Parameters* IE for the concerned DRB, then the gNB-CU-UP shall consider that PDCP duplication is deconfigured for this DRB. If such Bearer Context Modification (gNB-CU-CP initiated) procedure occurs, the *Duplication Activation* IE shall not be included for the concerned DRB.

If the *New UL TNL Information Required* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall include the new UP Transport Layer Information in the BEARER CONTEXT MODIFICATION RESPONSE message.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE or the *Security Indication Modify* IE is included in the *PDU Session Resource To Modify List* IE of the BEARER CONTEXT MODIFICATION REQUEST message, and the *Integrity Protection Indication* IE or *Confidentiality Protection Indication* IE is set to "preferred", then the gNB-CU-UP should, if supported, perform user plane integrity protection or ciphering, respectively, for the concerned PDU session and shall notify whether it performed the user plane integrity protection or ciphering by including the *Integrity Protection Result* IE or *Confidentiality Protection Result* IE, respectively, in the *PDU Session Resource Setup List* IE or the *PDU Session Resource Modified List* IE of the BEARER CONTEXT MODIFICATION RESPONSE message.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE or the *Security Indication Modify* IE is included in the *PDU Session Resource To Modify List* IE of the BEARER CONTEXT MODIFICATION REQUEST message, and the *Integrity Protection Indication* IE or *Confidentiality Protection Indication* IE is set to "required", then the gNB-CU-UP shall perform user plane integrity protection or ciphering, respectively, for the concerned PDU Session. If the gNB-CU-UP cannot perform the user plane integrity protection or ciphering, it shall reject the setup of the PDU Session Resources with an appropriate cause value.

For each PDU session for which the *Security Indication* IE is included in the *PDU Session Resource To Setup List* IE or the *Security Indication Modify* IE is included in the *PDU Session Resource To Modify List* IE of the BEARER CONTEXT MODIFICATION REQUEST message:

- if the *Integrity Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane integrity protection for the concerned PDU session;
- if the *Confidentiality Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane ciphering for the concerned PDU session.

For E-UTRAN:

- For each DRB for which the *Security Indication* IE is included in the *DRB To Setup List* IE of the BEARER CONTEXT MODIFICATION REQUEST message, and the *Integrity Protection Indication* IE is set to "preferred", then the gNB-CU-UP should, if supported, perform user plane integrity protection for the concerned DRB and notify whether it performed the user plane integrity protection by including the *Integrity Protection Result* IE in the DRB Setup List IE of the BEARER CONTEXT MODIFICATION RESPONSE message.
- For each DRB for which the *Security Indication* IE is included in the *DRB To Setup List* IE of the BEARER CONTEXT MODIFICATION REQUEST message, and the *Integrity Protection Indication* IE is set to "required", then the gNB-CU-UP shall, if supported, perform user plane integrity protection for the concerned DRB. If the gNB-CU-UP cannot perform the user plane integrity protection, it shall reject the setup of the DRB with an appropriate cause value.
- For each DRB for which the *Security Indication* IE is included in the *DRB To Setup List* IE of the BEARER CONTEXT MODIFICATION REQUEST message and the *Integrity Protection Indication* IE is set to "not needed", then the gNB-CU-UP shall not perform user plane integrity protection for the concerned DRB.

For each PDU Session Resource, if the *Network Instance* IE is included in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message and the *Common Network Instance* IE is not included, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

For each PDU session, if the *Common Network Instance* IE is included in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, use it when selecting transport network resource as specified in TS 23.501 [20].

For each PDU session, if the *Redundant NG UL UP Transport Layer Information* IE is included in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, include the *Redundant NG DL UP Transport Layer Information* IE in the *PDU Session Resource Setup List* IE or the *PDU Session Resource Modified List* IE in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *Redundant Common Network Instance* IE is included in the *PDU Session Resource To Setup List* IE or the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, use it when selecting transport network resource for the redundant transmission as specified in TS 23.501 [20].

For each PDU session for which the *Redundant QoS Flow Indicator* IE is included in *QoS Flows Information To Be Setup* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if support, shall store and use it as specified in TS 23.501 [20].

For each PDU session, if the *Redundant QoS Flow Indicator* IE is set to false for all QoS flows, the gNB-CU-UP shall, if supported, stop the redundant transmission and release the redundant tunnel for the concerned PDU session as specified in TS 23.501 [20].

For each PDU session, if the *Data Forwarding to E-UTRAN Information List* IE is included in the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, use it for inter-system data forwarding from 5GS to EPS as specified in TS 38.300 [4].

If the *Special Triggering Purpose* IE is included in *PDU Session Resource To Setup Modification List* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP may store the bearer context information and consider that the setup of the DRB or the PDU session for which the IE is included is for the purpose of indirect data forwarding.

If the *Special Triggering Purpose* IE is included in *PDU Session Resource To Modify List* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP may store the bearer context information and consider that the setup of the DRB for which the IE is included is for the purpose of indirect data forwarding.

If the *QoS Flow Mapping Indication* IE is contained in the *QoS Flow QoS Parameters List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP 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 *Data Discard Required* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message and the value is set to "Required", the gNB-CU-UP shall consider that a RAN Paging Failure occurred for that UE. The gNB-CU-UP shall discard the user plane data for that UE and consider that the bearer context is still suspended.

If *UE Inactivity Timer IE* or *PDU session Inactivity Timer IE* or *DRB Inactivity Timer IE* is contained in BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account when perform inactivity monitoring.

If the *S-NSSAI IE* is contained in the *PDU Session Resource To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store the corresponding information and replace any existing information.

If the *DRB QoS IE* is contained within the *DRB To Setup List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, take it into account for each DRB, as specified in TS 28.552 [22].

If the *DRB QoS IE* is contained within the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, replace any previously received value and take it into account for each DRB, as specified in TS 28.552 [22].

If the *gNB-DU-ID IE* is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store and replace any previous information received.

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

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message including *Activity Notification Level IE* and its value does not match the current bearer context, the gNB-CU-UP shall ignore the *Activity Notification Level IE* and also the requested modification of inactivity timer.

For each successfully established DRB, the gNB-CU-UP shall provide, in the respective *UL UP Parameters IE* of the BEARER CONTEXT MODIFICATION RESPONSE, one UL UP Transport Layer Information Item per cell group entry contained in the respective *Cell Group Information IE* of the BEARER CONTEXT MODIFICATION REQUEST message.

If the *Old QoS Flow List - UL End Marker expected IE* is included in the *PDU Session Resource To Modify List IE* of the BEARER CONTEXT MODIFICATION REQUEST message for a DRB to be modified, the gNB-CU-UP shall consider that the source NG-RAN node has initiated QoS flow re-mapping and has not yet received SDAP end markers, as described in TS 38.300 [4]. The gNB-CU-UP shall consider that the *Old QoS Flow List - UL End Marker expected IE* only contains UL QoS flow information for QoS flows for which no SDAP end marker has been yet received on the source side.

For EN-DC, if the *Subscriber Profile ID for RAT/Frequency priority IE* is included in the BEARER CONTEXT MODIFICATION REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25]. If the *Additional RRM Policy Index IE* is included in the BEARER CONTEXT MODIFICATION REQUEST, the gNB-CU-UP may use it to apply specific RRM policies as specified in TS 36.300 [25].

If there is at least one DRB removed by the gNB-CU-UP, the gNB-CU-UP shall, if supported, include the *Retainability Measurements Information IE* in the BEARER CONTEXT MODIFICATION RESPONSE message, providing information on the removed DRB(s) for retainability measurements in the gNB-CU-CP, as described in TS 32.425 [26] and TS 28.552 [22].

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

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 BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store this information, and, if supported, perform delay measurement and QoS monitoring, as specified in TS 23.501 [20]. If the *QoS Monitoring Reporting Frequency IE* was included in the *QoS Flow Level QoS Parameters IE* contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall store this information, and, if supported, use it for RAN part delay reporting.

For each QoS flow whose DRB has been successfully established or modified in the gNB-CU-UP, if the *ECN Marking or Congestion Information Reporting Request IE* is included in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, use it accordingly for the specific QoS flow. If the *ECN Marking or Congestion Information Reporting Status IE* is included in the *Flow Setup List IE* contained in the *PDU Session Resource Setup List IE* or the *PDU Session Resource Modified List IE* of the BEARER CONTEXT MODIFICATION

RESPONSE message, the gNB-CU-CP shall, if supported, use it to deduce if ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active.

For each requested DRB, if the *QoS Mapping Information* IE is contained in the *DL UP Parameters* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall use it to set DSCP and/or flow label fields in the downlink IP packets which are transmitted through the GTP tunnels indicated by the *UP Transport Layer Information* IE. The Diffserv code point (DSCP) marking is performed as specified in TS 38.474 [28].

If the *Early Forwarding COUNT Request* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall act as specified in TS 38.401 [2] and include the requested *FIRST DL COUNT Value* IE or *DISCARD DL COUNT Value* IE in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *Early Forwarding COUNT Information* IE is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account and act as specified in TS 38.401 [2].

If the *Ignore Mapping Rule Indication* IE is contained within the *DRB To Setup List* IE for a DRB in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, ignore the QoS flow mapping information indicated by the *QoS Flows Information To Be Setup* IE for the concerned DRB.

If the *DAPS Request Information* IE is included for a DRB to be modified in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall consider that the request concerns a DAPS handover for that DRB and, if admitted, act as specified in TS 38.300 [4].

If the *Early Data Forwarding Indicator* IE set to “stop” is contained in the *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported and if already initiated, stop the early data forwarding for the concerned DRB. If the *DRB Data forwarding information* IE containing the *DL Data Forwarding* IE is included together in the *DRB To Modify List* IE, the gNB-CU-UP shall consider that the stop is only for the early data forwarding initiated toward that forwarding TNL.

If the *MDT Polluted Measurement Indicator* IE is included in the BEARER CONTEXT MODIFICATION REQUEST, the gNB-CU-UP shall take this information into account as specified in TS 38.401 [2].

If the *UE Slice Maximum Bit Rate List* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, store and replace the previously provided UE Slice Maximum Bit Rate List by the received UE Slice Maximum Bit Rate List in the UE context, and use the received UE Slice Maximum Bit Rate List for the downlink traffic policing for each concerned slice as specified in TS 23.501 [20].

If the *SCG Activation Status* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account when handling DL data transfer as specified in TS 37.340 [19].

If the *UDC parameters* IE is included in the *PDCP Configuration* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, take these parameters into account to perform appropriate uplink data compression for the concerned DRB.

If the *Data Forwarding Source IP Address* IE is included in the *DRB To Setup Modification List E-UTRAN* IE or in the *QoS Flow Level QoS Parameters* IE within the *PDU Session Resource To Setup Modification List* IE and the *PDU Session Resource To Modify List* IE contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, store this information in the UE context and use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If the *Data Forwarding Source IP Address* IE is included in the *DRB Setup Modification List E-UTRAN* IE or in the *Flow Setup List* IE within the *PDU Session Resource Setup Modification List* IE and the *PDU Session Resource Modified List* IE of the BEARER CONTEXT MODIFICATION RESPONSE message, the gNB-CU-CP shall, if supported, store this information in the UE context and use it as part of its ACL functionality configuration actions, if such ACL functionality is deployed.

If the *Management Based MDT PLMN Modification List* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, overwrite any previously stored Management Based MDT PLMN List information in the UE context and use the received information to determine subsequent selection of the UE for management based MDT defined in TS 32.422 [24].

If the *Inactivity Information Request* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST, the gNB-CU-UP shall, if supported, include the *UE Inactivity Information* IE in the BEARER CONTEXT MODIFICATION RESPONSE message.

If the *PDU Set QoS Parameters* IE is contained in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, store it and use the information as specified in TS 23.501 [20].

For a QoS flow established with PDU Set QoS parameters, if the *PDU Set based Handling Indicator* IE is included in the *PDU Session Data Forwarding Information* IE within the BEARER CONTEXT MODIFICATION REQUEST message and the value of the *PDU Set based Handling Indicator* IE is set to "supported", the gNB-CU-UP shall, if supported, include the PDU Set Information Container in the data to be forwarded.

For each PDU session, if the *User Plane Failure Indication* IE is included in the *PDU Session Resource To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, allocate the new NG-U DL endpoint address for the concerned GTP-U tunnel as specified in TS 23.527 [36].

Interactions with DL Data Notification procedure:

If the *MT-SDT Information Request* IE is included in the BEARER CONTEXT MODIFICATION REQUEST message and the value is set to 'true', the gNB-CU-UP shall, if supported, store it and report the *MT-SDT Information* IE in the DL DATA NOTIFICATION message as specified in TS 38.401 [2].

If the *SDT Data Size Threshold* IE is included in the BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, store it and act as specified in TS 38.401 [2].

Interaction with the Bearer Context Modification (gNB-CU-CP initiated)

If the BEARER CONTEXT MODIFICATION REQUEST message includes for a DRB in the *DRB To Modify List* IE the *PDCP SN Status Request* IE set to "requested" and if the gNB-CU-UP has not yet received a SDAP end marker packet for a QoS flow which has been previously re-configured to another DRB by means of a gNB-CU-CP initiated Bearer Context Modification procedure, the gNB-CU-UP shall include the QoS Flow Identifier of that QoS flow in the *Old QoS Flow List - UL End Marker expected* IE in the *PDU Session Resource Modified List* IE in the BEARER CONTEXT MODIFICATION RESPONSE message.

8.3.2.3 Unsuccessful Operation

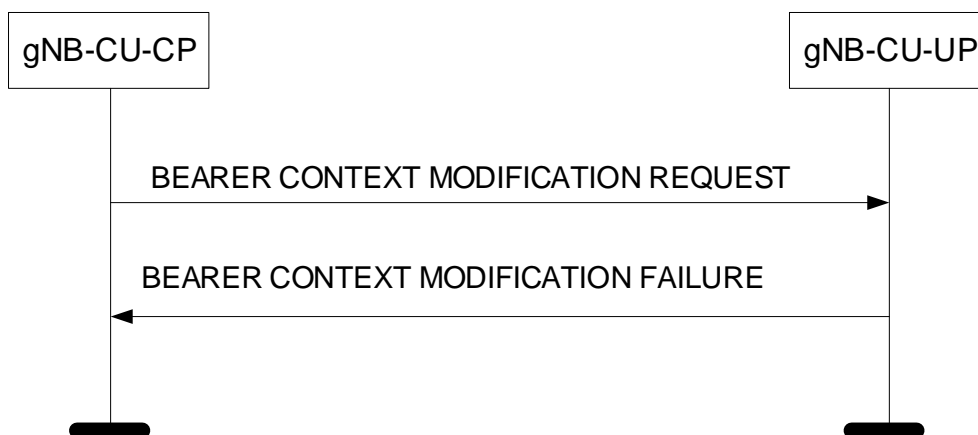


Figure 8.3.2.3-1: Bearer Context Modification procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot successfully perform any of the requested bearer context modifications, or cannot handle SCG with the indicated activated or deactivated status, it shall respond with a BEARER CONTEXT MODIFICATION FAILURE message and appropriate cause value.

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message containing the *Security Indication Modify* IE in the *PDU Session Resource To Modify List* IE for a PDU session that may result in the change of security status that has been applied but the DRBs that have been established for that PDU session are not requested to be released via the *DRB To Remove List* IEs as specified in TS 38.331 [10], then the gNB-CU-UP shall respond with a BEARER CONTEXT MODIFICATION FAILURE message and appropriate cause value.

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message containing the *PDCP COUNT Reset* IE in the *DRB To Modify List* IE of the *PDU Session Resource To Modify List* IE but if the *Security Information* IE is not present, then the gNB-CU-UP shall respond with a BEARER CONTEXT MODIFICATION FAILURE message and appropriate cause value.

8.3.2.4 Abnormal Conditions

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message containing a *E-UTRAN QoS IE* in the *DRB To Setup List* or the *DRB To Modify List IE* for a GBR QoS DRB but where the *GBR QoS Information IE* is not present, the gNB-CU-UP shall report the addition or the modification of the corresponding DRB as failed in the *DRB Failed List IE* or the *DRB Failed To Modify List IE* of the BEARER CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

If the gNB-CU-UP receives a BEARER CONTEXT MODIFICATION REQUEST message containing a *QoS Flow Level QoS Parameters IE* in the *PDU Session Resource To Setup List IE* or the *PDU Session Resource To Modify List IE* for a GBR QoS Flow but where the *GBR QoS Flow Information IE* is not present, the gNB-CU-UP shall report the addition or the modification of the corresponding QoS Flow as failed in the corresponding *Flow Failed List IE* of the BEARER CONTEXT MODIFICATION RESPONSE message with an appropriate cause value.

8.3.3 Bearer Context Modification Required (gNB-CU-UP initiated)

8.3.3.1 General

The purpose of the Bearer Context Modification Required procedure is to allow the gNB-CU-UP to modify a bearer context (e.g., due to local problems) and inform the gNB-CU-CP. The procedure uses UE-associated signalling.

8.3.3.2 Successful Operation

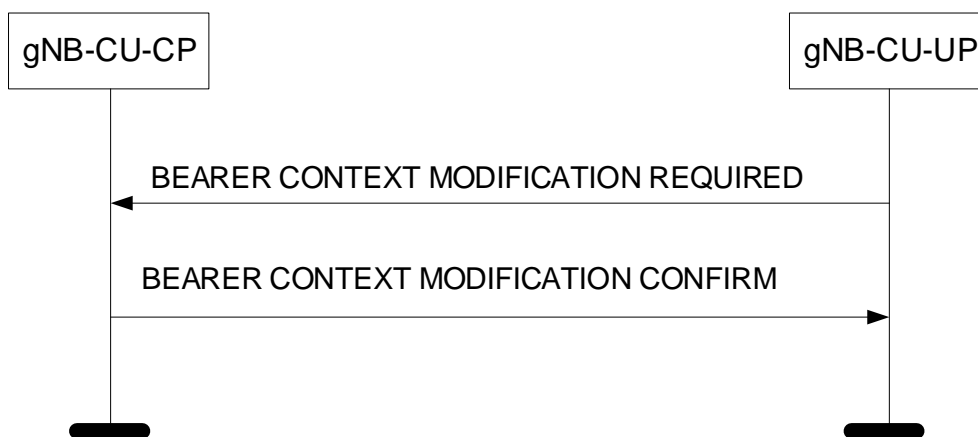


Figure 8.3.3.2-1: Bearer Context Modification Required procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the BEARER CONTEXT MODIFICATION REQUIRED message to the gNB-CU-CP. The gNB-CU-CP replies with the BEARER CONTEXT MODIFICATION CONFIRM message.

If the *S1 DL UP Transport Layer Information IE* or the *NG DL UP Transport Layer Information IE* or the *Redundant NG DL UP Transport Layer Information IE* is contained in the BEARER CONTEXT MODIFICATION REQUIRED message, the gNB-CU-CP shall update the corresponding information.

If the *gNB-CU-UP Cell Group Related Configuration IE* is contained in the *DRB To Modify List IE* in the BEARER CONTEXT MODIFICATION REQUIRED message, the gNB-CU-CP shall try to change the cell group related configuration accordingly. If the gNB-CU-CP is not able to update the requested cell group related configuration, it shall include the *Cell Group Information IE* with the current cell group configuration in the *DRB Modified List IE* in the BEARER CONTEXT MODIFICATION CONFIRM message.

If the *User Plane Error Indicator IE* is included in the *PDU Session Resource To Remove List IE* and is set to “GTP-U Error Indication Received” in the BEARER CONTEXT MODIFICATION REQUIRED message, the gNB-CU-CP shall, if supported, consider that the PDU session resource is released due to GTP-U Error Indication received over the NG-U tunnel and inform the SMF as specified in TS 23.527 [36].

8.3.3.3 Abnormal Conditions

Not applicable.

8.3.4 Bearer Context Release (gNB-CU-CP initiated)

8.3.4.1 General

The purpose of the Bearer Context Release procedure is to allow the gNB-CU-CP to command the release of an UE-associated logical E1 connection. The procedure uses UE-associated signalling.

8.3.4.2 Successful Operation

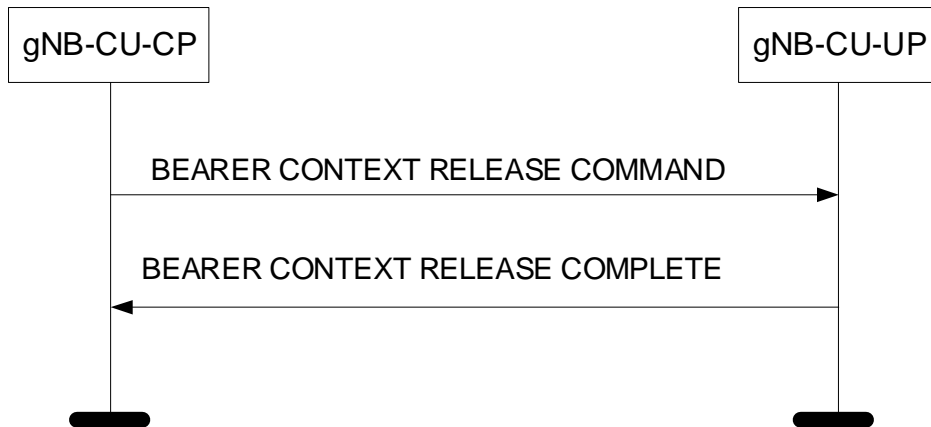


Figure 8.3.4.2-1: Bearer Context Release procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BEARER CONTEXT RELEASE COMMAND message to the gNB-CU-UP. The gNB-CU-UP replies with the BEARER CONTEXT RELEASE COMPLETE message.

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

The gNB-CU-UP shall, if supported, include the *Retainability Measurements Information* IE in the BEARER CONTEXT RELEASE COMPLETE message, providing information on the removed DRB(s) for retainability measurements in the gNB-CU-CP, as described in TS 32.425 [26] and TS 28.552 [22].

8.3.4.3 Abnormal Conditions

Not applicable.

8.3.5 Bearer Context Release Request (gNB-CU-UP initiated)

8.3.5.1 General

The purpose of the Bearer Context Release Request procedure is to allow the gNB-CU-UP to request the gNB-CU-CP to release an UE-associated logical E1 connection. The procedure uses UE-associated signalling.

8.3.5.2 Successful Operation



Figure 8.3.5.2-1: Bearer Context Release Request procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the BEARER CONTEXT RELEASE REQUEST message to the gNB-CU-CP.

If the *DRB Status List* IE is included in the BEARER CONTEXT RELEASE REQUEST message, the gNB-CU-CP shall act as specified in TS 38.401 [2].

Interactions with Bearer Context Release procedure:

The Bearer Context Release (gNB-CU-CP initiated) procedure may be initiated upon reception of a BEARER CONTEXT RELEASE REQUEST message.

Interaction with Bearer Context Modification (gNB-CU-CP initiated) procedure:

If applicable, as specified in TS 38.401 [2], the gNB-CU-UP may receive, after having performed the Bearer Context Release Request (gNB-CU-UP initiated) procedure, the BEARER CONTEXT MODIFICATION REQUEST message including the *Data Forwarding Information Request* IE within the *DRBs To Modify List* IE.

8.3.5.3 Abnormal Conditions

Not applicable.

8.3.6 Bearer Context Inactivity Notification

8.3.6.1 General

This procedure is initiated by the gNB-CU-UP to indicate the inactivity/resumption of activity related to the UE. The procedure uses UE-associated signalling.

8.3.6.2 Successful Operation



Figure 8.3.6.2-1: Bearer Context Inactivity Notification procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the BEARER CONTEXT INACTIVITY NOTIFICATION message to the gNB-CU-CP.

If the Activity Notification Level was set to "DRB" during the Bearer Context establishment, the gNB-CU-UP shall include the *DRB Activity List* IE in the BEARER CONTEXT INACTIVITY NOTIFICATION message.

If the Activity Notification Level was set to "PDU Session" during the Bearer Context establishment, the gNB-CU-UP shall include the *PDU Session Resource Activity List* IE in the BEARER CONTEXT INACTIVITY NOTIFICATION message.

If the Activity Notification Level was set to "UE" during the Bearer Context establishment, the gNB-CU-UP shall include the *UE Activity* IE in the BEARER CONTEXT INACTIVITY NOTIFICATION message.

8.3.6.3 Abnormal Conditions

Not applicable.

8.3.7 DL Data Notification

8.3.7.1 General

This procedure is initiated by the gNB-CU-UP to indicate the detection of DL data arrival for the UE, or indicate that a DL packet including a QFI value in the NG-U header not configured by the *QoS Flows Information To Be Setup* IE or the *Flow Mapping Information* IE is received for the first time. The procedure uses UE-associated signalling.

8.3.7.2 Successful Operation



Figure 8.3.7.2-1: DL Data Notification procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the DL DATA NOTIFICATION message to the gNB-CU-CP.

If the *PPI* IE is included in the DL DATA NOTIFICATION message, the gNB-CU-CP shall use it for paging policy differentiation.

If the *PDU Session To Notify List* IE is included in the DL DATA NOTIFICATION message, the gNB-CU-CP shall, if supported, either map the flow(s) included in *PDU Session To Notify List* IE to the existing DRB or establish a new DRB for the flow(s).

If the *MT-SDT Information* IE is included in the DL DATA NOTIFICATION message, the gNB-CU-CP shall, if supported, take it into account for MT-SDT paging.

If the *SDT Data Size Threshold Crossed* IE is included in the DL DATA NOTIFICATION message, the gNB-CU-CP shall, if supported, act as specified in TS 38.401 [2].

NOTE: If a DL packet including a QFI value in the NG-U header not configured by the *QoS Flows Information To Be Setup* IE or the *Flow Mapping Information* IE is received, the gNB-CU-UP may deliver the DL packet via any existing configured DRB before it initiates DL Data Notification procedure.

8.3.7.3 Abnormal Conditions

Not applicable.

8.3.8 Data Usage Report

8.3.8.1 General

This procedure is initiated by the gNB-CU-UP to report data volume served at the gNB-CU-UP. The procedure uses UE-associated signalling.

8.3.8.2 Successful Operation

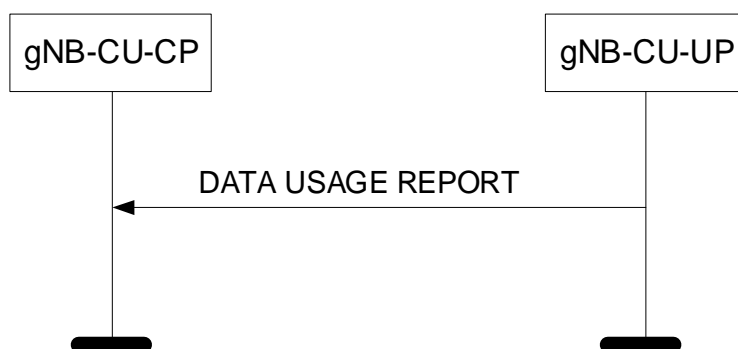


Figure 8.3.8.2-1: Data Usage Report procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the DATA USAGE REPORT message to the gNB-CU-CP.

8.3.8.3 Abnormal Conditions

Not applicable.

8.3.9 gNB-CU-UP Counter Check

8.3.9.1 General

This procedure is initiated by the gNB-CU-UP to request the gNB-CU-CP to execute a counter check procedure to verify the value of the PDCP COUNTs associated with DRBs established in the gNB-CU-UP.

The procedure uses UE-associated signalling.

8.3.9.2 Successful Operation

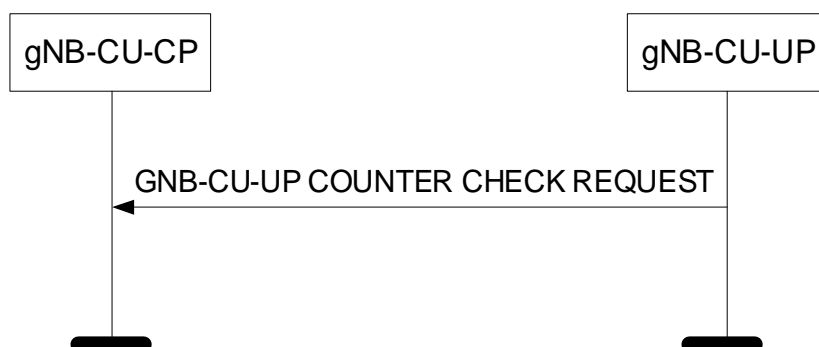


Figure 8.3.9.2-1: gNB-CU-UP Counter Check procedure, successful operation.

The gNB-CU-UP initiates the procedure by sending the gNB-CU-UP COUNTER CHECK REQUEST message to the gNB-CU-CP.

Upon reception of the gNB-CU-UP COUNTER CHECK REQUEST message, the gNB-CU-CP may perform the RRC counter check procedure as defined in TS 33.501 [13].

8.3.9.3 Unsuccessful Operation

Not applicable.

8.3.9.4 Abnormal Conditions

Not applicable.

8.3.10 UL Data Notification

8.3.10.1 General

This procedure is initiated by the gNB-CU-UP to notify the gNB-CU-CP that an UL packet including a QFI value in the SDAP header not configured by the *QoS Flows Information To Be Setup* IE or the *Flow Mapping Information* IE is received for the first time at the default DRB. The procedure uses UE-associated signalling.

8.3.10.2 Successful Operation

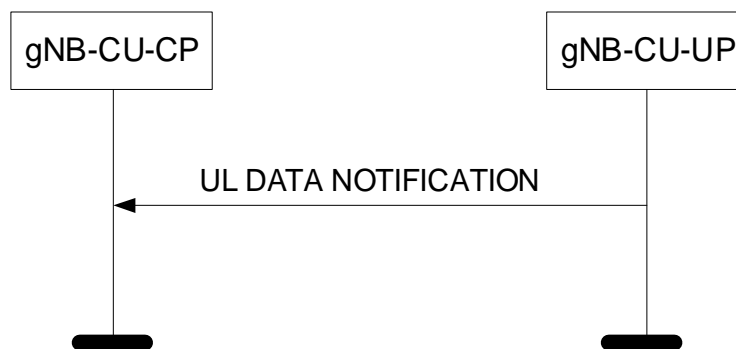


Figure 8.3.10.2-1: UL Data Notification procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the UL DATA NOTIFICATION message to the gNB-CU-CP.

8.3.10.3 Abnormal Conditions

Not applicable.

8.3.11 MR-DC Data Usage Report

8.3.11.1 General

This procedure is initiated by the gNB-CU-UP to report data volume served at the gNB-CU-UP, where the UE is connected to the 5GC. The procedure uses UE-associated signalling.

8.3.11.2 Successful Operation

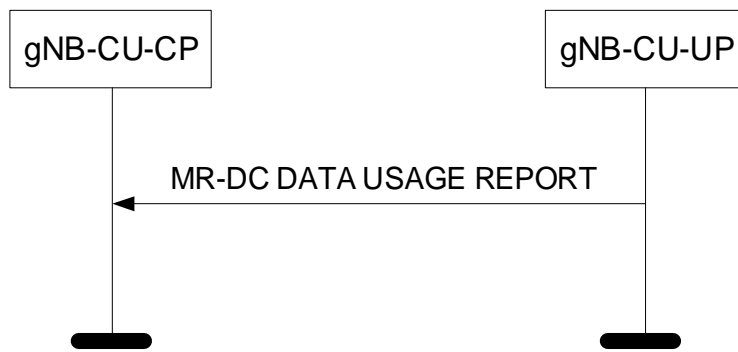


Figure 8.3.11.2-1: MR-DC Data Usage Report procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the MR-DC DATA USAGE REPORT message to the gNB-CU-CP.

8.3.11.3 Abnormal Conditions

Not applicable.

8.3.12 Early Forwarding SN Transfer

8.3.12.1 General

The purpose of the Early Forwarding SN Transfer procedure is to transfer, from the source gNB-CU-UP to the source gNB-CU-CP, DL COUNT of the last PDCP SDU successfully delivered or transmitted to the UE, for the purpose of discarding early forwarded downlink PDCP SDUs during Conditional Handover or conditional PSCell change or conditional PSCell addition.

The procedure uses UE-associated signalling.

8.3.12.2 Successful Operation



Figure 8.3.12.2-1: Early Forwarding SN Transfer procedure: Successful Operation.

The source gNB-CU-UP initiates the procedure by sending the EARLY FORWARDING SN TRANSFER message.

The *DRBs Subject To Early Forwarding List* IE included in the EARLY FORWARDING SN TRANSFER message contains the DRB ID(s) corresponding to the DRB(s) subject to early data forwarding during Conditional Handover or conditional PSCell change or conditional PSCell addition or subsequent CPAC.

For each DRB in the *DRBs Subject To Early Forwarding List* IE, the value of the *DL COUNT Value* IE indicates the DL COUNT of the last PDCP SDU successfully delivered in-sequence to the UE, if RLC-AM, and successfully transmitted, if RLC-UM.

8.3.12.3 Unsuccessful Operation

Not applicable.

8.3.12.4 Abnormal Conditions

If the source gNB-CU-CP receives this message for a UE for which no prepared Conditional Handover exists, the source gNB-CU-CP shall ignore the message.

8.3.13 GNB-CU-CP Measurement Results Information

8.3.13.1 General

This procedure is initiated by the gNB-CU-CP to inform the measurement results received from the UE to the gNB-CU-UP.

The procedure uses UE-associated signalling.

8.3.13.2 Successful Operation

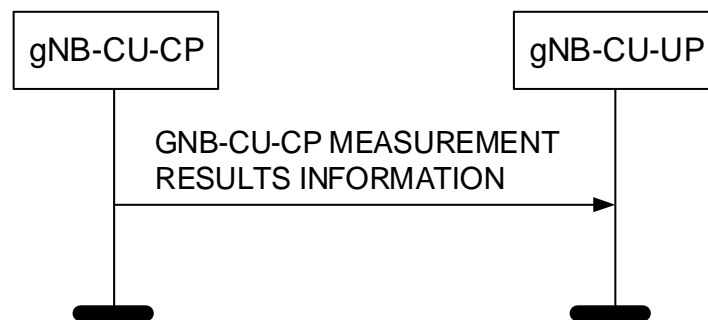


Figure 8.3.13.2-1: GNB-CU-CP Measurement Results Information procedure. Successful operation.

The gNB-CU-CP initiates the procedure by sending a GNB-CU-CP MEASUREMENT RESULTS INFORMATION message.

8.3.13.3 Abnormal Conditions

Not applicable.

8.4 Trace Procedures

8.4.1 Trace Start

8.4.1.1 General

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

8.4.1.2 Successful Operation



Figure 8.4.1.2-1: Trace start procedure: Successful Operation.

Upon reception of the TRACE START message, the gNB-CU-UP shall initiate the requested trace session for the requested UE, as described in TS 32.422 [24]. In particular, the gNB-CU-UP shall, if supported:

- if the *MDT Activation IE* is set to "Immediate MDT Only", initiate the requested MDT session as described in TS 32.422 [24] and the gNB-CU-UP shall ignore *Interfaces To Trace IE*, and *Trace Depth IE*.

8.4.1.3 Abnormal Conditions

Void.

8.4.2 Deactivate Trace

8.4.2.1 General

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

8.4.2.2 Successful Operation



Figure 8.4.2.2-1: Deactivate trace procedure: Successful Operation.

Upon reception of the DEACTIVATE TRACE message, the gNB-CU-UP shall stop the trace session for the indicated trace reference contained in the *Trace ID IE*, as described in TS 32.422 [24].

8.4.2.3 Abnormal Conditions

Void.

8.4.3 Cell Traffic Trace

8.4.3.1 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-CP. The procedure uses UE-associated signalling.

8.4.3.2 Successful Operation

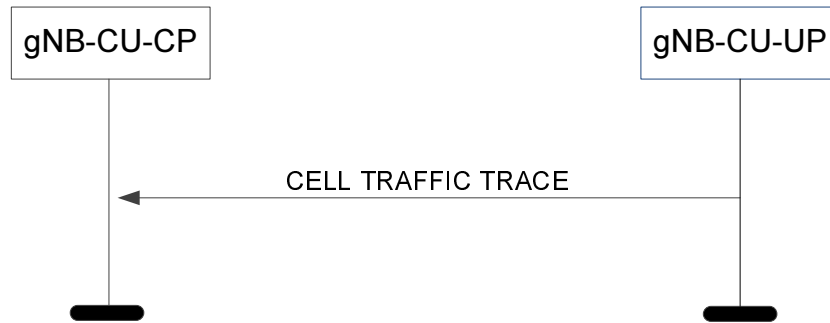


Figure 8.4.3.2-1: Cell Traffic Trace procedure. Successful operation.

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

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

8.4.3.3 Abnormal Conditions

Void.

8.5 IAB Procedures

8.5.1 IAB UP TNL Address Update

8.5.1.1 General

The purpose of the IAB UP TNL Address Update procedure is to allow the gNB-CU-CP to request the gNB-CU-UP to update the TNL Address(es) for all the DL F1-U GTP-U tunnels related to this (these) TNL address(es), and to allow the gNB-CU-UP to inform the gNB-CU-CP about the updated TNL Address(es) for all the UL F1-U GTP-U tunnels. The procedure uses non-UE associated signalling.

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

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

8.5.1.2 Successful Operation

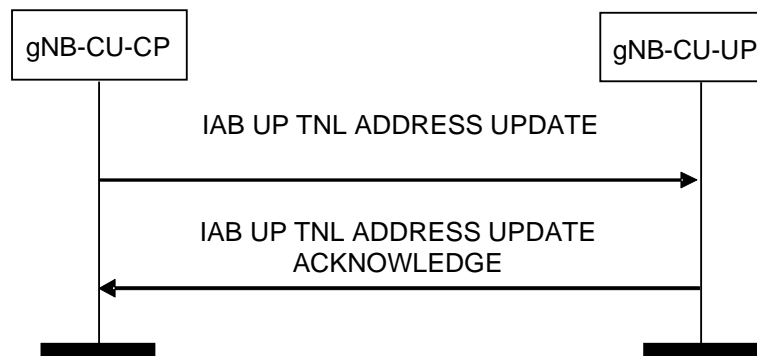


Figure 8.5.1.2-1: IAB UP TNL Address Update procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the IAB UP TNL ADDRESS UPDATE message to the gNB-CU-UP. If the gNB-CU-UP succeeds to update the TNL Address(es), it replies to the gNB-CU-CP with the IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE message.

Upon reception of the IAB UP TNL ADDRESS UPDATE message, if the *DL UP TNL Address to Update List* IE is included therein, the gNB-CU-UP shall replace the old TNL Address(es) by the new TNL Address(es) for all the maintained DL F1-U GTP tunnels corresponding to the old TNL Address(es).

If the *UL UP TNL Address to Update List* IE is contained in the IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE message, the gNB-CU-CP shall consider the new TNL address(es) as replacement for the corresponding old TNL address(es).

8.5.1.3 Unsuccessful Operation

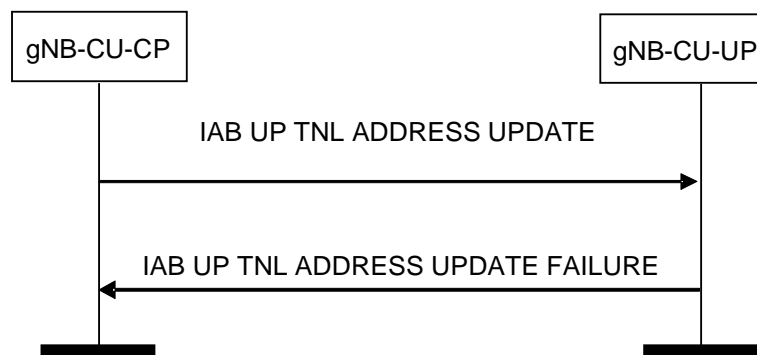


Figure 8.5.1.3-1: IAB UP TNL Address Update procedure: Unsuccessful Operation.

If the gNB-CU-UP receives an IAB UP TNL ADDRESS UPDATE message, but cannot perform the update accordingly, it shall consider the update procedure as failed and respond with an IAB UP TNL ADDRESS UPDATE FAILURE message and appropriate cause value.

If the IAB UP TNL ADDRESS UPDATE FAILURE message includes the *Time To Wait* IE, the gNB-CU-CP shall wait at least for the indicated amount of time before reinitiating the IAB UP TNL Address Update procedure towards the same gNB-CU-UP.

8.5.1.4 Abnormal Conditions

Not Applicable.

8.5.2 IAB PSK Notification

8.5.2.1 General

The purpose of the IAB PSK Notification procedure is to allow the gNB-CU-CP to send the security key info to the gNB-CU-UP, which will be used for the IKEv2 Pre-shared Secret Key (PSK) authentication to protect the F1-U interface of the IAB-node(s) as specified in TS 33.501 [13]. The procedure uses non-UE associated signalling.

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

NOTE: Implementation should ensure that the IAB PSK Notification procedure be performed after the IAB-donor-CU-CP obtains the IP address of the IAB-DU and of the IAB-donor-CU-UP.

8.5.2.2 Successful Operation



Figure 8.5.2.2-1: IAB PSK Notification procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the IAB PSK NOTIFICATION message to the gNB-CU-UP.

The gNB-CU-UP uses the *IAB-Donor-CU-UP PSK Info* IE included in the IAB PSK NOTIFICATION message as specified in TS 33.501 [13].

8.5.2.3 Abnormal Conditions

Not applicable.

8.6 MBS Procedures

8.6.1 MBS Procedures for Broadcast

8.6.1.1 BC Bearer Context Setup

8.6.1.1.1 General

The purpose of the BC Bearer Context Setup procedure is to allow the gNB-CU-CP to establish MBS session resources for a broadcast MBS session in the gNB-CU-UP. The procedure uses MBS-associated signalling.

8.6.1.1.2 Successful Operation

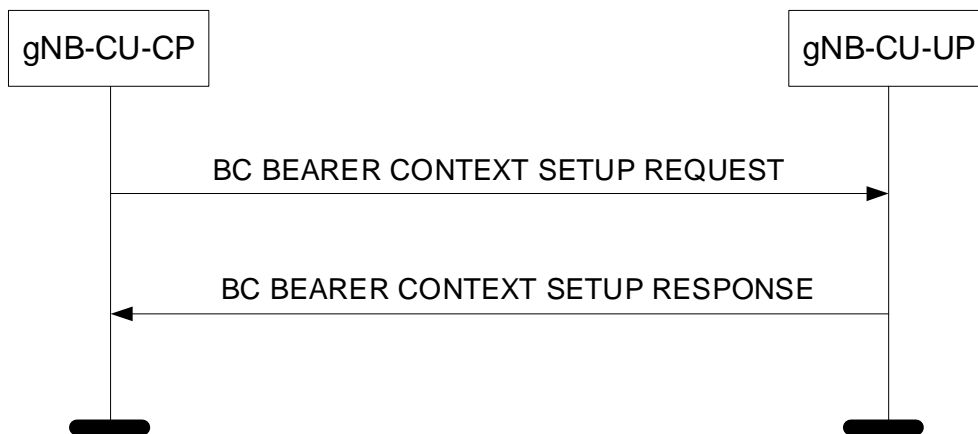


Figure 8.6.1.1.2-1: BC Bearer Context Setup procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BC BEARER CONTEXT SETUP REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to establish the requested MBS session resources, it replies to the gNB-CU-CP with the BC BEARER CONTEXT SETUP RESPONSE message.

The gNB-CU-UP shall report to the gNB-CU-CP, in the BC BEARER CONTEXT SETUP RESPONSE message, the result of all the requested resources in the following way:

- A list of BC MRBs which are successfully established shall be included in the *BC MRB Setup Response List IE*;
- A list of BC MRBs which failed to be established shall be included in the *BC MRB Failed List IE*;
- For each established BC MRB, a list of MBS QoS Flows which are successfully established shall be included in the *MBS QoS Flow Setup List IE*;
- For each established BC MRB, a list of MBS QoS Flows which failed to be established shall be included in the *MBS QoS Flow Failed List IE*;
- For each newly established BC MRB, if the *F1-U TNL Info to Add List IE* was included for an MRB within the *BC MRB Setup Configuration IE*, the gNB-CU-UP shall establish multiple F1-U resources which have one to one mapping with F1-U context referred by the *Broadcast F1-U Context ReferenceE1 IE* and include the *F1-U TNL Info Added List IE* in the *BC MRB Setup Response List IE*;

When the gNB-CU-UP reports the unsuccessful establishment of a BC MRB or MBS QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If the *Requested Action for Available Shared NG-U Termination IE* in the *BC Bearer Context To Setup IE* in the BC BEARER CONTEXT SETUP REQUEST message is set to

- "apply available configuration" and an appropriate Shared NG-U Termination is available, the gNB-CU-UP shall apply the radio bearer configuration of the Shared NG-U Termination, and indicate in the BC BEARER CONTEXT SETUP RESPONSE message within the *Available BC MRB Configuration IE* in the *BC Bearer Context To Setup Response IE* the radio bearer configuration of the Shared NG-U Termination, if the radio bearer configuration of the Shared NG-U Termination is different than the one requested by the gNB-CU-CP.
- "apply requested configuration" the gNB-CU-UP shall make use of an available appropriate Shared NG-U Termination if the radio bearer configuration of the Shared NG-U Termination, is the same as the one requested by the gNB-CU-CP, otherwise allocate separate resources as requested by the gNB-CU-CP and indicate in the BC BEARER CONTEXT SETUP RESPONSE message within the *Available BC MRB Configuration IE* in the *BC Bearer Context To Setup Response IE* the radio bearer configuration of the Shared NG-U Termination.
- "apply available configuration if same as requested" the gNB-CU-UP shall make use of an available appropriate Shared NG-U Termination only if the radio bearer configuration of the Shared NG-U Termination is the same as the one requested by the gNB-CU-CP and reply with BC BEARER CONTEXT SETUP RESPONSE message.

If the *Associated Session ID* IE is contained in the BC BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, take this information into account to determine the appropriate resources, as specified in TS 38.401 [2].

If the *MBS Service Area* IE is contained in the BC BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, take this information into account to determine the appropriate resources, as specified in TS 38.401 [2].

8.6.1.1.3 Unsuccessful Operation

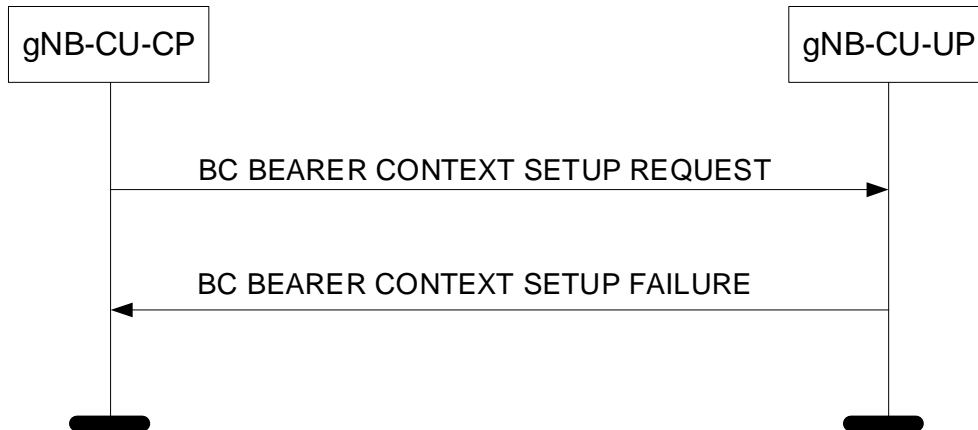


Figure 8.6.1.1.3-1: BC Bearer Context Setup procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot establish the requested resources for the MBS session, it shall consider the procedure as failed and respond with the BC BEARER CONTEXT SETUP FAILURE message and an appropriate cause value.

If the *Requested Action for Available Shared NG-U Termination* IE in the *BC Bearer Context To Setup* IE in the BC BEARER CONTEXT SETUP REQUEST message is set to "apply available configuration if same as requested" and the requested configuration does not match the available shared NG-U termination, the gNB-CU UP shall reply with BC BEARER CONTEXT SETUP FAILURE message.

8.6.1.1.4 Abnormal Conditions

void.

8.6.1.2 BC Bearer Context Modification (gNB-CU-CP initiated)

8.6.1.2.1 General

The purpose of the gNB-CU-CP initiated BC Bearer Context Modification procedure is to allow the gNB-CU-CP to modify MBS session resources for a broadcast MBS session. The procedure uses MBS-associated signalling.

8.6.1.2.2 Successful Operation

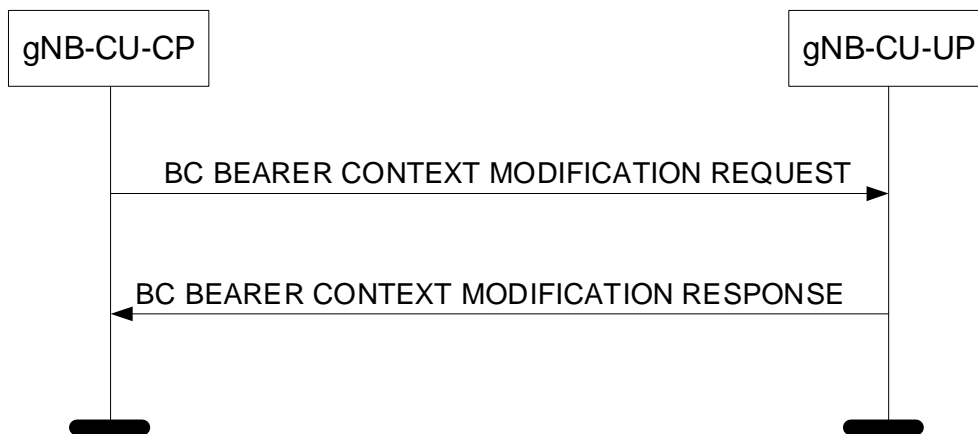


Figure 8.6.1.2.2-1: BC Bearer Context Modification procedure, gNB-CU-CP initiated: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BC BEARER CONTEXT MODIFICATION REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to perform at least partially the requested modifications it replies to the gNB-CU-CP with the BC BEARER CONTEXT MODIFICATION RESPONSE message.

The gNB-CU-UP shall report to the gNB-CU-CP, in the BC BEARER CONTEXT MODIFICATION RESPONSE message, the result of all the requested MBS session resources in the following way:

- A list of BC MRBs which are successfully established or modified shall be included in the *BC MRB Setup or Modify Response List IE*;
- A list of BC MRBs which failed to be established or modified shall be included in the *BC MRB Failed List IE*;
- For each newly established or modified BC MRB, a list of MBS QoS Flows which are successfully established or modified shall be included in the *MBS QoS Flow Setup List IE*;
- For each newly established or modified BC MRB, a list of MBS QoS Flows which failed to be established or modified shall be included in the *MBS QoS Flow Failed List IE*;
- If the *BC Bearer Context F1-U TNL Info at DU IE* is included in the *F1-U TNL Info to Add or Modify List IE* for an MRB indicated in the *BC Bearer Context To Modify IE*, the gNB-CU-UP shall allocate or update respective F1-U resources for the F1-U context referred by *Broadcast F1-U Context ReferenceE1 IE* and indicate in the *BC Bearer Context To Modify Response IE* the *BC Bearer Context F1-U TNL Info at CU IE* if updated;
- If the *F1-U TNL Info to Release List IE* is included for an MRB indicated in the *BC Bearer Context To Modify IE*, the gNB-CU-UP shall release the respective F1-U resources.

When the gNB-CU-UP reports the unsuccessful establishment of a BC MRB or MBS QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If the *BC Bearer Context NG-U TNL Info at 5GC To Setup or Modify IE* is contained in the *BC Bearer Context To Modify IE* in the BC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the previously received BC Bearer Context NG-U TNL Info at 5GC.

If the *BC Bearer Context NG-U TNL Info at NG-RAN Request IE* set to "true" is contained in the *BC Bearer Context To Modify IE* in the BC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP, shall, if supported, consider the shared NG-U resources for the indicated broadcast MBS session being released, and allocate new shared NG-U resources accordingly and include respective information in the *BC Bearer Context NG-U TNL Info at NG-RAN IE* in the BC BEARER CONTEXT MODIFICATION RESPONSE message.

8.6.1.2.3 Unsuccessful Operation

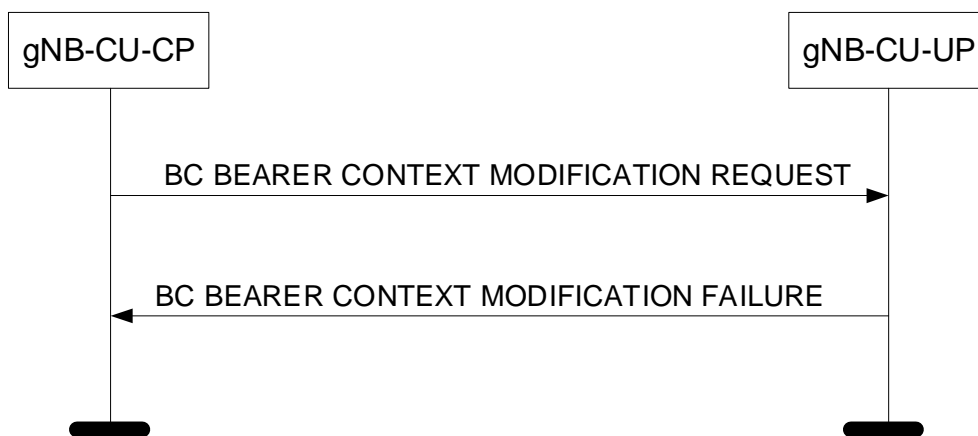


Figure 8.6.1.2.3-1: BC Bearer Context Modification procedure, gNB-CU-CP initiated: Unsuccessful Operation.

If the gNB-CU-UP cannot successfully perform any of the requested modifications, it shall respond with a BC BEARER CONTEXT MODIFICATION FAILURE message and an appropriate cause value.

8.6.1.2.4 Abnormal Conditions

void.

8.6.1.3 BC Bearer Context Modification Required

8.6.1.3.1 General

The purpose of the gNB-CU-UP initiated BC Bearer Context Modification Required procedure is to allow the gNB-CU-UP to request the gNB-CU-CP to initiate the modification MBS session resources for a broadcast MBS session and inform the gNB-CU-CP. The procedure uses MBS-associated signalling.

8.6.1.3.2 Successful Operation

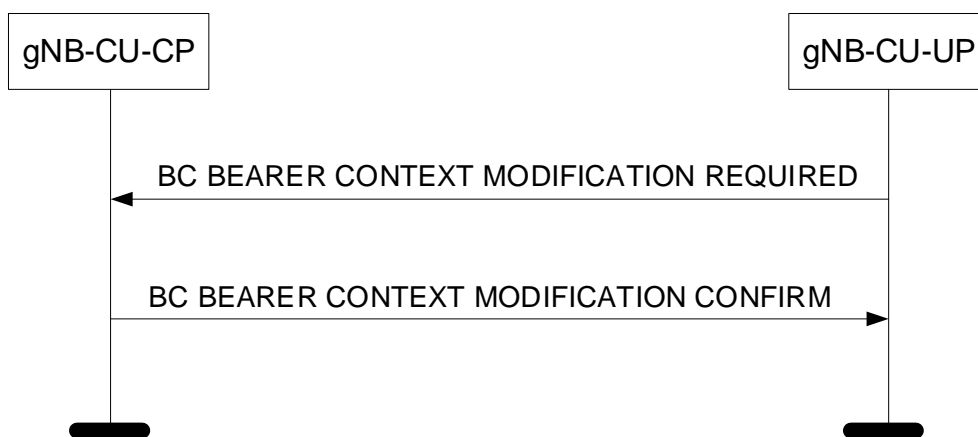


Figure 8.6.1.3.2-1: BC Bearer Context Modification Required procedure, gNB-CU-UP initiated: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the BC BEARER CONTEXT MODIFICATION REQUIRED message to the gNB-CU-CP. The gNB-CU-CP replies to the gNB-CU-UP with the BC BEARER CONTEXT MODIFICATION CONFIRM message.

8.6.1.3.3 Abnormal Conditions

void.

8.6.1.4 BC Bearer Context Release (gNB-CU-CP initiated)

8.6.1.4.1 General

The purpose of the gNB-CU-CP initiated BC Bearer Context Release procedure is to allow the gNB-CU-CP to command the release of MBS session resources for a broadcast MBS Session. The procedure uses MBS-associated signalling.

8.6.1.4.2 Successful Operation

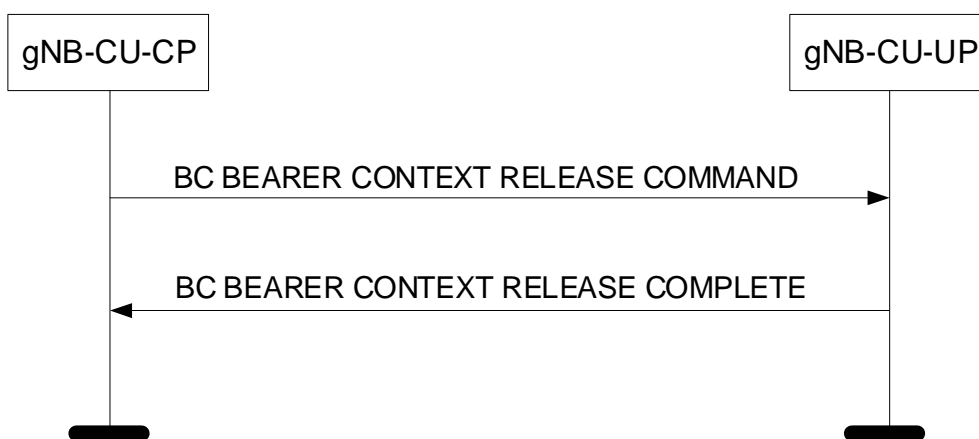


Figure 8.6.1.4.2-1: MC Bearer Context Release procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the BC BEARER CONTEXT RELEASE COMMAND message to the gNB-CU-UP.

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

8.6.1.4.3 Abnormal Conditions

Not applicable.

8.6.1.5 BC Bearer Context Release Request (gNB-CU-UP initiated)

8.6.1.5.1 General

The purpose of the BC Bearer Context Release Request procedure is to allow the gNB-CU-UP to request the gNB-CU-CP to trigger the release of MBS session resources for a broadcast MBS Session. The procedure uses MBS-associated signalling.

8.6.1.5.2 Successful Operation



Figure 8.6.1.5.2-1: BC Bearer Context Release Request procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the BC BEARER CONTEXT RELEASE REQUEST message to the gNB-CU-CP.

Interactions with gNB-CU-CP initiated BC Bearer Context Release procedure:

Upon reception of the BC BEARER CONTEXT RELEASE REQUEST message the gNB-CU-CP should initiate the BC Bearer Context Release procedure.

8.6.1.5.3 Abnormal Conditions

Not applicable.

8.6.2 MBS Procedures for Multicast

8.6.2.1 MC Bearer Context Setup

8.6.2.1.1 General

The purpose of the MC Bearer Context Setup procedure is to allow the gNB-CU-CP to establish MBS session resources for a multicast MBS session in the gNB-CU-UP. The procedure uses MBS-associated signalling.

8.6.2.1.2 Successful Operation

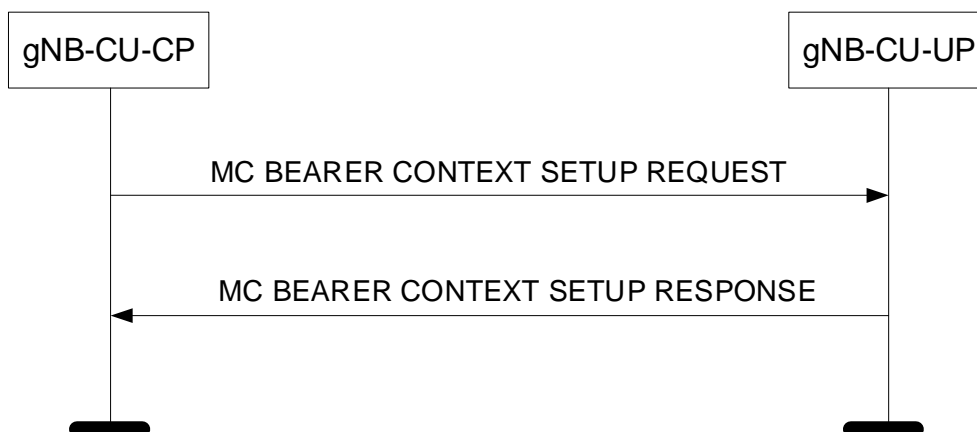


Figure 8.6.2.1.2-1: MC Bearer Context Setup procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the MC BEARER CONTEXT SETUP REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to establish the requested MBS session resources, it replies to the gNB-CU-CP with the MC BEARER CONTEXT SETUP RESPONSE message.

If MRB resources are requested to be setup by the gNB-CU-CP the gNB-CU-UP shall report to the gNB-CU-CP, in the MC BEARER CONTEXT SETUP RESPONSE message, the result of all the requested resources in the following way:

- A list of MC MRBs which are successfully established shall be included in the *MC MRB Setup Response List IE*;
- A list of MC MRBs which failed to be established shall be included in the *MC MRB Failed List IE*;
- For each established MC MRB, a list of MBS QoS Flows which are successfully established shall be included in the *MBS QoS Flow Setup List IE*;
- For each established MC MRB, a list of MBS QoS Flows which failed to be established shall be included in the *MBS QoS Flow Failed List IE*.

When the gNB-CU-UP reports the unsuccessful establishment of a MC MRB or MBS QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If MRB resources are requested to be setup by the gNB-CU-CP and if the *Requested Action for Available Shared NG-U Termination IE* in the *MC Bearer Context To Setup IE* in the MC BEARER CONTEXT SETUP REQUEST message is set to

- "apply available configuration" and an appropriate Shared NG-U Termination is available, the gNB-CU-UP shall apply the radio bearer configuration of the Shared NG-U Termination, and indicate in the MC BEARER CONTEXT SETUP RESPONSE message within the *Available MC MRB Configuration IE* in the *MC Bearer Context To Setup Response IE* the radio bearer configuration of the Shared NG-U Termination, if the radio bearer configuration of the Shared NG-U Termination is different than the one requested by the gNB-CU-CP.
- "apply requested configuration" the gNB-CU-UP shall make use of an available appropriate Shared NG-U Termination if the radio bearer configuration of the Shared NG-U Termination, is the same as the one requested by the gNB-CU-CP, otherwise allocate separate resources as requested by the gNB-CU-CP and indicate in the MC BEARER CONTEXT SETUP RESPONSE message within the *Available MC MRB Configuration IE* in the *MC Bearer Context To Setup Response IE* the radio bearer configuration of the Shared NG-U Termination.
- "apply available configuration if same as requested" the gNB-CU-UP shall make use of an available appropriate Shared NG-U Termination only if the radio bearer configuration of the Shared NG-U Termination is the same as the one requested by the gNB-CU-CP and reply with MC BEARER CONTEXT SETUP RESPONSE message.

If the *MBS Session Associated Information Non-Support-to-Support IE* is contained in the MC BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, perform duplication elimination between the packets delivered through the individual NG-U tunnel and the shared NG-U tunnel.

If the *MBS Area Session ID IE* is received in the MC BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, store it and use it to establish the shared NG-U tunnel.

If the *MC Bearer Context Status Change IE* set to "Resume" is contained in the MC BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall, if supported, resume transmitting DL data.

Interaction with other procedures

If the *MC Bearer Context Status Change IE* is contained in the MC BEARER CONTEXT SETUP REQUEST message and set to "Suspend", the gNB-CU-UP shall, if supported,

- suspend transmitting DL data to the gNB-DU.
- upon DL data arrival, buffer the received DL data and trigger the MC Bearer Notification procedure to indicate DL Data Arrival to the gNB-CU-CP.

If the *MC Bearer Context Inactivity Timer IE* is contained in MC BEARER CONTEXT SETUP REQUEST message, the gNB-CU-UP shall take it into account when performing inactivity monitoring, and if applicable, trigger MC Bearer Notification procedure to indicate inactivity of the MC Bearer context to the gNB-CU-CP.

8.6.2.1.3 Unsuccessful Operation

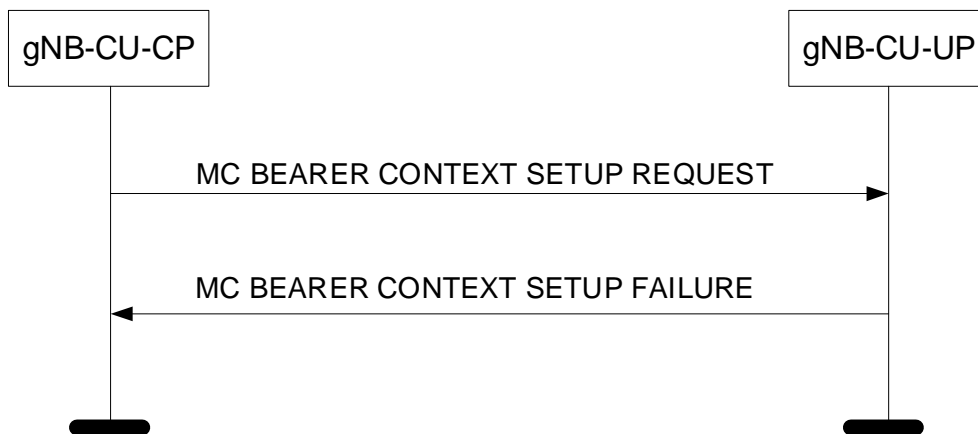


Figure 8.6.2.1.3-1: MC Bearer Context Setup procedure: Unsuccessful Operation.

If the gNB-CU-UP cannot establish the requested MBS session resources for the multicast MBS session, it shall consider the procedure as failed and respond with the MC BEARER CONTEXT SETUP FAILURE message and an appropriate cause value.

If the *Requested Action for Available Shared NG-U Termination* IE in the *MC Bearer Context To Setup* IE in the MC BEARER CONTEXT SETUP REQUEST message is set to "apply available configuration if same as requested" and the requested configuration does not match the available shared NG-U termination, the gNB-CU UP shall reply with MC BEARER CONTEXT SETUP FAILURE message.

8.6.2.1.4 Abnormal Conditions

void.

8.6.2.2 MC Bearer Context Modification (gNB-CU-CP initiated)

8.6.2.2.1 General

The purpose of the gNB-CU-CP initiated MC Bearer Context Modification procedure is to allow the gNB-CU-CP to modify MBS session resources for a multicast MBS session. The procedure uses MBS-associated signalling.

8.6.2.2.2 Successful Operation

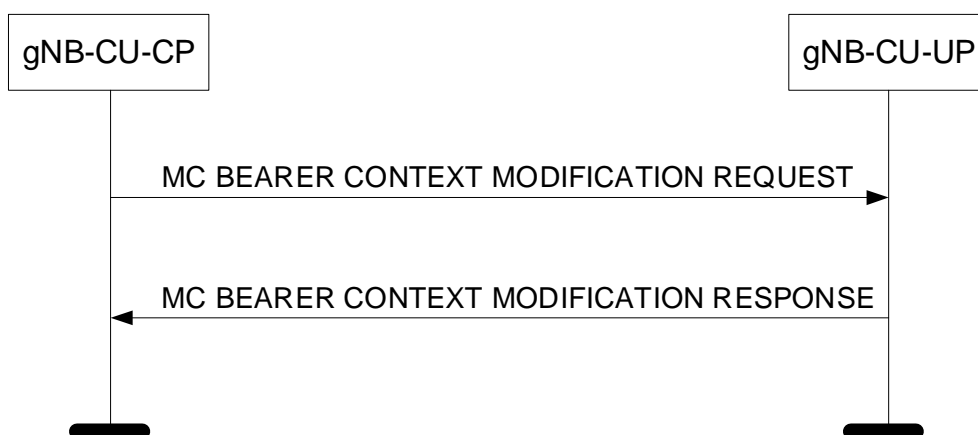


Figure 8.6.2.2.2-1: MC Bearer Context Modification procedure, gNB-CU-CP initiated: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the MC BEARER CONTEXT MODIFICATION REQUEST message to the gNB-CU-UP. If the gNB-CU-UP succeeds to perform at least partially the requested modifications it replies to the gNB-CU-CP with the MC BEARER CONTEXT MODIFICATION RESPONSE message.

If MRB resources are requested to be setup or modified by the gNB-CU-CP, the gNB-CU-UP shall report to the gNB-CU-CP, in the MC BEARER CONTEXT MODIFICATION RESPONSE message, the result of all the requested resources in the following way:

- A list of MC MRBs which are successfully established or modified shall be included in the *MC MRB Setup or Modify Response List IE*;
- A list of MC MRBs which failed to be established or modified shall be included in the *MC MRB Failed List IE*;
- For each newly established or modified MC MRB, a list of MBS QoS Flows which are successfully established or modified shall be included in the *MBS QoS Flow Setup List IE*;
- For each newly established or modified MC MRB, a list of MBS QoS Flows which failed to be established or modified shall be included in the *MBS QoS Flow Failed List IE*.

When the gNB-CU-UP reports the unsuccessful establishment of a MC MRB or MBS QoS Flow the cause value should be precise enough to enable the gNB-CU-CP to know the reason for the unsuccessful establishment.

If MRB resources are requested to be setup by the gNB-CU-CP and if the *Requested Action for Available Shared NG-U Termination IE* in the *MC Bearer Context To Modify IE* in the MC BEARER CONTEXT MODIFICATION REQUEST message is set to

- "apply available configuration" and an appropriate Shared NG-U Termination is available, the gNB-CU-UP shall apply the radio bearer configuration of the Shared NG-U Termination, and indicate in the MC BEARER CONTEXT MODIFICATION RESPONSE message within the *Available MC MRB Configuration IE* in the *MC Bearer Context To Modify Response IE* the radio bearer configuration of the Shared NG-U Termination, if the radio bearer configuration of the Shared NG-U Termination is different than the one requested by the gNB-CU-CP.
- "apply requested configuration" the gNB-CU-UP shall make use of an available appropriate Shared NG-U Termination if the radio bearer configuration of the Shared NG-U Termination, is the same as the one requested by the gNB-CU-CP, otherwise allocate separate resources as requested by the gNB-CU-CP and indicate in the MC BEARER CONTEXT MODIFICATION RESPONSE message within the *Available MC MRB Configuration IE* in the *MC Bearer Context To Modify Response IE* the radio bearer configuration of the Shared NG-U Termination.
- "apply available configuration if same as requested" the gNB-CU-UP shall make use of an available appropriate Shared NG-U Termination only if the radio bearer configuration of the Shared NG-U Termination is the same as the one requested by the gNB-CU-CP and reply with MC BEARER CONTEXT MODIFICATION RESPONSE message.

If the *MC Bearer Context NG-U TNL Info at 5GC IE* is contained in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall update the previously received MC Bearer Context NG-U TNL Info at 5GC.

If the *MC Bearer Context NG-U TNL Info at NG-RAN Request IE* is contained in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall include the *MC Bearer Context NG-U TNL Info at NG-RAN Modify Response IE* in the MC BEARER CONTEXT MODIFICATION RESPONSE message.

If the *MRB Progress Information Request Type IE* is contained within the *MC Forwarding Resource Request IE* in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, include the requested information in the *MRB Progress Information IE* within the *MC Forwarding Resource Response IE* in the MC BEARER CONTEXT MODIFICATION RESPONSE message. If the *MRB Forwarding Address Request IE* set to "true" is contained in the *MC Forwarding Resource Request IE* in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, include the *MRB Forwarding Address IE* within the *MC Forwarding Resource Response IE* in the MC BEARER CONTEXT MODIFICATION RESPONSE message.

If the *MC Forwarding Resource Indication IE* is contained in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, take the included information into account.

If the *MC Forwarding Resource Release* IE is contained in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, release the indicated MC Forwarding Resource.

If the *MBS Session Associated Information Non-Support-to-Support* IE is contained in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, perform duplication elimination between the packets delivered through the individual NG-U tunnel and the shared NG-U tunnel.

If the *MC Bearer Context Status Change* IE set to "Resume" is contained in the MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall, if supported, resume transmitting DL data.

Interaction with other procedures

If the *MC Bearer Context Status Change* IE is contained in MC BEARER CONTEXT MODIFICATION REQUEST message and set to "Suspend", the gNB-CU-UP shall, if supported,

- suspend transmitting DL data to the gNB-DU.
- upon DL data arrival, buffer the received DL data and trigger the MC Bearer Notification procedure to indicate DL Data Arrival to the gNB-CU-CP.

If the *MC Bearer Context Inactivity Timer* IE is contained in MC BEARER CONTEXT MODIFICATION REQUEST message, the gNB-CU-UP shall take it into account when perform inactivity monitoring, and if applicable, trigger MC Bearer Notification procedure to indicate inactivity of the MC Bearer context to the gNB-CU-CP.

8.6.2.2.3 Unsuccessful Operation

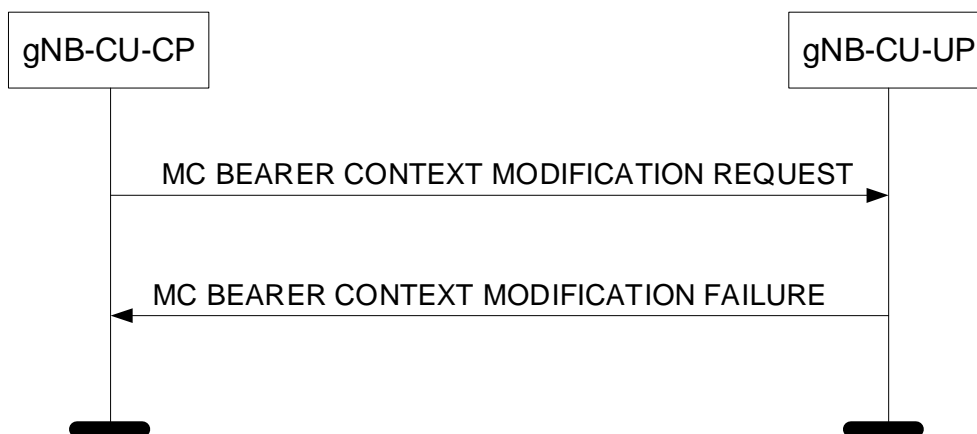


Figure 8.6.2.2.3-1: MC Bearer Context Modification procedure, gNB-CU-CP initiated: Unsuccessful Operation.

If the gNB-CU-UP cannot successfully perform any of the requested modifications, it shall respond with a MC BEARER CONTEXT MODIFICATION FAILURE message and an appropriate cause value.

If the *Requested Action for Available Shared NG-U Termination* IE in the *MC Bearer Context To Setup* IE in the MC BEARER CONTEXT MODIFICATION REQUEST message is set to "apply available configuration if same as requested" and the requested configuration does not match the available shared NG-U termination, the gNB-CU UP shall reply with MC BEARER CONTEXT MODIFICATION FAILURE message.

8.6.2.2.4 Abnormal Conditions

void.

8.6.2.3 MC Bearer Context Modification Required (gNB-CU-UP initiated)

8.6.2.3.1 General

The purpose of the gNB-CU-UP initiated MC Bearer Context Modification Required procedure is to allow the gNB-CU-UP to request the gNB-CU-CP to initiate the modification of MBS session resources for a multicast MBS session and inform the gNB-CU-CP. The procedure uses MBS-associated signalling.

8.6.2.3.2 Successful Operation

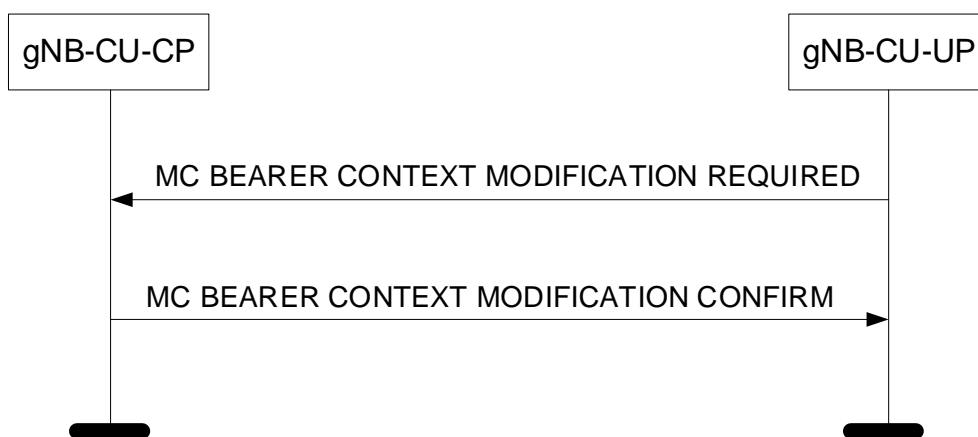


Figure 8.6.2.3.2-1: MC Bearer Context Modification Required procedure, gNB-CU-UP initiated: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the MC BEARER CONTEXT MODIFICATION REQUIRED message to the gNB-CU-CP. The gNB-CU-CP replies to the gNB-CU-UP with the MC BEARER CONTEXT MODIFICATION CONFIRM message.

If the *MC Forwarding Resource Release Indication* IE is contained in the MC BEARER CONTEXT MODIFICATION REQUIRED message, the gNB-CU-CP shall, if supported, assume that the indicated MC Forwarding Resource was released by the gNB-CU-UP.

8.6.2.3.3 Abnormal Conditions

void

8.6.2.4 MC Bearer Context Release (gNB-CU-CP initiated)

8.6.2.4.1 General

The purpose of the gNB-CU-CP initiated MC Bearer Context Release procedure is to allow the gNB-CU-CP to command the release of MBS session resources for a multicast MBS Session. The procedure uses MBS-associated signalling.

8.6.2.4.2 Successful Operation

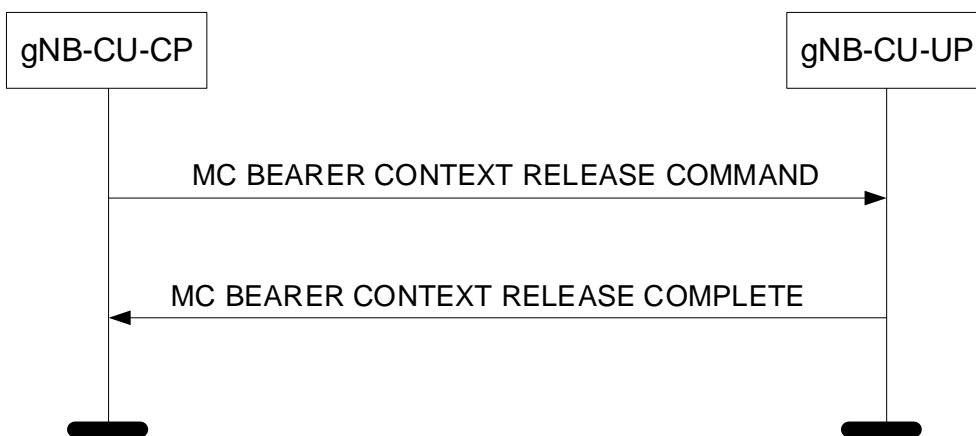


Figure 8.6.2.4.2-1: MC Bearer Context Release procedure: Successful Operation.

The gNB-CU-CP initiates the procedure by sending the MC BEARER CONTEXT RELEASE COMMAND message to the gNB-CU-UP.

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

8.6.2.4.3 Abnormal Conditions

Not applicable.

8.6.2.5 MC Bearer Context Release Request (gNB-CU-UP initiated)

8.6.2.5.1 General

The purpose of the MC Bearer Context Release Request procedure is to allow the gNB-CU-UP to request the gNB-CU-CP to trigger the release of MBS session resources for a multicast MBS Session. The procedure uses MBS-associated signalling.

8.6.2.5.2 Successful Operation



Figure 8.6.2.5.2-1: MC Bearer Context Release Request procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the MC BEARER CONTEXT RELEASE REQUEST message to the gNB-CU-CP.

Interactions with gNB-CU-CP initiated MC Bearer Context Release procedure:

Upon reception of the MC BEARER CONTEXT RELEASE REQUEST message the gNB-CU-CP should initiate the MC Bearer Context Release procedure.

8.6.2.5.3 Abnormal Conditions

Not applicable.

8.6.2.6 MC Bearer Notification

8.6.2.6.1 General

The purpose of MC Bearer Notification procedure is initiated by the gNB-CU-UP to indicate DL data arrival or inactivity of the MC Bearer context.

The procedure uses MBS-associated signalling.

8.6.2.6.2 Successful Operation



Figure 8.6.2.6.2-1: MC Bearer Notification procedure: Successful Operation.

The gNB-CU-UP initiates the procedure by sending the MC BEARER NOTIFICATION message to the gNB-CU-CP.

8.6.2.6.3 Abnormal Conditions

Not applicable.

9 Elements for E1AP communication

NOTE: In this section, each occurrence of gNB-CU-CP could be replaced by eNB-CP or ng-eNB-CU-CP, and each occurrence of gNB-CU-UP could be replaced by eNB-UP or ng-eNB-CU-UP, for eNB CP-UP separation and ng-eNB CP-UP separation respectively.

9.1 General

Subclauses 9.2 and 9.3 present the E1AP 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 [5].

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 [6].

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-CP and the gNB-CU-UP and is used to request that the E1 interface, or parts of the E1 interface, to be reset.

Direction: gNB-CU-CP → gNB-CU-UP and gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
CHOICE <i>Reset Type</i>	M				YES	reject
> <i>E1 interface</i>						
>>Reset All	M		ENUMERATED (Reset all,...)		-	
> <i>Part of E1 interface</i>						
>>UE-associated logical E1-connection list		1			-	
>>>UE-associated logical E1-connection Item		1 .. <maxnoofIndividualE1ConnectionsToReset>			EACH	reject
>>>>gNB-CU-CP UE E1AP ID	O		9.3.1.4		-	
>>>>gNB-CU-UP UE E1AP ID	O		9.3.1.5		-	

Range bound	Explanation
maxnoofIndividualE1ConnectionsToReset	Maximum no. of UE-associated logical E1-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-CP and the gNB-CU-UP as a response to a RESET message.

Direction: gNB-CU-UP → gNB-CU-CP and gNB-CU-CP → gNB-CU-UP.

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		9.3.1.53		YES	reject
UE-associated logical E1-connection list		0..1			YES	ignore
>UE-associated logical E1-connection Item		1 .. <maxnoofIndividualE1ConnectionsToReset>			EACH	ignore
>>gNB-CU-CP UE	O		9.3.1.4		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
E1AP ID						
>>gNB-CU-UP UE E1AP ID	O		9.3.1.5		-	
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofIndividualE1ConnectionsToReset	Maximum no. of UE-associated logical E1-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-CP and the gNB-CU-UP and is used to indicate that some error has been detected in the node.

Direction: gNB-CU-CP → gNB-CU-UP and gNB-CU-UP → gNB-CU-CP

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		9.3.1.53	This IE is ignored if received in UE associated signalling message.	YES	reject
gNB-CU-CP UE E1AP ID	O		9.3.1.4		YES	ignore
gNB-CU-UP UE E1AP 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
gNB-CU-CP MBS E1AP ID	O		9.3.1.106		YES	ignore
gNB-CU-UP MBS E1AP ID	O		9.3.1.107		YES	ignore

9.2.1.4 GNB-CU-UP E1 SETUP REQUEST

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

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
gNB-CU-UP ID	M		9.3.1.15		YES	reject
gNB-CU-UP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-UP.	YES	ignore
CN Support	M		ENUMERATED (EPC, 5GC, both, ...)		YES	reject
Supported PLMNs		1..<maxno ofSPLMNs >		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>NR CGI Support List	O		9.3.1.36	Supported cells for	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				gNB CP-UP separation.		
>QoS Parameters Support List	O		9.3.1.37	Supported QoS parameters per PLMN.	-	-
>NPN Support Information	O		9.3.1.83	<i>NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP</i>	YES	reject
>Extended Slice Support List	O		9.3.1.94	Additional Supported S-NSSAIs per PLMN.	YES	reject
>Extended NR CGI Support List	O		9.3.1.97	Additional supported cells per PLMN.	YES	ignore
>ECGI Support List	O		9.3.1.100	Supported cells for eNB or ng-eNB CP-UP separation.	YES	ignore
gNB-CU-UP Capacity	O		9.3.1.56		YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-UP Name	O		9.3.1.96		YES	ignore
gNB-CU-UP MBS Support Information	O		9.3.1.110		YES	reject

Range bound	Explanation
maxnoofSPLMNs	Maximum no. of Supported PLMN Ids. Value is 12.

9.2.1.5 GNB-CU-UP E1 SETUP RESPONSE

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

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
gNB-CU-CP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-CP.	YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-CP Name	O		9.3.1.95		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.6 GNB-CU-UP E1 SETUP FAILURE

This message is sent by the gNB-CU-CP to indicate E1 Setup failure.

Direction: gNB-CU-CP → gNB-CU-UP

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Transaction ID	M		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.7 GNB-CU-CP E1 SETUP REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
gNB-CU-CP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-CP.	YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-CP Name	O		9.3.1.95		YES	ignore

9.2.1.8 GNB-CU-CP E1 SETUP RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
gNB-CU-UP ID	M		9.3.1.15		YES	reject
gNB-CU-UP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-UP.	YES	ignore
CN Support	M		ENUMERATED (EPC, 5GC, both, ...)		YES	reject
Supported PLMNs		1..<maxno of S-PLMNs>		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	
>NR CGI Support List	O		9.3.1.36	Supported cells for gNB CP-UP separation.	-	
>QoS Parameters Support List	O		9.3.1.37	Supported QoS parameters per PLMN.	-	
>NPN Support Information	O		9.3.1.83	<i>NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP</i>	YES	reject
>Extended Slice Support List	O		9.3.1.94	Additional Supported S-NSSAIs per	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				PLMN.		
>Extended NR CGI Support List	O		9.3.1.97	Additional supported cells per PLMN.	YES	ignore
>ECGI Support List	O		9.3.1.100	Supported cells for eNB or ng-eNB CP-UP separation.	YES	ignore
gNB-CU-UP Capacity	O		9.3.1.56		YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-UP Name	O		9.3.1.96		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofSPLMNs	Maximum no. of Supported PLMN Ids. Value is 12.

9.2.1.9 GNB-CU-CP E1 SETUP FAILURE

This message is sent by the gNB-CU-UP to indicate E1 Setup failure.

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.10 GNB-CU-UP CONFIGURATION UPDATE

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

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
gNB-CU-UP ID	O		9.3.1.15		YES	reject
gNB-CU-UP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-UP.	YES	ignore
Supported PLMNs		<i>0..<maxno ofSPLMNs></i>		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	
>NR CGI Support List	O		9.3.1.36	Supported cells for gNB CP-UP separation.	-	
>QoS Parameters Support List	O		9.3.1.37	Supported QoS parameters per PLMN.	-	
>NPN Support Information	O		9.3.1.83	<i>NOTE: This IE is not applicable to</i>	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				<i>eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP</i>		
>Extended Slice Support List	O		9.3.1.94	Additional Supported S-NSSAIs per PLMN.	YES	reject
>Extended NR CGI Support List	O		9.3.1.97	Additional supported cells per PLMN.	YES	ignore
>ECGI Support List	O		9.3.1.100	Supported cells for eNB or ng-eNB CP-UP separation.	YES	ignore
gNB-CU-UP Capacity	O		9.3.1.56		YES	ignore
gNB-CU-UP TNLA To Remove List		<i>0..1</i>			YES	reject
>gNB-CU-UP TNLA To Remove Item IEs		<i>1..<maxno ofTNLAssociations></i>			-	
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-UP.	-	
>>TNLA Transport Layer Address gNB-CU-CP	O		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP.	-	
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-UP Name	O		9.3.1.96		YES	ignore
gNB-CU-UP MBS Support Information	O		9.3.1.110		YES	reject

Range bound	Explanation
maxnoofSPLMNs	Maximum no. of Supported PLMN Ids. Value is 12.
maxnoofTNLAssociations	Maximum numbers of TNL Associations between the gNB-CU-UP and the gNB-CU-CP. Value is 32.

9.2.1.11 GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE

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

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore

9.2.1.12 GNB-CU-UP CONFIGURATION UPDATE FAILURE

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

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.13 GNB-CU-CP CONFIGURATION UPDATE

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

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
gNB-CU-CP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-CP	YES	ignore
gNB-CU-CP TNLA To Add List		0..1			YES	ignore
>gNB-CU-CP TNLA To Add Item IEs		1..<maxno ofTNLAassociations>			-	
>>TNLA Transport Layer Information	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP.	-	
>>TNLA Usage	M		ENUMERATED (ue, non-ue, both, ...)	Indicates whether the TNLA is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 37.482 [18].	-	
gNB-CU-CP TNLA To Remove List		0..1			YES	ignore
>gNB-CU-CP TNLA To Remove Item IEs		1..<maxno ofTNLAassociations>			-	
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP.	-	
>>TNLA Transport Layer Address gNB-CU-UP	O		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-UP.	YES	reject
gNB-CU-CP TNLA To Update List		0..1			YES	ignore
>gNB-CU-CP TNLA To Update Item IEs		1..<maxno ofTNLAassociations>			-	
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP.	-	
>>TNLA Usage	O		ENUMERATED (ue, non-ue, both, ...)	Indicates whether the TNLA is only used for UE-associated	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 37.482 [18].		
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-CP Name	O		9.3.1.95		YES	ignore

Range bound	Explanation
maxnoofTNLAAssociations	Maximum numbers of TNL Associations between the gNB-CU-CP and the gNB-CU-UP. Value is 32.

9.2.1.14 GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE

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

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
gNB-CU-CP TNLA Setup List		0..1			YES	ignore
>gNB-CU-CP TNLA Setup Item IEs		1..<maxno ofTNLAAssociations>			-	
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP	-	
gNB-CU-CP TNLA Failed to Setup List		0..1			YES	ignore
>gNB-CU-CP TNLA Failed To Setup Item IEs		1..<maxno ofTNLAAssociations>			-	
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP	-	
>>Cause	M		9.3.1.2		-	
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore

Range bound	Explanation
maxnoofTNLAAssociations	Maximum numbers of TNL Associations between the gNB-CU-CP and the gNB-CU-UP. Value is 32.

9.2.1.15 GNB-CU-CP CONFIGURATION UPDATE FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.16 E1 RELEASE REQUEST

This message is sent by both the gNB-CU-CP and the gNB-CU-UP and is used to request the release of the E1 interface.

Direction: gNB-CU-CP → gNB-CU-UP and gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.1.17 E1 RELEASE RESPONSE

This message is sent by both the gNB-CU-CP and the gNB-CU-UP as a response to an E1 RELEASE REQUEST message.

Direction: gNB-CU-UP → gNB-CU-CP and gNB-CU-CP → gNB-CU-UP.

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		9.3.1.53		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.18 GNB-CU-UP STATUS INDICATION

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

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
gNB-CU-UP Overload Information	M		ENUMERATED (overloaded, not-overloaded)		YES	reject

9.2.1.19 RESOURCE STATUS REQUEST

This message is sent by an gNB-CU-CP to gNB-CU-UP to initiate the requested measurement according to the parameters given in the message.

Direction: gNB-CU-CP → gNB-CU-UP.

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		9.3.1.53		YES	reject
gNB-CU-CP	M		INTEGER	Allocated by gNB-	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Measurement ID			(1..4095,...)	CU-CP		
gNB-CU-UP Measurement ID	C-ifRegistrationRequestStop		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
Registration Request	M		ENUMERATED (start, stop, ...)	Type of request for which the resource status is required.	YES	reject
Report Characteristics	C-ifRegistrationRequestStart		BITSTRING (SIZE(36))	Each position in the bitmap indicates measurement object the gNB-CU-UP is requested to report. First Bit = TNL Available Capacity Ind Periodic, Second Bit = HW Capacity Ind Periodic. Other bits shall be ignored by the gNB-CU-UP.	YES	reject
Reporting Periodicity	O		ENUMERATED (500ms, 1000ms, 2000ms, 5000ms, 10000ms, 20000ms, 30000ms, 40000ms, 50000ms, 60000ms, 70000ms, 80000ms, 90000ms, 100000ms, 110000ms, 120000ms, ...)	Periodicity that can be used for reporting. Also used as the averaging window length for all measurement object if supported.	YES	ignore

Condition	Explanation
ifRegistrationRequestStop	This IE shall be present if the <i>Registration Request</i> IE is set to the value "stop"
ifRegistrationRequestStart	This IE shall be present if the <i>Registration Request</i> IE is set to the value "start".

9.2.1.20 RESOURCE STATUS RESPONSE

This message is sent by the gNB-CU-UP to indicate that the requested measurement, for all the measurement objects included in the measurement is successfully initiated.

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
gNB-CU-UP	M		INTEGER	Allocated by gNB-	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Measurement ID			(1..4095,...)	CU-UP		
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.21 RESOURCE STATUS FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP.

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		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
gNB-CU-UP Measurement ID	O		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.22 RESOURCE STATUS UPDATE

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

Direction: gNB-CU-UP → gNB-CU-CP.

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		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
gNB-CU-UP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
TNL Available Capacity Indicator	O		9.3.1.72		YES	ignore
HW Capacity Indicator	O		9.3.1.73		YES	ignore

Range bound	Explanation
maxnoofSPLMNs	Maximum no. of Supported PLMN Ids. Value is 12.
maxnoofSliceltems	Maximum no. of signalled slice support items. Value is 1024.

9.2.2 Bearer Context Management messages

9.2.2.1 BEARER CONTEXT SETUP REQUEST

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to setup a bearer context.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
Security Information	M		9.3.1.10		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UE DL Aggregate Maximum Bit Rate	M		Bit Rate 9.3.1.20		YES	reject
UE DL Maximum Integrity Protected Data Rate	O		Bit Rate 9.3.1.20	The Bit Rate is a portion of the UE's Maximum Integrity Protected Data Rate, and is enforced by the gNB-CU-UP node.	YES	reject
Serving PLMN	M		PLMN Identity 9.3.1.7		YES	ignore
Activity Notification Level	M		9.3.1.67		YES	reject
UE Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "UE".	YES	reject
Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, ..., ResumeforSDT)	Indicates the status of the Bearer Context. <i>NOTE: This IE is not applicable to eNB-CP/eNB-UP.</i>	YES	reject
CHOICE System	M				YES	reject
>E-UTRAN						
>>DRB To Setup List	M		DRB To Setup List E-UTRAN 9.3.3.1		YES	reject
>>Subscriber Profile ID for RAT/Frequency priority	O		9.3.1.69		YES	ignore
>>Additional RRM Policy Index	O		9.3.1.70		YES	ignore
>NG-RAN						
>>PDU Session Resource To Setup List	M		9.3.3.2		YES	reject
RAN UE ID	O		OCTET STRING (SIZE(8))		YES	ignore
gNB-DU ID	O		9.3.1.65	Included whenever it is known by the gNB-CU-CP or by the ng-eNB-CU-CP	YES	ignore
Trace Activation	O		9.3.1.68		YES	ignore
NPN Context Information	O		9.3.1.84		YES	reject
Management Based MDT PLMN List	O		MDT PLMN List 9.3.1.89		YES	ignore
CHO Initiation	O		ENUMERATED (True, ...)		YES	reject
Additional Handover Information	O		ENUMERATED (Discard PDCP SN, ...)	If set to "Discard PDCP SN", indicates that the forwarded PDCP SNs have to be removed	YES	ignore
Direct Forwarding Path Availability	O		9.3.1.98		YES	ignore
gNB-CU-UP UE E1AP ID	O		9.3.1.5		YES	ignore
MDT Polluted Measurement Indicator	O		ENUMERATED (IDC, no-IDC,	Indication on whether MDT	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			...)	Measurement affect (e.g. IDC) is undertake or not.		
UE Slice Maximum Bit Rate List	O		9.3.1.102		YES	ignore
SCG Activation Status	O		9.3.1.105		YES	ignore
MT-SDT Information Request	O		ENUMERATED (true, ...)	Indicates to request the report of MT-SDT Information.	YES	ignore
SDT Data Size Threshold	O		INTEGER (1..192000, ...)	Unit: byte.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.2 BEARER CONTEXT SETUP RESPONSE

This message is sent by the gNB-CU-UP to confirm the setup of the requested bearer context.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE <i>System</i>	M				YES	reject
> <i>E-UTRAN</i>						
>>DRB Setup List	M		DRB Setup List E-UTRAN 9.3.3.3		YES	reject
>>DRB Failed List	O		DRB Failed List E-UTRAN 9.3.3.4		YES	reject
> <i>NG-RAN</i>						
>>PDU Session Resource Setup List	M		9.3.3.5		YES	reject
>>PDU Session Resource Failed List	O		9.3.3.6		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.3 BEARER CONTEXT SETUP FAILURE

This message is sent by the gNB-CU-UP to indicate that the setup of the bearer context was unsuccessful.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP	M		9.3.1.4		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
ID						
gNB-CU-UP UE E1AP 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

9.2.2.4 BEARER CONTEXT MODIFICATION REQUEST

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to modify a bearer context.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Security Information	O		9.3.1.10		YES	reject
UE DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20		YES	reject
UE DL Maximum Integrity Protected Data Rate	O		Bit Rate 9.3.1.20	The Bit Rate is a portion of the UE's Maximum Integrity Protected Data Rate, and is enforced by the gNB-CU-UP node.	YES	reject
Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, ..., ResumeforSDT)	Indicates the status of the Bearer Context <i>NOTE: This IE is not applicable to eNB-CP/eNB-UP.</i>	YES	reject
New UL TNL Information Required	O		ENUMERATED (required, ...)	Indicates that new UL TNL information has been requested to be provided.	YES	reject
UE Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "UE".	YES	reject
Data Discard Required	O		ENUMERATED (required, ...)	Indicate to discard the DL user data in case of RAN paging failure.	YES	ignore
CHOICE System	O				YES	reject
>E-UTRAN						
>>DRB To Setup List	O		DRB To Setup Modification List E-UTRAN 9.3.3.7		YES	reject
>>DRB To Modify List	O		DRB To Modify List E-UTRAN 9.3.3.8		YES	reject
>>DRB To Remove List	O		DRB To Remove List E-UTRAN 9.3.3.9		YES	reject
>>Subscriber Profile ID for RAT/Frequency	O		9.3.1.69		YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
priority						
>>Additional RRM Policy Index	O		9.3.1.70		YES	ignore
>NG-RAN						
>>PDU Session Resource To Setup List	O		PDU Session Resource To Setup Modification List 9.3.3.10		YES	reject
>>PDU Session Resource To Modify List	O		9.3.3.11		YES	reject
>>PDU Session Resource To Remove List	O		9.3.3.12		YES	reject
RAN UE ID	O		OCTET STRING (SIZE(8))		YES	ignore
gNB-DU ID	O		9.3.1.65		YES	ignore
Activity Notification Level	O		9.3.1.67		YES	ignore
MDT Polluted Measurement Indicator	O		ENUMERATED (IDC, no-IDC, ...)	Indication on whether MDT Measurement affect (e.g. IDC) is undertake or not.	YES	ignore
UE Slice Maximum Bit Rate List	O		9.3.1.102		YES	ignore
SCG Activation Status	O		9.3.1.105		YES	ignore
SDT Continue ROHC	O		ENUMERATED (true, ...)	Indicates ROHC should be continued for SDT DRBs. This IE corresponds to information provided in the <i>sdt-DRB-ContinueROHC</i> contained in the <i>SDT-Config</i> IE as defined in TS 38.331 [10].	YES	reject
Management Based MDT PLMN Modification List	O		MDT PLMN Modification List 9.3.1.129		YES	ignore
Inactivity Information Request	O		ENUMERATED (true, ...)	Indicates to gNB-CU-UP to report the UE Inactivity Information	YES	ignore
MT-SDT Information Request	O		ENUMERATED (true, ...)	Indicates to request the report of MT-SDT Information.	YES	ignore
SDT Data Size Threshold	O		INTEGER (1..192000, ...)	Unit: byte.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.5 BEARER CONTEXT MODIFICATION RESPONSE

This message is sent by the gNB-CU-UP to confirm the modification of the requested bearer context.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE <i>System</i>	O				YES	ignore
> <i>E-UTRAN</i>						
>>DRB Setup List	O		DRB Setup Modification List E-UTRAN 9.3.3.13		YES	ignore
>>DRB Failed List	O		DRB Failed Modification List E-UTRAN 9.3.3.14		YES	ignore
>>DRB Modified List	O		DRB Modified List E-UTRAN 9.3.3.15		YES	ignore
>>DRB Failed To Modify List	O		DRB Failed To Modify List E-UTRAN 9.3.3.16		YES	ignore
>>Retainability Measurements Information	O		9.3.1.71	Provides information on all the removed DRB(s), needed for retainability measurements in the gNB-CU-CP	YES	ignore
> <i>NG-RAN</i>						
>>PDU Session Resource Setup List	O		PDU Session Resource Setup Modification List 9.3.3.17		YES	reject
>>PDU Session Resource Failed List	O		PDU Session Resource Failed Modification List 9.3.3.18		YES	reject
>>PDU Session Resource Modified List	O		9.3.3.19		YES	reject
>>PDU Session Resource Failed To Modify List	O		9.3.3.20		YES	reject
>>Retainability Measurements Information	O		9.3.1.71	Provides information on all the removed DRB(s), needed for retainability measurements in the gNB-CU-CP	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore
UE Inactivity Information	O		INTEGER (1.. 7200, ...)	Indicates the inactive time. The values are expressed in seconds.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.6 BEARER CONTEXT MODIFICATION FAILURE

This message is sent by the gNB-CU-UP to indicate that the modification of the bearer context was unsuccessful.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP 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

9.2.2.7 BEARER CONTEXT MODIFICATION REQUIRED

This message is sent by the gNB-CU-UP to inform the gNB-CU-CP that a modification of a bearer context is required (e.g., due to local problems at the gNB-CU-UP).

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE <i>System</i>	M				YES	reject
> <i>E-UTRAN</i>						
>>DRB To Modify List	O		DRB Required To Modify List E-UTRAN 9.3.3.21		YES	reject
>>DRB To Remove List	O		DRB Required To Remove List E-UTRAN 9.3.3.22		YES	reject
> <i>NG-RAN</i>						
>>PDU Session Resource Required To Modify List	O		9.3.3.23		YES	reject
>>PDU Session Resource To Remove List	O		9.3.3.12		YES	reject

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.8 BEARER CONTEXT MODIFICATION CONFIRM

This message is sent by the gNB-CU-CP to confirm the modification of the requested bearer context.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE System	O				YES	ignore
>E-UTRAN						
>>DRB Modified List	O		DRB Confirm Modified List E-UTRAN 9.3.3.24		YES	ignore
>NG-RAN						
>>PDU Session Resource Modified List	O		PDU Session Resource Confirm Modified List 9.3.3.25		YES	Ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.9 BEARER CONTEXT RELEASE COMMAND

This message is sent by the gNB-CU-CP to command the gNB-CU-UP to release an UE-associated logical E1 connection.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.2.10 BEARER CONTEXT RELEASE COMPLETE

This message is sent by the gNB-CU-UP to confirm the release of the UE-associated logical E1 connection.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Retainability Measurements Information	O		9.3.1.71	Provides information on all the removed DRB(s) and QoS Flow(s), needed for retainability measurements in	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				the gNB-CU-CP		

9.2.2.11 BEARER CONTEXT RELEASE REQUEST

This message is sent by the gNB-CU-UP to request the release of an UE-associated logical E1 connection.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
DRB Status List		<i>0.. 1</i>			YES	ignore
>DRB Status Item		<i>1..<maxno ofDRBs></i>			-	
>>DRB ID	M		9.3.1.16		-	
>>PDCP DL Count	O		PDCP Count 9.3.1.35	PDCP count for next DL packet to be assigned.	-	
>>PDCP UL Count	O		PDCP Count 9.3.1.35	PDCP count for first un-acknowledged UL packet.	-	
Cause	M		9.3.1.2		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.2.2.12 BEARER CONTEXT INACTIVITY NOTIFICATION

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

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE Activity Information	M				YES	reject
>DRB Activity List				Used if the <i>Activity Notification Level</i> IE is set as "DRB" in BEARER CONTEXT SETUP Request message		
>>DRB Activity Item		<i>1 .. <maxnoof DRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>DRB Activity	M		ENUMERATED (Active, Not active, ...)		-	
>PDU Session Resource Activity				Used if the <i>Activity Notification Level</i>		

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
<i>List</i>				IE is set as "PDU Session" in the BEARER CONTEXT SETUP Request message		
>>PDU Session Resource Activity Item		1 .. <maxnoof PDU Session Resource>			-	
>>>PDU Session ID	M		9.3.1.21		-	
>>>PDU Session Resource Activity	M		ENUMERATED (Active, Not active, ...)		-	
>UE Activity			ENUMERATED (Active, Not active, ...)	Used if the <i>Activity Notification Level</i> IE is set as "UE" in the BEARER CONTEXT SETUP Request message		

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRB for a UE, the maximum value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.13 DL DATA NOTIFICATION

This message is sent by the gNB-CU-UP to provide information about the DL data detection to the gNB-CU-CP.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Paging Priority Indicator (PPI)	O		9.3.1.55		YES	ignore
PDU Session To Notify List	O				YES	ignore
>PDU Session To Notify Item		1..<maxno ofPDUSessionResource>			-	
>>PDU Session ID	M		9.3.1.21		-	
>>QoS Flow List	M		9.3.1.12		-	
MT-SDT Information	O		9.3.1.142		YES	ignore
SDT Data Size Threshold Crossed	O		ENUMERATED (true, ...)	Indicates that the SDT Data Size Threshold is crossed.	YES	ignore

Range bound	Explanation
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.2.2.14 DATA USAGE REPORT

This message is sent by the gNB-CU-UP to report data volumes.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Data Usage Report List	M		9.3.1.44		YES	ignore

9.2.2.15 GNB-CU-UP COUNTER CHECK REQUEST

This message is sent by the gNB-CU-UP to request the verification of the value of the PDCP COUNTs associated with the DRBs established in the gNB-CU-UP.

Direction: gNB-CU-UP → gNB-CU-CP.

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE <i>System</i>	M				YES	reject
> <i>E-UTRAN</i>						
>>DRBs Subject to Counter Check List		1			YES	ignore
>>>DRBs Subject to Counter Check Item		1 .. <maxnoof DRBs>			-	
>>>>DRB ID	M		9.3.1.16		-	
>>>>PDCP UL Count	M		PDCP Count 9.3.1.35	Indicates the value of uplink COUNT associated to this DRB, as specified in TS 38.331 [10] for the gNB/ ng-eNB CP-UP separation, or in TS 36.331 [33] for the eNB CP-UP separation.	-	
>>>>PDCP DL Count	M		PDCP Count 9.3.1.35	Indicates the value of downlink COUNT associated to this DRB, as specified in TS 38.331 [10] for the gNB/ ng-eNB CP-UP separation, or in TS 36.331 [33] for the eNB CP-UP separation.	-	
> <i>NG-RAN</i>						
>>DRBs Subject to Counter Check List		1			YES	ignore
>>>DRBs Subject to Counter Check Item		1 .. <maxnoof DRBs>			-	
>>>>PDU Session ID	M		9.3.1.21		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>>DRB ID	M		9.3.1.16		-	
>>>>PDCP UL Count	M		PDCP Count 9.3.1.35	Indicates the value of uplink COUNT associated to this DRB, as specified in TS 38.331 [10] for the gNB/ ng-eNB CP-UP separation, or in TS 36.331 [33] for the eNB CP-UP separation.	-	
>>>>PDCP DL Count	M		PDCP Count 9.3.1.35	Indicates the value of downlink COUNT associated to this DRB, as specified in TS 38.331 [10] for the gNB/ ng-eNB CP-UP separation, or in TS 36.331 [33] for the eNB CP-UP separation.	-	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.2.2.16 UL DATA NOTIFICATION

This message is sent by the gNB-CU-UP to provide information about the UL data detection to the gNB-CU-CP.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
PDU Session To Notify List		1			YES	reject
>PDU Session To Notify Item		1..<maxno ofPDUSes sionResource>			-	
>>PDU Session ID	M		9.3.1.21		-	
>>QoS Flow List	M		9.3.1.12		-	-

9.2.2.17 MR-DC DATA USAGE REPORT

This message is sent by the gNB-CU-UP to report data volumes when the UE is connected to the 5GC.

Direction: gNB-CU-UP → gNB-CU-CP.

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-CP UE E1AP ID	M		9.3.1.4		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
PDU Session Resource Data Usage List		1			YES	ignore
>PDU Session Resource Data Usage Item		1 .. <maxnoof PDU sessions>			-	
>>PDU Session ID	M		9.3.1.21		-	
>>MR-DC Usage Information	M		9.3.1.63		-	

Range bound	Explanation
maxnoofPDU sessions	Maximum no. of PDU sessions. Value is 256

9.2.2.18 EARLY FORWARDING SN TRANSFER

This message is sent by the source gNB-CU-UP to the source gNB-CU-CP to transfer the COUNT value(s) related to early forwarded downlink PDCP SDUs during Conditional Handover or conditional PSCell change or conditional PSCell addition or subsequent CPAC.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
DRBs Subject To Early Forwarding List	M	1			YES	reject
>DRBs Subject To Early Forwarding Item		1 .. <maxnoof DRBs>			-	
>>DRB ID	M		9.3.1.16		-	
>>DL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper frame number of the last DL SDU successfully delivered in sequence to the UE, if RLC-AM, and successfully transmitted, if RLC-UM.	-	

9.2.2.19 GNB-CU-CP MEASUREMENT RESULTS INFORMATION

This message is sent to the gNB-CU-UP to provide the measurement result received by the gNB-CU-CP.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
DRB Measurement Results Information List		1			YES	reject
>DRB Measurement Results Information Item		1 .. <maxnoof DRBs>			-	
>>DRB ID	M		9.3.1.16		-	
>>UL D1 Result	O		INTEGER (0 .. 10000,...)	The unit is: 0.1ms	-	

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

9.2.3 Trace Messages

9.2.3.1 TRACE START

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

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Trace Activation	M		9.3.1.68		YES	ignore

9.2.3.2 DEACTIVATE TRACE

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

Direction: gNB-CU-CP → gNB-CU-UP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Trace ID	M		OCTET STRING (SIZE(8))	As per Trace ID in <i>Trace Activation</i> IE	YES	ignore

9.2.3.3 CELL TRAFFIC TRACE

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

Direction: gNB-CU-UP → gNB-CU-CP

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-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Trace ID	M		OCTET STRING (SIZE(8))	The Trace ID IE is composed of the following: Trace Reference defined in TS 32.422 [24] (leftmost 6 octets, with PLMN information coded as in 9.2.3.8), and Trace Recording Session Reference defined in TS 32.422 [24] (last 2 octets).	YES	ignore
Trace Collection Entity IP Address	M		Transport Layer Address 9.3.2.4	For File based Reporting. Defined in TS 32.422 [24]. 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 9.3.2.8	For Streaming based Reporting. Defined in TS 32.422 [24] Replaces Trace Collection Entity IP Address if present.	YES	ignore

9.2.4 IAB Messages

9.2.4.1 IAB UP TNL ADDRESS UPDATE

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to update the TNL address(es) of the DL F1-U GTP tunnel information.

NOTE: This message is not applicable for eNB CP-UP separation or ng-eNB CP-UP separation.

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
DL UP TNL Address To Update List		0..1			YES	ignore
>DL UP TNL Address To Update Item IEs		1..<maxno ofTNLAddresses>			-	
>>Old TNL Address	M		Transport Layer Address 9.3.2.4	The old Transport Layer Address of IAB-DU for DL F1-U GTP tunnel.	-	
>>New TNL Address	M		Transport Layer Address	The new Transport Layer Address of	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			9.3.2.4	IAB-DU for DL F1-U GTP tunnel.		

Range bound	Explanation
maxnoofTNLAddresses	Maximum no. of TNL addresses to be updated in one E1AP procedure. Value is 8.

9.2.4.2 IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE

This message is sent by the gNB-CU-UP to the gNB-CU-CP to acknowledge the update of TNL address in DL F1-U GTP tunnel information, or provide the updated TNL address(es) of the UL F1-U GTP tunnel information.

NOTE: This message is not applicable for eNB CP-UP separation or ng-eNB CP-UP separation.

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
UL UP TNL Address to Update List		0..1			YES	ignore
>UL UP TNL Address Updated Item IEs		1..<maxno ofTNLAddresses>			-	
>>Old TNL Address	M		Transport Layer Address 9.3.2.4	The old Transport Layer Address of CU-UP for UL F1-U GTP tunnel.	-	
>>New TNL Address	M		Transport Layer Address 9.3.2.4	The new Transport Layer Address of CU-UP for UL F1-U GTP tunnel.	-	

Range bound	Explanation
maxnoofTNLAddresses	Maximum no. of TNL addresses updated in one E1AP procedure. Value is 8.

9.2.4.3 IAB UP TNL ADDRESS UPDATE FAILURE

This message is sent by the gNB-CU-UP to indicate IAB UP TNL address Update failure.

NOTE: This message is not applicable for eNB CP-UP separation or ng-eNB CP-UP separation.

Direction: gNB-CU-UP → gNB-CU-CP

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		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.4.4 IAB PSK NOTIFICATION

This message is sent by the gNB-CU-CP to the gNB-CU-UP to transfer the security key info to be used for the IKEv2 Pre-shared Secret Key (PSK) authentication to protect the F1-U interface of the IAB-node(s).

Direction: gNB-CU-CP → gNB-CU-UP

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		9.3.1.53		YES	reject
IAB-donor-CU-UP PSK Info	M		9.3.1.99		YES	reject

9.2.5 MBS Messages

9.2.5.1 MBS Messages for Broadcast

9.2.5.1.1 BC BEARER CONTEXT SETUP REQUEST

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to setup MBS session resources for a broadcast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
Global MBS Session ID	M		9.3.1.108		YES	reject
BC Bearer Context To Setup	M		9.3.3.26		YES	reject
Associated Session ID	O		9.3.3.38		YES	ignore
MBS Service Area	O		9.3.3.39		YES	ignore

9.2.5.1.2 BC BEARER CONTEXT SETUP RESPONSE

This message is sent by the gNB-CU-UP to confirm the setup of the requested MBS session resources for a broadcast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Setup Response	M		9.3.3.27		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.3 BC BEARER CONTEXT SETUP FAILURE

This message is sent by the gNB-CU-UP to indicate that the setup of the requested broadcast MBS session resources was unsuccessful.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	O		9.3.1.107		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.4 BC BEARER CONTEXT MODIFICATION REQUEST

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to modify MBS session resources for a broadcast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify	M		9.3.3.28		YES	reject

9.2.5.1.5 BC BEARER CONTEXT MODIFICATION RESPONSE

This message is sent by the gNB-CU-UP to confirm the requested modification of MBS session resources for a broadcast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify Response	M		9.3.3.29		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.6 BC BEARER CONTEXT MODIFICATION FAILURE

This message is sent by the gNB-CU-UP to indicate that the requested modification of MBS session resources for a broadcast MBS session was unsuccessful.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.7 BC BEARER CONTEXT MODIFICATION REQUIRED

This message is sent by the gNB-CU-UP to request the gNB-CU-CP to initiate the modification of MBS session resources for a broadcast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify Required	M		9.3.3.30		YES	reject

9.2.5.1.8 BC BEARER CONTEXT MODIFICATION CONFIRM

This message is sent by the gNB-CU-CP to confirm the requested modification of the MBS session resources of a broadcast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify Confirm	M		9.3.3.31		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.9 BC BEARER CONTEXT RELEASE COMMAND

This message is sent by the gNB-CU-CP to command the gNB-CU-UP to release MBS session resources for a broadcast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.1.10 BC BEARER CONTEXT RELEASE COMPLETE

This message is sent by the gNB-CU-UP to confirm the release of the MBS session resources for a broadcast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
ID						
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.11 BC BEARER CONTEXT RELEASE REQUEST

This message is sent by the gNB-CU-UP to request the release of MBS session resources for a broadcast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.2 MBS Messages for Multicast

9.2.5.2.1 MC BEARER CONTEXT SETUP REQUEST

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to setup MBS session resources for a multicast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
Global MBS Session ID	M		9.3.1.108		YES	reject
MC Bearer Context To Setup	M		9.3.3.32		YES	reject

9.2.5.2.2 MC BEARER CONTEXT SETUP RESPONSE

This message is sent by the gNB-CU-UP to confirm the setup of the requested MBS session resources for a multicast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Setup Response	M		9.3.3.33		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.3 MC BEARER CONTEXT SETUP FAILURE

This message is sent by the gNB-CU-UP to indicate that the setup of MBS session resources for a multicast MBS session was unsuccessful.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	O		9.3.1.107		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.4 MC BEARER CONTEXT MODIFICATION REQUEST

This message is sent by the gNB-CU-CP to request the gNB-CU-UP to modify MBS session resources for a multicast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify	M		9.3.3.34		YES	reject

9.2.5.2.5 MC BEARER CONTEXT MODIFICATION RESPONSE

This message is sent by the gNB-CU-UP to confirm the requested modification of MBS session resources for a multicast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify Response	M		9.3.3.35		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.6 MC BEARER CONTEXT MODIFICATION FAILURE

This message is sent by the gNB-CU-UP to indicate that the requested modification of MBS session resources for a multicast MBS session was unsuccessful.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MBS Multicast F1-U Context Descriptor	O		9.3.1.125		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.7 MC BEARER CONTEXT MODIFICATION REQUIRED

This message is sent by the gNB-CU-UP to request the gNB-CU-CP to initiate the modification MBS session resources for a multicast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify Required	M		9.3.3.36		YES	reject

9.2.5.2.8 MC BEARER CONTEXT MODIFICATION CONFIRM

This message is sent by the gNB-CU-CP to confirm the requested modification of MBS session resources for a multicast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify Confirm	M		9.3.3.37		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.9 MC BEARER CONTEXT RELEASE COMMAND

This message is sent by the gNB-CU-CP to command the gNB-CU-UP to release MBS session resources for a multicast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.2.10 MC BEARER CONTEXT RELEASE COMPLETE

This message is sent by the gNB-CU-UP to confirm the release of MBS session resources for a multicast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.11 MC BEARER CONTEXT RELEASE REQUEST

This message is sent by the gNB-CU-UP to request the release of MBS session resources for a multicast MBS session.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.2.12 MC BEARER NOTIFICATION

This message is sent by the gNB-CU-UP to provide information about the DL data arrival or inactivity of the MC Bearer Context to the gNB-CU-CP.

Direction: gNB-CU-UP → gNB-CU-CP

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-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
CHOICE MBS Session Resource Notification	M				YES	ignore
>DL Data Arrival						
>>DL Data Arrival Indication	M		ENUMERATED (true, ...)		-	
>>Paging Priority Indicator (PPI)	O		9.3.1.55		-	
>MC Bearer Context Inactivity						
>>MC Bearer Context Inactivity Indication	M		ENUMERATED (true, ...)		-	

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 E1AP protocol.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE <i>Cause Group</i>	M			
> <i>Radio Network Layer</i>				
>>Radio Network Layer Cause	M		ENUMERATED (Unspecified, Unknown or already allocated gNB-CU-CP UE E1AP ID, Unknown or already allocated gNB-CU-UP UE E1AP ID, Unknown or inconsistent pair of UE E1AP ID, Interaction with other procedure, PDCP Count Wrap Around, Not supported QCI value, Not supported 5QI value, Encryption algorithms not supported, Integrity protection algorithms not supported, UP integrity protection not possible, UP confidentiality protection not possible, Multiple PDU Session ID Instances, Unknown PDU Session ID, Multiple QoS Flow ID Instances, Unknown QoS Flow ID, Multiple DRB ID Instances, Unknown DRB ID, Invalid QoS combination,	

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
			Procedure cancelled, Normal release, No radio resources available, Action desirable for radio reasons, Resources not available for the slice, PDCP configuration not supported, ... UE DL maximum integrity protected data rate reason, UP integrity protection failure, Release due to Pre-emption, RSN not available for the UP, NPN not supported, Report Characteristics Empty, Existing Measurement ID, Measurement Temporarily not Available, Measurement not Supported For The Object, SCG activation deactivation failure, SCG deactivation failure due to data transmission, Unknown or already allocated gNB-CU-CP MBS E1AP ID, Unknown or already allocated gNB-CU-UP MBS E1AP ID, Unknown or inconsistent pair of MBS E1AP ID, Unknown or inconsistent MRB ID)	
<i>>Transport Layer</i>				
>>Transport Layer Cause	M		ENUMERATED (Unspecified, Transport Resource Unavailable, ..., Unknown TNL address for IAB)	
<i>>Protocol</i>				
>>Protocol Cause	M		ENUMERATED (Transfer Syntax Error, Abstract Syntax Error (Reject), Abstract Syntax Error (Ignore and Notify),	

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
			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.
Unknown or already allocated gNB-CU-CP UE E1AP ID	The action failed because the gNB-CU-CP UE E1AP 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-CU-UP UE E1AP ID	The action failed because the gNB-CU-UP UE E1AP ID is either unknown, or (for a first message received at the gNB-CU-UP) is known and already allocated to an existing context.
Unknown or inconsistent pair of UE E1AP ID	The action failed because both UE E1AP 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.
PDCP COUNT wrap around	PDCP COUNT approaches the maximum value.
Not supported QCI value	The action failed because the requested QCI is not supported.
Not supported 5QI value	The action failed because the requested 5QI is not supported.
Encryption algorithms not supported	The gNB-CU-UP is unable to support the selected encryption algorithm for the UE.
Integrity protection algorithms not supported	The gNB-CU-UP is unable to support the selected integrity protection algorithm for the UE.
UP integrity protection not possible	The PDU Session (for 5GC) or E-RAB (for EPC) cannot be accepted according to the required user plane integrity protection policy.
UP confidentiality protection not possible	The PDU Session cannot be accepted according to the required user plane confidentiality protection policy
Multiple PDU Session ID Instances	The action failed because multiple instances of the same PDU Session had been provided.
Unknown PDU Session ID	The action failed because the PDU Session ID is unknown.
Multiple QoS Flow ID Instances	The action failed because multiple instances of the same QoS flow had been provided.
Unknown QoS Flow ID	The action failed because the QoS Flow ID is unknown.
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 unknown.
Invalid QoS combination	The action was failed because of invalid QoS combination
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.
No radio resources available	The requested node doesn't have sufficient radio resources

Radio Network Layer cause	Meaning
	available.
Action desirable for radio reasons	The reason for requesting the action is radio related.
Resources not available for the slice	The requested resources are not available for the slice.
PDCP configuration not supported,	The gNB-CU-UP is unable to support the selected PDCP configuration for the UE.
UE DL maximum integrity protected data rate reason	The request is not accepted in order to comply with the maximum downlink data rate for integrity protection supported by the UE.
UP integrity protection failure	The gNB-CU-UP detects an integrity protection failure in the UL PDU.
Release due to Pre-Emption	Release is initiated due to pre-emption.
RSN not available for the UP	The redundant user plane resources indicated by RSN are not available.
NPN not supported	The action failed because the indicated SNPN is not supported in the node.
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-CU-UP 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.
SCG activation deactivation failure	The action failed due to rejection of the SCG activation deactivation request.
SCG deactivation failure due to data transmission	The SCG deactivation failed due to ongoing or arriving data transmission.
Unknown or already allocated gNB-CU-CP MBS E1AP ID	The action failed because the gNB-CU-CP MBS E1AP ID is either unknown, or (for a first message received at the gNB-CU-CP) is known and already allocated to an existing context.
Unknown or already allocated gNB-CU-UP MBS E1AP ID	The action failed because the gNB-CU-UP MBS E1AP ID is either unknown, or (for a first message received at the gNB-CU-UP) is known and already allocated to an existing context.
Unknown or inconsistent pair of MBS E1AP ID	The action failed because both MBS E1AP IDs are unknown, or are known but do not define a single MBS context.
Unknown or inconsistent MRB ID	The action failed because the MRB ID is unknown or inconsistent.

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 applicable for IAB only.

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.

Miscellaneous cause	Meaning
Hardware Failure	Action related to hardware failure.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the above cause values applies and the cause is not related to any of the categories Radio Network Layer, Transport Network Layer, NAS or Protocol.

9.3.1.3 Criticality Diagnostics

The *Criticality Diagnostics* IE is sent by the gNB-CU-UP or the gNB-CU-CP 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. The conditions for inclusion of the *Transaction ID* IE are described in clause 10.

For further details on how to use the *Criticality Diagnostics* IE, (see 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		9.3.1.53	
Information Element Criticality Diagnostics		<i>0 .. <maxnoof Errors></i>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' 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-CP UE E1AP ID

The gNB-CU-CP UE E1AP ID uniquely identifies the UE association over the E1 interface within the gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU-CP UE E1AP ID	M		INTEGER (0 .. 2 ³² - 1)	

9.3.1.5 gNB-CU-UP UE E1AP ID

The gNB-CU-UP UE E1AP ID uniquely identifies the UE association over the E1 interface within the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU-UP UE E1AP ID	M		INTEGER (0 .. 2 ³² - 1)	

9.3.1.6 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)	

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

9.3.1.8 Slice Support List

This IE indicates the list of supported slices.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Slice Support Item IEs		1..<maxno ofSliceltems>			-	
>S-NSSAI	M		9.3.1.9		-	

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

9.3.1.9 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))	

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

9.3.1.10 Security Information

This IE provides the information for configuring UP ciphering and/or integrity protection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Security Algorithm	M		9.3.1.31	
User Plane Security Keys	M		9.3.1.32	

9.3.1.11 Cell Group Information

This IE provides information about the cell group(s) (i.e., radio leg(s)) that are part of the DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Cell Group List		1			-	
>Cell Group Item		1..<maxno ofCellGroups>			-	
>>Cell Group ID	M		INTEGER (0..3, ...)	This IE corresponds to information provided in the <i>CellGroupId</i> IE as defined in TS 38.331 [10] (0=MCG, 1=SCG). In this version of the specification, values "2" and "3" are not used. For E-UTRA Cell Groups, the same encoding is used as for NR Cell Groups. NOTE: There is no corresponding IE defined in TS 36.331 [33].	-	
>>UL Configuration	O		9.3.1.33	Indicates whether the Cell Group is used for UL traffic.	-	
>>DL TX Stop	O		ENUMERATED (stop, resume, ...)		-	
>>RAT Type	O		ENUMERATED (E-UTRA, NR, ...)	Indicates the RAT.	-	
>>Number of tunnels	O		INTEGER (1..4, ...)	Indicates the tunnel number of PDCP duplication for this cell group.	YES	ignore

Range bound	Explanation
maxnoofCellGroups	Maximum no. of cell groups for a DRB. Value is 4.

9.3.1.12 QoS Flow List

This IE includes a list of QoS Flows that are identified by the QoS Flow Identifier.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow List		1			-	
>QoS Flow Item		1..<maxno of QoSflows>			-	
>>QoS Flow Identifier	M		9.3.1.24		-	
>>QoS Flow Mapping Indication	O		9.3.1.60	Indicates that only the uplink or downlink QoS flow is mapped to the DRB	YES	ignore
>>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore
>>ECN Marking or Congestion Information Reporting Status	O		ENUMERATED (active, not active, ...)	Indicates whether ECN marking at NG-RAN or ECN marking at UPF or congestion information reporting is active or not active.	YES	ignore

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.13 UP Parameters

This IE provides information related to a DRB configured in the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UP Parameters List		1			-	
>UP Parameters Item		1..<maxno of UPParameters>			-	
>>UP Transport Layer Information	M		9.3.2.1		-	
>>Cell Group ID	M		INTEGER (0..3, ...)	This IE corresponds to information provided in the <i>CellGroupId</i> IE in TS 38.331 [10] (0=MCG, 1=SCG). In this version of the specification, values "2" and "3" are not used.	-	
>>QoS Mapping Information	O		9.3.1.81	This IE is only used for IAB.	YES	reject
>>Indirect Path Indication	O		ENUMERATED (true, ...)	This IE is only used for L2 U2N Remote UE	YES	ignore

Range bound	Explanation
maxnoofUPParameters	Maximum no. of UP parameters (e.g., GTP tunnels) for a DRB.

Range bound	Explanation
	Value is 8

9.3.1.14 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		9.3.1.7	
NR Cell Identity	M		BIT STRING (SIZE(36))	

9.3.1.15 gNB-CU-UP ID

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU-UP ID	M		INTEGER (0 .. 2 ³⁶ -1)	

9.3.1.16 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, ...)	This IE corresponds to information provided in the <i>DRB-Identity</i> IE as defined in TS 38.331 [10] for the gNB/ ng-eNB CP-UP separation, or in TS 36.331 [33] for the eNB CP-UP separation.

9.3.1.16a MRB ID

This IE identifies an MRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MRB ID	M		INTEGER (1.. 512, ...)	

9.3.1.17 E-UTRAN QoS

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QCI	M		INTEGER (0..255)	QoS Class Identifier defined in TS 23.401 [11]. Logical range and coding specified in TS 23.203 [12].	–	
E-UTRAN Allocation and Retention Priority	M		9.3.1.18		–	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
GBR QoS Information	O		9.3.1.19	This IE applies to GBR bearers only and is ignored otherwise.	–	

9.3.1.18 E-UTRAN 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 [11]). Usage: Value 15 means "no priority". Values between 1 and 14 are ordered in decreasing order of priority, i.e. 1 is the highest and 14 the lowest. Value 0 shall be treated as a logical error if received.
Pre-emption Capability	M		ENUMERATED(shall not trigger pre-emption, may trigger pre-emption)	Desc.: This IE indicates the pre-emption capability of the request on other E-RABs Usage: The E-RAB shall not pre-empt other E-RABs or, the E-RAB may pre-empt other E-RABs The Pre-emption Capability indicator applies to the allocation of resources for an E-RAB and as such it provides the trigger to the pre-emption procedures/processes of the eNB.
Pre-emption Vulnerability	M		ENUMERATED(not pre-emptable, pre-emptable)	Desc.: This IE indicates the vulnerability of the E-RAB to pre-emption of other E-RABs. Usage: The E-RAB shall not be pre-empted by other E-RABs or the E-RAB may be pre-empted by other RABs. Pre-emption Vulnerability indicator applies for the entire duration of the E-RAB, unless modified, and as such indicates whether the E-RAB is a target of the pre-emption procedures/processes of the eNB.

9.3.1.19 GBR QoS Information

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
E-RAB Maximum Bit	M		Bit Rate	Maximum Bit Rate	–	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Rate Downlink			9.3.1.20	in DL (i.e. from EPC to E-UTRAN) for the bearer. Details in TS 23.401 [11].		
E-RAB Maximum Bit Rate Uplink	M		Bit Rate 9.3.1.20	Maximum Bit Rate in UL (i.e. from E-UTRAN to EPC) for the bearer. Details in TS 23.401 [11].	–	
E-RAB Guaranteed Bit Rate Downlink	M		Bit Rate 9.3.1.20	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 [11].	–	
E-RAB Guaranteed Bit Rate Uplink	M		Bit Rate 9.3.1.20	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 [11].	–	

9.3.1.20 Bit Rate

This IE indicates the number of bits delivered by NG-RAN/E-UTRAN in UL or to NG-RAN/E-UTRAN 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 a GBR bearer, 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

9.3.1.21 PDU Session ID

This IE identifies a PDU Session for a UE. The definition and use of the PDU Session ID is specified in TS 23.501 [20].

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

9.3.1.22 PDU Session Type

This IE indicates the PDU Session Type as specified in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Type	M		ENUMERATED (IPv4, IPv6, IPv4v6, ethernet, unstructured, ...)	

9.3.1.23 Security Indication

This IE contains the user plane integrity protection indication and confidentiality protection indication which indicates the requirements on UP integrity protection and ciphering for corresponding PDU Session Resources, respectively.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Integrity Protection Indication	M		ENUMERATED (required, preferred, not needed, ...)	Indicates whether UP integrity protection shall apply, should apply or shall not apply for the concerned PDU Session Resource for the gNB/ng-eNB CP-UP separation, or for the concerned E-RAB for the eNB CP-UP separation.
Confidentiality Protection Indication	M		ENUMERATED (required, preferred, not needed, ...)	Indicates whether UP ciphering shall apply, should apply or shall not apply for the concerned PDU Session Resource. NOTE: This IE is not applicable to eNB CP-UP separation.
Maximum Integrity Protected Data Rate	C- ifIntegrityP rotectionre quiredorpr eferred		9.3.1.57	If present, this is the value received from the CN for the overall UE capability. This IE is ignored when enforcing the maximum IP data rate. NOTE: This IE is not applicable to eNB CP-UP separation.

Condition	Explanation
ifIntegrityProtectionrequiredorpreferred	This IE shall be present if the <i>Integrity Protection Indication</i> IE within the <i>Security Indication</i> IE is set to "required" or "preferred".

9.3.1.24 QoS Flow Identifier

This IE identifies a QoS Flow within a PDU Session. Definition and use of the QoS Flow Identifier is specified in TS 23.501 [20].

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

9.3.1.25 QoS Flow QoS Parameters List

This IE contains a list of QoS Flows including the QoS Flow parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow List		1			-	
>QoS Flow Item		1..<maxno ofQoSFlo ws>			-	
>>QoS Flow Identifier	M		9.3.1.24		-	
>>QoS Flow Level QoS Parameters	M		9.3.1.26		-	
>>QoS Flow Mapping Indication	O		9.3.1.60	Indicates that only the uplink or downlink QoS flow is mapped to the DRB. For MBS,	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				this IE is associated with an MRB and always set to "dl".		
>>Redundant QoS Flow Indicator	O		9.3.1.74	This IE indicates that this QoS flow is requested for the redundant transmission.	YES	ignore
>>TSC Traffic Characteristics	O		9.3.1.75	Traffic pattern information associated with the QFI. Details in TS 23.501 [20].	YES	ignore
>>ECN Marking or Congestion Information Reporting Request	O		9.3.1.145		YES	ignore

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.26 QoS Flow Level QoS Parameters

This IE defines the QoS parameters to be applied to a 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		9.3.1.27		-	
>Dynamic 5QI						
>>Dynamic 5QI Descriptor	M		9.3.1.28		-	
NG-RAN Allocation and Retention Priority	M		9.3.1.29		-	
GBR QoS Flow Information	O		9.3.1.30	This IE shall be present for GBR QoS Flows and is ignored otherwise.	-	
Reflective QoS Attribute	O		ENUMERATED (subject to, ...)	Details in TS 23.501 [20]. This IE applies to Non-GBR flows only and is ignored otherwise.	-	
Additional QoS Flow Information	O		ENUMERATED (more likely, ...)	This IE indicates that traffic for this QoS flow is likely to appear more often than traffic for other flows established for the PDU Session.	-	
Paging Priority Index	O		INTEGER (1.. 8, ...)	This IE is not used in this version of the specification.	-	
RDI	O		ENUMERATED (enabled, ...)	Indicates whether Reflective QoS flow to DRB mapping should	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				be applied.		
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
MCG Offered GBR QoS Flow Information	O		GBR QoS Flow Information 9.3.1.30	This IE contains M-Node offered GBR QoS Flow Information.	YES	ignore
QoS Monitoring Reporting Frequency	O		INTEGER (1..1800, ...)	Indicates the Reporting Frequency for RAN part delay for QoS monitoring. Units: second	YES	ignore
QoS Monitoring Disabled	O		ENUMERATED (true, ...)	Indicates to stop the QoS monitoring.	YES	ignore
Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore
PDU Set QoS Parameters		0..1			YES	ignore
>UL PDU Set QoS Information	O		PDU Set QoS Information 9.3.1.143		-	
>DL PDU Set QoS Information	O		PDU Set QoS Information 9.3.1.143		-	

9.3.1.27 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 [20].	-	
Priority Level	O		9.3.1.51	For details see TS 23.501 [20]. When included overrides standardized or pre-configured value.	-	
Averaging Window	O		9.3.1.49	This IE applies to GBR QoS Flows only. For details see TS 23.501 [20]. When included overrides standardized or pre-configured value.	-	
Maximum Data Burst Volume	O		9.3.1.50	For details see TS 23.501 [20]. When included overrides standardized or	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				pre-configured value.		
CN Packet Delay Budget Downlink	O		Extended Packet Delay Budget 9.3.1.79	Core Network Packet Delay Budget is specified in TS 23.501 [20]. 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 9.3.1.79	Core Network Packet Delay Budget is specified in TS 23.501 [20]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore

9.3.1.28 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
Priority Level	M		9.3.1.51	For details see TS 23.501 [20].	-	
Packet Delay Budget	M		9.3.1.47	For details see TS 23.501 [20]. This IE is ignored if the <i>Extended Packet Delay Budget</i> IE is present.	-	
Packet Error Rate	M		9.3.1.48	For details see TS 23.501 [20].	-	
5QI	O		INTEGER (0..255,...)	This IE contains the dynamically assigned 5QI as specified in TS 23.501 [20].	-	
Delay Critical	C-ifGBRflow		ENUMERATED (delay critical, non-delay critical)	For details see TS 23.501 [20].	-	
Averaging Window	C-ifGBRflow		9.3.1.49	For details see TS 23.501 [20].	-	
Maximum Data Burst Volume	O		9.3.1.50	For details see TS 23.501 [20]. This IE shall be included if the <i>Delay Critical</i> IE is set to "delay critical" and is ignored otherwise.	-	
Extended Packet Delay Budget	O		9.3.1.79	Packet Delay Budget is specified in TS 23.501 [20]	YES	ignore
CN Packet Delay Budget Downlink	O		Extended Packet Delay Budget 9.3.1.79	Core Network Packet Delay Budget is specified in TS 23.501 [20]. This IE may be	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				present in case of GBR QoS flows and is ignored otherwise.		
CN Packet Delay Budget Uplink	O		Extended Packet Delay Budget 9.3.1.79	Core Network Packet Delay Budget is specified in TS 23.501 [20]. 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 <i>GBR QoS Flow Information</i> IE is present in the <i>QoS Flow Level QoS Parameters</i> IE.

9.3.1.29 NG-RAN Allocation and Retention Priority

This IE specifies the relative importance of a QoS flow compared to other QoS flows 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 [20]). 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 [20].
Pre-emption Capability	M		ENUMERATED (shall not trigger pre-emption, may trigger pre-emption)	Desc.: This IE indicates the pre-emption capability of the request on other QoS flows. Usage: The QoS flow shall not pre-empt other QoS flows or, the QoS flow may pre-empt other QoS flows. Specified in TS 23.501 [20] 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. 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. Specified in TS 23.501 [20] NOTE: The Pre-emption Vulnerability indicator applies for the entire duration of the QoS flow, unless modified and as such indicates whether the QoS

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				flow is a target of the pre-emption procedures/processes of the NG-RAN node.

9.3.1.30 GBR QoS Flow Information

This IE indicates QoS parameters for a GBR QoS flow 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 9.3.1.20	Maximum Bit Rate in DL. Details in TS 23.501 [20].	-	
Maximum Flow Bit Rate Uplink	M		Bit Rate 9.3.1.20	Maximum Bit Rate in UL. Details in TS 23.501 [20].	-	
Guaranteed Flow Bit Rate Downlink	M		Bit Rate 9.3.1.20	Guaranteed Bit Rate (provided there is data to deliver) in DL. Details in TS 23.501 [20].	-	
Guaranteed Flow Bit Rate Uplink	M		Bit Rate 9.3.1.20	Guaranteed Bit Rate (provided there is data to deliver). Details in TS 23.501 [20].	-	
Maximum Packet Loss Rate Downlink	O		Packet Loss Rate 9.3.1.46	Indicates the maximum rate for lost packets that can be tolerated in the downlink direction. Details in TS 23.501 [20].	-	
Maximum Packet Loss Rate Uplink	O		Packet Loss Rate 9.3.1.46	Indicates the maximum rate for lost packets that can be tolerated in the uplink direction. Details in TS 23.501 [20].	-	
Alternative QoS Parameters Set List	O		9.3.1.93	Indicates alternative sets of QoS Parameters for the QoS flow.	YES	ignore

9.3.1.31 Security Algorithm

This IE defines the type of ciphering algorithm and/or integrity protection used for the DRBs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Ciphering Algorithm	M		ENUMERATED (NEA0, 128-NEA1, 128-NEA2, 128-NEA3)	As defined in TS 33.501 [13] for NG-RAN or TS 33.401 [32] for E-UTRAN where the corresponding enumerated value is EEA0, 128-EEA1, 128-EEA2, 128-EEA3.
Integrity Protection Algorithm	O		ENUMERATED (NIA0, 128-NIA1, 128-NIA2, 128-NIA3)	As defined in TS 33.501 [13] for NG-RAN or TS 33.401 [32] for E-UTRAN where the corresponding enumerated value is EIA0, 128-EIA1, 128-EIA2, 128-EIA3.

9.3.1.32 User Plane Security Keys

This IE contains the ciphering and/or integrity protection keys generated by the gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Encryption Key	M		OCTET STRING	As defined in TS 33.501 [13] for gNB or ng-eNB CP-UP separation, or in TS 33.401 [32] for eNB CP-UP separation.
Integrity Protection Key	O		OCTET STRING	As defined in TS 33.501 [13] for NG-RAN or TS 33.401 [32] for eNB CP-UP separation..

9.3.1.33 UL Configuration

This IE includes the UL configuration for the DRB and the corresponding Cell Groups.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UL Configuration	M		ENUMERATED (no-data, shared, only, ..)	Indicates the UL configuration for a Cell Group that is part of a DRB. "no data" means that the Cell Group is not used for UL data. "shared" means that the Cell Group is used for UL data together with at least another Cell Group. "only" means that only this Cell Group is used for UL data.

9.3.1.34 gNB-CU-UP Cell Group Related Configuration

This IE provides information related to a cell group that the gNB-CU-UP is allowed to change.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UP Parameters List		1			-	
>UP Parameters Item		1..<maxno ofUPParameters>			-	
>>Cell Group ID	M		INTEGER (0..3, ...)	This IE corresponds to information provided in the <i>CellGroupId</i> IE as defined in TS 38.331 [10] (0=MCG, 1=SCG). Used to identify the Cell Group to modify. In this version of the specification, values "2" and "3" are not used.	-	
>>UP Transport Layer Information	M		9.3.2.1		-	
>>UL Configuration	O		9.3.1.33	Indicates whether the Cell Group is used for UL traffic.	-	

Range bound	Explanation
maxnoofUPParameters	Maximum no. of UP parameters (e.g., GTP tunnels) for a DRB. Value is 8.

9.3.1.35 PDCP Count

This IE include the PDCP Count information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>PDCP SN	M		INTEGER (0 .. $2^{PDCP_SN_Size-1}$)	The PDCP SN Size is provided in the <i>PDCP Configuration</i> IE.
>HFN	M		INTEGER (0 .. $2^{32-PDCP_SN_Size-1}$)	The PDCP SN Size is provided in the <i>PDCP Configuration</i> IE.

9.3.1.35a MBS PDCP COUNT

This IE includes the MBS PDCP Count information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS PDCP COUNT	M		BIT STRING (32)	Corresponds to information provided in the <i>initialRX-DELIV</i> contained in the <i>PDCP-Config</i> IE and to be taken into account to configure the UE, as specified in TS 38.331 [10].

9.3.1.36 NR CGI Support List

This IE indicates the list of supported NR CGIs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NR CGI Support Item IEs		1..<maxnoofN RCGI>		
>NR CGI	M		9.3.1.14	

Range bound	Explanation
maxnoofNRCGI	Maximum no. of supported NR CGIs. Value is 512. This range may be redefined.

9.3.1.37 QoS Parameters Support List

This IE indicates the list of supported QoS parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
E-UTRAN QoS Support List	O			
>E-UTRAN QoS Support Item		1..<maxnoofE UTRNQOSParameters>		
>>E-UTRAN QoS	M		9.3.1.17	
NG-RAN QoS Support List	O			
>NG-RAN QoS Support Item		1..<maxnoofN GRANQOSParameters>		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>>Non Dynamic 5QI Descriptor	M		9.3.1.27	

Range bound	Explanation
maxnoofEUTRANQOSParameters	Maximum no. of supported E-UTRAN QoS parameters. Value is 256. This range may be redefined.
maxnoofNGRANQOSParameters	Maximum no. of supported NG-RAN QoS parameters. Value is 256. This range may be redefined.

9.3.1.38 PDCP Configuration

This IE carries the PDCP configuration.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDCP SN UL Size	M		PDCP SN Size 9.3.1.61	Indicates the PDCP SN UL size in bits. Corresponds to information provided in the <i>pdcp-SN-SizeUL</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. Is ignored if received through <i>DRB To Modify List</i> IE in the BEARER CONTEXT MODIFICATION REQUEST message.	-	
PDCP SN DL Size	M		PDCP SN Size 9.3.1.61	Indicates the PDCP SN DL size in bits. Corresponds to information provided in the <i>pdcp-SN-SizeDL</i> contained in the <i>PDCP-Config</i> IE in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. Is ignored if received through <i>DRB To Modify List</i> IE in the BEARER CONTEXT MODIFICATION REQUEST	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				message.		
RLC mode	M		ENUMERATED (RLC-TM, RLC-AM, RLC-UM-Bidirectional, RLC-UM-Unidirectional-UL, RLC-UM-Unidirectional-DL, ...)	Indicates the RLC mode for the DRB. For more information see <i>PDCP-Config</i> IE in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. Is ignored if received through <i>DRB To Modify List</i> IE in the BEARER CONTEXT MODIFICATION REQUEST message.	-	
ROHC Parameters	O		9.3.1.40		-	
T-Reordering Timer	O		9.3.1.41		-	
Discard Timer	O		9.3.1.42	This IE is ignored if the <i>Discard Timer Extended</i> IE is present.	-	
UL Data Split Threshold	O		9.3.1.43		-	
PDCP Duplication	O		ENUMERATED (True, ...)	Indicates whether PDCP duplication is to be configured for the DRB. This IE is ignored when the " <i>Additional PDCP duplication Information</i> " IE is present.	-	
PDCP Re-establishment	O		ENUMERATED (true,...)	Indicates PDCP entity re-establishment to be triggered as defined in TS 38.323 [17] for gNB or ng-eNB CP-UP separation, or in TS 36.323 [34] for eNB CP-UP separation.	-	
PDCP Data Recovery	O		ENUMERATED (true,...)	Indicates PDCP data recovery to be triggered as defined in TS 38.323 [17] for gNB or ng-eNB CP-UP separation, or in TS 36.323 [34] for eNB CP-UP separation.	-	
Duplication Activation	O		ENUMERATED (Active, Inactive, ...)	Information on the initial state of DL PDCP duplication	-	
Out Of Order Delivery	O		ENUMERATED (true,...)	Indicates whether or not <i>outOfOrderDelivery</i> specified in TS	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				38.323 [17] is configured. Out of order delivery is configured only when the radio bearer is established for gNB or ng-eNB CP-UP separation, or indicates whether or not rlc-OutOfOrderDelivery in TS 36.323 [34] is configured for eNB CP-UP separation.		
PDCP Status Report Indication	O		ENUMERATED (downlink, uplink, both, ...)	For AM DRB, "downlink" indicates that the PDCP entity is configured to send PDCP status report(s) to the UE, and "uplink" indicates that the UE is configured to send PDCP status report(s), as specified in TS 38.323 [17] for gNB or ng-eNB CP-UP separation, or in TS 36.323 [34] for eNB CP-UP separation. "both" indicates that both "downlink" and "uplink" should be applied.	YES	ignore
Additional PDCP duplication Information	O		ENUMERATED (three, four, ...)	Indicates the number of PDCP duplication configured when it is more than 2 for the DRB	YES	ignore
EHC Parameters	O		9.3.1.90		YES	ignore
UDC Parameters	O		9.3.1.104		YES	ignore
Discard Timer Extended	O		9.3.1.128		YES	reject
PSI Based Discard Timer	O		9.3.1.146		YES	ignore
PDCP SN Gap Report	O		ENUMERATED (true, ...)	Indicates whether the PDCP entity is configured to send a PDCP SN gap report in the downlink, as specified in TS 38.323 [17].	YES	ignore

9.3.1.39 SDAP Configuration

This IE carries the SDAP configuration.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Default DRB	M		ENUMERATED (True, False, ...)	Indicates whether or not this is the default DRB for the PDU Session Resource. Corresponds to information provided in the <i>defaultDRB</i> contained in the <i>SDAP-Config</i> IE as defined in TS 38.331 [10].
SDAP Header UL	M		ENUMERATED (Present, Absent, ...)	Indicates whether or not a SDAP header is present for UL data on this DRB. Corresponds to information provided in the <i>sdap-HeaderUL</i> contained in the <i>SDAP-Config</i> IE as defined in TS 38.331 [10].
SDAP Header DL	M		ENUMERATED (Present, Absent, ...)	Indicates whether or not a SDAP header is present for DL data on this DRB. Corresponds to information provided in the <i>sdap-HeaderDL</i> contained in the <i>SDAP-Config</i> IE as defined in TS 38.331 [10].

9.3.1.40 ROHC Parameters

This IE carries the ROHC parameters for header compressions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>ROHC Parameters</i>	M			Corresponds to information provided in the <i>rohc</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
> <i>ROHC</i>				
>>max CID	M		INTEGER (0..16383)	Corresponds to information provided in the <i>maxCID</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
>>ROHC Profiles	M		INTEGER (0..511)	Bitmap with supported UE profiles, bit 0 (LSB 0) = profile0x0001, bit 1 = profile0x0002, bit 2 = profile0x0003, bit 3 = profile0x0004, bit 4 = profile0x0006, bit 5 = profile0x0101, bit 6 = profile0x0102, bit 7 = profile0x0103, bit 8 = profile0x0104. Corresponds to information provided in the <i>supportedROHC-Profiles</i> contained in the <i>PDCP-Parameters</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
>>Continue ROHC	O		ENUMERATED (true, ...)	Corresponds to information provided in the <i>drb-</i>

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				<i>ContinueROHC</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10]
> <i>uplinkOnlyROHC</i>				
>> <i>maxCID</i>	M		INTEGER (0..16383)	Corresponds to information provided in the <i>maxCID</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
>> <i>ROHC Profiles</i>	M		INTEGER (0..511)	Bitmap with supported UE profiles, bit 4 = profile0x0006. Corresponds to information provided in the <i>supportedROHC-Profiles</i> contained in the <i>PDCP-Parameters</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
>> <i>Continue ROHC</i>	O		ENUMERATED (true, ...)	Corresponds to information provided in the <i>drb-ContinueROHC</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10]

9.3.1.41 T-Reordering Timer

This IE indicates the t-Reordering timer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
T-Reordering Timer	M		ENUMERATED (0, 1, 2, 4, 5, 8, 10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 500, 750, 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000, ...)	Indicates the t-Reordering UL timer. The values are expressed in <i>ms</i> . Corresponds to information provided in the <i>t-Reordering</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.

9.3.1.42 Discard Timer

This IE indicates PDCP discard timer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Discard Timer			ENUMERATED (10, 20, 30, 40, 50, 60, 75, 100, 150, 200, 250, 300, 500, 750, 1500, Infinity)	Indicates the PDCP discard timer. The values are expressed in <i>ms</i> . Corresponds to information provided in the <i>discardTimer</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.

9.3.1.43 UL Data Split Threshold

This IE indicates UL data split threshold.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UL Data Split Threshold			ENUMERATED (0, 100, 200, 400, 800, 1600, 3200, 6400, 12800, 25600, 51200, 102400, 204800, 409600, 819200, 1228800, 1638400, 2457600, 3276800, 4096000, 4915200, 5734400, 6553600, Infinity, ...)	Indicates the UL data split threshold. The values are expressed in bytes. Corresponds to information provided in the <i>ul-DataSplitThreshold</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.

9.3.1.44 Data Usage Report List

This IE provides information on the data usage for the UE, e.g., secondary NR RAT in EN-DC as specified in TS 37.340 [19].

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Data usage report Item		1 .. <maxnoof DRBs>			-	
>DRB ID	M		9.3.1.16		-	
>RAT Type	M		ENUMERATED (E-UTRA, NR, ...)	The value E-UTRA is not used in this version of the specification.	-	
>DRB Usage Report List		1			-	
>>DRB Usage Report Item		1.. <maxnooft imeperiod s>			-	
>>>Start timestamp	M		OCTET STRING (SIZE(4))	Encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [14]. It indicates the UTC time when the recording of the Data Volume was started.	-	
>>>End timestamp	M		OCTET STRING (SIZE(4))	Encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [14]. It indicates the UTC time when the recording of the Data Volume was ended.	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>Usage count UL	M		INTEGER (0..2 ⁶⁴ -1)	The unit is: octets.	-	
>>>Usage count DL	M		INTEGER (0..2 ⁶⁴ -1)	The unit is: octets.	-	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs. Value is 32.
Maxnooftimeperiods	Maximum no. of time reporting periods. Value is 2.

9.3.1.45 Flow Failed List

This IE contains a list of QoS flows with a cause value. It is used for example to indicate failed QoS flow(s) or QoS flow(s) to be released.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow Item IEs		1..<maxno ofQoSFlows>			-	
>QoS Flow Identifier	M		9.3.1.24		-	
>Cause	M		9.3.1.2		-	

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.46 Packet Loss Rate

This IE indicates the Packet Loss Rate for a QoS Flow.

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

9.3.1.47 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.

9.3.1.48 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, ...)	

9.3.1.49 Averaging Window

This IE indicates the Averaging Window for a QoS Flow.

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

9.3.1.50 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.

9.3.1.51 Priority Level

This IE indicates the Priority Level for a QoS Flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Priority Level	M		INTEGER (0..127, ...)	Values ordered in decreasing order of priority i.e. with 1 as the highest priority and 127 as the lowest priority. The value 0 is not used in this version of the specification.

9.3.1.52 Security Result

This IE indicates whether the security policy indicated as "preferred" in the *Security Indication* IE is performed or not.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Integrity Protection Result	M		ENUMERATED (performed, not performed, ...)	Indicates whether UP integrity protection is performed or not for the concerned PDU Session Resource for the gNB/ng-eNB CP-UP separation, or for the concerned DRB for the eNB CP-UP separation.
Confidentiality Protection Result	M		ENUMERATED (performed, not performed, ...)	Indicates whether UP ciphering is performed or not for the concerned PDU Session Resource. NOTE: This IE is not applicable to eNB CP-UP separation.

9.3.1.53 Transaction ID

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
			...)	

9.3.1.54 Inactivity timer

This IE indicates the inactivity timer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Inactivity Timer	M		INTEGER (1.. 7200, ...)	Indicates the inactivity timer. The values are expressed in <i>seconds</i> .

9.3.1.55 Paging Priority Indicator (PPI)

The Paging Policy Indicator is used for paging policy differentiation (see details in TS 23.501 [20]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PPI	M		INTEGER (0.. 7, ...)	

9.3.1.56 gNB-CU-UP Capacity

This IE indicates the relative processing capacity of an gNB-CU-UP with respect to other gNB-CU-UPs in order to load-balance among different gNB-CU-UPs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
gNB-CU-UP Capacity	M		INTEGER(0..255)		-	

9.3.1.57 Maximum Integrity Protected Data Rate

This IE indicates the maximum aggregate data rate for integrity protected DRBs for a UE as defined in TS 38.300 [4].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Maximum IP rate	M		ENUMERATED (64kbps, max-UErate, ...)	Defines the upper bound of the aggregated data rate of user plane integrity protected data. This limit applies to both UL and DL independently.

9.3.1.58 PDCP SN Status Information

This IE contains information about PDCP PDU transfer status of a DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDCP Status Transfer UL		1			-	
>Receive Status Of PDCP SDU	O		BIT STRING (SIZE(1.. 131072))	The first bit indicates the status of the SDU after the First Missing UL PDCP SDU.	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				The Nth bit indicates the status of the UL PDCP SDU in position (N + First Missing SDU Number) modulo (1 + the maximum value of the PDCP-SN). 0: PDCP SDU has not been received. 1: PDCP SDU has been received correctly.		
>UL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper Frame Number of the first missing UL SDU	–	
PDCP Status Transfer DL		1			–	
>DL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper Frame Number that the target NG-RAN node (handover) or the NG-RAN node to which the DRB context is transferred (dual connectivity) should assign for the next DL SDU not having an SN yet.	–	

9.3.1.59 QoS Flow Mapping List

This IE contains a list of DRBs containing information about the mapped QoS flows.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow Mapping Item		1..<maxno of QoS Flows>			–	
>QoS Flow Identifier	M		9.3.1.24		–	
>QoS Flow Mapping Indication	O		9.3.1.60		–	

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows allowed within one PDU Session. Value is 64.

9.3.1.60 QoS Flow Mapping Indication

This IE is used to indicate whether only the uplink or only the downlink of a QoS flow is mapped to a DRB. For MBS this IE is applied to an MRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
QoS Flow Mapping	M		ENUMERATED (ul,	Indicates that only the uplink or

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Indication			dl, ...)	downlink QoS flow is mapped to the DRB. If applied to an MRB, the IE is always set to "dl".

9.3.1.61 PDCP SN Size

This IE carries the PDCP SN Size.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDCP SN Size	M		ENUMERATED (s-12, s-18, ..., s-7, s-15, s-16)	Indicates the PDCP SN size in bits. For more information see <i>PDCP-Config IE</i> in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.

9.3.1.62 Network Instance

This IE provides the network instance to be used by the NG-RAN node when selecting a particular transport network resource as described in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Network Instance	M		INTEGER (1..256, ...)	

9.3.1.63 MR-DC Usage Information

This IE provides information on the data usage for the UE connected to 5GC, e.g., secondary RAT in MR-DC as specified in TS 37.340 [19].

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Data Usage per PDU Session Report	O				-	
>Secondary RAT Type	M		ENUMERATED (nR, e-UTRA...)		-	
>PDU session Timed Report List	M		MR-DC Data Usage Report List 9.3.1.64		-	
Data Usage per QoS Flow List	O				-	
>Data Usage per QoS Flow Item		1..<maxno of QoSFlows>			-	
>>QoS Flow Indicator	M		QoS Flow Identifier 9.3.1.24		-	
>>Secondary RAT Type	M		ENUMERATED (nR, e-UTRA...)		-	
>>QoS Flow Timed Report List	M		MR-DC Data Usage Report List 9.3.1.64		-	

Range bound	Explanation
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maxnoofQoSFlows	Maximum no. of QoS flows allowed within one PDU session. Value is 64.
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9.3.1.64 MR-DC Data Usage Report List

This IE provides information on the data usage.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MR-DC Data Usage Report Item		1.. <maxnooftime periods>		
>Start timestamp	M		OCTET STRING (SIZE(4))	UTC time encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [14]. It indicates the start time of the collecting period of the included <i>Usage Count UL</i> IE and <i>Usage Count DL</i> IE.
>End timestamp	M		OCTET STRING (SIZE(4))	UTC time encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [14]. It indicates the end time of the collecting period of the included <i>Usage Count UL</i> IE and <i>Usage Count DL</i> IE.
>Usage count UL	M		INTEGER (0..2 ⁶⁴ -1)	The unit is: octets.
>Usage count DL	M		INTEGER (0..2 ⁶⁴ -1)	The unit is: octets.

Range bound	Explanation
maxnooftimeperiods	Maximum no. of time reporting periods. Value is 2.

9.3.1.65 gNB-DU ID

The gNB-DU ID uniquely identifies a 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.

9.3.1.66 Common Network Instance

This IE provides the common network instance to be used by the NG-RAN node when selecting a particular transport network resource as described in TS 23.501 [20] in a format common with 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Common Network Instance	M		OCTET STRING	The octets of OCTET STRING are encoded as the Network Instance field of the <i>Network Instance</i> IE specified in TS 29.244 [29]

9.3.1.67 Activity Notification Level

This IE contains information on which level activity notification shall be performed..

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Activity Notification Level	M		ENUMERATED (DRB, PDU Session, UE, ...)	

9.3.1.68 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 [24] (leftmost 6 octets, with PLMN information encoded as in 9.3.1.7), and Trace Recording Session Reference defined in TS 32.422 [24] (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, minimumWithoutVendorSpecific Extension, mediumWithout VendorSpecific Extension, maximumWitho utVendorSpecifi cExtension, ...)	Defined in TS 32.422 [24].	-	
Trace Collection Entity IP Address	M		Transport Layer Address 9.3.2.4	For File based Reporting. Defined in TS 32.422 [24]. Should be ignored if URI is present.	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MDT Configuration	O		9.3.1.85		YES	ignore
Trace Collection Entity URI	O		URI 9.3.2.8	For Streaming based Reporting. Defined in TS 32.422 [24] Replaces Trace Collection Entity IP Address if present.	YES	ignore

9.3.1.69 Subscriber Profile ID for RAT/Frequency priority

This parameter is used to define local configuration for RRM strategies.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Subscriber Profile ID for RAT/Frequency priority	M		INTEGER (1.. 256, ...)	

9.3.1.70 Additional RRM Policy Index

The *Additional RRM Policy Index* IE is used to provide additional information as specified in TS 36.300 [25].

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

9.3.1.71 Retainability Measurements Information

This IE contains information on removed DRB(s) and QoS Flow(s) which are needed to perform retainability measurements.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB Removed List		1			-	
>DRB Removed Item		1..<maxno ofDRBs>			-	
>>DRB ID	M		9.3.1.16		-	
>>DRB Released In Session	O		ENUMERATED (released in session, not released in session, ...)	Indicates if the DRB was "in session" or not (as defined in TS 32.425 [26] and TS 28.552 [22]) when released	-	
>>DRB Accumulated Session Time	O		OCTET STRING (SIZE(5))	Accumulated "in session" time for the DRB, as defined in TS 32.425 [26] and TS 28.552 [22], in milliseconds	-	
>>QoS Flow Removed List		0..1			-	
>>>QoS Flow Removed Item		1..<maxno of QoS Flows >			-	
>>>>QoS Flow Identifier	M		9.3.1.24		-	
>>>>QoS Flow	O		ENUMERATED	Indicates if the	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Released In Session			(released in session, not released in session, ...)	QoS Flow was "in session" or not (as defined in TS 28.552 [22]), when released		
>>>>QoS Flow Accumulated Session Time	O		OCTET STRING (SIZE(5))	Accumulated "in session" time for the QoS Flow, as defined in TS 28.552 [22], in milliseconds	-	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofQoSFlows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.72 TNL Available Capacity Indicator

The *TNL Available Capacity Indicator* IE indicates offered and available capacity of the Transport Network.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DL TNL Offered Capacity	M		INTEGER (0..16777216,...)	Maximum capacity in kbps
DL TNL Available Capacity	M		INTEGER (0..100,...)	Available capacity. Value 100 corresponds to the offered capacity.
UL TNL Offered Capacity	M		INTEGER (0..16777216,...)	Maximum capacity in kbps
UL TNL Available Capacity	M		INTEGER (0..100,...)	Available capacity. Value 100 corresponds to the offered capacity.

9.3.1.73 HW Capacity Indicator

The *HW Capacity Indicator* IE indicates offered and available throughput experienced by the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Offered Throughput	M		INTEGER (1..16777216,...)	Maximum capacity offered by the gNB-CU-UP in kbps
Available Throughput	M		INTEGER(0..100, ...)	Average available capacity at the gNB-CU-UP. Value 100 corresponds to the offered throughput.

9.3.1.74 Redundant QoS Flow Indicator

This IE provides the Redundant QoS Flow Indicator for a QoS flow as specified in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Redundant QoS Flow Indicator	M		ENUMERATED (true, false)	This IE indicates that this QoS flow is requested for the redundant transmission. Value "true" indicates that redundant transmission is requested for this QoS flow. Value "false" indicates that redundant transmission is

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				requested to be stopped if started.

9.3.1.75 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 9.3.1.76	
TSC Assistance Information Uplink	O		TSC Assistance Information 9.3.1.76	

9.3.1.76 TSC Assistance Information

This IE provides the TSC assistance information for a TSC QoS flow in the uplink or downlink (see TS 23.501 [20]).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Periodicity	M		9.3.1.77		-	
Burst Arrival Time	O		9.3.1.78		-	
Survival Time	O		9.3.1.103		YES	ignore
N6 Jitter Information	O		9.3.1.144		YES	ignore

9.3.1.77 Periodicity

This IE indicates the Periodicity of the TSC QoS flow as defined in TS 23.501 [20].

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

9.3.1.78 Burst Arrival Time

This IE indicates the Burst Arrival Time of the TSC QoS flow as defined in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Burst Arrival Time	M		OCTET STRING	Encoded in the same format as the <i>ReferenceTime</i> IE as defined in TS 38.331 [10]. The value is provided with 1 us accuracy.

9.3.1.79 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 (1..65535, ..., 65536..109999)	Upper bound value for the delay that a packet may experience expressed in unit of 0.01ms.

9.3.1.80 Redundant PDU Session Information

This IE defines Redundancy information to be applied to a PDU Session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
RSN	M		ENUMERATED (v1, v2, ...)		-	
PDU Session Pair ID	O		INTEGER (0..255, ...)	as defined in TS 23.501 [20]. This IE is not used in the response message. If received, the gNB-CU-CP shall ignore it.	YES	ignore

9.3.1.81 QoS Mapping Information

This IE indicates the DSCP and/or IPv6 Flow Label field(s) of IP packet which is sent through the GTP-U tunnel of a requested DRB. This IE is only used for IAB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DSCP	O		BIT STRING (SIZE(6))	
Flow Label	O		BIT STRING (SIZE(20))	

9.3.1.82 NID

This IE contains the Network Identifier of an SNPN, as specified in TS 23.501 [20]. 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))	

9.3.1.83 NPN Support Information

This IE provides NPN related information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>NPN Support Information</i>	M			
> <i>NPN Support Information</i> -SNPN				
>>NID	M		9.3.1.82	This IE is associated with the PLMN Identity and the Slice Support List contained in the <i>Supported PLMNs</i> IE. Together with the PLMN Identity it identifies the SNPN supported by the gNB-CU-UP.

9.3.1.84 NPN Context Information

This IE provides bearer context related NPN information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>NPN Context Information</i>	M			
> <i>SNPN Information</i>				
>>NID	M		9.3.1.82	This IE is associated with Serving PLMN information contained in bearer context related E1AP message. Together with the Serving PLMN identity it identifies the serving SNPN.

9.3.1.85 MDT Configuration

The IE defines the NR/E-UTRAN 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,...)	
CHOICE <i>MDT Mode</i>	M			
> <i>Immediate MDT</i>				
>>Measurements to Activate	M		BITSTRING (SIZE(8))	Each position in the bitmap indicates a MDT measurement, as defined in TS 37.320 [27]. Fourth Bit = M4, 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 2, bit 3, bit 5 and bit 6.
>>M4 Configuration	C-ifM4		9.3.1.86	
>>M6 Configuration	C-ifM6		9.3.1.87	
>>M7 Configuration	C-ifM7		9.3.1.88	

Condition	Explanation
ifM4	This IE shall be present if the <i>Measurements to Activate</i> IE has the fourth bit set to "1".
ifM6	This IE shall be present if the <i>Measurements to Activate</i> IE has the seventh bit set to "1".
ifM7	This IE shall be present if the <i>Measurements to Activate</i> IE has the eighth bit set to "1".

9.3.1.86 M4 Configuration

This IE defines the parameters for M4 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
M4 Collection Period	M		ENUMERATED (ms1024, ms2048, ms5120, ms10240, min1, ...)		-	
M4 Links to log	M		ENUMERATED (uplink,		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			downlink, both-uplink-and-downlink, ...)			
M4 Report Amount	O		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity, ...)	Number of reports.	YES	ignore

9.3.1.87 M6 Configuration

This IE defines the parameters for M6 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
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, ...)		-	
M6 Report Amount	O		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity,...)	Number of reports.	YES	ignore

9.3.1.88 M7 Configuration

This IE defines the parameters for M7 measurement collection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
M7 Collection Period	M		INTEGER (1..60, ...)		-	
M7 Links to log	M		ENUMERATED(uplink, ...)		-	
M7 Report Amount	O		ENUMERATED (1, 2, 4, 8, 16, 32, 64, infinity,...)	Number of reports.	YES	ignore

9.3.1.89 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		<i>1..<maxnoofMDTPLMNs></i>		
>PLMN Identity	M		9.3.1.7	

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

9.3.1.90 EHC Parameters

This IE carries the EHC parameters for ethernet header compression.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
EHC Common	M				-	
>EHC-CID-Length	M		ENUMERATED { bits7, bits15, ... }	Corresponds to information provided in the <i>ehc-CID-Length</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.	-	
EHC Downlink	O				-	
>drb-ContinueEHC-DL	M		ENUMERATED { true, ..., false }	Corresponds to information provided in the <i>drb-ContinueEHC-DL</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. The value "false" indicates that the PDCP entity resets the downlink EHC header compression protocol during PDCP re-establishment.	-	
> <i>maxCID-EHC-DL</i>	O		INTEGER(1..32 767, ...)	Indicate the maximum number of DL EHC contexts that can be established for the DRB. The total value of <i>maxCID-EHC-DL</i> plus <i>maxCID-EHC-UL</i> (as specified in TS 38.331) across all bearers for the UE should be less than or equal to the value of <i>maxNumberEHC-Contexts</i> parameter as indicated by the UE.	YES	ignore
EHC Uplink	O				-	-
>drb-ContinueEHC-UL	M		ENUMERATED { true, ..., false }	Corresponds to information provided in the <i>drb-ContinueEHC-UL</i> contained in	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. The value "false" indicates that the PDCP entity resets the uplink EHC header compression protocol during PDCP re-establishment.		

9.3.1.91 DAPS Request Information

The *DAPS Indicator* IE indicates that DAPS HO is requested for the concerned DRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DAPS Indicator	M		ENUMERATED (DAPS HO required, ...)	Indicates that DAPS HO is requested

9.3.1.92 Early Forwarding COUNT Information

This IE contains DL COUNT value related to early data forwarding during DAPS Handover or Conditional Handover or conditional PSCell change or conditional PSCell addition or subsequent CPAC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>Early Forwarding</i>	M			
> <i>First DL COUNT</i>				
>>FIRST DL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper frame number of the first DL SDU that the source NG-RAN node forwards to the target NG-RAN node
> <i>DL Discarding</i>				
>>DISCARD DL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper frame number for which the target NG-RAN node should discard forwarded DL SDUs associated with lower values.

9.3.1.93 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	Criticality	Assigned Criticality
Alternative QoS Parameters Set Item		1..<maxnoofQoSparaSets>				
>Alternative QoS Parameters Set Index	M		INTEGER (1..8,..)		–	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>Guaranteed Flow Bit Rate Downlink	O		Bit Rate 9.3.1.20		–	
>Guaranteed Flow Bit Rate Uplink	O		Bit Rate 9.3.1.20		–	
>Packet Delay Budget	O		9.3.1.47		–	
>Packet Error Rate	O		9.3.1.48		–	
>Maximum Data Burst Volume	O		9.3.1.50	For details see TS 23.501 [20]. This IE shall be included if the <i>Delay Critical</i> IE is set to “delay critical” and is ignored otherwise.	YES	ignore

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

9.3.1.94 Extended Slice Support List

This IE indicates a list of supported slices.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Slice Support Item IEs		<i>1..<maxno ofExtSliceItems></i>			-	
>S-NSSAI	M		9.3.1.9		-	

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

9.3.1.95 Extended gNB-CU-CP Name

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

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

9.3.1.96 Extended gNB-CU-UP Name

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

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

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

9.3.1.97 Extended NR CGI Support List

This IE indicates the list of supported NR CGIs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Extended NR CGI Support Item IEs		0..<maxnoofExtNR CGI>		
>NR CGI	M		9.3.1.14	

Range bound	Explanation
maxnoofExtNR CGI	Maximum no. of extended NR CGIs supported. Value is 16384.

9.3.1.98 Direct Forwarding Path Availability

This IE indicates whether a direct forwarding path is available.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Direct Forwarding Path Availability	M		ENUMERATED (inter-system direct path available, ..., intra-system direct path available)	

9.3.1.99 IAB-donor-CU-UP PSK Info

This IE contains the IAB-Donor-CU-UP Pre-Shared Key generated by the gNB-CU-CP and IP addresses for IAB-donor-CU-UP and IAB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IAB-donor-CU-UP PSK Info Item IEs		1..<maxnoofPSKs>		
>IAB-Donor-CU-UP PSK	M		OCTET STRING	This IE contains the $K_{IAB-CU-UP}$ as defined in TS 33.501 [13].
>IAB-Donor-CU-UP IP Address	M		Transport Layer Address 9.3.2.4	
>IAB-DU IP Address	M		Transport Layer Address 9.3.2.4	

Range bound	Explanation
maxnoofPSKs	Maximum no. of PSKs to be updated in one E1AP procedure. Value is 256.

9.3.1.100 ECGI Support List

This IE indicates the list of supported ECGIs.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
ECGI Support Item IEs		1..<maxnoofECGI>		
>ECGI	M		9.3.1.101	

Range bound	Explanation
maxnoofECGI	Maximum no. of supported ECGIs. Value is 512. This range may be redefined.

9.3.1.101 ECGI

The E-UTRAN Cell Global Identifier (ECGI) is used to globally identify a cell.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		9.3.1.7	
E-UTRAN Cell Identity	M		BIT STRING (SIZE(28))	

9.3.1.102 UE Slice Maximum Bit Rate List

This IE contains the UE Slice Maximum Bit Rate List as specified in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Slice Maximum Bit Rate Item		1..<maxnoofSMBRValues>		
>S-NSSAI	M		9.3.1.9	
>UE Slice Maximum Bit Rate Downlink	M		Bit Rate 9.3.1.20	This IE indicates the UE-Slice-MBR as specified in TS 23.501 [20] in the downlink direction.

Range bound	Explanation
maxnoofSMBRValuesmaxnoofAllowedS-NSSAIs	Maximum no. of SLICE MAXIMUM BIT RATE values for a UE. Value is 8 Maximum no. of allowed S-NSSAI. Value is 8.

9.3.1.103 Survival Time

This IE indicates the Survival Time of the TSC QoS flow as defined in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Survival Time	M		INTEGER (0..1920000, ...)	Survival Time expressed in units of 1 us.

9.3.1.104 UDC Parameters

This IE carries the UDC parameters for uplink data compression.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Buffer Size	M		ENUMERATED (kbyte2, kbyte4, kbyte8, ...)	Indicates the buffer size applied for UDC. Corresponds to information provided in the <i>bufferSize</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.	-	
Dictionary	O		ENUMERATED (sip-SDP, operator, ...)	Indicates which pre-defined dictionary is used for UDC. Corresponds to information provided in the <i>dictionary</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.	-	
Continue UDC	O		ENUMERATED (true, ...)	Corresponds to information provided in the <i>drb-ContinueUDC</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10].	-	
Version ID	O		INTEGER (0..15)	Indicates the version ID for Operator Defined Dictionary. Corresponds to information provided in <i>versionOfDictionary</i> contained in the <i>PDCP-Parameters</i> IE as defined in TS38.331[10].	YES	ignore

9.3.1.105 SCG Activation Status

The *SCG Activation Status* IE indicates the status of SCG resources.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SCG Activation Status	M		ENUMERATED (SCG activated, SCG deactivated, ...)	

9.3.1.106 gNB-CU-CP MBS E1AP ID

The gNB-CU-CP MBS E1AP ID uniquely identifies the MBS association over the E1 interface within the gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU-CP MBS E1AP ID	M		INTEGER (0 .. 2 ²⁴ - 1)	

9.3.1.107 gNB-CU-UP MBS E1AP ID

The gNB-CU-UP MBS E1AP ID uniquely identifies the MBS association over the E1 interface within the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-CU-UP MBS E1AP ID	M		INTEGER (0 .. 2 ¹⁶ - 1)	

9.3.1.108 Global MBS Session ID

This IE indicates the TMGI uniquely identifies an MBS session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
TMGI	M		OCTET STRING (SIZE(6))	Encoded as defined in TS 23.003.
NID	O		9.3.1.82	Defined in TS 23.003 [23].

9.3.1.109 DU Cell Reference

This IE indicates the index of an NR CGI within a DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DU Cell Index	M		INTEGER (1..512)	To support per cell F1-U tunnels and being able to refer to it.
NR CGI	M		9.3.1.14	

9.3.1.110 gNB-CU-UP MBS Support Information

This IE includes MBS related support information for the E1 Setup procedure.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Support Information To Add List		0..1		
>MBS Support Information To Add Item		1..<maxnoofM BSSessionIDs >		
>>Global MBS Session ID	M		9.3.1.108	
MBS Support Information To Remove List		0..1		
>MBS Support Information To Remove Item		1..<maxnoofM BSSessionIDs >		
>>Global MBS Session	M		9.3.1.108	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
ID				

Range bound	Explanation
maxnoofMBSsessionIDs	Maximum no. of MBS Session IDs. Value is 512.

9.3.1.111 MBS Area Session ID

This IE indicates an MBS Area Session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Area Session ID	M		INTEGER (0 .. 65535, ...)	

9.3.1.112 BC Bearer Context NG-U TNL Info at 5GC

This IE contains TNL information for an MBS Session as provided by the 5GC for shared NG-U multicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS Session Type</i>				
> <i>location independent</i>				
>>MBS NG-U Information at 5GC	M		9.3.1.113	
> <i>location dependent</i>				
>>Location dependent MBS NG-U Information at 5GC		1..<maxnoofMBSAreaSessionIDs>		
>>>MBS Area Session ID	M		9.3.1.111	
>>>MBS NG-U Information at 5GC	M		9.3.1.113	

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.113 MBS NG-U Information at 5GC

This IE contains TNL information for a single shared NG-U tunnel as provided by the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS NG-U Transport</i>				
> <i>multicast</i>				
>>IP Multicast Address	M		Transport Layer Address 9.3.2.4	
>>IP Source Address	M		Transport Layer Address 9.3.2.4	
>>GTP DL TEID	M		GTP-TEID 9.3.2.3	

9.3.1.114 BC MRB Setup Configuration

This IE contains MRB configuration information for a BC Bearer Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
BC MRB To Setup List		1..<maxno ofMRBs>			-	
>MRB ID	M		9.3.1.16a		-	
>MBS PDCP Configuration	M		PDCP Configuration 9.3.1.38		-	
>MBS QoS Flows Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25		-	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.	-	
>F1-U TNL Info to Add List		0..1			YES	ignore
>>F1-U TNL Info to Add Item		1..<maxno ofDUs>			-	
>>>Broadcast F1-U Context ReferenceE1	M		9.3.1.139a		-	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.
maxnoofDUs	Maximum no. of DUs in a RAN node. Value is 512.

9.3.1.115 Requested Action for Available Shared NG-U Termination

This IE provides information about the requested gNB-CU-UP's action with regards to a potentially available shared NG-U termination.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Requested Action for Available Shared NG-U Termination	M		ENUMERATED (apply available configuration, apply requested configuration, ..., apply available configuration if same as requested)	

9.3.1.116 BC Bearer Context NG-U TNL Info at NG-RAN

This IE contains NG-RAN NG-U TNL information for an MBS Session for both, shared NG-U unicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS Session Type</i>	M			
>location independent				
>>MBS NG-U Information at NG-RAN	M		9.3.1.117	
>location dependent				
>>Location dependent MBS NG-U Information		1..<maxnoofMBSAreaSessio		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
at NG-RAN		<i>nIDs</i> >		
>>>MBS Area Session ID	M		9.3.1.111	
>>MBS NG-U Information at NG-RAN	M		9.3.1.117	

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.117 MBS NG-U Information at NG-RAN

This IE contains NG-RAN TNL information for a single shared NG-U tunnel.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS NG-U Transport</i>	M			
> <i>unicast</i>				
>>Shared NG-U DL Transport Layer Information	M		UP Transport Layer Information 9.3.2.1	

9.3.1.118 BC Bearer Context F1-U TNL Info at CU

This IE contains gNB-CU UP F1-U TNL information for an MBS Session. It may also contain per Area Session ID F1-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS Session Type</i>	M			
> <i>location independent</i>				
>>MBS F1-U Information at CU	M		UP Transport Layer Information 9.3.2.1	
> <i>location dependent</i>				
>>>Location dependent MBS F1-U Information at CU		<i>1..<maxnoofMBSAreaSessionIDs></i>		
>>>MBS Area Session ID	M		9.3.1.111	
>>MBS F1-U Information at CU	M		UP Transport Layer Information 9.3.2.1	

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.119 BC Bearer Context F1-U TNL Info at DU

This IE contains CU F1-U TNL information for an MBS Session. It may also contain per Area Session ID F1-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE <i>MBS Session Type</i>	M				-	
> <i>location independent</i>						

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>MBS F1-U Information at DU	M		UP Transport Layer Information 9.3.2.1		-	
>>F1-U tunnel Not Established	O		ENUMERATE D (true, ...)	Indicates to not establish F1-U tunnel for this MBS session.	YES	ignore
<i>>location dependent</i>						
>>Location dependent MBS F1-U Information at DU		1..<maxnoofMBSAreaSessionIDs>			-	
>>>MBS Area Session ID	M		9.3.1.111		-	
>>>MBS F1-U Information at DU	M		UP Transport Layer Information 9.3.2.1		-	
>>>F1-U tunnel Not Established	O		ENUMERATE D (true, ...)	Indicates to not establish F1-U tunnel for this MBS Area session.	YES	ignore

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.120 MC MRB Setup Configuration

This IE contains MRB configuration information for a MC Bearer Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC MRB To Setup List		1..<maxnoofMRBs>		
>MRB ID	M		9.3.1.16a	
>MBS PDCP Configuration	M		PDCP Configuration 9.3.1.38	
>MBS QoS Flows Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.1.121 MC Bearer Context NG-U TNL Info at NG-RAN

This IE contains NG-RAN NG-U TNL information for an MBS Session for both, shared NG-U unicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS Session Type</i>	M			

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>location independent				
>>MBS NG-U Information at NG-RAN	M		9.3.1.117	
>location dependent				
>>Location dependent MBS NG-U Information at NG-RAN		1..<maxnoofMBSAreaSessionIDs>		
>>>MBS Area Session ID	M		9.3.1.111	
>>>MBS NG-U Information at NG-RAN	M		9.3.1.117	

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.122 MC Bearer Context NG-U TNL Info at 5GC

This IE contains TNL information for a multicast MBS Session as provided by the 5GC for shared NG-U multicast transport. It may also contain an MBS Area Session ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS NG-U Information at 5GC	M		9.3.1.113	
MBS Area Session ID	O		9.3.1.111	For a location dependent multicast MBS Session

9.3.1.123 MC Bearer Context NG-U TNL Info at NG-RAN Request

This IE is used to request NG-U TNL information from the gNB-CU-UP, if not yet available at gNB-CU-CP and may contain an MBS Area Session ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
NG-RAN NG-U TNL requested.	M		ENUMERATED (requested, ...)	
MBS Area Session ID	O		9.3.1.111	

9.3.1.124 MC Bearer Context F1-U TNL Info at DU

This IE contains DU F1-U TNL information for a multicast MBS Session. It may also contain per Area Session ID F1-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS F1-U Information at DU	M		UP Transport Layer Information 9.3.2.1	
MBS Multicast F1-U Context Descriptor	M		9.3.1.125	To support per DU, per cell or per MBS Area Session F1-U tunnels and being able to refer to it.

9.3.1.125 MBS Multicast F1-U Context Descriptor

This IE contains a reference to a Multicast F1-U Context and may contain an MBS Area Session ID and an indication to setup a Multicast F1-U Context for ptp retransmissions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Multicast F1-U Context ReferenceE1	M		9.3.1.139	
MC F1-U Context usage	M		ENUMERATED (ptm, ptp, ptp retransmission, ptp forwarding, ...)	"ptm" indicates that the Multicast F1-U Context is setup for ptm transmissions; decided by the DU. "ptp" indicates that the Multicast F1-U Context is setup for ptp transmissions; decided by the DU. "ptp retransmission" indicates that the Multicast F1-U Context is setup for ptp retransmissions (based on PDCP Status Report); requested by the CU "ptp forwarding" indicates that the Multicast F1-U Context is setup for transmitting from a defined MBS Progress Information status onwards; requested by the CU.
MBS Area Session ID	O		9.3.1.111	To support per MBS Area Session F1-U tunnels and being able to refer to it.

9.3.1.126 Void

Void.

9.3.1.127 MC Bearer Context NG-U TNL Info at NG-RAN Modify Response

This IE contains NG-RAN NG-U TNL information for an MBS Session for both, shared NG-U multicast and unicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS NG-U Information at NG-RAN	M		9.3.1.117	
MBS Area Session ID	O		9.3.1.111	

9.3.1.128 Discard Timer Extended

This IE indicates the extended PDCP discard timer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Discard Timer Extended	M		ENUMERATED (0.5, 1, 2, 4, 6, 8, ..., 2000)	Indicates the PDCP discard timer. The values are expressed in <i>ms</i> . Corresponds to information provided in the <i>DiscardTimerExt-r16</i> or the <i>DiscardTimerExt2-r17</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10].

9.3.1.129 MDT PLMN Modification List

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT PLMN Modification List		<i>0..<maxnoofMDTPLMNs></i>		An empty list indicates there is no PLMN allowed for MDT.
>PLMN Identity	M		9.3.1.7	

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

9.3.1.130 MRB Progress Information

This IE contains the MRB progress information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE MRB Progress Information SNs	M			
>12bits				
>>PDCP SN Length 12	M		INTEGER (0..4095)	
>18bits				
>>PDCP SN Length 18	M		INTEGER (0..262143)	
MRB Progress Information Type	M		9.3.1.131	

9.3.1.131 MRB Progress Information Type

This IE contains the MRB progress information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MRB Progress Information Type	M		ENUMERATED (oldest available, last delivered, ...)	

9.3.1.132 MC Forwarding Resource ID

This IE provides the means to identify a MC forwarding resource. It is uniquely allocated for a MC Bearer Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		OCTET STRING (SIZE(2))	

9.3.1.133 MBS Session Associated Information

This IE provides the means to establish a MC MBS session level forwarding resource to support handover to a gNB not supporting NR MBS.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Associated QoS Flow Information List		<i>1..<maxnoofQoSflows></i>		
>MBS QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	
>Associated Unicast QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	
MBS Session Forwarding Address	M		UP Transport Layer Information	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
			9.3.2.1	

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.134 MC Forwarding Resource Request

This IE is used by the gNB-CU-CP for request from the gNB-CU-UP information from the peer node regarding a MC Forwarding Resource.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	
MBS Area Session ID	O		9.3.1.111	
MRB Forwarding Resource Request List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MRB Progress Information Type	O		9.3.1.131	Requests MRB Progress Information of the indicated type from the peer node
>MRB Forwarding Address Request	O		ENUMERATED (request, ...)	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.1.135 MC Forwarding Resource Indication

This IE is used by the gNB-CU-CP for indicate to the gNB-CU-UP information from the peer node regarding MC Forwarding Resources.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	
MRB Forwarding Indication List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MRB Progress Information	O		9.3.1.130	Provides MRB Progress Information from the peer node.
>MRB Forwarding Address	O		UP Transport Layer Information 9.3.2.1	
MBS Session Associated Information	O		9.3.1.133	

9.3.1.136 MC Forwarding Resource Response

This IE is used by the gNB-CU-UP to response to requests from the gNB-CU-CP regarding a MC Forwarding Resource at the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	
MRB Forwarding Indication List		<i>0..<maxnoofMRBs></i>		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>MRB ID	M		9.3.1.16a	
>MRB Progress Information	O		9.3.1.130	
>MRB Forwarding Address	O		UP Transport Layer Information 9.3.2.1	

9.3.1.137 MC Forwarding Resource Release

This IE is used by the gNB-CU-CP to release a MC Forwarding Resource at the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	

9.3.1.138 MC Forwarding Resource Release Indication

This IE is used by the gNB-CU-UP to indicate the release of a MC Forwarding Resource to the gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	

9.3.1.139 Multicast F1-U Context ReferenceE1

This IE contains a reference to a Multicast F1-U Context used within an MBS-associated logical E1-connection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Multicast F1-U Context ReferenceE1	M		OCTET STRING (SIZE(4))	This value is allocated to uniquely denote an Multicast F1-U Context within an MBS-associated logical E1-connection.

9.3.1.139a Broadcast F1-U Context ReferenceE1

This IE contains a reference to a Broadcast F1-U Context used within an MBS-associated logical E1-connection. In case of location independent Broadcast service, one Broadcast F1-U Context corresponds to a F1-U tunnel towards one gNB-DU for one MRB. In case of location dependent Broadcast service, one Broadcast F1-U Context corresponds to all F1-U tunnel(s) toward one gNB-DU for one MRB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Broadcast F1-U Context ReferenceE1	M		OCTET STRING (SIZE(4))	This value is allocated to uniquely denote a Broadcast F1-U Context within an MBS-associated logical E1-connection.

9.3.1.140 MBS Session Associated Information Non-Support-to-Support

This IE contains the UE ID, PDU session ID and QFIs associated to a given MBS session, used in handover from non-MBS-supporting RAN node to MBS-supporting RAN node to eliminate packet duplication.

NOTE: This IE is only applicable for deployments deriving the PDCP COUNT values by means of a DL MBS QFI Sequence Number provided on NG-U and requires the appropriate associated PDU Session and MBS session resources to be provided by the same logical gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Reference ID	M		gNB-CU-CP UE E1AP ID 9.3.1.4	
PDU Session ID	M		9.3.1.21	
Associated QoS Flow Information List	M		MBS Session Associated Information List 9.3.1.141	

9.3.1.141 MBS Session Associated Information List

This IE provides the association between MBS QoS flows and unicast QoS flows.

NOTE: This IE is only applicable for deployments deriving the PDCP COUNT values by means of a DL MBS QFI Sequence Number provided on NG-U and requires the appropriate associated PDU Session and MBS session resources to be provided by the same logical gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session Association Information Item		$1..<maxnoofQoSflows>$		
>MBS QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	
>Associated Unicast QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	

Range bound	Explanation
maxnoofQoSFlows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.142 MT-SDT Information

This IE provides the assistant information for MT-SDT.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
MT-SDT Data Size	M		INTEGER (1..96000,...)	Indicates the total data size for all SDT bearers. Unit: byte. Corresponds to the SDAP SDU size of the received DL data. If the total data size exceeds 96000 bytes, the value is set to 96000.

9.3.1.143 PDU Set QoS Information

This IE defines PDU Set QoS information to be applied to a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Set Delay Budget	O		Extended Packet Delay Budget 9.3.1.79	The PDU Set Delay Budget is specified in TS 23.501 [20].
PDU Set Error Rate	O		Packet Error Rate 9.3.1.48	The PDU Set Error Rate is specified in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Set Integrated Handling Information	O		ENUMERATED (true, false, ...)	The PDU Set Integrated Handling Information is specified in TS 23.501 [20].

9.3.1.144 N6 Jitter Information

This IE defines the N6 jitter information associated with the Periodicity in downlink.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
N6 Jitter Lower Bound	M		INTEGER (-127..127, ...)	Indicates the lower bound of the N6 jitter. The unit is: 0.5ms.
N6 Jitter Upper Bound	M		INTEGER (-127..127, ...)	Indicates the upper bound of the N6 jitter. The unit is: 0.5ms.

9.3.1.145 ECN Marking or Congestion Information Reporting Request

This IE indicates the gNB-CU-UP to perform ECN marking or to report information for ECN marking or to report congestion information for a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>ECN Marking or Congestion Information Request</i>	M			
> <i>ECN Marking at RAN</i>				
>>ECN Marking at NG-RAN Request	M		ENUMERATED (ul, dl, both, stop, ...)	
> <i>ECN Marking at UPF</i>				
>>ECN Marking at UPF Request	M		ENUMERATED (ul, dl, both, stop, ...)	
> <i>Congestion Information</i>				
>>Congestion Information Request	M		ENUMERATED (ul, dl, both, stop, ...)	

9.3.1.146 PSI Based Discard Timer

This IE indicates PDCP discard timer used for DL PSI based discarding.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PSI Based Discard Timer	M		ENUMERATED (0, 2, 4, 6, 8, 10, 12, 14, 18, 22, 26, 30, 40, 50, 75, 100, ...)	Corresponds to information provided in the <i>discardTimerForLowImportance</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10]. Unit: millisecond.

9.3.1.147 BC Bearer Context NG-U TNL Info at NG-RAN Request

This IE contains the request for NG-RAN NG-U TNL information for an MBS Session of shared NG-U resources of unicast transport, e.g., in case of the N3mb path failure as specified in TS 23.527 [36].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS Session Type</i>	M			
> <i>location independent</i>				
>>MBS NG-U Information at NG-RAN Request	M		9.3.1.148	
> <i>location dependent</i>				
>>MBS NG-U Information at NG-RAN Request List		1..<maxnoofMBSAreaSessionIDs>		
>>>MBS Area Session ID	M		9.3.1.111	
>>>MBS NG-U Information at NG-RAN Request	M		9.3.1.148	

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.148 MBS NG-U Information at NG-RAN Request

This IE contains the MBS NG-U Information at NG-RAN Request.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS NG-U Information at NG-RAN Request	M		ENUMERATED (true, ...)	This IE is used to request the gNB-CU-UP to allocate shared NG-U resources for unicast transport.

9.3.2 Transport Network Layer Related IEs

9.3.2.1 UP Transport Layer Information

The *UP Transport Layer Information* IE identifies an 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 user plane transport.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>Transport Layer Information</i>	M			
> <i>GTP Tunnel</i>				
>>Transport Layer Address	M		9.3.2.4	
>>GTP-TEID	M		9.3.2.3	

9.3.2.2 CP Transport Layer Information

This IE is used to provide the E1 control plane transport layer information associated with an gNB-CU-CP and gNB-CU-UP pair.

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
address			Address 9.3.2.4			
>Endpoint-IP-address-and-port					YES	reject
>>Endpoint IP address	M		Transport Layer Address 9.3.2.4		-	-
>>Port Number	M		BIT STRING (SIZE(16))		-	-

9.3.2.3 GTP-TEID

The *GTP-TEID* IE is the GTP Tunnel Endpoint Identifier to be used for the user plane transport.

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 [15].

9.3.2.4 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 [16].

9.3.2.5 Data Forwarding Information Request

This IE offers the possibility for the gNB-CU-CP to request data forwarding addresses to the gNB-CU-UP. It also offers the possibility for the gNB-CU-CP to provide a list of QoS flows subject to PDU Session level or DRB level data forwarding to the gNB to which DRBs or QoS flows have been offloaded.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Data Forwarding Request	M		ENUMERATED (UL, DL, both, ...)	
QoS Flows forwarded on the forwarding tunnel(s)	O		QoS Flow Mapping List 9.3.1.59	This IE contains information for which QoS flows forwarded data packets are sent on: - either the PDU Session forwarding tunnel (UL and DL) - or the DRB forwarding tunnel (UL and DL).

9.3.2.6 Data Forwarding Information

This IE provides the data forwarding information when performing handover or data offloading.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
UL Data Forwarding	O		UP Transport Layer		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			Information 9.3.2.1			
DL Data Forwarding	O		UP Transport Layer Information 9.3.2.1		-	
Data Forwarding to NG-RAN QoS Flow Information List		<i>0..1</i>		Providing QoS flows accepted for data forwarding to the source gNB-CU-UP.	YES	ignore
>Data Forwarding to NG-RAN QoS Flow Information List Item		<i>1..<maxno ofQoSflows></i>			-	
>>QoS Flow Identifier	M		9.3.1.24		-	
PDU Set based Handling Indicator	O		ENUMERATED (supported, ...)	Indicates the support of PDU Set based QoS handling.	YES	ignore

9.3.2.7 Transport Network Layer Address Info

This IE is used for signalling TNL address information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Transport UP Layer Addresses Info to Add List		<i>0..1</i>		
>Transport UP Layer Addresses Info to Add Item		<i>1..<maxnoofTLAs></i>		
>>IPsec Transport Layer Address	M		Transport Layer Address 9.3.2.4	Transport Network Layer address for IPsec endpoint.
>>GTP Transport Layer Addresses To Add List		<i>0..1</i>		
>>>GTP Transport Layer Addresses To Add Item		<i>1..<maxnoofGTPTLAs></i>		
>>>>GTP Transport Layer Address Info	M		Transport Layer Address 9.3.2.4	GTP Transport Layer Addresses for GTP end-points.
Transport UP Layer Addresses Info to Remove List		<i>0..1</i>		
>Transport UP Layer Addresses Info to Remove Item		<i>1..<maxnoofTLAs></i>		
>>IPsec Transport Layer Address	M		Transport Layer Address 9.3.2.4	Transport Network Layer address for IPsec endpoint.
>>GTP Transport Layer Addresses To Remove List		<i>0..1</i>		
>>>GTP Transport Layer Addresses To Remove Item		<i>1..<maxnoofGTPTLAs></i>		
>>>>GTP Transport Layer Address Info	M		Transport Layer Address 9.3.2.4	GTP Transport Layer Addresses for GTP end-points.

Range bound	Explanation
maxnoofTLAs	Maximum no. of Transport Layer Addresses in the message. Value is 16.
maxnoofGTPTLAs	Maximum no. of GTP Transport Layer Addresses for a GTP end-point in the message. Value is 16.

9.3.2.8 URI

This IE is defined to contain a URI address.

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

9.3.2.9 User Plane Failure Indication

This IE contains information to notify that a user plane failure occurred over NG-U interface.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
User Plane Failure Type	M		ENUMERATED (GTP-U Error Indication Received, UP Path Failure, ...)	Indicates the type of NG-U failure.
NG UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1	Identifies the NG-U transport bearer at the UPF node.
NG DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1	Identifies the NG-U transport bearer at the gNB-CU-UP.

9.3.3 Container and List IE definitions

9.3.3.1 DRB To Setup List E-UTRAN

This IE contains DRB related information used at Bearer Context Setup Request in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB To Setup Item E-UTRAN		<i>1..<maxno ofDRBs></i>			-	
>DRB ID	M		9.3.1.16		-	
>PDCP Configuration	M		9.3.1.38		-	
>E-UTRAN QoS	M		9.3.1.17		-	
>S1 UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>Data Forwarding Information Request	O		9.3.2.5	Requesting forwarding info from the target gNB-CU-UP.	-	
>Cell Group Information	M		9.3.1.11		-	
>DL UP Parameters	O		UP Parameters 9.3.1.13		-	
>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".	-	
>Existing Allocated S1	O		UP Transport	This IE is not used	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DL UP Transport Layer Information			Layer Information 9.3.2.1	in this version of the specification.		
>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore
>Security Indication	O		9.3.1.23		YES	reject

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.2 PDU Session Resource To Setup List

This IE contains PDU session resource related information used at Bearer Context Setup Request

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Setup Item		<i>1..<maxno ofPDUSes sionResource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>PDU Session Type	M		9.3.1.22		-	
>S-NSSAI	M		9.3.1.9		-	
>Security Indication	M		9.3.1.23		-	
>PDU Session Resource DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20	This IE shall be present when at least one Non-GBR QoS Flows is being setup.	-	
>NG UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>PDU Session Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5		-	
>PDU Session Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "PDU Session".	-	-
>Existing Allocated NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	-
>Network Instance	O		9.3.1.62	This IE is ignored if the <i>Common Network Instance</i> IE is included.	-	-
>DRB To Setup List		<i>1</i>			-	-
>>DRB To Setup Item		<i>1..<maxno ofDRBs></i>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>SDAP Configuration	M		9.3.1.39		-	-
>>>PDCP Configuration	M		9.3.1.38		-	-
>>>Cell Group Information	M		9.3.1.11		-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>QoS Flows Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25		-	-
>>>DRB Data forwarding information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding info from the target gNB-CU-UP.	-	-
>>>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".	-	-
>>>PDCP SN Status Information	O		9.3.1.58	Contains the PDCP SN Status at setup after Resume.	-	-
>>>DRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the DRB QoS when more than one QoS Flow is mapped to the DRB.	YES	ignore
>>>DAPS Request Information	O		9.3.1.91		YES	ignore
>>>Ignore Mapping Rule Indication	O		ENUMERATED (True, ...)	Included if the QoS flow mapping rule for the DRB has not been decided by gNB-CU-CP.	YES	reject
>>>QoS Flows Remapping	O		ENUMERATED (update, source configuration, ...)	Indicates that the target gNB-CU-CP requests QoS flow remapping during an intra-system lossless handover as specified in TS 38.300 [4].	YES	reject
>>>SDT Indicator Setup	O		ENUMERATED (true, ...)	Indicates that the DRB is for SDT.	YES	reject
>>>Special Triggering Purpose	O		ENUMERATED (indirect-data-forwarding, ...)		YES	ignore
>Common Network Instance	O		9.3.1.66		YES	ignore
>Redundant NG UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore
>Redundant Common Network Instance	O		Common Network Instance 9.3.1.66		YES	ignore
>Redundant PDU Session Information	O		9.3.1.80		YES	ignore
>Special Triggering Purpose	O		ENUMERATED (indirect-data-forwarding, ...)		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.3 DRB Setup List E-UTRAN

This IE contains setup DRB related information at Bearer Context Setup Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB Setup Item E-UTRAN		<i>1..<maxno ofDRBs></i>			-	
>DRB ID	M		9.3.1.16		-	
>S1 DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6	Providing forwarding info from the target gNB-CU-UP.	-	
>UL UP Parameters	M		UP Parameters 9.3.1.13		-	
>S1 DL UP Unchanged	O		ENUMERATED (True, ...)	This IE is not used in this version of the specification.	-	
>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore
>Security Result	O		9.3.1.52		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.4 DRB Failed List E-UTRAN

This IE contains failed to setup DRB related information at Bearer Context Setup Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Failed Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.5 PDU Session Resource Setup List

This IE contains setup PDU session resource related information used at Bearer Context Setup Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Setup Item		<i>1..<maxno ofPDUSessionResource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>Security Result	O		9.3.1.52		-	
>NG DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>PDU Session Data Forwarding	O		Data Forwarding Information	Providing forwarding info	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Information Response			9.3.2.6	from the target gNB-CU-UP.		
>NG DL UP Unchanged	O		ENUMERATED (True, ...)		-	
>DRB Setup List		1			-	
>>DRB Setup Item		1..<maxno ofDRBs>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>DRB Data forwarding information Response	O		Data Forwarding Information 9.3.2.6	Providing forwarding info from the target gNB-CU-UP.	-	
>>>UL UP Parameters	M		UP Parameters 9.3.1.13		-	
>>>Flow Setup List	M		QoS Flow List 9.3.1.12		-	
>>>Flow Failed List	O		9.3.1.45		-	
>DRB Failed List		0.. 1			-	
>>DRB Failed Item		1..<maxno ofDRBs>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore
>Used Redundant PDU Session Information	O		Redundant PDU Session Information 9.3.1.80		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.6 PDU Session Resource Failed List

This IE contains failed PDU session resource related information used at Bearer Context Setup Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Failed Item		1..<maxnoofPDU SessionResource>		
>PDU Session ID	M		9.3.1.21	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.7 DRB To Setup Modification List E-UTRAN

This IE contains DRB to setup related information used at Bearer Context Modification Request in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB To Setup Modification Item E-UTRAN		1..<maxno ofDRBs>			-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>DRB ID	M		9.3.1.16		-	
>PDCP Configuration	M		9.3.1.38		-	
>E-UTRAN QoS	M		9.3.1.17		-	
>S1 UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>Data Forwarding Information Request	O		9.3.2.5	Requesting forwarding info from the target gNB-CU-UP.	-	
>Cell Group Information	M		9.3.1.11		-	
>DL UP Parameters	O		UP Parameters 9.3.1.13		-	
>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".	-	
>Security Indication	O		9.3.1.23		YES	reject
>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.8 DRB To Modify List E-UTRAN

This IE contains DRB to modify related information used at Bearer Context Modification Request in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB To Modify Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>PDCP Configuration	O		9.3.1.38	
>E-UTRAN QoS	O		9.3.1.17	
>S1 UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1	
>Data Forwarding Information	O		9.3.2.6	Providing forwarding info to the source gNB-CU-UP.
>PDCP SN Status Request	O		ENUMERATED (requested, ...)	The gNB-CU-CP requests the gNB-CU-UP to provide the PDCP SN Status in the response message.
>PDCP SN Status Information	O		9.3.1.58	Providing SN Status information to the target gNB-CU-UP.
>DL UP Parameters	O		UP Parameters 9.3.1.13	
>Cell Group To Add	O		Cell Group Information 9.3.1.11	
>Cell Group To Modify	O		Cell Group Information 9.3.1.11	
>Cell Group To Remove	O		Cell Group Information 9.3.1.11	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.9 DRB To Remove List E-UTRAN

This IE contains DRB to remove related information used at Bearer Context Modification Request in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB To Remove Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.10 PDU Session Resource To Setup Modification List

This IE contains PDU session resource to setup related information used at Bearer Context Modification Request

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Setup Modification Item		<i>1..<maxnoofPDU Session Resource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>PDU Session Type	M		9.3.1.22		-	
>S-NSSAI	M		9.3.1.9		-	
>Security Indication	M		9.3.1.23		-	
>PDU Session Resource DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20	This IE shall be present when Non-GBR QoS Flows are setting up.	-	
>NG UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>PDU Session Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding info from the target gNB-CU-UP.	-	
>PDU Session Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "PDU Session".	-	
>DRB To Setup List		<i>1</i>			-	
>>DRB To Setup Item		<i>1..<maxnoofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>SDAP Configuration	M		9.3.1.39		-	
>>>PDCP Configuration	M		9.3.1.38		-	
>>>Cell Group	M		9.3.1.11		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Information						
>>>QoS Flows Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25		-	
>>>DRB Data forwarding information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding info from the target gNB-CU-UP.	-	
>>>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".	-	
>>>PDCP SN Status Information	O		9.3.1.58	Provides the PDCP SN Status at setup after Resume to the target gNB-CU-UP.	-	
>>>DRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the DRB QoS when more than one QoS Flow is mapped to the DRB	YES	ignore
>>>Ignore Mapping Rule Indication	O		ENUMERATED (True, ...)	Included if the QoS flow mapping rule for the DRB has not been decided by gNB-CU-CP.	YES	reject
>>>DAPS Request Information	O		9.3.1.91	This IE is not used in this version of the specification.	YES	ignore
>>>SDT Indicator Setup	O		ENUMERATED (true, ...)	Indicates that the DRB is for SDT.	YES	reject
>>>Special Triggering Purpose	O		ENUMERATED (indirect-data-forwarding, ...)		YES	ignore
>Network Instance	O		9.3.1.62		YES	ignore
>Common Network Instance	O		9.3.1.66		YES	ignore
>Redundant NG UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore
>Redundant Common Network Instance	O		Common Network Instance 9.3.1.66		YES	ignore
>Special Triggering Purpose	O		ENUMERATED (indirect-data-forwarding, ...)		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.11 PDU Session Resource To Modify List

This IE contains PDU session resource to modify related information used at Bearer Context Modification Request

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Modify Item		<i>1..<maxno ofPDUSes sionResource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>Security Indication	O		9.3.1.23	This IE is not used in this release.	-	
>PDU Session Resource DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20		-	
>NG UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	
>PDU Session Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding information from the target gNB-CU-UP.	-	
>PDU Session Data Forwarding Information	O		Data Forwarding Information 9.3.2.6	Providing forwarding information to the gNB-CU-UP.	-	
>PDU Session Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "PDU Session".	-	
>Network Instance	O		9.3.1.62	This IE is ignored if the <i>Common Network Instance</i> IE is included.	-	
>DRB To Setup List		<i>0..1</i>			-	
>>DRB To Setup Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>SDAP Configuration	M		9.3.1.39		-	
>>>PDCP Configuration	M		9.3.1.38		-	
>>>Cell Group Information	M		9.3.1.11		-	
>>>QoS Flow Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25		-	
>>>DRB Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding information from the target gNB-CU-UP.	-	
>>>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".	-	
>>>PDCP SN Status Information	O		9.3.1.58	Provides the PDCP SN Status at setup after Resume to the target gNB-CU-UP.	-	
>>>DRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the DRB QoS when more than one QoS Flow is mapped to the DRB	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>DAPS Request Information	O		9.3.1.91	This IE is not used in this version of the specification	YES	ignore
>>>Ignore Mapping Rule Indication	O		ENUMERATED (True, ...)	Included if the QoS flow mapping rule for the DRB has not been decided by gNB-CU-CP.	YES	reject
>>>QoS Flows Remapping	O		ENUMERATED (update, source configuration, ...)	This IE is not used in this version of the specification.	YES	reject
>>>SDT Indicator Setup	O		ENUMERATED (true, ...)	Indicates that the DRB is for SDT.	YES	reject
>>>Special Triggering Purpose	O		ENUMERATED (indirect-data-forwarding, ...)		YES	ignore
>DRB To Modify List		<i>0.. 1</i>			-	
>>DRB To Modify Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>SDAP Configuration	O		9.3.1.39		-	
>>>PDCP Configuration	O		9.3.1.38		-	
>>>DRB Data forwarding information	O		Data Forwarding Information 9.3.2.6	Providing forwarding information to the gNB-CU-UP.	-	
>>>PDCP SN Status Request	O		ENUMERATED (requested, ...)	The gNB-CU-CP requests the gNB-CU-UP to provide the PDCP SN Status in the response message.	-	
>>>PDCP SN Status Information	O		9.3.1.58	Provides the PDCP SN Status to the target gNB-CU-UP.	-	
>>>DL UP Parameters	O		UP Parameters 9.3.1.13		-	
>>>Cell Group To Add	O		Cell Group Information 9.3.1.11		-	
>>>Cell Group To Modify	O		Cell Group Information 9.3.1.11		-	
>>>Cell Group To Remove	O		Cell Group Information 9.3.1.11		-	
>>>Flow Mapping Information	O		QoS Flow QoS Parameters List 9.3.1.25	Overrides previous mapping information.	-	
>>>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to "DRB".	-	
>>>Old QoS Flow List - UL End Marker expected	O		QoS Flow List 9.3.1.12	Indicates that the source NG-RAN node has initiated QoS flow re-mapping and has not yet received	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				SDAP end markers, as described in TS 38.300 [4].		
>>>DRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the DRB QoS when more than one QoS Flow is mapped to the DRB	YES	ignore
>>>Early Forwarding COUNT Request	O		ENUMERATED (First DL count, DL discarding, ...)	Requests early data forwarding information from the source gNB-CU-UP	YES	reject
>>>Early Forwarding COUNT Information	O		9.3.1.92	Provides early data forwarding information to the target gNB-CU-UP.	YES	reject
>>>DAPS Request Information	O		9.3.1.91	Used to request intra-gNB-CU-UP DAPS HO	YES	ignore
>>>Early Data Forwarding Indicator	O		ENUMERATED (stop, ...)		YES	ignore
>>>SDT Indicator Modify	O		ENUMERATED (true, false, ...)	Indicates that the DRB is for SDT or not.	YES	reject
>>>PDCP COUNT Reset	O		ENUMERATED (True, ...)	Used for intra-gNB-CU-UP HO with full configuration	YES	reject
>DRB To Remove List		0.. 1			-	
>>DRB To Remove Item		1..<maxno ofDRBs>			-	
>>>DRB ID	M		9.3.1.16		-	
>S-NSSAI	O		9.3.1.9		YES	reject
>Common Network Instance	O		9.3.1.66		YES	ignore
>Redundant NG UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore
>Redundant Common Network Instance	O		Common Network Instance 9.3.1.66		YES	ignore
>Data Forwarding to E-UTRAN Information List		0.. 1		Contains a list of DL Data Forwarding tunnels and the associated QoS Flows to be forwarded on each tunnel	YES	ignore
>>Data Forwarding to E-UTRAN Information List Item		1..<maxno ofDataForwardingTunneltoE-UTRAN>			-	
>>>Data forwarding tunnel information	M		UP Transport Layer Information 9.3.2.1		-	
>>>QoS Flows to		1			-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
be forwarded List						
>>>>QoS Flows to be forwarded Item		1..<maxno ofQoSflows>			-	
>>>>QoS Flow Identifier	M		9.3.1.24		-	
>Security Indication Modify	O		Security Indication 9.3.1.23		YES	ignore
>Secondary PDU Session Data Forwarding Information	O		Data Forwarding Information 9.3.2.6	Providing secondary forwarding information to the source gNB-CU-UP in case of split PDU session.	YES	ignore
>User Plane Failure Indication	O		9.3.2.9		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.
maxnoofDataForwardingTunneltoE-UTRAN	Maximum no. of Data Forwarding Tunnels to E-UTRAN for a UE. Value is 256.
maxnoofQoSflows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.3.12 PDU Session Resource To Remove List

This IE contains PDU session resource to remove related information

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Remove Item		1..<maxno ofPDUSessionResource>			-	
>PDU Session ID	M		9.3.1.21		-	
>Cause	O		9.3.1.2		YES	ignore
>User Plane Error Indicator	O		ENUMERATED (GTP-U Error Indication Received, ...)		YES	ignore

Range bound	Explanation
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.13 DRB Setup Modification List E-UTRAN

This IE contains setup DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB Setup Modification Item E-UTRAN		1..<maxno ofDRBs>			-	
>DRB ID	M		9.3.1.16		-	
>S1 DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6	Provides forwarding information from the target gNB-CU-UP.	-	
>UL UP Parameters	M		UP Parameters 9.3.1.13		-	
>Security Result	O		9.3.1.52		YES	ignore
>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.14 DRB Failed Modification List E-UTRAN

This IE contains failed to setup DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Failed Modification Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.15 DRB Modified List E-UTRAN

This IE contains modified DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Modified Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>S1 DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1	
>PDCP SN Status Information	O		9.3.1.58	Provides the PDCP SN Status from the source gNB-CU-UP.
>UL UP Parameters	O		UP Parameters 9.3.1.13	Carries the UL UP parameters.

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.16 DRB Failed To Modify List E-UTRAN

This IE contains failed to modify DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Failed To Modify Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.17 PDU Session Resource Setup Modification List

This IE contains setup PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Setup Modification Item		<i>1..<maxnoofPDU SessionResource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>Security Result	O		9.3.1.52		-	
>NG DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	
>PDU Session Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6	Provides forwarding information from the target gNB-CU-UP.	-	
>DRB Setup List		<i>1</i>			-	
>>DRB Setup Item		<i>1..<maxnoofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>DRB Data forwarding information Response	O		Data Forwarding Information 9.3.2.6	Provides forwarding information from the target gNB-CU-UP.	-	
>>>UL UP Parameters	M		UP Parameters 9.3.1.13		-	
>>>Flow Setup List	M		QoS Flow List 9.3.1.12		-	
>>>Flow Failed List	O		9.3.1.45		-	
>DRB Failed List		<i>0.. 1</i>			-	
>>DRB Failed Item		<i>1..<maxnoofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.18 PDU Session Resource Failed Modification List

This IE contains failed to setup PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Failed Modification Item		<i>1..<maxnoofPDU Session Resource></i>		
>PDU Session ID	M		9.3.1.21	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofPDU Session Resource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.19 PDU Session Resource Modified List

This IE contains modified PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Modified Item		<i>1..<maxno ofPDU Session Resource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	
>Security Result	O		9.3.1.52		-	
>PDU Session Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6		-	
>DRB Setup List		<i>0.. 1</i>			-	
>>DRB Setup Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>DRB Data forwarding information Response	O		Data Forwarding Information 9.3.2.6		-	
>>>UL UP Parameters	M		UP Parameters 9.3.1.13		-	
>>>Flow Setup List	M		QoS Flow List 9.3.1.12		-	
>>>Flow Failed List	O		9.3.1.45		-	
>DRB Failed List		<i>0.. 1</i>			-	
>>DRB Failed Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>DRB Modified List		<i>0.. 1</i>			-	
>>DRB Modified Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>UL UP Parameters	O		UP Parameters 9.3.1.13	Carries the UL UP parameters.	-	
>>>PDCP SN Status Information	O		9.3.1.58	Provides PDCP SN Status to the target gNB-CU-UP.	-	
>>>Flow Setup List	O		QoS Flow List 9.3.1.12		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>Flow Failed List	O		9.3.1.45		-	
>>>Early Forwarding COUNT Information	O		9.3.1.92	Provides early data forwarding information from the source gNB-CU-UP.	-	
>>>Old QoS Flow List - UL End Marker expected	O		QoS Flow List 9.3.1.12	Indicates the QoS flow(s) for which the gNB-CU-UP has not yet received SDAP end markers after the gNB-CU-CP reconfigured those QoS flow(s) to another DRB.	YES	ignore
>DRB Failed To Modify List		0.. 1			-	
>>DRB Failed To Modify Item		1..<maxno ofDRBs>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.20 PDU Session Resource Failed To Modify List

This IE contains failed to modify PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Failed To Modify Item		1..<maxnoofPDUSessionResource>		
>PDU Session ID	M		9.3.1.21	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.21 DRB Required To Modify List E-UTRAN

This IE contains DRB to modify related information used at Bearer Context Modification Required in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Required To Modify Item E-UTRAN		1..<maxnoofDRBs>		
>DRB ID	M		9.3.1.16	
>S1 DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1	
>gNB-CU-UP Cell Group	O		9.3.1.34	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Related Configuration				
>Cause	O		9.3.1.2	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.22 DRB Required To Remove List E-UTRAN

This IE contains DRB to remove related information used at Bearer Context Modification Required in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Required To Remove Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.23 PDU Session Resource Required To Modify List

This IE contains PDU session resource to modify related information used at Bearer Context Modification Required

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Required To Modify Item		<i>1..<maxno ofPDU SessionResource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	
>DRB To Modify List		<i>0.. 1</i>			-	
>>DRB To Modify Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>gNB-CU-UP Cell Group Related Configuration	O		9.3.1.34		-	
>>>Flow To Remove	O		QoS Flow List 9.3.1.12		-	
>>>Cause	O		9.3.1.2		-	
>DRB To Remove List		<i>0.. 1</i>			-	
>>DRB To Remove Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

Range bound	Explanation
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.24 DRB Confirm Modified List E-UTRAN

This IE contains modified DRB related information at Bearer Context Modification Confirm in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Confirm Modified Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cell Group Information	O		9.3.1.11	Included if the gNB-CU-CP was unable to change cell group related information as requested in the <i>gNB-CU-UP Cell Group Related Configuration</i> IE (e.g., UL Configuration).

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.

9.3.3.25 PDU Session Resource Confirm Modified List

This IE contains modified PDU session resource related information used at Bearer Context Modification Confirm

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Modified Item		<i>1..<maxnoofPDU SessionResource></i>		
>PDU Session ID	M		9.3.1.21	
>DRB Modified List		<i>0.. 1</i>		
>>DRB Modified Item		<i>1..<maxnoofDRBs></i>		
>>>DRB ID	M		9.3.1.16	
>>>Cell Group Information	O		9.3.1.11	Included if the gNB-CU-CP was unable to change cell group related information as requested in the <i>gNB-CU-UP Cell Group Related Configuration</i> IE (e.g., UL Configuration).

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.26 BC Bearer Context To Setup

This IE contains MBS session resource related information used to request BC Bearer Context Setup.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
S-NSSAI	M		9.3.1.9	
BC Bearer Context NG-U TNL Info at 5GC	O		9.3.1.112	
BC MRB To Setup List	M		BC MRB Setup Configuration 9.3.1.114	
Requested Action for	O		9.3.1.115	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Available Shared NG-U Termination				

9.3.3.27 BC Bearer Context To Setup Response

This IE contains MBS session resource related information used to confirm BC Bearer Context Setup.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
BC Bearer Context NG-U TNL Info at NG-RAN	O		9.3.1.116		-	
BC MRB Setup Response List		1..<maxno ofMRBs>			-	
>MRB ID	M		9.3.1.16a		-	
>MBS QoS Flow Setup List	M		QoS Flow List 9.3.1.12		-	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45		-	
>BC Bearer Context F1-U TNL Info at CU	M		9.3.1.118	Indicates the F1-U TNL Info at CU if there is only one gNB-DU within the gNB-CU supporting the MBS service. This IE is ignored in case <i>F1-U TNL Info Added List</i> IE is present	-	
>F1-U TNL Info Added List		0..1			YES	ignore
>>F1-U TNL Info Added Item		1..<maxno ofDUs>			-	
>>>Broadcast F1-U Context ReferenceE1	M		9.3.1.139a		-	
>>>BC Bearer Context F1-U TNL Info at CU	M		9.3.1.118		-	
BC MRB Failed List		0..<maxno ofMRBs>			-	
>MRB ID	M		9.3.1.16a		-	
>Cause	M		9.3.1.2		-	
Available BC MRB Configuration	O		BC MRB Setup Configuration 9.3.1.114		-	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.
maxnoofDUs	Maximum no. of DUs in a RAN node. Value is 512.

9.3.3.28 BC Bearer Context To Modify

This IE contains MBS session resource related information used to request BC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
BC Bearer Context NG-U TNL Info at 5GC To Setup or Modify	O		BC Bearer Context NG-U TNL Info at 5GC		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			9.3.1.112			
BC MRB To Setup List	O		BC MRB Setup Configuration 9.3.1.114		-	
BC MRB To Modify List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>BC Bearer Context F1-U TNL Info at DU	O		9.3.1.119	Indicate the F1-U TNL Info at DU if there is only one gNB-DU within the gNB-CU supporting the MBS service. This IE is ignored in case <i>F1-U TNL Info to Add or Modify List</i> IE is present	-	
>MBS PDCP Configuration	O		PDCP Configuration 9.3.1.38		-	
>MBS QoS Flows Information To Be Setup	O		QoS Flow QoS Parameters List 9.3.1.25		-	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.	-	
>F1-U TNL Info to Add or Modify List		<i>0..1</i>			YES	ignore
>>F1-U TNL Info to Add or Modify Item		<i>1..<maxno ofDUs></i>			-	
>>>Broadcast F1-U Context ReferenceE1	M		9.3.1.139a		-	
>>>BC Bearer Context F1-U TNL Info at DU	O		9.3.1.119		-	
>F1-U TNL Info to Release List		<i>0..1</i>			YES	ignore
>>F1-U TNL Info to Release Item		<i>1..<maxno ofDUs></i>			-	
>>>Broadcast F1-U Context ReferenceE1	M		9.3.1.139a		-	
BC MRB To Remove List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
BC Bearer Context NG-U TNL Info at NG-RAN Request	O		9.3.1.147		YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.29 BC Bearer Context To Modify Response

This IE contains MBS session resource related information used to confirm a BC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
BC Bearer Context NG-U TNL Info at NG-RAN	O		9.3.1.116		-	
BC MRB Setup or Modify Response List		1..<maxno ofMRBs>			-	
>MRB ID	M		9.3.1.16a		-	
>MBS QoS Flow Setup List	O		QoS Flow List 9.3.1.12		-	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45		-	
>BC Bearer Context F1-U TNL Info at CU	O		9.3.1.118	Indicates the F1-U TNL Info at CU if there is only one gNB-DU within the gNB-CU supporting the MBS service. This IE is ignored in case the <i>F1-U TNL Info Added or Modified List</i> IE is present	-	
>F1-U TNL Info Added or Modified List		0..1			YES	ignore
>>F1-U TNL Info Added or Modified Item		1..<maxno ofDUs>			-	
>>>Broadcast F1-U Context ReferenceE1	M		9.3.1.139a		-	
>>>BC Bearer Context F1-U TNL Info at CU	O		9.3.1.118		-	
BC MRB Failed List		0..<maxno ofMRBs>			-	
>MRB ID	M		9.3.1.16a		-	
>Cause	M		9.3.1.2		-	
Available BC MRB Configuration	O		BC MRB Setup Configuration 9.3.1.114	In case the shared MBS NG-U termination had a different MRB Configuration applied.	-	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.
maxnoofDUs	Maximum no. of DUs in a RAN node. Value is 512.

9.3.3.30 BC Bearer Context To Modify Required

This IE contains MBS session resource related information used to request BC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BC MRB To Remove List Required		0..<maxnoofMRBs>		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.31 BC Bearer Context To Modify Confirm

This IE contains MBS session resource related information used to confirm a BC Bearer Context Modification.

NOTE: In the current version of this specification, this IE does not contain any information.

9.3.3.32 MC Bearer Context To Setup

This IE contains MBS session resource related information used to request MC Bearer Context Setup.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Criticality
S-NSSAI	M		9.3.1.9		-	
MC MRB To Setup List	O		MC MRB Setup Configuration 9.3.1.120		-	
Requested Action for Available Shared NG-U Termination	O		9.3.1.115		-	
MBS Session Associated Information Non-Support-to-Support	O		9.3.1.140		YES	ignore
MBS Area Session ID	O		9.3.1.111		YES	ignore
MC Bearer Context Inactivity Timer	O		Inactivity Timer 9.3.1.54		YES	ignore
MC Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, ...)		YES	ignore

9.3.3.33 MC Bearer Context To Setup Response

This IE contains MBS session resource related information used to confirm MC Bearer Context Setup.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Bearer Context NG-U TNL Info at NG-RAN	O		9.3.1.121	
MC MRB Setup Response List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MBS QoS Flow Setup List	M		QoS Flow List 9.3.1.12	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45	
>MBS PDCP COUNT	O		9.3.1.35a	
MC MRB Failed List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>Cause	M		9.3.1.2	
Available MC MRB Configuration	O		MC MRB Setup Configuration 9.3.1.120	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.34 MC Bearer Context To Modify

This IE contains MBS session resource related information used to request a modification of a multicast MC Bearer Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MC Bearer Context NG-	O		9.3.1.122		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
U TNL Info at 5GC						
MC Bearer Context NG-U TNL Info at NG-RAN Request	O		9.3.1.123	To request NG-U TNL information from the gNB-CU-UP, if not yet available at gNB-CU-CP	-	
MBS Multicast F1-U Context Descriptor	C-ifSetupOr Remove		9.3.1.125		-	
Requested Action for Available Shared NG-U Termination	O		9.3.1.115		-	
MC MRB To Setup or Modify List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>MC Bearer Context F1-U TNL Info at DU	O		9.3.1.124		-	
>MBS PDCP Configuration	O		PDCP Configuration 9.3.1.38		-	
>MBS QoS Flows Information To Be Setup	O		QoS Flow QoS Parameters List 9.3.1.25		-	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.	-	
>MBS PDCP COUNT Request	O		ENUMERATED (true, ...)	Indicates that the MBS PDCP COUNT is requested.	-	
MC MRB To Remove List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
MC Forwarding Resource Request	O		9.3.1.134	Requests MC Forwarding Resource related information for the peer node	YES	ignore
MC Forwarding Resource Indication	O		9.3.1.135	Provides MC Forwarding Resource related information from the peer node	YES	ignore
MC Forwarding Resource Release	O		9.3.1.137	Requests the release of the MC Forwarding Resource	YES	ignore
MBS Session Associated Information Non-Support-to-Support	O		9.3.1.140		YES	ignore
MC Bearer Context Inactivity Timer	O		Inactivity Timer 9.3.1.54		YES	ignore
MC Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, ...)		YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

Condition	Explanation
ifSetupOrRemove	This IE shall be present if either the <i>MC MRB To Setup or Modify List</i> IE or the <i>MC MRB To Remove List</i> IE or both IEs are included.

9.3.3.35 MC Bearer Context To Modify Response

This IE contains MBS session resource related information used to confirm a MC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MC Bearer Context NG-U TNL Info at NG-RAN Modify Response	O		9.3.1.127		-	
MBS Multicast F1-U Context Descriptor	C-ifSetupOrFailed		9.3.1.125		-	
MC MRB Setup or Modify Response List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>MBS QoS Flow Setup List	O		QoS Flow List 9.3.1.12		-	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45		-	
>MC Bearer Context F1-U TNL Info at CU	O		UP Transport Layer Information 9.3.2.1		-	
>MBS PDCP COUNT	O		9.3.1.35a		-	
MC MRB Failed List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>Cause	M		9.3.1.2		-	
Available MC MRB Configuration	O		MC MRB Setup Configuration 9.3.1.120	In case the shared MBS NG-U termination had a different MRB Configuration applied.	-	
MC Forwarding Resource Response	O		9.3.1.136	Provides MC Forwarding Resource related information destined to the peer node	YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

Condition	Explanation
ifSetupOrFailed	This IE shall be present if either the <i>MC MRB Setup or Modify Response List</i> IE or the <i>MC MRB Failed List</i> IE or both IEs are included.

9.3.3.36 MC Bearer Context To Modify Required

This IE contains MBS session resource related information used to request MC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MBS Multicast F1-U Context Descriptor	C-ifRemoved		9.3.1.125		-	
MC MRB To Remove		<i>0..<maxno</i>			-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
List Required		<i>ofMRBs></i>				
>MRB ID	M		9.3.1.16a		-	
MC MRB To Modify List Required		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>MBS PDCP COUNT	O		9.3.1.35a		-	
MC Forwarding Resource Release Indication	O		9.3.1.138	Indicates the release of an MC Forwarding Resource	YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

Condition	Explanation
ifRemoved	This IE shall be present if either the <i>MC MRB To Remove List Required</i> IE is included.

9.3.3.37 MC Bearer Context To Modify Confirm

This IE contains MBS session resource related information used to confirm a MC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Multicast F1-U Context Descriptor	O		9.3.1.125	
MC MRB Modify List Required		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.38 Associated Session ID

This IE is used to associate MBS Session IDs providing identical user data.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Associated Session ID	M		OCTET STRING	Coded as <i>AssociatedSessionId</i> defined in TS 29.571 [35]. The gNB-CU-UP does not interpret the content of the Associated Session ID IE.

9.3.3.39 MBS Service Area

This IE contains the MBS service area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Service Area Information List	M			
>MBS Service Area Information Item		<i>1..maxnoofMBSServiceAreaInformation</i>		
>>MBS Area Session ID	M		9.3.1.111	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>>MBS Service Area Information	M		9.3.3.40	

Range bound	Explanation
maxnoofMBSServiceAreaInformation	Maximum no. of MBS Service Area Information elements in the MBS Service Area Information Location Dependent List IE. Value is 256

9.3.3.40 MBS Service Area information

This IE contains MBS service area information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Service Area Cell List		<i>0..<maxnoofCellsforMBS></i>		
>NR CGI	M		9.3.1.14	
MBS Service Area TAI List		<i>0..<maxnoofTAIforMBS></i>		
>PLMN-Identity	M		9.3.1.7	
>5GS TAC	M		9.3.3.41	

Range bound	Explanation
maxnoofCellsforMBS	Maximum no. of cells allowed within one MBS Service Area. Value is 512.
maxnoofTAIforMBS	Maximum no. of TAIs allowed within one MBS Service Area. Value is 512.

9.3.3.41 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))	

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

9.4.1 General

E1AP ASN.1 definition conforms to ITU-T Rec. X.691 [7], ITU-T Rec. X.680 [8] and ITU-T Rec. X.681 [9].

The ASN.1 definition specifies the structure and content of E1AP messages. E1AP 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 E1AP 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 E1AP 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
--
-- *****

ElAP-PDU-Descriptions {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-PDU-Descriptions (0) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    Criticality,
    ProcedureCode

FROM ElAP-CommonDataTypes
    Reset,
    ResetAcknowledge,
    ErrorIndication,
    GNB-CU-UP-ElSetupRequest,
    GNB-CU-UP-ElSetupResponse,
    GNB-CU-UP-ElSetupFailure,
    GNB-CU-CP-ElSetupRequest,
    GNB-CU-CP-ElSetupResponse,
    GNB-CU-CP-ElSetupFailure,
    GNB-CU-UP-ConfigurationUpdate,
    GNB-CU-UP-ConfigurationUpdateAcknowledge,
    GNB-CU-UP-ConfigurationUpdateFailure,
    GNB-CU-CP-ConfigurationUpdate,
    GNB-CU-CP-ConfigurationUpdateAcknowledge,
    GNB-CU-CP-ConfigurationUpdateFailure,
    BCBearerContextSetupRequest,
    BCBearerContextSetupResponse,
    BCBearerContextSetupFailure,
    BCBearerContextModificationRequest,
    BCBearerContextModificationResponse,
    BCBearerContextModificationFailure,
    BCBearerContextModificationRequired,
    BCBearerContextModificationConfirm,
```

BCBearerContextReleaseCommand,
BCBearerContextReleaseComplete,
BCBearerContextReleaseRequest,
BearerContextSetupRequest,
BearerContextSetupResponse,
BearerContextSetupFailure,
BearerContextModificationRequest,
BearerContextModificationResponse,
BearerContextModificationFailure,
BearerContextModificationRequired,
BearerContextModificationConfirm,
BearerContextReleaseCommand,
BearerContextReleaseComplete,
BearerContextReleaseRequest,
BearerContextInactivityNotification,
DLDataNotification,
ULDataNotification,
DataUsageReport,
E1ReleaseRequest,
E1ReleaseResponse,
GNB-CU-UP-CounterCheckRequest,
GNB-CU-UP-StatusIndication,
MCBearerContextSetupRequest,
MCBearerContextSetupResponse,
MCBearerContextSetupFailure,
MCBearerContextModificationRequest,
MCBearerContextModificationResponse,
MCBearerContextModificationFailure,
MCBearerContextModificationRequired,
MCBearerContextModificationConfirm,
MCBearerNotification,
MCBearerContextReleaseCommand,
MCBearerContextReleaseComplete,
MCBearerContextReleaseRequest,
MRDC-DataUsageReport,
DeactivateTrace,
TraceStart,
PrivateMessage,
ResourceStatusRequest,
ResourceStatusResponse,
ResourceStatusFailure,
ResourceStatusUpdate,
IAB-UPTNLAddressUpdate,
IAB-UPTNLAddressUpdateAcknowledge,
IAB-UPTNLAddressUpdateFailure,
CellTrafficTrace,
EarlyForwardingSNTransfer,
GNB-CU-CPMeasurementResultsInformation,
IABPSKNotification

FROM E1AP-PDU-Contents
id-reset,
id-errorIndication,
id-gNB-CU-UP-E1Setup,

```

id-gNB-CU-CP-ElSetup,
id-gNB-CU-UP-ConfigurationUpdate,
id-gNB-CU-CP-ConfigurationUpdate,
id-elRelease,
id-bearerContextSetup,
id-bearerContextModification,
id-bearerContextModificationRequired,
id-bearerContextRelease,
id-bearerContextReleaseRequest,
id-bearerContextInactivityNotification,
id-dLDataNotification,
id-uLDataNotification,
id-dataUsageReport,
id-gNB-CU-UP-CounterCheck,
id-gNB-CU-UP-StatusIndication,
id-mRDC-DataUsageReport,
id-DeactivateTrace,
id-TraceStart,
id-privateMessage,
id-resourceStatusReportingInitiation,
id-resourceStatusReporting,
id-iAB-UPTNLAddressUpdate,
id-CellTrafficTrace,
id-earlyForwardingSNTransfer,
id-gNB-CU-CPMeasurementResultsInformation,
id-iABPSKNotification,
id-BCBearerContextSetup,
id-BCBearerContextModification,
id-BCBearerContextModificationRequired,
id-BCBearerContextRelease,
id-BCBearerContextReleaseRequest,
id-MCBearerContextSetup,
id-MCBearerContextModification,
id-MCBearerContextModificationRequired,
id-MCBearerNotification,
id-MCBearerContextRelease,
id-MCBearerContextReleaseRequest

```

FROM ElAP-Constants;

```

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

```

```

ElAP-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
--
-- *****

ElAP-PDU ::= CHOICE {
  initiatingMessage          InitiatingMessage,
  successfulOutcome          SuccessfulOutcome,
  unsuccessfulOutcome        UnsuccessfulOutcome,
  ...
}

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

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

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

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

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

ElAP-ELEMENTARY-PROCEDURES-CLASS-1 ElAP-ELEMENTARY-PROCEDURE ::= {
  reset                                     |

```

```

gNB-CU-UP-E1Setup
gNB-CU-CP-E1Setup
gNB-CU-UP-ConfigurationUpdate
gNB-CU-CP-ConfigurationUpdate
e1Release
bearerContextSetup
bearerContextModification
bearerContextModificationRequired
bearerContextRelease
resourceStatusReportingInitiation
iAB-UPTNLAddressUpdate
bBearerContextSetup
bBearerContextModification
bBearerContextModificationRequired
bBearerContextRelease
mBearerContextSetup
mBearerContextModification
mBearerContextModificationRequired
mBearerContextRelease
...
}

E1AP-ELEMENTARY-PROCEDURES-CLASS-2 E1AP-ELEMENTARY-PROCEDURE ::= {
  errorIndication
  bearerContextReleaseRequest
  bearerContextInactivityNotification
  dLDataNotification
  uLDataNotification
  dataUsageReport
  gNB-CU-UP-CounterCheck
  gNB-CU-UP-StatusIndication
  mRDC-DataUsageReport
  deactivateTrace
  traceStart
  privateMessage
  cellTrafficTrace
  resourceStatusReporting
  earlyForwardingSNTransfer
  gNB-CU-CPMeasurementResultsInformation
  iABPSKNotification
  bBearerContextReleaseRequest
  mBearerContextReleaseRequest
  mBearerNotification
  ...
}

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

reset E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      Reset

```

```
    SUCCESSFUL OUTCOME      ResetAcknowledge
    PROCEDURE CODE          id-reset
    CRITICALITY              reject
}

errorIndication E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ErrorIndication
    PROCEDURE CODE          id-errorIndication
    CRITICALITY              ignore
}

gNB-CU-UP-E1Setup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-UP-E1SetupRequest
    SUCCESSFUL OUTCOME      GNB-CU-UP-E1SetupResponse
    UNSUCCESSFUL OUTCOME    GNB-CU-UP-E1SetupFailure
    PROCEDURE CODE          id-gNB-CU-UP-E1Setup
    CRITICALITY              reject
}

gNB-CU-CP-E1Setup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-CP-E1SetupRequest
    SUCCESSFUL OUTCOME      GNB-CU-CP-E1SetupResponse
    UNSUCCESSFUL OUTCOME    GNB-CU-CP-E1SetupFailure
    PROCEDURE CODE          id-gNB-CU-CP-E1Setup
    CRITICALITY              reject
}

gNB-CU-UP-ConfigurationUpdate E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-UP-ConfigurationUpdate
    SUCCESSFUL OUTCOME      GNB-CU-UP-ConfigurationUpdateAcknowledge
    UNSUCCESSFUL OUTCOME    GNB-CU-UP-ConfigurationUpdateFailure
    PROCEDURE CODE          id-gNB-CU-UP-ConfigurationUpdate
    CRITICALITY              reject
}

gNB-CU-CP-ConfigurationUpdate E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-CP-ConfigurationUpdate
    SUCCESSFUL OUTCOME      GNB-CU-CP-ConfigurationUpdateAcknowledge
    UNSUCCESSFUL OUTCOME    GNB-CU-CP-ConfigurationUpdateFailure
    PROCEDURE CODE          id-gNB-CU-CP-ConfigurationUpdate
    CRITICALITY              reject
}

e1Release E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      E1ReleaseRequest
    SUCCESSFUL OUTCOME      E1ReleaseResponse
    PROCEDURE CODE          id-e1Release
    CRITICALITY              reject
}

bearerContextSetup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextSetupRequest
    SUCCESSFUL OUTCOME      BearerContextSetupResponse
    UNSUCCESSFUL OUTCOME    BearerContextSetupFailure
}
```

```
    PROCEDURE CODE      id-bearerContextSetup
    CRITICALITY         reject
}

bearerContextModification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  BearerContextModificationRequest
    SUCCESSFUL OUTCOME  BearerContextModificationResponse
    UNSUCCESSFUL OUTCOME BearerContextModificationFailure
    PROCEDURE CODE      id-bearerContextModification
    CRITICALITY         reject
}

bearerContextModificationRequired E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  BearerContextModificationRequired
    SUCCESSFUL OUTCOME  BearerContextModificationConfirm
    PROCEDURE CODE      id-bearerContextModificationRequired
    CRITICALITY         reject
}

bearerContextRelease E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  BearerContextReleaseCommand
    SUCCESSFUL OUTCOME  BearerContextReleaseComplete
    PROCEDURE CODE      id-bearerContextRelease
    CRITICALITY         reject
}

bearerContextReleaseRequest E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  BearerContextReleaseRequest
    PROCEDURE CODE      id-bearerContextReleaseRequest
    CRITICALITY         ignore
}

bearerContextInactivityNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  BearerContextInactivityNotification
    PROCEDURE CODE      id-bearerContextInactivityNotification
    CRITICALITY         ignore
}

dLDataNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  DLDataNotification
    PROCEDURE CODE      id-dLDataNotification
    CRITICALITY         ignore
}

uLDataNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  ULDataNotification
    PROCEDURE CODE      id-uLDataNotification
    CRITICALITY         ignore
}

dataUsageReport E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  DataUsageReport
    PROCEDURE CODE      id-dataUsageReport
    CRITICALITY         ignore
}
```



```
}  
  
gNB-CU-UP-CounterCheck ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      GNB-CU-UP-CounterCheckRequest  
    PROCEDURE CODE          id-gNB-CU-UP-CounterCheck  
    CRITICALITY              ignore  
}  
  
gNB-CU-UP-StatusIndication ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      GNB-CU-UP-StatusIndication  
    PROCEDURE CODE          id-gNB-CU-UP-StatusIndication  
    CRITICALITY              ignore  
}  
  
privateMessage ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      PrivateMessage  
    PROCEDURE CODE          id-privateMessage  
    CRITICALITY              ignore  
}  
  
gNB-CU-CPMeasurementResultsInformation ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      GNB-CU-CPMeasurementResultsInformation  
    PROCEDURE CODE          id-gNB-CU-CPMeasurementResultsInformation  
    CRITICALITY              ignore  
}  
  
mRDC-DataUsageReport      ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      MRDC-DataUsageReport  
    PROCEDURE CODE          id-mRDC-DataUsageReport  
    CRITICALITY              ignore  
}  
  
deactivateTrace ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      DeactivateTrace  
    PROCEDURE CODE          id-DeactivateTrace  
    CRITICALITY              ignore  
}  
  
traceStart ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      TraceStart  
    PROCEDURE CODE          id-TraceStart  
    CRITICALITY              ignore  
}  
  
resourceStatusReportingInitiation ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      ResourceStatusRequest  
    SUCCESSFUL OUTCOME      ResourceStatusResponse  
    UNSUCCESSFUL OUTCOME    ResourceStatusFailure  
    PROCEDURE CODE          id-resourceStatusReportingInitiation  
    CRITICALITY              reject  
}  
  
resourceStatusReporting ElAP-ELEMENTARY-PROCEDURE ::= {  
    INITIATING MESSAGE      ResourceStatusUpdate
```

```
    PROCEDURE CODE          id-resourceStatusReporting
    CRITICALITY             ignore
}

iAB-UPTNLAddressUpdate ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      IAB-UPTNLAddressUpdate
    SUCCESSFUL OUTCOME      IAB-UPTNLAddressUpdateAcknowledge
    UNSUCCESSFUL OUTCOME    IAB-UPTNLAddressUpdateFailure
    PROCEDURE CODE          id-iAB-UPTNLAddressUpdate
    CRITICALITY             reject
}

cellTrafficTrace ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      CellTrafficTrace
    PROCEDURE CODE          id-CellTrafficTrace
    CRITICALITY             ignore
}

earlyForwardingSNTransfer ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      EarlyForwardingSNTransfer
    PROCEDURE CODE          id-earlyForwardingSNTransfer
    CRITICALITY             ignore
}

iABPSKNotification ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      IABPSKNotification
    PROCEDURE CODE          id-iABPSKNotification
    CRITICALITY             reject
}

bCBearerContextSetup ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BCBearerContextSetupRequest
    SUCCESSFUL OUTCOME      BCBearerContextSetupResponse
    UNSUCCESSFUL OUTCOME    BCBearerContextSetupFailure
    PROCEDURE CODE          id-BCBearerContextSetup
    CRITICALITY             reject
}

bCBearerContextModification ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BCBearerContextModificationRequest
    SUCCESSFUL OUTCOME      BCBearerContextModificationResponse
    UNSUCCESSFUL OUTCOME    BCBearerContextModificationFailure
    PROCEDURE CODE          id-BCBearerContextModification
    CRITICALITY             reject
}

bCBearerContextModificationRequired ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BCBearerContextModificationRequired
    SUCCESSFUL OUTCOME      BCBearerContextModificationConfirm
    PROCEDURE CODE          id-BCBearerContextModificationRequired
    CRITICALITY             reject
}

bCBearerContextRelease ElAP-ELEMENTARY-PROCEDURE ::= {
```

```
INITIATING MESSAGE      BCBearerContextReleaseCommand
SUCCESSFUL OUTCOME      BCBearerContextReleaseComplete
PROCEDURE CODE          id-BCBearerContextRelease
CRITICALITY             reject
}

BCBearerContextReleaseRequest E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      BCBearerContextReleaseRequest
  PROCEDURE CODE          id-BCBearerContextReleaseRequest
  CRITICALITY             reject
}

MCBearerContextSetup E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextSetupRequest
  SUCCESSFUL OUTCOME      MCBearerContextSetupResponse
  UNSUCCESSFUL OUTCOME   MCBearerContextSetupFailure
  PROCEDURE CODE          id-MCBearerContextSetup
  CRITICALITY             reject
}

MCBearerContextModification E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextModificationRequest
  SUCCESSFUL OUTCOME      MCBearerContextModificationResponse
  UNSUCCESSFUL OUTCOME   MCBearerContextModificationFailure
  PROCEDURE CODE          id-MCBearerContextModification
  CRITICALITY             reject
}

MCBearerContextModificationRequired E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextModificationRequired
  SUCCESSFUL OUTCOME      MCBearerContextModificationConfirm
  PROCEDURE CODE          id-MCBearerContextModificationRequired
  CRITICALITY             reject
}

MCBearerNotification E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerNotification
  PROCEDURE CODE          id-MCBearerNotification
  CRITICALITY             reject
}

MCBearerContextRelease E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextReleaseCommand
  SUCCESSFUL OUTCOME      MCBearerContextReleaseComplete
  PROCEDURE CODE          id-MCBearerContextRelease
  CRITICALITY             reject
}

MCBearerContextReleaseRequest E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextReleaseRequest
  PROCEDURE CODE          id-MCBearerContextReleaseRequest
  CRITICALITY             reject
}
```

```
END
-- ASN1STOP
```

9.4.4 PDU Definitions

```
-- ASN1START
-- *****
--
-- PDU definitions for ELAP
--
-- *****

ElAP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS

    AssociatedSessionID,
    Cause,
    CriticalityDiagnostics,
    GNB-CU-CP-MBS-ElAP-ID,
    GNB-CU-UP-MBS-ElAP-ID,
    GNB-CU-CP-UE-ElAP-ID,
    GNB-CU-UP-UE-ElAP-ID,
    UE-associatedLogicalE1-ConnectionItem,
    GNB-CU-UP-ID,
    GNB-CU-UP-Name,
    Extended-GNB-CU-UP-Name,
    GNB-CU-CP-Name,
    Extended-GNB-CU-CP-Name,
    CNSupport,
    PLMN-Identity,
    Slice-Support-List,
    NR-CGI-Support-List,
    QoS-Parameters-Support-List,
    SecurityInformation,
    BitRate,
    BearerContextStatusChange,
    DRB-To-Setup-List-EUTRAN,
    DRB-Setup-List-EUTRAN,
    DRB-Failed-List-EUTRAN,
    DRB-To-Modify-List-EUTRAN,
```

DRB-Measurement-Results-Information-List,
DRB-Modified-List-EUTRAN,
DRB-Failed-To-Modify-List-EUTRAN,
DRB-To-Remove-List-EUTRAN,
DRB-Required-To-Remove-List-EUTRAN,
DRB-Required-To-Modify-List-EUTRAN,
DRB-Confirm-Modified-List-EUTRAN,
DRB-To-Setup-Mod-List-EUTRAN,
DRB-Setup-Mod-List-EUTRAN,
DRB-Failed-Mod-List-EUTRAN,
PDU-Session-Resource-To-Setup-List,
PDU-Session-Resource-Setup-List,
PDU-Session-Resource-Failed-List,
PDU-Session-Resource-To-Modify-List,
PDU-Session-Resource-Modified-List,
PDU-Session-Resource-Failed-To-Modify-List,
PDU-Session-Resource-To-Remove-List,
PDU-Session-Resource-Required-To-Modify-List,
PDU-Session-Resource-Confirm-Modified-List,
PDU-Session-Resource-To-Setup-Mod-List,
PDU-Session-Resource-Setup-Mod-List,
PDU-Session-Resource-Failed-Mod-List,
PDU-Session-To-Notify-List,
DRB-Status-Item,
DRB-Activity-Item,
Data-Usage-Report-List,
TimeToWait,
ActivityNotificationLevel,
ActivityInformation,
New-UL-TNL-Information-Required,
GNB-CU-CP-TNLA-Setup-Item,
GNB-CU-CP-TNLA-Failed-To-Setup-Item,
GNB-CU-CP-TNLA-To-Add-Item,
GNB-CU-CP-TNLA-To-Remove-Item,
GNB-CU-CP-TNLA-To-Update-Item,
GNB-CU-UP-TNLA-To-Remove-Item,
TransactionID,
Inactivity-Timer,
DRBs-Subject-To-Counter-Check-List-EUTRAN,
DRBs-Subject-To-Counter-Check-List-NG-RAN,
PPI,
GNB-CU-UP-Capacity,
GNB-CU-UP-OverloadInformation,
DataDiscardRequired,
PDU-Session-Resource-Data-Usage-List,
RANUEID,
GNB-DU-ID,
TraceID,
TraceActivation,
SubscriberProfileIDforRFP,
AdditionalRRMPriorityIndex,
RetainabilityMeasurementsInfo,
Transport-Layer-Address-Info,
HW-CapacityIndicator,

RegistrationRequest,
ReportCharacteristics,
ReportingPeriodicity,
TNL-AvailableCapacityIndicator,
DLUPTNLAddressToUpdateItem,
ULUPTNLAddressToUpdateItem,
NPNContextInfo,
NPNSupportInfo,
MDTPLMNList,
PrivacyIndicator,
URIaddress,
DRBs-Subject-To-Early-Forwarding-List,
CHOInitiation,
ExtendedSliceSupportList,
TransportLayerAddress,
AdditionalHandoverInfo,
Extended-NR-CGI-Support-List,
DirectForwardingPathAvailability,
IAB-Donor-CU-UPPSKInfo-Item,
ECGI-Support-List,
MDTPollutedMeasurementIndicator,
UESliceMaximumBitRateList,
SCGActivationStatus,
GlobalMBSSessionID,
BCBearerContextToSetup,
BCBearerContextToSetupResponse,
BCBearerContextToModify,
BCBearerContextToModifyResponse,
BCBearerContextToModifyRequired,
BCBearerContextToModifyConfirm,
MCBearerContextToSetup,
MCBearerContextToSetupResponse,
MCBearerContextToModify,
MCBearerContextToModifyResponse,
MCBearerContextToModifyRequired,
MCBearerContextToModifyConfirm,
MBSMulticastFlUContextDescriptor,
MBS-ServiceArea,
GNB-CU-UP-MBS-Support-Info,
SDTContinueROHC,
MDTPLMNModificationList,
InactivityInformationRequest,
UEInactivityInformation,
MBSSessionResourceNotification,
MT-SDT-Information,
MT-SDT-Information-Request,
SDT-data-size-threshold,
SDT-data-size-threshold-Crossed

FROM E1AP-IEs

PrivateIE-Container{ },

```
ProtocolExtensionContainer{}  
ProtocolIE-Container{}  
ProtocolIE-ContainerList{}  
ProtocolIE-SingleContainer{}  
E1AP-PRIVATE-IES  
E1AP-PROTOCOL-EXTENSION  
E1AP-PROTOCOL-IES
```

FROM E1AP-Containers

```
id-AssociatedSessionID,  
id-Cause,  
id-CriticalityDiagnostics,  
id-gNB-CU-CP-UE-E1AP-ID,  
id-gNB-CU-UP-UE-E1AP-ID,  
id-ResetType,  
id-UE-associatedLogicalE1-ConnectionItem,  
id-UE-associatedLogicalE1-ConnectionListResAck,  
id-gNB-CU-UP-ID,  
id-gNB-CU-UP-Name,  
id-Extended-gNB-CU-UP-Name,  
id-gNB-CU-CP-Name,  
id-Extended-gNB-CU-CP-Name,  
id-CNSupport,  
id-SupportedPLMNs,  
id-NPNSupportInfo,  
id-NPNContextInfo,  
id-SecurityInformation,  
id-UEDLAggregateMaximumBitRate,  
id-BearerContextStatusChange,  
id-System-BearerContextSetupRequest,  
id-System-BearerContextSetupResponse,  
id-System-BearerContextModificationRequest,  
id-System-BearerContextModificationResponse,  
id-System-BearerContextModificationConfirm,  
id-System-BearerContextModificationRequired,  
id-DRB-Status-List,  
id-Data-Usage-Report-List,  
id-TimeToWait,  
id-ActivityNotificationLevel,  
id-ActivityInformation,  
id-New-UL-TNL-Information-Required,  
id-gNB-CU-CP-TNLA-Setup-List,  
id-gNB-CU-CP-TNLA-Failed-To-Setup-List,  
id-gNB-CU-CP-TNLA-To-Add-List,  
id-gNB-CU-CP-TNLA-To-Remove-List,  
id-gNB-CU-CP-TNLA-To-Update-List,  
id-gNB-CU-UP-TNLA-To-Remove-List,  
id-DRB-To-Setup-List-EUTRAN,  
id-DRB-To-Modify-List-EUTRAN,  
id-DRB-To-Remove-List-EUTRAN,  
id-DRB-Required-To-Modify-List-EUTRAN,  
id-DRB-Required-To-Remove-List-EUTRAN,
```

id-DRB-Setup-List-EUTRAN,
id-DRB-Failed-List-EUTRAN,
id-DRB-Measurement-Results-Information-List,
id-DRB-Modified-List-EUTRAN,
id-DRB-Failed-To-Modify-List-EUTRAN,
id-DRB-Confirm-Modified-List-EUTRAN,
id-DRB-To-Setup-Mod-List-EUTRAN,
id-DRB-Setup-Mod-List-EUTRAN,
id-DRB-Failed-Mod-List-EUTRAN,
id-PDU-Session-Resource-To-Setup-List,
id-PDU-Session-Resource-To-Modify-List,
id-PDU-Session-Resource-To-Remove-List,
id-PDU-Session-Resource-Required-To-Modify-List,
id-PDU-Session-Resource-Setup-List,
id-PDU-Session-Resource-Failed-List,
id-PDU-Session-Resource-Modified-List,
id-PDU-Session-Resource-Failed-To-Modify-List,
id-PDU-Session-Resource-Confirm-Modified-List,
id-PDU-Session-Resource-Setup-Mod-List,
id-PDU-Session-Resource-Failed-Mod-List,
id-PDU-Session-Resource-To-Setup-Mod-List,
id-PDU-Session-To-Notify-List,
id-TransactionID,
id-Serving-PLMN,
id-UE-Inactivity-Timer,
id-System-GNB-CU-UP-CounterCheckRequest,
id-DRBs-Subject-To-Counter-Check-List-EUTRAN,
id-DRBs-Subject-To-Counter-Check-List-NG-RAN,
id-PPI,
id-gNB-CU-UP-Capacity,
id-gNB-CU-UP-OverloadInformation,
id-UEDLMaximumIntegrityProtectedDataRate,
id-DataDiscardRequired,
id-PDU-Session-Resource-Data-Usage-List,
id-RANUEID,
id-GNB-DU-ID,
id-TraceID,
id-TraceActivation,
id-SubscriberProfileIDforRFP,
id-AdditionalRRMPriorityIndex,
id-RetainabilityMeasurementsInfo,
id-Transport-Layer-Address-Info,
id-gNB-CU-CP-Measurement-ID,
id-gNB-CU-UP-Measurement-ID,
id-RegistrationRequest,
id-ReportCharacteristics,
id-ReportingPeriodicity,
id-TNL-AvailableCapacityIndicator,
id-HW-CapacityIndicator,
id-DLUPTNLAddressToUpdateList,
id-ULUPTNLAddressToUpdateList,
id-ManagementBasedMDTPLMNList,
id-TraceCollectionEntityIPAddress,
id-PrivacyIndicator,


```

id-URIAddress,
id-DRBs-Subject-To-Early-Forwarding-List,
id-CHOInitiation,
id-ExtendedSliceSupportList,
id-AdditionalHandoverInfo,
id-Extended-NR-CGI-Support-List,
id-DirectForwardingPathAvailability,      id-IAB-Donor-CU-UPPSKInfo,
id-ECGI-Support-List,
id-MDTPollutedMeasurementIndicator,
id-UESliceMaximumBitRateList,
id-SCGActivationStatus,
id-GNB-CU-CP-MBS-ElAP-ID,
id-GNB-CU-UP-MBS-ElAP-ID,
id-GlobalMBSSESSIONID,
id-BCBearerContextToSetup,
id-BCBearerContextToSetupResponse,
id-BCBearerContextToModify,
id-BCBearerContextToModifyResponse,
id-BCBearerContextToModifyRequired,
id-BCBearerContextToModifyConfirm,
id-MCBearerContextToSetup,
id-MCBearerContextToSetupResponse,
id-MCBearerContextToModify,
id-MCBearerContextToModifyResponse,
id-MCBearerContextToModifyRequired,
id-MCBearerContextToModifyConfirm,
id-MBSMulticastFLUContextDescriptor,
id-gNB-CU-UP-MBS-Support-Info,
id-SDTContinueROHC,
id-ManagementBasedMDTPLMNModificationList,
id-MBS-ServiceArea,
id-InactivityInformationRequest,
id-UEInactivityInformation,
id-MBSSessionResourceNotification,
id-MT-SDT-Information,
id-MT-SDT-Information-Request,
id-SDT-data-size-threshold,
id-SDT-data-size-threshold-Crossed,
maxnoofErrors,
maxnoofSPLMNs,
maxnoofDRBs,
maxnoofTNLAssociations,
maxnoofIndividualElConnectionsToReset,
maxnoofTNLAddresses,
maxnoofPSKs

```

FROM ElAP-Constants;

```

-- *****
--
-- RESET
--
-- *****

```

```

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

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

ResetIEs E1AP-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 {
    e1-Interface                ResetAll,
    partOfE1-Interface          UE-associatedLogicalE1-ConnectionListRes,
    choice-extension            ProtocolIE-SingleContainer  {{ResetType-ExtIEs}}
}

ResetType-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

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

UE-associatedLogicalE1-ConnectionListRes ::= SEQUENCE (SIZE(1.. maxnoofIndividualE1ConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-associatedLogicalE1-ConnectionItemRes } }

UE-associatedLogicalE1-ConnectionItemRes E1AP-PROTOCOL-IES ::= {
    { ID id-UE-associatedLogicalE1-ConnectionItem  CRITICALITY reject  TYPE UE-associatedLogicalE1-ConnectionItem  PRESENCE mandatory},
    ...
}

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

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

```

```

ResetAcknowledgeIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID                CRITICALITY reject  TYPE TransactionID                PRESENCE mandatory }|
  { ID id-UE-associatedLogicalE1-ConnectionListResAck  CRITICALITY ignore  TYPE UE-associatedLogicalE1-ConnectionListResAck  PRESENCE
optional }|
  { ID id-CriticalityDiagnostics        CRITICALITY ignore  TYPE CriticalityDiagnostics        PRESENCE optional },
  ...
}

UE-associatedLogicalE1-ConnectionListResAck ::= SEQUENCE (SIZE(1.. maxnoofIndividualE1ConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-
associatedLogicalE1-ConnectionItemResAck } }

UE-associatedLogicalE1-ConnectionItemResAck E1AP-PROTOCOL-IES ::= {
  { ID id-UE-associatedLogicalE1-ConnectionItem  CRITICALITY ignore  TYPE UE-associatedLogicalE1-ConnectionItem  PRESENCE mandatory },
  ...
}

-- *****
--
-- ERROR INDICATION
--
-- *****

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

ErrorIndication-IEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID                CRITICALITY reject  TYPE TransactionID                PRESENCE mandatory }|
  { ID id-gNB-CU-CP-UE-E1AP-ID         CRITICALITY ignore  TYPE GNB-CU-CP-UE-E1AP-ID         PRESENCE optional }|
  { ID id-gNB-CU-UP-UE-E1AP-ID         CRITICALITY ignore  TYPE GNB-CU-UP-UE-E1AP-ID         PRESENCE optional }|
  { ID id-Cause                         CRITICALITY ignore  TYPE Cause                         PRESENCE optional }|
  { ID id-CriticalityDiagnostics        CRITICALITY ignore  TYPE CriticalityDiagnostics        PRESENCE optional }|
  { ID id-GNB-CU-CP-MBS-E1AP-ID        CRITICALITY ignore  TYPE GNB-CU-CP-MBS-E1AP-ID        PRESENCE optional }|
  { ID id-GNB-CU-UP-MBS-E1AP-ID        CRITICALITY ignore  TYPE GNB-CU-UP-MBS-E1AP-ID        PRESENCE optional },
  ...
}

-- *****
--
-- GNB-CU-UP E1 SETUP
--
-- *****

-- *****
--
-- GNB-CU-UP E1 Setup Request
--
-- *****

GNB-CU-UP-E1SetupRequest ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container    { {GNB-CU-UP-E1SetupRequestIEs} },
  ...
}

```

```

}

GNB-CU-UP-E1SetupRequestIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-ID           CRITICALITY reject  TYPE GNB-CU-UP-ID           PRESENCE mandatory }|
  { ID id-gNB-CU-UP-Name         CRITICALITY ignore  TYPE GNB-CU-UP-Name         PRESENCE optional }|
  { ID id-CNSupport              CRITICALITY reject  TYPE CNSupport              PRESENCE mandatory }|
  { ID id-SupportedPLMNs         CRITICALITY reject  TYPE SupportedPLMNs-List    PRESENCE mandatory }|
  { ID id-gNB-CU-UP-Capacity     CRITICALITY ignore  TYPE GNB-CU-UP-Capacity     PRESENCE optional }|
  { ID id-Transport-Layer-Address-Info CRITICALITY ignore  TYPE Transport-Layer-Address-Info PRESENCE optional }|
  { ID id-Extended-GNB-CU-UP-Name CRITICALITY ignore  TYPE Extended-GNB-CU-UP-Name PRESENCE optional }|
  { ID id-gNB-CU-UP-MBS-Support-Info CRITICALITY reject  TYPE GNB-CU-UP-MBS-Support-Info PRESENCE optional },
  ...
}

SupportedPLMNs-List ::= SEQUENCE (SIZE (1..maxnoofSPLMNs)) OF SupportedPLMNs-Item

SupportedPLMNs-Item ::= SEQUENCE {
  pLMN-Identity          PLMN-Identity,
  slice-Support-List     Slice-Support-List          OPTIONAL,
  nR-CGI-Support-List   NR-CGI-Support-List        OPTIONAL,
  qos-Parameters-Support-List QoS-Parameters-Support-List OPTIONAL,
  iE-Extensions         ProtocolExtensionContainer { { SupportedPLMNs-ExtIEs } } OPTIONAL,
  ...
}

SupportedPLMNs-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-NPNSupportInfo          CRITICALITY reject  EXTENSION NPNSupportInfo          PRESENCE optional }|
  { ID id-ExtendedSliceSupportList CRITICALITY reject  EXTENSION ExtendedSliceSupportList PRESENCE optional }|
  { ID id-Extended-NR-CGI-Support-List CRITICALITY ignore  EXTENSION Extended-NR-CGI-Support-List PRESENCE optional }|
  { ID id-ECGI-Support-List       CRITICALITY ignore  EXTENSION ECGI-Support-List       PRESENCE optional },
  ...
}

-- *****
--
-- GNB-CU-UP E1 Setup Response
--
-- *****

GNB-CU-UP-E1SetupResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {GNB-CU-UP-E1SetupResponseIEs} },
  ...
}

GNB-CU-UP-E1SetupResponseIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
  { ID id-gNB-CU-CP-Name         CRITICALITY ignore  TYPE GNB-CU-CP-Name         PRESENCE optional }|
  { ID id-Transport-Layer-Address-Info CRITICALITY ignore  TYPE Transport-Layer-Address-Info PRESENCE optional }|
  { ID id-Extended-GNB-CU-CP-Name CRITICALITY ignore  TYPE Extended-GNB-CU-CP-Name PRESENCE optional }|
  { ID id-CriticalityDiagnostics CRITICALITY ignore  TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

```

```

-- *****
--
-- GNB-CU-UP E1 Setup Failure
--
-- *****

GNB-CU-UP-E1SetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {GNB-CU-UP-E1SetupFailureIEs} },
    ...
}

GNB-CU-UP-E1SetupFailureIEs E1AP-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-CP E1 SETUP
--
-- *****

-- *****
--
-- GNB-CU-CP E1 Setup Request
--
-- *****

GNB-CU-CP-E1SetupRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {GNB-CU-CP-E1SetupRequestIEs} },
    ...
}

GNB-CU-CP-E1SetupRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-gNB-CU-CP-Name         CRITICALITY ignore TYPE GNB-CU-CP-Name         PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
    { ID id-Extended-GNB-CU-CP-Name CRITICALITY ignore TYPE Extended-GNB-CU-CP-Name PRESENCE optional },
    ...
}

-- *****
--
-- GNB-CU-CP E1 Setup Response
--
-- *****

GNB-CU-CP-E1SetupResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {GNB-CU-CP-E1SetupResponseIEs} },
    ...
}

```

```

GNB-CU-CP-E1SetupResponseIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-ID           CRITICALITY reject TYPE GNB-CU-UP-ID           PRESENCE mandatory }|
  { ID id-gNB-CU-UP-Name         CRITICALITY ignore TYPE GNB-CU-UP-Name         PRESENCE optional }|
  { ID id-CNSupport              CRITICALITY reject TYPE CNSupport              PRESENCE mandatory }|
  { ID id-SupportedPLMNs         CRITICALITY reject TYPE SupportedPLMNs-List     PRESENCE mandatory }|
  { ID id-gNB-CU-UP-Capacity     CRITICALITY ignore TYPE GNB-CU-UP-Capacity     PRESENCE optional }|
  { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
  { ID id-Extended-GNB-CU-UP-Name CRITICALITY ignore TYPE Extended-GNB-CU-UP-Name PRESENCE optional }|
  { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional }|
  ...
}

-- *****
--
-- GNB-CU-CP E1 Setup Failure
--
-- *****

GNB-CU-CP-E1SetupFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container   { {GNB-CU-CP-E1SetupFailureIEs} },
  ...
}

GNB-CU-CP-E1SetupFailureIEs E1AP-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-UP CONFIGURATION UPDATE
--
-- *****

-- *****
--
-- GNB-CU-UP Configuration Update
--
-- *****

GNB-CU-UP-ConfigurationUpdate ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container   { {GNB-CU-UP-ConfigurationUpdateIEs} },
  ...
}

GNB-CU-UP-ConfigurationUpdateIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-ID           CRITICALITY reject TYPE GNB-CU-UP-ID           PRESENCE mandatory }|
  { ID id-gNB-CU-UP-Name         CRITICALITY ignore TYPE GNB-CU-UP-Name         PRESENCE optional }|

```

```

    { ID id-SupportedPLMNs                CRITICALITY reject TYPE SupportedPLMNs-List      PRESENCE optional }|
    { ID id-gNB-CU-UP-Capacity            CRITICALITY ignore TYPE GNB-CU-UP-Capacity        PRESENCE optional }|
    { ID id-gNB-CU-UP-TNLA-To-Remove-List CRITICALITY reject TYPE GNB-CU-UP-TNLA-To-Remove-List PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info  CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
    { ID id-Extended-GNB-CU-UP-Name       CRITICALITY ignore TYPE Extended-GNB-CU-UP-Name     PRESENCE optional }|
    { ID id-gNB-CU-UP-MBS-Support-Info    CRITICALITY reject TYPE GNB-CU-UP-MBS-Support-Info  PRESENCE optional },
    ...
}

GNB-CU-UP-TNLA-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF GNB-CU-UP-TNLA-To-Remove-Item

-- *****
--
-- GNB-CU-UP Configuration Update Acknowledge
--
-- *****

GNB-CU-UP-ConfigurationUpdateAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {GNB-CU-UP-ConfigurationUpdateAcknowledgeIEs} },
    ...
}

GNB-CU-UP-ConfigurationUpdateAcknowledgeIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics    PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional },
    ...
}

-- *****
--
-- GNB-CU-UP Configuration Update Failure
--
-- *****

GNB-CU-UP-ConfigurationUpdateFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {GNB-CU-UP-ConfigurationUpdateFailureIEs} },
    ...
}

GNB-CU-UP-ConfigurationUpdateFailureIEs E1AP-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-CP CONFIGURATION UPDATE
--
-- *****

```

```

-- *****
--
-- GNB-CU-CP Configuration Update
--
-- *****

GNB-CU-CP-ConfigurationUpdate ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {GNB-CU-CP-ConfigurationUpdateIEs} },
    ...
}

GNB-CU-CP-ConfigurationUpdateIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-gNB-CU-CP-Name         CRITICALITY ignore TYPE GNB-CU-CP-Name         PRESENCE optional }|
    { ID id-gNB-CU-CP-TNLA-To-Add-List CRITICALITY ignore TYPE GNB-CU-CP-TNLA-To-Add-List PRESENCE optional }|
    { ID id-gNB-CU-CP-TNLA-To-Remove-List CRITICALITY ignore TYPE GNB-CU-CP-TNLA-To-Remove-List PRESENCE optional }|
    { ID id-gNB-CU-CP-TNLA-To-Update-List CRITICALITY ignore TYPE GNB-CU-CP-TNLA-To-Update-List PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
    { ID id-Extended-GNB-CU-CP-Name CRITICALITY ignore TYPE Extended-GNB-CU-CP-Name PRESENCE optional },
    ...
}

GNB-CU-CP-TNLA-To-Add-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-To-Add-Item
GNB-CU-CP-TNLA-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-To-Remove-Item
GNB-CU-CP-TNLA-To-Update-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-To-Update-Item

-- *****
--
-- GNB-CU-CP Configuration Update Acknowledge
--
-- *****

GNB-CU-CP-ConfigurationUpdateAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {GNB-CU-CP-ConfigurationUpdateAcknowledgeIEs} },
    ...
}

GNB-CU-CP-ConfigurationUpdateAcknowledgeIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional }|
    { ID id-gNB-CU-CP-TNLA-Setup-List CRITICALITY ignore TYPE GNB-CU-CP-TNLA-Setup-List PRESENCE optional }|
    { ID id-gNB-CU-CP-TNLA-Failed-To-Setup-List CRITICALITY ignore TYPE GNB-CU-CP-TNLA-Failed-To-Setup-List PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional },
    ...
}

GNB-CU-CP-TNLA-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-Setup-Item
GNB-CU-CP-TNLA-Failed-To-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-Failed-To-Setup-Item

-- *****
--
-- GNB-CU-CP Configuration Update Failure
--
-- *****

```



```

-- *****
GNB-CU-CP-ConfigurationUpdateFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {GNB-CU-CP-ConfigurationUpdateFailureIEs} },
    ...
}

GNB-CU-CP-ConfigurationUpdateFailureIEs E1AP-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 },
    ...
}

-- *****
--
-- E1 RELEASE
--
-- *****

-- *****
--
-- E1 Release Request
--
-- *****

E1ReleaseRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {E1ReleaseRequestIEs} },
    ...
}

E1ReleaseRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-Cause                  CRITICALITY ignore TYPE Cause                  PRESENCE mandatory },
    ...
}

-- *****
--
-- E1 Release Response
--
-- *****

E1ReleaseResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {E1ReleaseResponseIEs} },
    ...
}

E1ReleaseResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

```

```

-- *****
--
-- BEARER CONTEXT SETUP
--
-- *****
--
-- *****
--
-- Bearer Context Setup Request
--
-- *****

BearerContextSetupRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { BearerContextSetupRequestIEs } },
    ...
}

BearerContextSetupRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory } |
    { ID id-SecurityInformation           CRITICALITY reject  TYPE SecurityInformation         PRESENCE mandatory } |
    { ID id-UEDLAggregateMaximumBitRate   CRITICALITY reject  TYPE BitRate                     PRESENCE mandatory } |
    { ID id-UEDLMaximumIntegrityProtectedDataRate CRITICALITY reject  TYPE BitRate                     PRESENCE optional } |
    { ID id-Serving-PLMN                   CRITICALITY ignore  TYPE PLMN-Identity              PRESENCE mandatory } |
    { ID id-ActivityNotificationLevel      CRITICALITY reject  TYPE ActivityNotificationLevel   PRESENCE mandatory } |
    { ID id-UE-Inactivity-Timer           CRITICALITY reject  TYPE Inactivity-Timer           PRESENCE optional } |
    { ID id-BearerContextStatusChange     CRITICALITY reject  TYPE BearerContextStatusChange   PRESENCE optional } |
    { ID id-System-BearerContextSetupRequest CRITICALITY reject  TYPE System-BearerContextSetupRequest PRESENCE mandatory } |
    { ID id-RANUEID                        CRITICALITY ignore  TYPE RANUEID                    PRESENCE optional } |
    { ID id-GNB-DU-ID                      CRITICALITY ignore  TYPE GNB-DU-ID                  PRESENCE optional } |
    { ID id-TraceActivation                CRITICALITY ignore  TYPE TraceActivation            PRESENCE optional } |
    { ID id-NPNContextInfo                 CRITICALITY reject  TYPE NPNContextInfo            PRESENCE optional } |
    { ID id-ManagementBasedMDTPLMNList    CRITICALITY ignore  TYPE MDTPLMNList               PRESENCE optional } |
    { ID id-CHOInitiation                  CRITICALITY reject  TYPE CHOInitiation              PRESENCE optional } |
    { ID id-AdditionalHandoverInfo         CRITICALITY ignore  TYPE AdditionalHandoverInfo     PRESENCE optional } |
    { ID id-DirectForwardingPathAvailability CRITICALITY ignore  TYPE DirectForwardingPathAvailability PRESENCE optional } |
    { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY ignore  TYPE GNB-CU-UP-UE-E1AP-ID      PRESENCE optional } |
    { ID id-MDTPollutedMeasurementIndicator CRITICALITY ignore  TYPE MDTPollutedMeasurementIndicator PRESENCE optional } |
    { ID id-UESliceMaximumBitRateList     CRITICALITY ignore  TYPE UESliceMaximumBitRateList  PRESENCE optional } |
    { ID id-SCGActivationStatus           CRITICALITY ignore  TYPE SCGActivationStatus        PRESENCE optional } |
    { ID id-MT-SDT-Information-Request     CRITICALITY ignore  TYPE MT-SDT-Information-Request  PRESENCE optional } |
    { ID id-SDT-data-size-threshold       CRITICALITY ignore  TYPE SDT-data-size-threshold    PRESENCE optional },
    ...
}

System-BearerContextSetupRequest ::= CHOICE {
    e-UTRAN-BearerContextSetupRequest     ProtocolIE-Container          {{EUTRAN-BearerContextSetupRequest}},
    nG-RAN-BearerContextSetupRequest      ProtocolIE-Container          {{NG-RAN-BearerContextSetupRequest}},
    choice-extension                       ProtocolIE-SingleContainer    {{System-BearerContextSetupRequest-ExtIEs}}
}

System-BearerContextSetupRequest-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

```

```

EUTRAN-BearerContextSetupRequest E1AP-PROTOCOL-IES ::= {
  { ID id-DRB-To-Setup-List-EUTRAN          CRITICALITY reject  TYPE DRB-To-Setup-List-EUTRAN  PRESENCE mandatory }|
  { ID id-SubscriberProfileIDforRFP        CRITICALITY ignore  TYPE SubscriberProfileIDforRFP  PRESENCE optional }|
  { ID id-AdditionalRRMPriorityIndex       CRITICALITY ignore  TYPE AdditionalRRMPriorityIndex  PRESENCE optional },
  ...
}

NG-RAN-BearerContextSetupRequest E1AP-PROTOCOL-IES ::= {
  { ID id-PDU-Session-Resource-To-Setup-List  CRITICALITY reject  TYPE PDU-Session-Resource-To-Setup-List  PRESENCE mandatory },
  ...
}

-- *****
--
-- Bearer Context Setup Response
--
-- *****

BearerContextSetupResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { BearerContextSetupResponseIEs} },
  ...
}

BearerContextSetupResponseIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-System-BearerContextSetupResponse  CRITICALITY ignore  TYPE System-BearerContextSetupResponse  PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
  ...
}

System-BearerContextSetupResponse ::= CHOICE {
  e-UTRAN-BearerContextSetupResponse  ProtocolIE-Container      {{EUTRAN-BearerContextSetupResponse}},
  nG-RAN-BearerContextSetupResponse    ProtocolIE-Container      {{NG-RAN-BearerContextSetupResponse}},
  choice-extension                     ProtocolIE-SingleContainer {{System-BearerContextSetupResponse-ExtIEs}}
}

System-BearerContextSetupResponse-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

EUTRAN-BearerContextSetupResponse E1AP-PROTOCOL-IES ::= {
  { ID id-DRB-Setup-List-EUTRAN          CRITICALITY ignore  TYPE DRB-Setup-List-EUTRAN          PRESENCE mandatory }|
  { ID id-DRB-Failed-List-EUTRAN         CRITICALITY ignore  TYPE DRB-Failed-List-EUTRAN         PRESENCE optional },
  ...
}

NG-RAN-BearerContextSetupResponse E1AP-PROTOCOL-IES ::= {
  { ID id-PDU-Session-Resource-Setup-List  CRITICALITY ignore  TYPE PDU-Session-Resource-Setup-List  PRESENCE mandatory }|
  { ID id-PDU-Session-Resource-Failed-List  CRITICALITY ignore  TYPE PDU-Session-Resource-Failed-List  PRESENCE optional },

```

```

}
...
}

-- *****
--
-- Bearer Context Setup Failure
--
-- *****

BearerContextSetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BearerContextSetupFailureIEs } },
    ...
}

BearerContextSetupFailureIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY ignore  TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE optional   } |
    { ID id-Cause                          CRITICALITY ignore  TYPE Cause                        PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics       PRESENCE optional   } |
    ...
}

-- *****
--
-- BEARER CONTEXT MODIFICATION
--
-- *****

--
-- Bearer Context Modification Request
--
-- *****

BearerContextModificationRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BearerContextModificationRequestIEs } },
    ...
}

BearerContextModificationRequestIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-SecurityInformation           CRITICALITY reject  TYPE SecurityInformation           PRESENCE optional   } |
    { ID id-UEDLAggregateMaximumBitRate   CRITICALITY reject  TYPE BitRate                       PRESENCE optional   } |
    { ID id-UEDLMaximumIntegrityProtectedDataRate CRITICALITY reject  TYPE BitRate                       PRESENCE optional   } |
    { ID id-BearerContextStatusChange     CRITICALITY reject  TYPE BearerContextStatusChange     PRESENCE optional   } |
    { ID id-New-UL-TNL-Information-Required CRITICALITY reject  TYPE New-UL-TNL-Information-Required PRESENCE optional   } |
    { ID id-UE-Inactivity-Timer           CRITICALITY reject  TYPE Inactivity-Timer              PRESENCE optional   } |
    { ID id-DataDiscardRequired           CRITICALITY ignore  TYPE DataDiscardRequired           PRESENCE optional   } |
    { ID id-System-BearerContextModificationRequest CRITICALITY reject  TYPE System-BearerContextModificationRequest PRESENCE optional } |
    { ID id-RANUEID                       CRITICALITY ignore  TYPE RANUEID                       PRESENCE optional   } |
    { ID id-GNB-DU-ID                     CRITICALITY ignore  TYPE GNB-DU-ID                     PRESENCE optional   } |
    { ID id-ActivityNotificationLevel      CRITICALITY ignore  TYPE ActivityNotificationLevel      PRESENCE optional   } |
}

```

```

    { ID id-MDTPollutedMeasurementIndicator          CRITICALITY ignore TYPE MDTPollutedMeasurementIndicator          PRESENCE optional }|
    { ID id-UESliceMaximumBitRateList                CRITICALITY ignore TYPE UESliceMaximumBitRateList                PRESENCE optional }|
    { ID id-SCGActivationStatus                       CRITICALITY ignore TYPE SCGActivationStatus                       PRESENCE optional }|
    { ID id-SDTContinueROHC                           CRITICALITY reject TYPE SDTContinueROHC                           PRESENCE optional }|
    { ID id-ManagementBasedMDTPLMNModificationList   CRITICALITY ignore TYPE MDTPLMNModificationList                   PRESENCE optional }|
    { ID id-InactivityInformationRequest              CRITICALITY ignore TYPE InactivityInformationRequest              PRESENCE optional }|
    { ID id-MT-SDT-Information-Request               CRITICALITY ignore TYPE MT-SDT-Information-Request               PRESENCE optional }|
    { ID id-SDT-data-size-threshold                  CRITICALITY ignore TYPE SDT-data-size-threshold                  PRESENCE optional },
    ...
}

System-BearerContextModificationRequest ::= CHOICE {
    e-UTRAN-BearerContextModificationRequest          ProtocolIE-Container          {{e-UTRAN-BearerContextModificationRequest}},
    nG-RAN-BearerContextModificationRequest          ProtocolIE-Container          {{nG-RAN-BearerContextModificationRequest}},
    choice-extension                                  ProtocolIE-SingleContainer    {{System-BearerContextModificationRequest-ExtIEs}}
}

System-BearerContextModificationRequest-ExtIEs ELAP-PROTOCOL-IES ::= {
    ...
}

EUTRAN-BearerContextModificationRequest ELAP-PROTOCOL-IES ::= {
    { ID id-DRB-To-Setup-Mod-List-EUTRAN             CRITICALITY reject TYPE DRB-To-Setup-Mod-List-EUTRAN             PRESENCE optional }|
    { ID id-DRB-To-Modify-List-EUTRAN                CRITICALITY reject TYPE DRB-To-Modify-List-EUTRAN                PRESENCE optional }|
    { ID id-DRB-To-Remove-List-EUTRAN                CRITICALITY reject TYPE DRB-To-Remove-List-EUTRAN                PRESENCE optional }|
    { ID id-SubscriberProfileIDforRFP                CRITICALITY ignore TYPE SubscriberProfileIDforRFP                PRESENCE optional }|
    { ID id-AdditionalRRMPriorityIndex                CRITICALITY ignore TYPE AdditionalRRMPriorityIndex                PRESENCE optional },
    ...
}

NG-RAN-BearerContextModificationRequest ELAP-PROTOCOL-IES ::= {
    { ID id-PDU-Session-Resource-To-Setup-Mod-List   CRITICALITY reject TYPE PDU-Session-Resource-To-Setup-Mod-List   PRESENCE optional }|
    { ID id-PDU-Session-Resource-To-Modify-List      CRITICALITY reject TYPE PDU-Session-Resource-To-Modify-List      PRESENCE optional }|
    { ID id-PDU-Session-Resource-To-Remove-List     CRITICALITY reject TYPE PDU-Session-Resource-To-Remove-List     PRESENCE optional },
    ...
}

-- *****
--
-- Bearer Context Modification Response
--
-- *****

BearerContextModificationResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { BearerContextModificationResponseIEs } },
    ...
}

BearerContextModificationResponseIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID                     CRITICALITY reject TYPE gNB-CU-CP-UE-ElAP-ID                     PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-ElAP-ID                     CRITICALITY reject TYPE gNB-CU-UP-UE-ElAP-ID                     PRESENCE mandatory }|
    { ID id-System-BearerContextModificationResponse   CRITICALITY ignore TYPE System-BearerContextModificationResponse   PRESENCE optional }|
}

```

```

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

System-BearerContextModificationResponse ::= CHOICE {
  e-UTRAN-BearerContextModificationResponse ProtocolIE-Container {{UTRAN-BearerContextModificationResponse}},
  nG-RAN-BearerContextModificationResponse ProtocolIE-Container {{NG-RAN-BearerContextModificationResponse}},
  choice-extension                          ProtocolIE-SingleContainer {{System-BearerContextModificationResponse-ExtIEs}}
}

System-BearerContextModificationResponse-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

EUTRAN-BearerContextModificationResponse E1AP-PROTOCOL-IES ::= {
  { ID id-DRB-Setup-Mod-List-EUTRAN          CRITICALITY ignore TYPE DRB-Setup-Mod-List-EUTRAN          PRESENCE optional }|
  { ID id-DRB-Failed-Mod-List-EUTRAN         CRITICALITY ignore TYPE DRB-Failed-Mod-List-EUTRAN         PRESENCE optional }|
  { ID id-DRB-Modified-List-EUTRAN          CRITICALITY ignore TYPE DRB-Modified-List-EUTRAN          PRESENCE optional }|
  { ID id-DRB-Failed-To-Modify-List-EUTRAN   CRITICALITY ignore TYPE DRB-Failed-To-Modify-List-EUTRAN   PRESENCE optional }|
  { ID id-RetainabilityMeasurementsInfo     CRITICALITY ignore TYPE RetainabilityMeasurementsInfo     PRESENCE optional },
  ...
}

NG-RAN-BearerContextModificationResponse E1AP-PROTOCOL-IES ::= {
  { ID id-PDU-Session-Resource-Setup-Mod-List CRITICALITY reject TYPE PDU-Session-Resource-Setup-Mod-List PRESENCE optional }|
  { ID id-PDU-Session-Resource-Failed-Mod-List CRITICALITY reject TYPE PDU-Session-Resource-Failed-Mod-List PRESENCE optional }|
  { ID id-PDU-Session-Resource-Modified-List CRITICALITY reject TYPE PDU-Session-Resource-Modified-List PRESENCE optional }|
  { ID id-PDU-Session-Resource-Failed-To-Modify-List CRITICALITY reject TYPE PDU-Session-Resource-Failed-To-Modify-List PRESENCE optional }|
  { ID id-RetainabilityMeasurementsInfo     CRITICALITY ignore TYPE RetainabilityMeasurementsInfo     PRESENCE optional },
  ...
}

-- *****
--
-- Bearer Context Modification Failure
--
-- *****

BearerContextModificationFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container   { { BearerContextModificationFailureIEs} },
  ...
}

BearerContextModificationFailureIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-Cause                          CRITICALITY ignore TYPE Cause                          PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional },
  ...
}

-- *****

```

```

--
-- BEARER CONTEXT MODIFICATION REQUIRED
--
-- *****
--
-- *****
--
-- Bearer Context Modification Required
--
-- *****

BearerContextModificationRequired ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BearerContextModificationRequiredIEs } },
    ...
}

BearerContextModificationRequiredIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory
    }|
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory
    }|
    { ID id-System-BearerContextModificationRequired  CRITICALITY reject  TYPE System-BearerContextModificationRequired  PRESENCE mandatory
    },
    ...
}

System-BearerContextModificationRequired ::= CHOICE {
    e-UTRAN-BearerContextModificationRequired  ProtocolIE-Container  {{EUTRAN-BearerContextModificationRequired}},
    nG-RAN-BearerContextModificationRequired  ProtocolIE-Container  {{NG-RAN-BearerContextModificationRequired}},
    choice-extension                          ProtocolIE-SingleContainer  {{System-BearerContextModificationRequired-ExtIEs}}
}

System-BearerContextModificationRequired-ExtIEs ELAP-PROTOCOL-IES ::= {
    ...
}

EUTRAN-BearerContextModificationRequired ELAP-PROTOCOL-IES ::= {
    { ID id-DRB-Required-To-Modify-List-EUTRAN  CRITICALITY reject  TYPE DRB-Required-To-Modify-List-EUTRAN  PRESENCE optional }|
    { ID id-DRB-Required-To-Remove-List-EUTRAN  CRITICALITY reject  TYPE DRB-Required-To-Remove-List-EUTRAN  PRESENCE optional },
    ...
}

NG-RAN-BearerContextModificationRequired ELAP-PROTOCOL-IES ::= {
    { ID id-PDU-Session-Resource-Required-To-Modify-List  CRITICALITY reject  TYPE PDU-Session-Resource-Required-To-Modify-List  PRESENCE
optional }|
    { ID id-PDU-Session-Resource-To-Remove-List  CRITICALITY reject  TYPE PDU-Session-Resource-To-Remove-List  PRESENCE optional },
    ...
}

-- *****
--
-- Bearer Context Modification Confirm
--

```

```

-- *****
BearerContextModificationConfirm ::= SEQUENCE {
    protocolIES          ProtocolIE-Container    { { BearerContextModificationConfirmIEs } },
    ...
}

BearerContextModificationConfirmIEs E1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-System-BearerContextModificationConfirm  CRITICALITY ignore  TYPE System-BearerContextModificationConfirm  PRESENCE optional }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

System-BearerContextModificationConfirm ::= CHOICE {
    e-UTRAN-BearerContextModificationConfirm  ProtocolIE-Container {{EUTRAN-BearerContextModificationConfirm}},
    nG-RAN-BearerContextModificationConfirm    ProtocolIE-Container {{NG-RAN-BearerContextModificationConfirm}},
    choice-extension                           ProtocolIE-SingleContainer {{System-BearerContextModificationConfirm-ExtIEs}}
}

System-BearerContextModificationConfirm-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

EUTRAN-BearerContextModificationConfirm E1AP-PROTOCOL-IES ::= {
    { ID id-DRB-Confirm-Modified-List-EUTRAN  CRITICALITY ignore  TYPE DRB-Confirm-Modified-List-EUTRAN PRESENCE optional },
    ...
}

NG-RAN-BearerContextModificationConfirm E1AP-PROTOCOL-IES ::= {
    { ID id-PDU-Session-Resource-Confirm-Modified-List  CRITICALITY ignore  TYPE PDU-Session-Resource-Confirm-Modified-List PRESENCE optional },
    ...
}

-- *****
--
-- BEARER CONTEXT RELEASE
--
-- *****

-- *****
--
-- Bearer Context Release Command
--
-- *****

BearerContextReleaseCommand ::= SEQUENCE {
    protocolIES          ProtocolIE-Container    { { BearerContextReleaseCommandIEs } },
    ...
}

```



```

BearerContextReleaseCommandIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-Cause                          CRITICALITY ignore   TYPE Cause                        PRESENCE mandatory },
  ...
}

-- *****
--
-- Bearer Context Release Complete
--
-- *****

BearerContextReleaseComplete ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { BearerContextReleaseCompleteIEs } },
  ...
}

BearerContextReleaseCompleteIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics         CRITICALITY ignore   TYPE CriticalityDiagnostics         PRESENCE optional }|
  { ID id-RetainabilityMeasurementsInfo  CRITICALITY ignore   TYPE RetainabilityMeasurementsInfo  PRESENCE optional },
  ...
}

-- *****
--
-- BEARER CONTEXT RELEASE REQUEST
--
-- *****
--
-- *****
--
-- Bearer Context Release Request
--
-- *****

BearerContextReleaseRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { BearerContextReleaseRequestIEs } },
  ...
}

BearerContextReleaseRequestIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-DRB-Status-List               CRITICALITY ignore   TYPE DRB-Status-List               PRESENCE optional }|
  { ID id-Cause                          CRITICALITY ignore   TYPE Cause                          PRESENCE mandatory },
  ...
}

DRB-Status-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRB-Status-Item

```

```

-- *****
--
-- BEARER CONTEXT INACTIVITY NOTIFICATION
--
-- *****

-- *****
--
-- Bearer Context Inactivity Notification
--
-- *****

BearerContextInactivityNotification ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BearerContextInactivityNotificationIEs } },
    ...
}

BearerContextInactivityNotificationIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory }|
    { ID id-ActivityInformation           CRITICALITY reject TYPE ActivityInformation        PRESENCE mandatory },
    ...
}

-- *****
--
-- DL DATA NOTIFICATION
--
-- *****

-- *****
--
-- DL Data Notification
--
-- *****

DLDataNotification ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { DLDataNotificationIEs } },
    ...
}

DLDataNotificationIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory }|
    { ID id-PPI                           CRITICALITY ignore TYPE PPI                           PRESENCE optional }|
    { ID id-PDU-Session-To-Notify-List     CRITICALITY ignore TYPE PDU-Session-To-Notify-List     PRESENCE optional }|
    { ID id-MT-SDT-Information             CRITICALITY ignore TYPE MT-SDT-Information             PRESENCE optional }|
    { ID id-SDT-data-size-threshold-Crossed CRITICALITY ignore TYPE SDT-data-size-threshold-Crossed PRESENCE optional },
    ...
}

-- *****

```

```

-- *****
--
-- UL DATA NOTIFICATION
--
-- *****

ULDataNotification ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { ULDataNotificationIEs } },
    ...
}

ULDataNotificationIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-PDU-Session-To-Notify-List     CRITICALITY reject TYPE PDU-Session-To-Notify-List PRESENCE mandatory },
    ...
}

-- *****
--
-- DATA USAGE REPORT
--
-- *****

-- *****
--
-- Data Usage Report
--
-- *****

DataUsageReport ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { DataUsageReportIEs } },
    ...
}

DataUsageReportIEs ELAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-Data-Usage-Report-List        CRITICALITY ignore TYPE Data-Usage-Report-List        PRESENCE mandatory },
    ...
}

-- *****
--
-- GNB-CU-UP COUNTER CHECK
--
-- *****

-- *****
--
-- gNB-CU-UP Counter Check Request
--

```

-- *****

```
GNB-CU-UP-CounterCheckRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container    { { GNB-CU-UP-CounterCheckRequestIEs } },
  ...
}
```

```
GNB-CU-UP-CounterCheckRequestIEs ELAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory } |
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory } |
  { ID id-System-GNB-CU-UP-CounterCheckRequest  CRITICALITY reject  TYPE System-GNB-CU-UP-CounterCheckRequest  PRESENCE mandatory },
  ...
}
```

```
System-GNB-CU-UP-CounterCheckRequest ::= CHOICE {
  e-UTRAN-GNB-CU-UP-CounterCheckRequest  ProtocolIE-Container    {{EUTRAN-GNB-CU-UP-CounterCheckRequest}},
  nG-RAN-GNB-CU-UP-CounterCheckRequest    ProtocolIE-Container    {{NG-RAN-GNB-CU-UP-CounterCheckRequest}},
  choice-extension                         ProtocolIE-SingleContainer {{System-GNB-CU-UP-CounterCheckRequest-ExtIEs}}
}
```

```
System-GNB-CU-UP-CounterCheckRequest-ExtIEs ELAP-PROTOCOL-IES ::= {
  ...
}
```

```
EUTRAN-GNB-CU-UP-CounterCheckRequest ELAP-PROTOCOL-IES ::= {
  { ID id-DRBs-Subject-To-Counter-Check-List-EUTRAN  CRITICALITY ignore  TYPE DRBs-Subject-To-Counter-Check-List-EUTRAN  PRESENCE mandatory },
  ...
}
```

```
NG-RAN-GNB-CU-UP-CounterCheckRequest ELAP-PROTOCOL-IES ::= {
  { ID id-DRBs-Subject-To-Counter-Check-List-NG-RAN  CRITICALITY ignore  TYPE DRBs-Subject-To-Counter-Check-List-NG-RAN  PRESENCE mandatory },
  ...
}
```

-- *****

--
-- gNB-CU-UP STATUS INDICATION ELEMENTARY PROCEDURE
--

-- *****

-- *****

-- gNB-CU-UP Status Indication
--

-- *****

```
GNB-CU-UP-StatusIndication ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container    { { GNB-CU-UP-StatusIndicationIEs } },
  ...
}
```

```

GNB-CU-UP-StatusIndicationIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
  { ID id-GNB-CU-UP-OverloadInformation  CRITICALITY reject  TYPE GNB-CU-UP-OverloadInformation  PRESENCE mandatory },
  ...
}

-- *****
--
-- gNB-CU-CP MEASUREMENT RESULTS INFORMATION
--
-- *****

GNB-CU-CPMeasurementResultsInformation ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container      { { GNB-CU-CPMeasurementResultsInformationIEs } },
  ...
}

GNB-CU-CPMeasurementResultsInformationIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-DRB-Measurement-Results-Information-List  CRITICALITY ignore  TYPE DRB-Measurement-Results-Information-List  PRESENCE mandatory},
  ...
}

-- *****
--
-- MR-DC DATA USAGE REPORT
--
-- *****

MRDC-DataUsageReport ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container      { { MRDC-DataUsageReportIEs } },
  ...
}

MRDC-DataUsageReportIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-PDU-Session-Resource-Data-Usage-List  CRITICALITY ignore  TYPE PDU-Session-Resource-Data-Usage-List  PRESENCE mandatory},
  ...
}

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

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

```

```

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

TraceStartIEs E1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-TraceActivation                CRITICALITY ignore  TYPE TraceActivation              PRESENCE mandatory },
    ...
}

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

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

DeactivateTraceIEs E1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-TraceID                       CRITICALITY ignore  TYPE TraceID                       PRESENCE mandatory },
    ...
}

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

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

CellTrafficTraceIEs E1AP-PROTOCOL-IES ::= {
    {ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
    {ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-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-URIaddress                    CRITICALITY ignore  TYPE URIaddress                    PRESENCE optional},
    ...
}

-- *****
--

```

```

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

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

PrivateMessage-IEs E1AP-PRIVATE-IES ::= {
    ...
}

-- *****
--
-- RESOURCE STATUS REQUEST
--
-- *****

ResourceStatusRequest ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { ResourceStatusRequestIEs } },
    ...
}

ResourceStatusRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject          TYPE TransactionID PRESENCE mandatory}|
    { ID id-gNB-CU-CP-Measurement-ID CRITICALITY reject          TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-gNB-CU-UP-Measurement-ID CRITICALITY ignore       TYPE INTEGER (1..4095, ...) PRESENCE conditional}|
-- This IE shall be present if the Registration Request IE is set to the value "stop" --
    { ID id-RegistrationRequest     CRITICALITY reject          TYPE RegistrationRequest PRESENCE mandatory}|
    { ID id-ReportCharacteristics    CRITICALITY reject          TYPE ReportCharacteristics PRESENCE conditional}|
-- This IE shall be present if the Registration Request IE is set to the value "start". --|
    { ID id-ReportingPeriodicity     CRITICALITY ignore          TYPE ReportingPeriodicity PRESENCE optional},
    ...
}

-- *****
--
-- RESOURCE STATUS RESPONSE
--
-- *****

ResourceStatusResponse ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { ResourceStatusResponseIEs } },
    ...
}

ResourceStatusResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject          TYPE TransactionID PRESENCE mandatory}|
    { ID id-gNB-CU-CP-Measurement-ID CRITICALITY reject          TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-gNB-CU-UP-Measurement-ID CRITICALITY ignore       TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-CriticalityDiagnostics  CRITICALITY ignore          TYPE CriticalityDiagnostics PRESENCE optional},
}

```

```

}
...
}
-- *****
--
-- RESOURCE STATUS FAILURE
--
-- *****

ResourceStatusFailure ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { ResourceStatusFailureIEs } },
    ...
}

ResourceStatusFailureIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject          TYPE TransactionID PRESENCE mandatory}|
    { ID id-gNB-CU-CP-Measurement-ID CRITICALITY reject          TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-gNB-CU-UP-Measurement-ID CRITICALITY ignore        TYPE INTEGER (1..4095, ...) PRESENCE optional}|
    { ID id-Cause                   CRITICALITY ignore        TYPE Cause          PRESENCE mandatory}|
    { ID id-CriticalityDiagnostics CRITICALITY ignore        TYPE CriticalityDiagnostics PRESENCE optional},
    ...
}

-- *****
--
-- RESOURCE STATUS UPDATE
--
-- *****

ResourceStatusUpdate ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { ResourceStatusUpdateIEs } },
    ...
}

ResourceStatusUpdateIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject          TYPE TransactionID PRESENCE mandatory}|
    { ID id-gNB-CU-CP-Measurement-ID CRITICALITY reject          TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-gNB-CU-UP-Measurement-ID CRITICALITY ignore        TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    optional}|
    { ID id-TNL-AvailableCapacityIndicator CRITICALITY ignore        TYPE                                TNL-AvailableCapacityIndicator PRESENCE
optional},
    { ID id-HW-CapacityIndicator          CRITICALITY ignore        TYPE                                HW-CapacityIndicator          PRESENCE
optional},
    ...
}

-- *****
--
-- IAB UP TNL ADDRESS UPDATE
--
-- *****
--
-- *****
--

```



```

-- IAB UP TNL Address Update
--
-- *****
IAB-UPTNLAddressUpdate ::= SEQUENCE {
    protocolIES          ProtocolIE-Container    { { IAB-UPTNLAddressUpdateIEs} },
    ...
}

IAB-UPTNLAddressUpdateIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-DLUPTNLAddressToUpdateList CRITICALITY ignore TYPE DLUPTNLAddressToUpdateList PRESENCE optional },
    ...
}

DLUPTNLAddressToUpdateList ::= SEQUENCE (SIZE(1.. maxnoofTNLAddresses)) OF DLUPTNLAddressToUpdateItem

-- *****
--
-- IAB UP TNL Address Update Acknowledge
--
-- *****

IAB-UPTNLAddressUpdateAcknowledge ::= SEQUENCE {
    protocolIES          ProtocolIE-Container    { { IAB-UPTNLAddressUpdateAcknowledgeIEs} },
    ...
}

IAB-UPTNLAddressUpdateAcknowledgeIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional }|
    { ID id-ULUPTNLAddressToUpdateList CRITICALITY ignore TYPE ULUPTNLAddressToUpdateList PRESENCE optional },
    ...
}

ULUPTNLAddressToUpdateList ::= SEQUENCE (SIZE(1.. maxnoofTNLAddresses)) OF ULUPTNLAddressToUpdateItem

-- *****
--
-- IAB UP TNL Address Update Failure
--
-- *****

IAB-UPTNLAddressUpdateFailure ::= SEQUENCE {
    protocolIES          ProtocolIE-Container    { {IAB-UPTNLAddressUpdateFailureIEs} },
    ...
}

IAB-UPTNLAddressUpdateFailureIEs ELAP-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 },

```

```

}
...
-- *****
--
-- EARLY FORWARDING SN TRANSFER
--
-- *****

-- *****
--
-- Early Forwarding SN Transfer
--
-- *****

EarlyForwardingSNTransfer ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { EarlyForwardingSNTransferIEs } },
    ...
}

EarlyForwardingSNTransferIEs ElAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-DRBs-Subject-To-Early-Forwarding-List          CRITICALITY reject TYPE DRBs-Subject-To-Early-Forwarding-List          PRESENCE mandatory },
    ...
}

-- *****
--
-- IAB PSK NOTIFICATION
--
-- *****

-- *****
--
-- IAB PSK Notification
--
-- *****

IABPSKNotification ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { IABPSKNotificationIEs } },
    ...
}

IABPSKNotificationIEs ElAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory } |
    { ID id-IAB-Donor-CU-UPPSKInfo          CRITICALITY reject TYPE IAB-Donor-CU-UPPSKInfo          PRESENCE mandatory },
    ...
}

IAB-Donor-CU-UPPSKInfo ::= SEQUENCE (SIZE(1.. maxnoofPSKs)) OF IAB-Donor-CU-UPPSKInfo-Item

-- *****
--

```

```

-- BC BEARER CONTEXT SETUP
--
-- *****
-- *****
--
-- BC BEARER CONTEXT SETUP REQUEST
--
-- *****

BCBearerContextSetupRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BCBearerContextSetupRequestIEs } },
    ...
}

BCBearerContextSetupRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory } |
    { ID id-GlobalMBSSESSIONID            CRITICALITY reject TYPE GlobalMBSSESSIONID            PRESENCE mandatory } |
    { ID id-BCBearerContextToSetup        CRITICALITY reject TYPE BCBearerContextToSetup        PRESENCE mandatory } |
    { ID id-AssociatedSessionID           CRITICALITY ignore  TYPE AssociatedSessionID           PRESENCE optional } |
    { ID id-MBS-ServiceArea                CRITICALITY ignore  TYPE MBS-ServiceArea                PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT SETUP RESPONSE
--
-- *****

BCBearerContextSetupResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BCBearerContextSetupResponseIEs } },
    ...
}

BCBearerContextSetupResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory } |
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory } |
    { ID id-BCBearerContextToSetupResponse CRITICALITY reject TYPE BCBearerContextToSetupResponse PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT SETUP FAILURE
--
-- *****

BCBearerContextSetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BCBearerContextSetupFailureIEs } },
    ...
}

```

```

BCBearerContextSetupFailureIEs E1AP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory }|
  { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY ignore TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE optional }|
  { ID id-Cause                           CRITICALITY ignore TYPE Cause PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION
--
-- *****

-- *****
--
-- BC BEARER CONTEXT MODIFICATION REQUEST
--
-- *****

BCBearerContextModificationRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { BCBearerContextModificationRequestIEs } },
  ...
}

BCBearerContextModificationRequestIEs E1AP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory }|
  { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory }|
  { ID id-BCBearerContextToModify        CRITICALITY reject TYPE BCBearerContextToModify PRESENCE mandatory },
  ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION RESPONSE
--
-- *****

BCBearerContextModificationResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { BCBearerContextModificationResponseIEs } },
  ...
}

BCBearerContextModificationResponseIEs E1AP-PROTOCOL-IES ::= {
  { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory }|
  { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory }|
  { ID id-BCBearerContextToModifyResponse CRITICALITY reject TYPE BCBearerContextToModifyResponse PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION FAILURE

```

```

--
-- *****
BCBearerContextModificationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextModificationFailureIEs } },
    ...
}

BCBearerContextModificationFailureIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory }|
    { ID id-Cause                           CRITICALITY ignore TYPE Cause PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION REQUIRED
--
-- *****

-- *****
--
-- BC BEARER CONTEXT MODIFICATION REQUIRED
--
-- *****

BCBearerContextModificationRequired ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextModificationRequiredIEs } },
    ...
}

BCBearerContextModificationRequiredIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory }|
    { ID id-BCBearerContextToModifyRequired CRITICALITY reject TYPE BCBearerContextToModifyRequired PRESENCE mandatory },
    ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION CONFIRM
--
-- *****

BCBearerContextModificationConfirm ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextModificationConfirmIEs } },
    ...
}

BCBearerContextModificationConfirmIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory }|
}

```

```

    { ID id-BCBearerContextToModifyConfirm CRITICALITY reject TYPE BCBearerContextToModifyConfirm PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT RELEASE
--
-- *****

-- *****
--
-- BC BEARER CONTEXT RELEASE COMMAND
--
-- *****

BCBearerContextReleaseCommand ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { BCBearerContextReleaseCommandIEs } },
    ...
}

BCBearerContextReleaseCommandIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID CRITICALITY reject TYPE GNB-CU-CP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID CRITICALITY reject TYPE GNB-CU-UP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-Cause CRITICALITY ignore TYPE Cause PRESENCE mandatory },
    ...
}

-- *****
--
-- BC BEARER CONTEXT RELEASE COMPLETE
--
-- *****

BCBearerContextReleaseComplete ::= SEQUENCE {
    protocolIEs ProtocolIE-Container { { BCBearerContextReleaseCompleteIEs } },
    ...
}

BCBearerContextReleaseCompleteIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID CRITICALITY reject TYPE GNB-CU-CP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID CRITICALITY reject TYPE GNB-CU-UP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT RELEASE REQUEST
--
-- *****

```

```

--
-- BC BEARER CONTEXT RELEASE REQUEST
--
-- *****

BCBearerContextReleaseRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextReleaseRequestIEs } },
    ...
}

BCBearerContextReleaseRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject  TYPE  GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory } |
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject  TYPE  GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory } |
    { ID id-Cause                           CRITICALITY ignore   TYPE  Cause                           PRESENCE mandatory   },
    ...
}

-- *****
--
-- MC BEARER CONTEXT SETUP
--
-- *****

-- *****

-- MC BEARER CONTEXT SETUP REQUEST
--
-- *****

MCBearerContextSetupRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextSetupRequestIEs } },
    ...
}

MCBearerContextSetupRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject  TYPE  GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory } |
    { ID id-GlobalMBSSESSIONID             CRITICALITY reject  TYPE  GlobalMBSSESSIONID             PRESENCE mandatory } |
    { ID id-MCBearerContextToSetup         CRITICALITY reject  TYPE  MCBearerContextToSetup         PRESENCE mandatory   },
    ...
}

-- *****
--
-- MC BEARER CONTEXT SETUP RESPONSE
--
-- *****

MCBearerContextSetupResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextSetupResponseIEs } },
    ...
}

MCBearerContextSetupResponseIEs E1AP-PROTOCOL-IES ::= {

```

```

    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToSetupResponse CRITICALITY reject TYPE MCBearerContextToSetupResponse PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

-- *****
--
-- MC BEARER CONTEXT SETUP FAILURE
--
-- *****

MCBearerContextSetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextSetupFailureIEs } },
    ...
}

MCBearerContextSetupFailureIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY ignore TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE optional }|
    { ID id-Cause                          CRITICALITY ignore TYPE Cause                          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

-- *****
--
-- MC BEARER CONTEXT MODIFICATION
--
-- *****

-- *****
--
-- MC BEARER CONTEXT MODIFICATION REQUEST
--
-- *****

MCBearerContextModificationRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationRequestIEs } },
    ...
}

MCBearerContextModificationRequestIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModify        CRITICALITY reject TYPE MCBearerContextToModify        PRESENCE mandatory },
    ...
}

-- *****
--
-- MC BEARER CONTEXT MODIFICATION RESPONSE
--

```



```

-- *****
MCBearerContextModificationResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationResponseIEs } },
    ...
}

MCBearerContextModificationResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModifyResponse CRITICALITY reject TYPE MCBearerContextToModifyResponse PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- MC BEARER CONTEXT MODIFICATION FAILURE
--
-- *****

MCBearerContextModificationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationFailureIEs } },
    ...
}

MCBearerContextModificationFailureIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-MBSMulticastFLUContextDescriptor CRITICALITY reject TYPE MBSMulticastFLUContextDescriptor PRESENCE optional }|
    { ID id-Cause                           CRITICALITY ignore TYPE Cause                           PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- MC BEARER CONTEXT MODIFICATION REQUIRED
--
-- *****
--
-- MC BEARER CONTEXT MODIFICATION REQUIRED
--
-- *****

MCBearerContextModificationRequired ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationRequiredIEs } },
    ...
}

MCBearerContextModificationRequiredIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|

```

```

    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject  TYPE  GNB-CU-UP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModifyRequired CRITICALITY reject  TYPE  MCBearerContextToModifyRequired PRESENCE mandatory },
    ...
}

-- *****
--
-- MC BEARER CONTEXT MODIFICATION CONFIRM
--
-- *****

MCBearerContextModificationConfirm ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationConfirmIEs } },
    ...
}

MCBearerContextModificationConfirmIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject  TYPE  GNB-CU-CP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject  TYPE  GNB-CU-UP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModifyConfirm CRITICALITY reject  TYPE  MCBearerContextToModifyConfirm PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE  CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- MC BEARER CONTEXT RELEASE
--
-- *****

-- *****
--
-- MC BEARER CONTEXT RELEASE COMMAND
--
-- *****

MCBearerContextReleaseCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextReleaseCommandIEs } },
    ...
}

MCBearerContextReleaseCommandIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject  TYPE  GNB-CU-CP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject  TYPE  GNB-CU-UP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-Cause                          CRITICALITY ignore  TYPE  Cause                          PRESENCE mandatory },
    ...
}

-- *****
--
-- MC BEARER CONTEXT RELEASE COMPLETE
--
-- *****

```

```

MCBearerContextReleaseComplete ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextReleaseCompleteIEs } },
    ...
}

MCBearerContextReleaseCompleteIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory } |
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory } |
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

-- *****
--
-- MC BEARER CONTEXT RELEASE REQUEST
--
-- *****
--
-- *****
--
-- MC BEARER CONTEXT RELEASE REQUEST
--
-- *****

MCBearerContextReleaseRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextReleaseRequestIEs } },
    ...
}

MCBearerContextReleaseRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory } |
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory } |
    { ID id-Cause                           CRITICALITY ignore TYPE Cause PRESENCE mandatory },
    ...
}

-- *****
--
-- MC BEARER NOTIFICATION
--
-- *****

MCBearerNotification ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerNotificationIEs } },
    ...
}

MCBearerNotificationIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID PRESENCE mandatory } |
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID PRESENCE mandatory } |
    { ID id-MBSSessionResourceNotification CRITICALITY ignore TYPE MBSSessionResourceNotification PRESENCE mandatory },
    ...
}

```

```
END
-- ASN1STOP
```

9.4.5 Information Element Definitions

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

ElAP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    id-CommonNetworkInstance,
    id-SNSSAI,
    id-OldQoSFlowMap-ULendmarkerexpected,
    id-DRB-QoS,
    id-endpoint-IP-Address-and-Port,
    id-NetworkInstance,
    id-QoSFlowMappingIndication,
    id-TNLAssociationTransportLayerAddressgNBCUUP,
    id-Cause,
    id-BCBearerContextNGU-TNLInfoatNGRAN-Request,
    id-QoSMonitoringRequest,
    id-QoSMonitoringReportingFrequency,
    id-QoSMonitoringDisabled,
    id-PDCP-StatusReportIndication,
    id-RedundantCommonNetworkInstance,
    id-redundant-nG-UL-UP-TNL-Information,
    id-redundant-nG-DL-UP-TNL-Information,
    id-RedundantQoSFlowIndicator,
    id-TSCTrafficCharacteristics,
    id-ExtendedPacketDelayBudget,
    id-CNPacketDelayBudgetDownlink,
    id-CNPacketDelayBudgetUplink,
    id-AdditionalPDCPduplicationInformation,
    id-RedundantPDUSessionInformation,
    id-RedundantPDUSessionInformation-used,
    id-QoS-Mapping-Information,
    id-MDTConfiguration,
    id-TraceCollectionEntityURI,
    id-EHC-Parameters,
    id-DAPSRequestInfo,
```

id-EarlyForwardingCOUNTReq,
id-EarlyForwardingCOUNTInfo,
id-AlternativeQoSParaSetList,
id-MCG-OfferedGBRQoSFlowInfo,
id-Number-of-tunnels,
id-DataForwardingtoE-UTRANInformationList,
id-DataForwardingtoNG-RANQoSFlowInformationList,
id-MaxCIDEHCDL,
id-ignoreMappingRuleIndication,
id-EarlyDataForwardingIndicator,
id-QoSFlowsDRBRemapping,
id-SecurityIndicationModify,
id-DataForwardingSourceIPAddress,
id-M4ReportAmount,
id-M6ReportAmount,
id-M7ReportAmount,
id-PDUSession-PairID,
id-SurvivalTime,
id-UDC-Parameters,
id-SecurityIndication,
id-SecurityResult,
id-SDTindicatorSetup,
id-SDTindicatorMod,
id-DiscardTimerExtended,
id-MCForwardingResourceRequest,
id-MCForwardingResourceIndication,
id-MCForwardingResourceResponse,
id-MCForwardingResourceRelease,
id-MCForwardingResourceReleaseIndication,
id-PDCP-COUNT-Reset,
id-MBSSessionAssociatedInfoNonSupportToSupport,
id-VersionID,
id-MBSAreaSessionID,
id-Secondary-PDU-Session-Data-Forwarding-Information,
id-MBSSessionResourceNotification,
id-MCBearerContextInactivityTimer,
id-MCBearerContextStatusChange,
id-SpecialTriggeringPurpose,
id-FlUTunnelNotEstablished,
id-PDUSetQoSParameters,
id-N6JitterInformation,
id-ECNMarkingorCongestionInformationReportingRequest,
id-ECNMarkingorCongestionInformationReportingStatus,
id-PDUSetbasedHandlingIndicator,
id-IndirectPathIndication,
id-FlU-TNL-InfoToAdd-List,
id-FlU-TNL-InfoAdded-List,
id-FlU-TNL-InfoToAddOrModify-List,
id-FlU-TNL-InfoAddedOrModified-List,
id-FlU-TNL-InfoToRelease-List,
id-BroadcastFlU-ContextReferenceE1,
id-PSIbasedDiscardTimer,
id-UserPlaneErrorIndicator,
id-MaximumDataBurstVolume,

```
id-PDCPSNGapReport,  
id-UserPlaneFailureIndication,  
maxnoofMBSAreaSessionIDs,  
maxnoofSharedNG-UTerminations,  
maxnoofMRBs,  
maxnoofMBSSessionIDs,  
maxnoofQoSParaSets,  
maxnoofErrors,  
maxnoofSliceItems,  
maxnoofEUTRANQoSParameters,  
maxnoofNGRANQoSParameters,  
maxnoofDRBs,  
maxnoofPDUSessionResource,  
maxnoofQoSFlows,  
maxnoofUPParameters,  
maxnoofCellGroups,  
maxnoofTimeperiods,  
maxnoofNR CGI,  
maxnoofTLAs,  
maxnoofGTPTLAs,  
maxnoofSPLMNs,  
maxnoofMDT PLMNs,  
maxnoofExtSliceItems,  
maxnoofDataForwardingTunneltoE-UTRAN,  
maxnoofExtNR CGI,  
maxnoofECGI,  
maxnoofSMBRValues,  
maxnoofCellsforMBS,  
maxnoofTAIforMBS,  
maxnoofMBSServiceAreaInformation,  
maxnoofDUs
```

```
FROM ElAP-Constants
```

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

```
FROM ElAP-CommonDataTypes
```

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

```
FROM ElAP-Containers;
```

```
-- A
```

```
ActivityInformation ::= CHOICE {  
    dRB-Activity-List  
        DRB-Activity-List,
```

```

    pdu-Session-Resource-Activity-List      PDU-Session-Resource-Activity-List,
    ue-Activity                             UE-Activity,
    choice-extension                       ProtocolIE-SingleContainer  {{ActivityInformation-ExtIEs}}
}

ActivityInformation-ExtIEs ELAP-PROTOCOL-IES ::= {
    ...
}

ActivityNotificationLevel ::= ENUMERATED {
    drb,
    pdu-session,
    ue,
    ...
}

AdditionalHandoverInfo ::= ENUMERATED {
    discard-pdpc-SN,
    ...
}

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

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

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

AlternativeQoSParaSetList ::= SEQUENCE (SIZE(1..maxnoofQoSParaSets)) OF AlternativeQoSParaSetItem

AlternativeQoSParaSetItem ::= SEQUENCE {
    alternativeQoSParameterIndex      INTEGER(1..8,...),
    guaranteedFlowBitRateDL           BitRate                OPTIONAL,
    guaranteedFlowBitRateUL           BitRate                OPTIONAL,
    packetDelayBudget                  PacketDelayBudget     OPTIONAL,
    packetErrorRate                    PacketErrorRate       OPTIONAL,
    iE-Extensions                     ProtocolExtensionContainer {{AlternativeQoSParaSetItem-ExtIEs}} OPTIONAL,
    ...
}

AlternativeQoSParaSetItem-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-MaximumDataBurstVolume CRITICALITY ignore EXTENSION MaxDataBurstVolume PRESENCE optional },
    ...
}

AssociatedSessionID ::= OCTET STRING

-- B

-- BCBearerContextToSetup

```

```

BCBearerContextToSetup ::= SEQUENCE {
    snssai                SNSSAI,
    bcBearerContextNGU-TNLInfoat5GC    BCBearerContextNGU-TNLInfoat5GC    OPTIONAL,
    bcMRBToSetupList      BCMRBSetupConfiguration,
    requestedAction       RequestedAction4AvailNGUTermination    OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { {BCBearerContextToSetup-ExtIEs} }    OPTIONAL,
    ...
}

BCBearerContextToSetup-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BCBearerContextNGU-TNLInfoat5GC ::= CHOICE {
    locationindependent    MBSNGUIInformationAt5GC,
    locationdependent      LocationDependentMBSNGUIInformationAt5GC,
    choice-extension       ProtocolIE-SingleContainer { {BCBearerContextNGU-TNLInfoat5GC-ExtIEs} }
}

BCBearerContextNGU-TNLInfoat5GC-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

BCMRBSetupConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBSetupConfiguration-Item

BCMRBSetupConfiguration-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    mbs-pdcp-config       PDCP-Configuration,
    qos-Flow-QoS-Parameter-List    QoS-Flow-QoS-Parameter-List,
    qosFlowLevelQoSParameters    QoSFlowLevelQoSParameters    OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { {BCMRBSetupConfiguration-Item-ExtIEs} }    OPTIONAL,
    ...
}

BCMRBSetupConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-F1U-TNL-InfoToAdd-List    CRITICALITY ignore    EXTENSION F1U-TNL-InfoToAdd-List    PRESENCE optional},
    ...
}

-- BCBearerContextToSetupResponse

BCBearerContextToSetupResponse ::= SEQUENCE {
    bcBearerContextNGU-TNLInfoatNGRAN    BCBearerContextNGU-TNLInfoatNGRAN    OPTIONAL,
    bcMRBSetupResponseList    BCMRBSetupResponseList,
    bcMRBFailedList          BCMRBFailedList    OPTIONAL,
    availableBCMRBConfig     BCMRBSetupConfiguration    OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {BCBearerContextToSetupResponse-ExtIEs} }    OPTIONAL,
    ...
}

BCBearerContextToSetupResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```



```

BCBearerContextNGU-TNLInfoatNGRAN ::= CHOICE {
    locationindependent      MBSNGUInformationAtNGRAN,
    locationdependent        LocationDependentMBSNGUInformationAtNGRAN,
    choice-extension         ProtocolIE-SingleContainer {{BCBearerContextNGU-TNLInfoatNGRAN-ExtIEs}}
}

BCBearerContextNGU-TNLInfoatNGRAN-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

BCMRBSetupResponseList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBSetupResponseList-Item
BCMRBSetupResponseList-Item ::= SEQUENCE {
    mrb-ID                    MRB-ID,
    qosflow-setup             QoS-Flow-List,
    qosflow-failed            QoS-Flow-Failed-List          OPTIONAL,
    bcbearercontextflU-TNLInfoatCU  BCBearerContextFlU-TNLInfoatCU,
    iE-Extensions             ProtocolExtensionContainer {{BCMRBSetupResponseList-Item-ExtIEs}} OPTIONAL,
    ...
}

BCMRBSetupResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-FlU-TNL-InfoAdded-List  CRITICALITY ignore  EXTENSION FlU-TNL-InfoAdded-List  PRESENCE optional},
    ...
}

BCBearerContextFlU-TNLInfoatCU ::= CHOICE {
    locationindependent      MBSFlUInformationAtCU,
    locationdependent        LocationDependentMBSFlUInformationAtCU,
    choice-extension         ProtocolIE-SingleContainer {{BCBearerContextFlU-TNLInfoatCU-ExtIEs}}
}

BCBearerContextFlU-TNLInfoatCU-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

BCMRBFailedList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBFailedList-Item
BCMRBFailedList-Item ::= SEQUENCE {
    mrb-ID                    MRB-ID,
    cause                     Cause,
    iE-Extensions             ProtocolExtensionContainer {{BCMRBFailedList-Item-ExtIEs}}  OPTIONAL,
    ...
}

BCMRBFailedList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- BCBearerContextToModify
BCBearerContextToModify ::= SEQUENCE {

```

```

    bcBearerContextNGU-TNLInfoat5GC      BCBearerContextNGU-TNLInfoat5GC OPTIONAL,
    bcMRBToSetupList                     BCMRBSetupConfiguration      OPTIONAL,
    bcMRBToModifyList                    BCMRBModifyConfiguration    OPTIONAL,
    bcMRBToRemoveList                   BCMRBRemoveConfiguration    OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {BCBearerContextToModify-ExtIEs} } OPTIONAL,
    ...
}

BCBearerContextToModify-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-BCBearerContextNGU-TNLInfoatNGRAN-Request      CRITICALITY ignore  EXTENSION BCBearerContextNGU-TNLInfoatNGRAN-Request PRESENCE optional},
  ...
}

BCBearerContextNGU-TNLInfoatNGRAN-Request ::= CHOICE {
  locationindependent      MBSNGUIInformationAtNGRAN-Request,
  locationdependent        MBSNGUIInformationAtNGRAN-Request-List,
  choice-extension         ProtocolIE-SingleContainer { { BCBearerContextNGU-TNLInfoatNGRAN-Request-ExtIEs} }
}

BCBearerContextNGU-TNLInfoatNGRAN-Request-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

BCMRBModifyConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBModifyConfiguration-Item

BCMRBModifyConfiguration-Item ::= SEQUENCE {
  mrb-ID      MRB-ID,
  bcBearerContextFlU-TNLInfoatDU BCBearerContextFlU-TNLInfoatDU OPTIONAL,
  mbs-pdcp-config      PDCP-Configuration      OPTIONAL,
  qos-Flow-QoS-Parameter-List      QoS-Flow-QoS-Parameter-List      OPTIONAL,
  qosFlowLevelQoSParameters      QoSFlowLevelQoSParameters      OPTIONAL,
  iE-Extensions      ProtocolExtensionContainer { {BCMRBModifyConfiguration-Item-ExtIEs} } OPTIONAL,
  ...
}

BCMRBModifyConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-FlU-TNL-InfoToAddOrModify-List      CRITICALITY ignore  EXTENSION FlU-TNL-InfoToAddOrModify-List      PRESENCE optional}|
  {ID id-FlU-TNL-InfoToRelease-List          CRITICALITY ignore  EXTENSION FlU-TNL-InfoToRelease-List          PRESENCE optional},
  ...
}

BCBearerContextFlU-TNLInfoatDU ::= CHOICE {
  locationindependent      MBSFlUInformationAtDU,
  locationdependent        LocationDependentMBSFlUInformationAtDU,
  choice-extension         ProtocolIE-SingleContainer { {BCBearerContextFlU-TNLInfoatDU-ExtIEs} }
}

BCBearerContextFlU-TNLInfoatDU-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

BCMRBRemoveConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MRB-ID

```

```

-- BCBearerContextToModifyResponse

BCBearerContextToModifyResponse ::= SEQUENCE {
    bcBearerContextNGU-TNLInfoatNGRAN          BCBearerContextNGU-TNLInfoatNGRAN          OPTIONAL,
    bcMRBSetupModifyResponseList              BCMRBSetupModifyResponseList,
    bcMRBFailedList                            BCMRBFailedList                            OPTIONAL,
    availableBCMRBConfig                       BCMRBSetupConfiguration                    OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {BCBearerContextToModifyResponse-ExtIEs} } OPTIONAL,
    ...
}

BCBearerContextToModifyResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BCMRBSetupModifyResponseList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBSetupModifyResponseList-Item

BCMRBSetupModifyResponseList-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    qosflow-setup          QoS-Flow-List          OPTIONAL,
    qosflow-failed         QoS-Flow-Failed-List   OPTIONAL,
    bcBearerContextFLU-TNLInfoatCU          BCBearerContextFLU-TNLInfoatCU          OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {BCMRBSetupModifyResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

BCMRBSetupModifyResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-FLU-TNL-InfoAddedOrModified-List CRITICALITY ignore EXTENSION FLU-TNL-InfoAddedOrModified-List PRESENCE optional},
    ...
}

BroadcastFLU-ContextReferenceE1 ::= OCTET STRING (SIZE(4))

-- BCBearerContextToModifyRequired

BCBearerContextToModifyRequired ::= SEQUENCE {
    bcMRBToRemoveList      BCMRBRemoveConfiguration          OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {BCBearerContextToModifyRequired-ExtIEs} } OPTIONAL,
    ...
}

BCBearerContextToModifyRequired-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- BCBearerContextToModifyConfirm

BCBearerContextToModifyConfirm ::= SEQUENCE {
    iE-Extensions          ProtocolExtensionContainer { {BCBearerContextToModifyConfirm-ExtIEs} } OPTIONAL,
    ...
}

BCBearerContextToModifyConfirm-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

```

```
    ...
}

BearerContextStatusChange ::= ENUMERATED {
    suspend,
    resume,
    ... ,
    resumeforSDT
}

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

BufferSize ::= ENUMERATED {
    kbyte2,
    kbyte4,
    kbyte8,
    ...
}

-- C

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

Cause-ExtIEs ELAP-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,
    unknown-or-already-allocated-gnb-cu-cp-ue-elap-id,
    unknown-or-already-allocated-gnb-cu-up-ue-elap-id,
    unknown-or-inconsistent-pair-of-ue-elap-id,
    interaction-with-other-procedure,
    pDCP-Count-wrap-around,
    not-supported-QCI-value,
    not-supported-5QI-value,
    encryption-algorithms-not-supported,
    integrity-protection-algorithms-not-supported,
    uP-integrity-protection-not-possible,
    uP-confidentiality-protection-not-possible,
    multiple-PDU-Session-ID-Instances,
    unknown-PDU-Session-ID,
    multiple-QoS-Flow-ID-Instances,
    unknown-QoS-Flow-ID,
    multiple-DRB-ID-Instances,
    unknown-DRB-ID,
    invalid-QoS-combination,
    procedure-cancelled,
    normal-release,
    no-radio-resources-available,
    action-desirable-for-radio-reasons,
    resources-not-available-for-the-slice,
    pDCP-configuration-not-supported,
    ...,
    ue-dl-max-IP-data-rate-reason,
    uP-integrity-protection-failure,
    release-due-to-pre-emption,
    rsn-not-available-for-the-up,
    nPN-not-supported,
    report-characteristic-empty,
    existing-measurement-ID,
    measurement-temporarily-not-available,
    measurement-not-supported-for-the-object,
    scg-activation-deactivation-failure,
    scg-deactivation-failure-due-to-data-transmission,
    unknown-or-already-allocated-gNB-CU-CP-MBS-ElAP-ID,
    unknown-or-already-allocated-gNB-CU-UP-MBS-ElAP-ID,
    unknown-or-inconsistent-pair-of-MBS-ElAP-ID,
    unknown-or-inconsistent-MRB-ID
}

CauseTransport ::= ENUMERATED {
    unspecified,
    transport-resource-unavailable,
    ...,
    unknown-TNL-address-for-IAB
}

Cell-Group-Information ::= SEQUENCE (SIZE(1.. maxnoofCellGroups)) OF Cell-Group-Information-Item

Cell-Group-Information-Item ::= SEQUENCE {
```

```

cell-Group-ID          Cell-Group-ID,
uL-Configuration      UL-Configuration      OPTIONAL,
dL-TX-Stop            DL-TX-Stop            OPTIONAL,
rAT-Type              RAT-Type              OPTIONAL,
iE-Extensions         ProtocolExtensionContainer { { Cell-Group-Information-Item-ExtIEs } } OPTIONAL,
...
}

Cell-Group-Information-Item-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-Number-of-tunnels  CRITICALITY ignore  EXTENSION Number-of-tunnels  PRESENCE optional},
  ...
}

Cell-Group-ID ::= INTEGER (0..3, ...)

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

Number-of-tunnels ::= INTEGER (1..4, ...)

CipheringAlgorithm ::= ENUMERATED {
  nEA0,
  c-128-NEA1,
  c-128-NEA2,
  c-128-NEA3,
  ...
}

CNSupport ::= ENUMERATED {
  c-epc,
  c-5gc,
  both,
  ...
}

CommonNetworkInstance ::= OCTET STRING

ConfidentialityProtectionIndication ::= ENUMERATED {
  required,
  preferred,
  not-needed,
  ...
}

ConfidentialityProtectionResult ::= ENUMERATED {
  performed,
  not-performed,
  ...
}

CP-TNL-Information ::= CHOICE {
  endpoint-IP-Address  TransportLayerAddress,
  choice-extension     ProtocolIE-SingleContainer  {{CP-TNL-Information-ExtIEs}}
}

```

```

}
CP-TNL-Information-ExtIEs E1AP-PROTOCOL-IES ::= {
  { ID id-endpoint-IP-Address-and-Port    CRITICALITY reject  TYPE Endpoint-IP-address-and-port  PRESENCE mandatory},
  ...
}

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 E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxnoofErrors)) OF
  SEQUENCE {
    iECriticality          Criticality,
    iE-ID                 ProtocolIE-ID,
    typeOfError           TypeOfError,
    iE-Extensions         ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
    ...
  }

CriticalityDiagnostics-IE-List-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

-- D

DAPSRequestInfo ::= SEQUENCE {
  dapsIndicator           ENUMERATED {daps-HO-required, ...},
  iE-Extensions          ProtocolExtensionContainer { {DAPSRequestInfo-ExtIEs} } OPTIONAL,
  ...
}

DAPSRequestInfo-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

Data-Forwarding-Information-Request ::= SEQUENCE {
  data-Forwarding-Request Data-Forwarding-Request,
  qos-Flows-Forwarded-On-Fwd-Tunnels QoS-Flow-Mapping-List OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { { Data-Forwarding-Information-Request-ExtIEs } } OPTIONAL,
  ...
}

```

```

Data-Forwarding-Information-Request-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

Data-Forwarding-Information ::= SEQUENCE {
  uL-Data-Forwarding          UP-TNL-Information      OPTIONAL,
  dL-Data-Forwarding          UP-TNL-Information      OPTIONAL,
  iE-Extensions               ProtocolExtensionContainer { { Data-Forwarding-Information-ExtIEs } } OPTIONAL,
  ...
}

Data-Forwarding-Information-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-DataForwardingtoNG-RANQoSFlowInformationList CRITICALITY ignore EXTENSION DataForwardingtoNG-RANQoSFlowInformationList PRESENCE optional}|
  {ID id-PDUSetbasedHandlingIndicator CRITICALITY ignore EXTENSION PDUSetbasedHandlingIndicator PRESENCE optional},
  ...
}

Data-Forwarding-Request ::= ENUMERATED {
  uL,
  dL,
  both,
  ...
}

DataForwardingtoE-UTRANInformationList ::= SEQUENCE (SIZE(1..maxnoofDataForwardingTunneltoE-UTRAN)) OF DataForwardingtoE-UTRANInformationListItem

DataForwardingtoE-UTRANInformationListItem ::= SEQUENCE {
  data-forwarding-tunnel-information          UP-TNL-Information,
  qos-Flows-to-be-forwarded-List             QoS-Flows-to-be-forwarded-List,
  iE-Extensions                             ProtocolExtensionContainer { { DataForwardingtoE-UTRANInformationListItem-ExtIEs } } OPTIONAL,
  ...
}

DataForwardingtoE-UTRANInformationListItem-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

Data-Usage-per-PDU-Session-Report ::= SEQUENCE {
  secondaryRATType          ENUMERATED {nR, e-UTRA, ...},
  pdu-session-Timed-Report-List SEQUENCE (SIZE(1..maxnooftimeperiods)) OF MRDC-Data-Usage-Report-Item,
  iE-Extensions             ProtocolExtensionContainer { { Data-Usage-per-PDU-Session-Report-ExtIEs } } OPTIONAL,
  ...
}

Data-Usage-per-PDU-Session-Report-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

Data-Usage-per-QoS-Flow-List ::= SEQUENCE (SIZE(1..maxnoofQoSFlows)) OF Data-Usage-per-QoS-Flow-Item

Data-Usage-per-QoS-Flow-Item ::= SEQUENCE {
  qos-Flow-Identifier      QoS-Flow-Identifier,

```



```

secondaryRATType          ENUMERATED {nR, e-UTRA, ...},
qoS-Flow-Timed-Report-List SEQUENCE (SIZE(1..maxnooftimeperiods)) OF MRDC-Data-Usage-Report-Item,
iE-Extensions             ProtocolExtensionContainer { { Data-Usage-per-QoS-Flow-Item-ExtIEs } } OPTIONAL,
...
}

Data-Usage-per-QoS-Flow-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Data-Usage-Report-List ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF Data-Usage-Report-Item

Data-Usage-Report-Item ::= SEQUENCE {
    dRB-ID                DRB-ID,
    rAT-Type              RAT-Type,
    dRB-Usage-Report-List DRB-Usage-Report-List,
    iE-Extensions         ProtocolExtensionContainer { { Data-Usage-Report-ItemExtIEs } } OPTIONAL,
    ...
}

Data-Usage-Report-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

Dictionary ::= ENUMERATED {
    sip-SDP,
    operator,
    ...
}

DirectForwardingPathAvailability ::= ENUMERATED {
    inter-system-direct-path-available,
    ...,
    intra-system-direct-path-available
}

DiscardTimer ::= ENUMERATED {ms10, ms20, ms30, ms40, ms50, ms60, ms75, ms100, ms150, ms200, ms250, ms300, ms500, ms750, ms1500, infinity}

DiscardTimerExtended ::= ENUMERATED {ms0dot5, ms1, ms2, ms4, ms6, ms8,..., ms2000}

PSIbasedDiscardTimer ::= ENUMERATED {ms0, ms2, ms4, ms6, ms8, ms10, ms12, ms14, ms18, ms22, ms26, ms30, ms40, ms50, ms75, ms100, ...}

DLDiscarding ::= SEQUENCE {
    dLDiscardingCountVal PDCP-Count,
    iE-Extensions         ProtocolExtensionContainer { { DLDiscarding-ExtIEs } } OPTIONAL
}

DLDiscarding-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {

```

```

}
...
}
DLUPTNLAddressToUpdateItem ::= SEQUENCE {
    oldTNLAddress      TransportLayerAddress,
    newTNLAddress      TransportLayerAddress,
    IE-Extensions      ProtocolExtensionContainer { { DLUPTNLAddressToUpdateItemExtIEs } } OPTIONAL,
    ...
}
DLUPTNLAddressToUpdateItemExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
DL-TX-Stop ::= ENUMERATED {
    stop,
    resume,
    ...
}
DRB-Activity ::= ENUMERATED {
    active,
    not-active,
    ...
}
DRB-Activity-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRB-Activity-Item
DRB-Activity-Item ::= SEQUENCE {
    dRB-ID              DRB-ID,
    dRB-Activity        DRB-Activity,
    IE-Extensions      ProtocolExtensionContainer { { DRB-Activity-ItemExtIEs } } OPTIONAL,
    ...
}
DRB-Activity-ItemExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
DRB-Confirm-Modified-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Confirm-Modified-Item-EUTRAN
DRB-Confirm-Modified-Item-EUTRAN ::= SEQUENCE {
    dRB-ID              DRB-ID,
    cell-Group-Information Cell-Group-Information OPTIONAL,
    IE-Extensions      ProtocolExtensionContainer { { DRB-Confirm-Modified-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}
DRB-Confirm-Modified-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
DRB-Confirm-Modified-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Confirm-Modified-Item-NG-RAN

```

```

DRB-Confirm-Modified-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cell-Group-Information Cell-Group-Information OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { { DRB-Confirm-Modified-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Confirm-Modified-Item-NG-RAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Item-EUTRAN

DRB-Failed-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions         ProtocolExtensionContainer { { DRB-Failed-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Item-EUTRAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-Mod-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Mod-Item-EUTRAN

DRB-Failed-Mod-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions         ProtocolExtensionContainer { { DRB-Failed-Mod-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Mod-Item-EUTRAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Item-NG-RAN

DRB-Failed-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions         ProtocolExtensionContainer { { DRB-Failed-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Item-NG-RAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-Mod-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Mod-Item-NG-RAN

DRB-Failed-Mod-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,

```

```

    cause                Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-Mod-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Mod-Item-NG-RAN-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-To-Modify-List-EUTRAN    ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-To-Modify-Item-EUTRAN

DRB-Failed-To-Modify-Item-EUTRAN    ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-To-Modify-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-To-Modify-Item-EUTRAN-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-To-Modify-List-NG-RAN    ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-To-Modify-Item-NG-RAN

DRB-Failed-To-Modify-Item-NG-RAN    ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-To-Modify-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-To-Modify-Item-NG-RAN-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-ID ::= INTEGER (1..32, ...)
DRB-Measurement-Results-Information-List ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Measurement-Results-Information-Item
DRB-Measurement-Results-Information-Item ::= SEQUENCE {
    dRB-ID                DRB-ID,
    uL-DL-Result          INTEGER (0..10000, ...) OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Measurement-Results-Information-Item-ExtIEs } } OPTIONAL,
    ...
}

DRB-Measurement-Results-Information-Item-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Modified-List-EUTRAN    ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Modified-Item-EUTRAN

DRB-Modified-Item-EUTRAN    ::= SEQUENCE {
    dRB-ID                DRB-ID,
    s1-DL-UP-TNL-Information    UP-TNL-Information                OPTIONAL,
    pDCP-SN-Status-Information    PDCP-SN-Status-Information        OPTIONAL,

```

```

    uL-UP-Transport-Parameters          UP-Parameters          OPTIONAL,
    iE-Extensions                        ProtocolExtensionContainer { { DRB-Modified-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Modified-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Modified-List-NG-RAN             ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Modified-Item-NG-RAN

DRB-Modified-Item-NG-RAN             ::= SEQUENCE {
    dRB-ID                             DRB-ID,
    uL-UP-Transport-Parameters         UP-Parameters          OPTIONAL,
    pDCP-SN-Status-Information         PDCP-SN-Status-Information OPTIONAL,
    flow-Setup-List                   QoS-Flow-List          OPTIONAL,
    flow-Failed-List                  QoS-Flow-Failed-List  OPTIONAL,
    iE-Extensions                      ProtocolExtensionContainer { { DRB-Modified-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Modified-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-EarlyForwardingCOUNTInfo  CRITICALITY reject  EXTENSION EarlyForwardingCOUNTInfo  PRESENCE optional}|
    {ID id-OldQoSFlowMap-ULendmarkerexpected  CRITICALITY ignore  EXTENSION QoS-Flow-List  PRESENCE optional},
    ...
}

DRB-Removed-Item                    ::= SEQUENCE {
    dRB-ID                             DRB-ID,
    dRB-Released-In-Session            ENUMERATED {released-in-session, not-released-in-session, ...} OPTIONAL,
    dRB-Accumulated-Session-Time       OCTET STRING (SIZE(5)) OPTIONAL,
    qoS-Flow-Removed-List              SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Removed-Item OPTIONAL,
    iE-Extensions                      ProtocolExtensionContainer { { DRB-Removed-Item-ExtIEs } } OPTIONAL,
    ...
}

DRB-Removed-Item-ExtIEs              E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Required-To-Modify-List-EUTRAN   ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Modify-Item-EUTRAN

DRB-Required-To-Modify-Item-EUTRAN   ::= SEQUENCE {
    dRB-ID                             DRB-ID,
    s1-DL-UP-TNL-Information           UP-TNL-Information     OPTIONAL,
    gNB-CU-UP-CellGroupRelatedConfiguration GNB-CU-UP-CellGroupRelatedConfiguration OPTIONAL,
    cause                              Cause                  OPTIONAL,
    iE-Extensions                      ProtocolExtensionContainer { { DRB-Required-To-Modify-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Required-To-Modify-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```

DRB-Required-To-Modify-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Modify-Item-NG-RAN

```
DRB-Required-To-Modify-Item-NG-RAN ::= SEQUENCE {
  dRB-ID                DRB-ID,
  gNB-CU-UP-CellGroupRelatedConfiguration  GNB-CU-UP-CellGroupRelatedConfiguration  OPTIONAL,
  flow-To-Remove       QoS-Flow-List                OPTIONAL,
  cause                Cause                OPTIONAL,
  iE-Extensions        ProtocolExtensionContainer { { DRB-Required-To-Modify-Item-NG-RAN-ExtIEs } } OPTIONAL,
  ...
}
```

```
DRB-Required-To-Modify-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}
```

DRB-Setup-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Item-EUTRAN

```
DRB-Setup-Item-EUTRAN ::= SEQUENCE {
  dRB-ID                DRB-ID,
  s1-DL-UP-TNL-Information  UP-TNL-Information,
  data-Forwarding-Information-Response  Data-Forwarding-Information  OPTIONAL,
  uL-UP-Transport-Parameters  UP-Parameters,
  s1-DL-UP-Unchanged        ENUMERATED {true, ...}  OPTIONAL,
  iE-Extensions            ProtocolExtensionContainer { { DRB-Setup-Item-EUTRAN-ExtIEs } }  OPTIONAL,
  ...
}
```

```
DRB-Setup-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-DataForwardingSourceIPAddress  CRITICALITY ignore  EXTENSION TransportLayerAddress  PRESENCE optional}|
  {ID id-SecurityResult                 CRITICALITY ignore  EXTENSION SecurityResult    PRESENCE optional},
  ...
}
```

DRB-Setup-Mod-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Mod-Item-EUTRAN

```
DRB-Setup-Mod-Item-EUTRAN ::= SEQUENCE {
  dRB-ID                DRB-ID,
  s1-DL-UP-TNL-Information  UP-TNL-Information,
  data-Forwarding-Information-Response  Data-Forwarding-Information  OPTIONAL,
  uL-UP-Transport-Parameters  UP-Parameters,
  iE-Extensions            ProtocolExtensionContainer { { DRB-Setup-Mod-Item-EUTRAN-ExtIEs } }  OPTIONAL,
  ...
}
```

```
DRB-Setup-Mod-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-SecurityResult                 CRITICALITY ignore  EXTENSION SecurityResult    PRESENCE optional}|
  {ID id-DataForwardingSourceIPAddress  CRITICALITY ignore  EXTENSION TransportLayerAddress  PRESENCE optional},
  ...
}
```

DRB-Setup-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Item-NG-RAN

```

DRB-Setup-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    dRB-data-Forwarding-Information-Response  Data-Forwarding-Information OPTIONAL,
    uL-UP-Transport-Parameters  UP-Parameters,
    flow-Setup-List            QoS-Flow-List,
    flow-Failed-List          QoS-Flow-Failed-List OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { DRB-Setup-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Setup-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Setup-Mod-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Mod-Item-NG-RAN

DRB-Setup-Mod-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    dRB-data-Forwarding-Information-Response  Data-Forwarding-Information OPTIONAL,
    uL-UP-Transport-Parameters  UP-Parameters,
    flow-Setup-List            QoS-Flow-List,
    flow-Failed-List          QoS-Flow-Failed-List OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { DRB-Setup-Mod-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Setup-Mod-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Status-Item ::= SEQUENCE {
    dRB-ID                DRB-ID,
    pDCP-DL-Count          PDCP-Count OPTIONAL,
    pDCP-UL-Count          PDCP-Count OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { { DRB-Status-ItemExtIEs } } OPTIONAL,
    ...
}

DRB-Status-ItemExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-Subject-To-Counter-Check-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRBs-Subject-To-Counter-Check-Item-EUTRAN

DRBs-Subject-To-Counter-Check-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    pDCP-UL-Count          PDCP-Count,
    pDCP-DL-Count          PDCP-Count,
    iE-Extensions          ProtocolExtensionContainer { { DRBs-Subject-To-Counter-Check-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRBs-Subject-To-Counter-Check-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

}

DRBs-Subject-To-Counter-Check-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRBs-Subject-To-Counter-Check-Item-NG-RAN

DRBs-Subject-To-Counter-Check-Item-NG-RAN ::= SEQUENCE {
    pdu-Session-ID          PDU-Session-ID,
    drb-ID                  DRB-ID,
    pdcp-UL-Count           PDCP-Count,
    pdcp-DL-Count           PDCP-Count,
    iE-Extensions           ProtocolExtensionContainer { { DRBs-Subject-To-Counter-Check-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRBs-Subject-To-Counter-Check-Item-NG-RAN-ExtIEs          E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-Subject-To-Early-Forwarding-List ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRBs-Subject-To-Early-Forwarding-Item

DRBs-Subject-To-Early-Forwarding-Item ::= SEQUENCE {
    drb-ID                DRB-ID,
    dlCountValue          PDCP-Count,
    iE-Extensions         ProtocolExtensionContainer { { DRBs-Subject-To-Early-Forwarding-Item-ExtIEs } } OPTIONAL,
    ...
}

DRBs-Subject-To-Early-Forwarding-Item-ExtIEs          E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-To-Modify-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Modify-Item-EUTRAN

DRB-To-Modify-Item-EUTRAN ::= SEQUENCE {
    drb-ID                DRB-ID,
    pdcp-Configuration    PDCP-Configuration          OPTIONAL,
    eUTRAN-QoS            EUTRAN-QoS                OPTIONAL,
    s1-UL-UP-TNL-Information  UP-TNL-Information        OPTIONAL,
    data-Forwarding-Information  Data-Forwarding-Information  OPTIONAL,
    pdcp-SN-Status-Request    PDCP-SN-Status-Request          OPTIONAL,
    pdcp-SN-Status-Information  PDCP-SN-Status-Information  OPTIONAL,
    dl-UP-Parameters         UP-Parameters            OPTIONAL,
    cell-Group-To-Add        Cell-Group-Information    OPTIONAL,
    cell-Group-To-Modify    Cell-Group-Information    OPTIONAL,
    cell-Group-To-Remove    Cell-Group-Information    OPTIONAL,
    drb-Inactivity-Timer     Inactivity-Timer        OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { DRB-To-Modify-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Modify-Item-EUTRAN-ExtIEs          E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-To-Modify-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Modify-Item-NG-RAN

```



```

DRB-To-Modify-Item-NG-RAN ::= SEQUENCE {
    dRB-ID DRB-ID,
    sDAP-Configuration SDAP-Configuration OPTIONAL,
    pDCP-Configuration PDCP-Configuration OPTIONAL,
    dRB-Data-Forwarding-Information Data-Forwarding-Information OPTIONAL,
    pDCP-SN-Status-Request PDCP-SN-Status-Request OPTIONAL,
    pdcp-SN-Status-Information PDCP-SN-Status-Information OPTIONAL,
    dL-UP-Parameters UP-Parameters OPTIONAL,
    cell-Group-To-Add Cell-Group-Information OPTIONAL,
    cell-Group-To-Modify Cell-Group-Information OPTIONAL,
    cell-Group-To-Remove Cell-Group-Information OPTIONAL,
    flow-Mapping-Information QoS-Flow-QoS-Parameter-List OPTIONAL,
    dRB-Inactivity-Timer Inactivity-Timer OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRB-To-Modify-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Modify-Item-NG-RAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-OldQoSFlowMap-ULendmarkerexpected CRITICALITY reject EXTENSION QoS-Flow-List PRESENCE optional}|
    {ID id-DRB-QoS CRITICALITY ignore EXTENSION QoSFlowLevelQoSParameters PRESENCE optional}|
    {ID id-EarlyForwardingCOUNTReq CRITICALITY reject EXTENSION EarlyForwardingCOUNTReq PRESENCE optional}|
    {ID id-EarlyForwardingCOUNTInfo CRITICALITY reject EXTENSION EarlyForwardingCOUNTInfo PRESENCE optional}|
    {ID id-DAPSRequestInfo CRITICALITY ignore EXTENSION DAPSRequestInfo PRESENCE optional}|
    {ID id-EarlyDataForwardingIndicator CRITICALITY ignore EXTENSION EarlyDataForwardingIndicator PRESENCE optional}|
    {ID id-SDTindicatorMod CRITICALITY reject EXTENSION SDTindicatorMod PRESENCE optional}|
    {ID id-PDCP-COUNT-Reset CRITICALITY reject EXTENSION PDCP-COUNT-Reset PRESENCE optional},
    ...
}

DRB-To-Remove-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Remove-Item-EUTRAN

DRB-To-Remove-Item-EUTRAN ::= SEQUENCE {
    dRB-ID DRB-ID,
    iE-Extensions ProtocolExtensionContainer { { DRB-To-Remove-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Remove-Item-EUTRAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Required-To-Remove-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Remove-Item-EUTRAN

DRB-Required-To-Remove-Item-EUTRAN ::= SEQUENCE {
    dRB-ID DRB-ID,
    cause Cause,
    iE-Extensions ProtocolExtensionContainer { { DRB-Required-To-Remove-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Required-To-Remove-Item-EUTRAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

DRB-To-Remove-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Remove-Item-NG-RAN

DRB-To-Remove-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    iE-Extensions         ProtocolExtensionContainer { { DRB-To-Remove-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Remove-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Required-To-Remove-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Remove-Item-NG-RAN

DRB-Required-To-Remove-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions         ProtocolExtensionContainer { { DRB-Required-To-Remove-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Required-To-Remove-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-To-Setup-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Item-EUTRAN

DRB-To-Setup-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    pDCP-Configuration    PDCP-Configuration,
    eUTRAN-QoS            EUTRAN-QoS,
    s1-UL-UP-TNL-Information    UP-TNL-Information,
    data-Forwarding-Information-Request    Data-Forwarding-Information-Request    OPTIONAL,
    cell-Group-Information    Cell-Group-Information,
    dL-UP-Parameters        UP-Parameters        OPTIONAL,
    dRB-Inactivity-Timer     Inactivity-Timer     OPTIONAL,
    existing-Allocated-S1-DL-UP-TNL-Info    UP-TNL-Information    OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { { DRB-To-Setup-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Setup-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-DataForwardingSourceIPAddress    CRITICALITY ignore    EXTENSION TransportLayerAddress    PRESENCE optional}|
    {ID id-SecurityIndication              CRITICALITY reject    EXTENSION SecurityIndication    PRESENCE optional},
    ...
}

DRB-To-Setup-Mod-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Mod-Item-EUTRAN

DRB-To-Setup-Mod-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    pDCP-Configuration    PDCP-Configuration,
    eUTRAN-QoS            EUTRAN-QoS,

```

```

s1-UL-UP-TNL-Information      UP-TNL-Information,
data-Forwarding-Information-Request  Data-Forwarding-Information-Request  OPTIONAL,
cell-Group-Information        Cell-Group-Information,
dL-UP-Parameters              UP-Parameters                        OPTIONAL,
dRB-Inactivity-Timer          Inactivity-Timer                        OPTIONAL,
iE-Extensions                  ProtocolExtensionContainer { { DRB-To-Setup-Mod-Item-EUTRAN-ExtIEs } } OPTIONAL,
...
}

DRB-To-Setup-Mod-Item-EUTRAN-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-SecurityIndication          CRITICALITY reject  EXTENSION SecurityIndication          PRESENCE optional}|
  {ID id-DataForwardingSourceIPAddress  CRITICALITY ignore  EXTENSION TransportLayerAddress  PRESENCE optional},
  ...
}

DRB-To-Setup-List-NG-RAN      ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Item-NG-RAN

DRB-To-Setup-Item-NG-RAN      ::= SEQUENCE {
  dRB-ID                        DRB-ID,
  sDAP-Configuration            SDAP-Configuration,
  pDCP-Configuration            PDCP-Configuration,
  cell-Group-Information        Cell-Group-Information,
  qos-flow-Information-To-Be-Setup  QoS-Flow-QoS-Parameter-List,
  dRB-Data-Forwarding-Information-Request  Data-Forwarding-Information-Request  OPTIONAL,
  dRB-Inactivity-Timer          Inactivity-Timer  OPTIONAL,
  pDCP-SN-Status-Information      PDCP-SN-Status-Information  OPTIONAL,
  iE-Extensions                  ProtocolExtensionContainer { { DRB-To-Setup-Item-NG-RAN-ExtIEs } }  OPTIONAL,
  ...
}

DRB-To-Setup-Item-NG-RAN-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-DRB-QoS                CRITICALITY ignore  EXTENSION QoSFlowLevelQoSParameters  PRESENCE optional}|
  {ID id-DAPSRequestInfo         CRITICALITY ignore  EXTENSION DAPSRequestInfo            PRESENCE optional}|
  {ID id-ignoreMappingRuleIndication  CRITICALITY reject  EXTENSION IgnoreMappingRuleIndication  PRESENCE optional}|
  {ID id-QoSFlowsDRBRemapping       CRITICALITY reject  EXTENSION QoS-Flows-DRB-Remapping     PRESENCE optional}|
  {ID id-SDTIndicatorSetup         CRITICALITY reject  EXTENSION SDTIndicatorSetup          PRESENCE optional}|
  {ID id-SpecialTriggeringPurpose    CRITICALITY ignore  EXTENSION SpecialTriggeringPurpose    PRESENCE optional},
  ...
}

DRB-To-Setup-Mod-List-NG-RAN      ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Mod-Item-NG-RAN

DRB-To-Setup-Mod-Item-NG-RAN      ::= SEQUENCE {
  dRB-ID                        DRB-ID,
  sDAP-Configuration            SDAP-Configuration,
  pDCP-Configuration            PDCP-Configuration,
  cell-Group-Information        Cell-Group-Information,
  flow-Mapping-Information       QoS-Flow-QoS-Parameter-List,
  dRB-Data-Forwarding-Information-Request  Data-Forwarding-Information-Request  OPTIONAL,
  dRB-Inactivity-Timer          Inactivity-Timer  OPTIONAL,
  pDCP-SN-Status-Information      PDCP-SN-Status-Information  OPTIONAL,
  iE-Extensions                  ProtocolExtensionContainer { { DRB-To-Setup-Mod-Item-NG-RAN-ExtIEs } }  OPTIONAL,
  ...
}

```

```

DRB-To-Setup-Mod-Item-NG-RAN-ExtIEs      ELAP-PROTOCOL-EXTENSION ::= {
  { ID id-DRB-QoS                        CRITICALITY ignore  EXTENSION QoSFlowLevelQoSParameters  PRESENCE optional } |
  { ID id-ignoreMappingRuleIndication    CRITICALITY reject  EXTENSION IgnoreMappingRuleIndication PRESENCE optional } |
  { ID id-DAPSRequestInfo                CRITICALITY ignore  EXTENSION DAPSRequestInfo           PRESENCE optional } |
  { ID id-SDTindicatorSetup              CRITICALITY reject  EXTENSION SDTindicatorSetup         PRESENCE optional } |
  { ID id-SpecialTriggeringPurpose       CRITICALITY ignore  EXTENSION SpecialTriggeringPurpose  PRESENCE optional } |
  ...
}

DRB-Usage-Report-List ::= SEQUENCE (SIZE(1..maxnooftimeperiods)) OF DRB-Usage-Report-Item

DRB-Usage-Report-Item ::= SEQUENCE {
  startTimeStamp      OCTET STRING (SIZE(4)),
  endTimeStamp       OCTET STRING (SIZE(4)),
  usageCountUL        INTEGER (0..18446744073709551615),
  usageCountDL        INTEGER (0..18446744073709551615),
  iE-Extensions       ProtocolExtensionContainer { { DRB-Usage-Report-Item-ExtIEs } } OPTIONAL,
  ...
}

DRB-Usage-Report-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

Duplication-Activation ::= ENUMERATED {
  active,
  inactive,
  ...
}

Dynamic5QIDescriptor ::= SEQUENCE {
  qoSPriorityLevel      QoSPriorityLevel,
  packetDelayBudget     PacketDelayBudget,
  packetErrorRate       PacketErrorRate,
  fiveQI                INTEGER (0..255, ...) OPTIONAL,
  delayCritical         ENUMERATED {delay-critical, non-delay-critical} OPTIONAL,
  -- 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,
  -- 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 ELAP-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 } |
  ...
}

DataDiscardRequired ::= ENUMERATED {
  required,
}

```

```

}
...
-- E

EarlyDataForwardingIndicator ::= ENUMERATED {stop, ...}

EarlyForwardingCOUNTInfo ::= CHOICE {
    firstDLCount          FirstDLCount,
    dLDiscardingCount    DLDiscarding,
    choice-Extension     ProtocolIE-SingleContainer { { EarlyForwardingCOUNTInfo-ExtIEs } }
}

EarlyForwardingCOUNTInfo-ExtIEs ELAP-PROTOCOL-IES ::= {
    ...
}

EarlyForwardingCOUNTReq ::= ENUMERATED { first-dl-count, dl-discarding, ...}

ECNMarkingorCongestionInformationReportingRequest ::= CHOICE {
    eCNMarkingatNGRAN      ENUMERATED { ul, dl, both, stop, ...},
    eCNMarkingatUPF        ENUMERATED { ul, dl, both, stop, ...},
    congestionInformation   ENUMERATED { ul, dl, both, stop, ...},
    choice-extension       ProtocolIE-SingleContainer { {ECNMarkingorCongestionInformationReportingRequest-ExtIEs}}
}

ECNMarkingorCongestionInformationReportingRequest-ExtIEs ELAP-PROTOCOL-IES ::= {
    ...
}

ECNMarkingorCongestionInformationReportingStatus ::= ENUMERATED { active, not-active, ...}

EHC-Common-Parameters ::= SEQUENCE {
    ehc-CID-Length          ENUMERATED { bits7, bits15, ...},
    iE-Extensions           ProtocolExtensionContainer { { EHC-Common-Parameters-ExtIEs } }      OPTIONAL
}

EHC-Common-Parameters-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

EHC-Downlink-Parameters ::= SEQUENCE {
    drb-ContinueEHC-DL      ENUMERATED {true, ..., false},
    iE-Extensions           ProtocolExtensionContainer { { EHC-Downlink-Parameters-ExtIEs } }      OPTIONAL
}

EHC-Downlink-Parameters-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-MaxCIDEHCDL      CRITICALITY ignore EXTENSION MaxCIDEHCDL      PRESENCE optional },
    ...
}

EHC-Uplink-Parameters ::= SEQUENCE {

```

```

    drb-ContinueEHC-UL          ENUMERATED {true, ... , false},
    iE-Extensions                ProtocolExtensionContainer { { EHC-Uplink-Parameters-ExtIEs } }    OPTIONAL
}

EHC-Uplink-Parameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EHC-Parameters ::= SEQUENCE {
    ehc-Common                EHC-Common-Parameters,
    ehc-Downlink              EHC-Downlink-Parameters          OPTIONAL,
    ehc-Uplink                EHC-Uplink-Parameters            OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { { EHC-Parameters-ExtIEs } }    OPTIONAL
}

EHC-Parameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EncryptionKey ::= OCTET STRING

Endpoint-IP-address-and-port ::= SEQUENCE {
    endpoint-IP-Address        TransportLayerAddress,
    portNumber                 PortNumber,
    iE-Extensions              ProtocolExtensionContainer { { Endpoint-IP-address-and-port-ExtIEs } } OPTIONAL
}

Endpoint-IP-address-and-port-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

ExtendedPacketDelayBudget ::= INTEGER (1..65535, ..., 65536..109999)

EUTRANAllocationAndRetentionPriority-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

E-UTRAN-Cell-Identity ::= BIT STRING (SIZE(28))

ECGI ::= SEQUENCE {
    plmn-Identity              PLMN-Identity,
    eUTRAN-Cell-Identity      E-UTRAN-Cell-Identity,
    iE-Extensions              ProtocolExtensionContainer { { ECGI-ExtIEs } }    OPTIONAL
}

```

```

ECGI-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

ECGI-Support-List ::= SEQUENCE (SIZE(1.. maxnoofECGI)) OF ECGI-Support-Item

ECGI-Support-Item ::= SEQUENCE {
    eCGI      ECGI,
    iE-Extensions      ProtocolExtensionContainer { { ECGI-Support-Item-ExtIEs } } OPTIONAL
}

ECGI-Support-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRAN-QoS-Support-List ::= SEQUENCE (SIZE(1.. maxnoofEUTRANQoSParameters)) OF EUTRAN-QoS-Support-Item

EUTRAN-QoS-Support-Item ::= SEQUENCE {
    eUTRAN-QoS      EUTRAN-QoS,
    iE-Extensions      ProtocolExtensionContainer { { EUTRAN-QoS-Support-Item-ExtIEs } } OPTIONAL
}

EUTRAN-QoS-Support-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRAN-QoS ::= SEQUENCE {
    qCI      QCI,
    eUTRANAllocationAndRetentionPriority      EUTRANAllocationAndRetentionPriority,
    gbrQoSInformation      GBR-QoSInformation OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { EUTRAN-QoS-ExtIEs } } OPTIONAL,
    ...
}

EUTRAN-QoS-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

ExtendedSliceSupportList ::= SEQUENCE (SIZE(1.. maxnoofExtSliceItems)) OF Slice-Support-Item

-- F

FirstDLCount ::= SEQUENCE {
    firstDLCountVal      PDCP-Count,
    iE-Extensions      ProtocolExtensionContainer { { FirstDLCount-ExtIEs } } OPTIONAL
}

FirstDLCount-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

FiveGS-TAC ::= OCTET STRING (SIZE(3))

FlU-TNL-InfoAdded-List ::= SEQUENCE (SIZE(1..maxnoofDUs)) OF FlU-TNL-InfoAdded-Item

```

```

FlU-TNL-InfoAdded-Item ::= SEQUENCE {
    broadcastFlU-ContextReferenceE1          BroadcastFlU-ContextReferenceE1,
    bcBearerContextFlU-TNLInfoatCU         BCBearerContextFlU-TNLInfoatCU,
    iE-Extensions          ProtocolExtensionContainer { {FlU-TNL-InfoAdded-Item-ExtIEs} } OPTIONAL,
    ...
}

FlU-TNL-InfoAdded-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

FlU-TNL-InfoToAdd-List ::= SEQUENCE (SIZE(1..maxnoofDUs)) OF FlU-TNL-InfoToAdd-Item

FlU-TNL-InfoToAdd-Item ::= SEQUENCE {
    broadcastFlU-ContextReferenceE1          BroadcastFlU-ContextReferenceE1,
    iE-Extensions          ProtocolExtensionContainer { {FlU-TNL-InfoToAdd-Item-ExtIEs} } OPTIONAL,
    ...
}

FlU-TNL-InfoToAdd-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

FlU-TNL-InfoAddedOrModified-List ::= SEQUENCE (SIZE(1..maxnoofDUs)) OF FlU-TNL-InfoAddedOrModified-Item

FlU-TNL-InfoAddedOrModified-Item ::= SEQUENCE {
    broadcastFlU-ContextReferenceE1          BroadcastFlU-ContextReferenceE1,
    bcBearerContextFlU-TNLInfoatCU         BCBearerContextFlU-TNLInfoatCU          OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {FlU-TNL-InfoAddedOrModified-Item-ExtIEs} } OPTIONAL,
    ...
}

FlU-TNL-InfoAddedOrModified-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

FlU-TNL-InfoToAddOrModify-List ::= SEQUENCE (SIZE(1..maxnoofDUs)) OF FlU-TNL-InfoToAddOrModify-Item

FlU-TNL-InfoToAddOrModify-Item ::= SEQUENCE {
    broadcastFlU-ContextReferenceE1          BroadcastFlU-ContextReferenceE1,
    bcBearerContextFlU-TNLInfoatDU         BCBearerContextFlU-TNLInfoatDU          OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {FlU-TNL-InfoToAddOrModify-Item-ExtIEs} } OPTIONAL,
    ...
}

FlU-TNL-InfoToAddOrModify-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

FlU-TNL-InfoToRelease-List ::= SEQUENCE (SIZE(1..maxnoofDUs)) OF FlU-TNL-InfoToRelease-Item

FlU-TNL-InfoToRelease-Item ::= SEQUENCE {
    broadcastFlU-ContextReferenceE1          BroadcastFlU-ContextReferenceE1,

```



```

    iE-Extensions      ProtocolExtensionContainer { {FlU-TNL-InfoToRelease-Item-ExtIEs} } OPTIONAL,
    ...
}

FlU-TNL-InfoToRelease-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- G

GlobalMBSSESSID ::= SEQUENCE {
    tmgi      OCTET STRING (SIZE(6)),
    nid       NID                                OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { GlobalMBSSESSID-ExtIEs } } OPTIONAL,
    ...
}

GlobalMBSSESSID-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-CP-Name      ::= PrintableString(SIZE(1..150,...))

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

Extended-GNB-CU-CP-Name-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-CP-MBS-E1AP-ID      ::= INTEGER (0..16777215)

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

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

GNB-CU-CP-UE-E1AP-ID      ::= INTEGER (0..4294967295)

GNB-CU-UP-Capacity        ::= INTEGER (0..255)

GNB-CU-UP-CellGroupRelatedConfiguration ::= SEQUENCE (SIZE(1.. maxnoofUPParameters)) OF GNB-CU-UP-CellGroupRelatedConfiguration-Item

GNB-CU-UP-CellGroupRelatedConfiguration-Item ::= SEQUENCE {
    cell-Group-ID          Cell-Group-ID,
    uP-TNL-Information     UP-TNL-Information,
    uL-Configuration       UL-Configuration      OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { {GNB-CU-UP-CellGroupRelatedConfiguration-Item-ExtIEs } } OPTIONAL
}

```

```

GNB-CU-UP-CellGroupRelatedConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UP-ID ::= INTEGER (0..68719476735)

GNB-CU-UP-MBS-Support-Info ::= SEQUENCE {
    mbs-Support-Info-ToAdd-List MBS-Support-Info-ToAdd-List OPTIONAL,
    mbs-Support-Info-ToRemove-List MBS-Support-Info-ToRemove-List OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { GNB-CU-UP-MBS-Support-Info-ExtIEs } } OPTIONAL,
    ...
}

GNB-CU-UP-MBS-Support-Info-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UP-Name ::= PrintableString(SIZE(1..150,...))

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

Extended-GNB-CU-UP-Name-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UP-MBS-E1AP-ID ::= INTEGER (0..65535)

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

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

GNB-CU-UP-UE-E1AP-ID ::= INTEGER (0..4294967295)

GNB-CU-CP-TNLA-Setup-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TNL-Information,
    iE-Extensions ProtocolExtensionContainer { { GNB-CU-CP-TNLA-Setup-Item-ExtIEs } } OPTIONAL,
    ...
}

GNB-CU-CP-TNLA-Setup-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-CP-TNLA-Failed-To-Setup-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TNL-Information,
    cause Cause,
    iE-Extensions ProtocolExtensionContainer { { GNB-CU-CP-TNLA-Failed-To-Setup-Item-ExtIEs } } OPTIONAL
}

```

```

GNB-CU-CP-TNLA-Failed-To-Setup-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-CP-TNLA-To-Add-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TNL-Information,
    tNLAssociationUsage                 TNLAssociationUsage,
    iE-Extensions                       ProtocolExtensionContainer { { GNB-CU-CP-TNLA-To-Add-Item-ExtIEs } } OPTIONAL
}

GNB-CU-CP-TNLA-To-Add-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-CP-TNLA-To-Remove-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TNL-Information,
    iE-Extensions                       ProtocolExtensionContainer { { GNB-CU-CP-TNLA-To-Remove-Item-ExtIEs } } OPTIONAL
}

GNB-CU-CP-TNLA-To-Remove-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-TNLAssociationTransportLayerAddresssgNBCUUP CRITICALITY reject EXTENSION CP-TNL-Information PRESENCE optional},
    ...
}

GNB-CU-CP-TNLA-To-Update-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TNL-Information,
    tNLAssociationUsage                 TNLAssociationUsage OPTIONAL,
    iE-Extensions                       ProtocolExtensionContainer { { GNB-CU-CP-TNLA-To-Update-Item-ExtIEs } } OPTIONAL
}

GNB-CU-CP-TNLA-To-Update-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UP-TNLA-To-Remove-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress CP-TNL-Information,
    tNLAssociationTransportLayerAddresssgNBCUCP CP-TNL-Information OPTIONAL,
    iE-Extensions                       ProtocolExtensionContainer { { GNB-CU-UP-TNLA-To-Remove-Item-ExtIEs } } OPTIONAL
}

GNB-CU-UP-TNLA-To-Remove-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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 ELAP-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 ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-AlternativeQoSParaSetList CRITICALITY ignore EXTENSION AlternativeQoSParaSetList PRESENCE optional},
    ...
}

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

GTPTLAs ::= SEQUENCE (SIZE(1.. maxnoofGTPTLAs)) OF GTPTLA-Item

GTPTLA-Item ::= SEQUENCE {
    gTPTransportLayerAddresses      TransportLayerAddress,
    iE-Extensions  ProtocolExtensionContainer { { GTPTLA-Item-ExtIEs } } OPTIONAL,
    ...
}

GTPTLA-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

GPTunnel-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UP-OverloadInformation ::= ENUMERATED {overloaded, not-overloaded}

GNB-DU-ID ::= INTEGER (0..68719476735)

-- H

HFN ::= INTEGER (0..4294967295)

HW-CapacityIndicator ::= SEQUENCE {

```

```
    offeredThroughput          INTEGER (1..16777216, ...),
    availableThroughput        INTEGER (0..100, ...),
    iE-Extensions              ProtocolExtensionContainer { { HW-CapacityIndicator-ExtIEs } } OPTIONAL,
    ...
}

HW-CapacityIndicator-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- I

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

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

IntegrityProtectionIndication ::= ENUMERATED {
    required,
    preferred,
    not-needed,
    ...
}

IntegrityProtectionAlgorithm ::= ENUMERATED {
    nIA0,
    i-128-NIA1,
    i-128-NIA2,
    i-128-NIA3,
    ...
}

IntegrityProtectionKey ::= OCTET STRING

IntegrityProtectionResult ::= ENUMERATED {
    performed,
    not-performed,
    ...
}

Inactivity-Timer ::= INTEGER (1..7200, ...)

InterfacesToTrace ::= BIT STRING (SIZE(8))

ImmediateMDT ::= SEQUENCE {
    measurementsToActivate MeasurementsToActivate,
    measurementFour M4Configuration OPTIONAL,
}
-- This IE shall be present if the Measurements to Activate IE has the fourth bit set to "1".--
```

```

    measurementSix          M6Configuration    OPTIONAL,
-- This IE shall be present if the Measurements to Activate IE has the seventh bit set to "1".--
    measurementSeven       M7Configuration    OPTIONAL,
-- This IE shall be present if the Measurements to Activate IE has the eighth bit set to "1".--
    iE-Extensions          ProtocolExtensionContainer { { ImmediateMDT-ExtIEs } } OPTIONAL,
    ...
}
ImmediateMDT-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

IAB-Donor-CU-UPPSKInfo-Item ::= SEQUENCE {
    iAB-donor-CU-UPPSK      IAB-donor-CU-UPPSK,
    iAB-donor-CU-UIPAddress TransportLayerAddress,
    iAB-DUIPAddress         TransportLayerAddress,
    iE-Extensions          ProtocolExtensionContainer { { IAB-donor-CU-UPPSKInfoItemExtIEs } } OPTIONAL,
    ...
}
IAB-donor-CU-UPPSKInfoItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
IAB-donor-CU-UPPSK ::= OCTET STRING

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

-- J
-- K
-- L

Links-to-log ::= ENUMERATED {
    uplink,
    downlink,
    both-uplink-and-downlink,
    ...
}

LocationDependentMBSNGUInformationAt5GC ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSNGUInformationAt5GC-Item

LocationDependentMBSNGUInformationAt5GC-Item ::= SEQUENCE {
    mbsAreaSession-ID      MBSAreaSessionID,
    mbsNGUInformationAt5GC MBSNGUInformationAt5GC,
    iE-Extensions          ProtocolExtensionContainer { { LocationDependentMBSNGUInformationAt5GC-Item-ExtIEs } } OPTIONAL,
    ...
}
LocationDependentMBSNGUInformationAt5GC-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

LocationDependentMBSFlUInformationAtCU ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSFlUInformationAtCU-Item

```

```

LocationDependentMBSFlUInformationAtCU-Item ::= SEQUENCE {
    mbsAreaSession-ID          MBSAreaSessionID,
    mbs-flu-info-at-CU         UP-TNL-Information,
    iE-Extensions              ProtocolExtensionContainer { { LocationDependentMBSFlUInformationAtCU-Item-ExtIEs } } OPTIONAL,
    ...
}

LocationDependentMBSFlUInformationAtCU-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

LocationDependentMBSFlUInformationAtDU ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSFlUInformationAtDU-Item

LocationDependentMBSFlUInformationAtDU-Item ::= SEQUENCE {
    mbsAreaSession-ID          MBSAreaSessionID,
    mbs-flu-info-at-DU         UP-TNL-Information,
    iE-Extensions              ProtocolExtensionContainer { { LocationDependentMBSFlUInformationAtDU-Item-ExtIEs } } OPTIONAL,
    ...
}

LocationDependentMBSFlUInformationAtDU-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-FlUTunnelNotEstablished      CRITICALITY ignore      EXTENSION      FlUTunnelNotEstablished      PRESENCE      optional },
    ...
}

LocationDependentMBSNGUInformationAtNGRAN ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSNGUInformationAtNGRAN-Item

LocationDependentMBSNGUInformationAtNGRAN-Item ::= SEQUENCE {
    mbsAreaSession-ID          MBSAreaSessionID,
    mbsNGUInformationAtNGRAN    MBSNGUInformationAtNGRAN,
    iE-Extensions              ProtocolExtensionContainer { { LocationDependentMBSNGUInformationAtNGRAN-Item-ExtIEs } } OPTIONAL,
    ...
}

LocationDependentMBSNGUInformationAtNGRAN-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- M

MaxDataBurstVolume ::= INTEGER (0..4095, ..., 4096.. 2000000)

MaximumIPdatarate ::= SEQUENCE {
    maxIPrate      MaxIPrate,
    iE-Extensions  ProtocolExtensionContainer { {MaximumIPdatarate-ExtIEs} } OPTIONAL,
    ...
}

MaximumIPdatarate-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MaxIPrate ::= ENUMERATED {

```

```

    bitrate64kbs,
    max-UErate,
    ...
}

MaxPacketLossRate ::= INTEGER (0..1000, ...)

MaxCIDEHCDL ::= INTEGER (1..32767, ...)

MBSAreaSessionID ::= INTEGER (0..65535, ...)

MBSFlUInformationAtCU ::= SEQUENCE {
    mbs-flu-info-at-CU          UP-TNL-Information,
    iE-Extensions              ProtocolExtensionContainer { { MBSFlUInformationAtCU-ExtIEs } } OPTIONAL,
    ...
}

MBSFlUInformationAtCU-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSFlUInformationAtDU ::= SEQUENCE {
    mbs-flu-info-at-DU          UP-TNL-Information,
    iE-Extensions              ProtocolExtensionContainer { { MBSFlUInformationAtDU-ExtIEs } } OPTIONAL,
    ...
}

MBSFlUInformationAtDU-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-FlUTunnelNotEstablished      CRITICALITY      ignore      EXTENSION      FlUTunnelNotEstablished      PRESENCE      optional },
    ...
}

MBSNGUInformationAt5GC ::= CHOICE {
    multicast                    MBSNGUInformationAt5GC-Multicast,
    choice-extension             ProtocolIE-SingleContainer { {MBSNGUInformationAt5GC-ExtIEs} }
}

MBSNGUInformationAt5GC-ExtIEs     E1AP-PROTOCOL-IES ::= {
    ...
}

MBSNGUInformationAt5GC-Multicast ::= SEQUENCE {
    ipmcAddress                  TransportLayerAddress,
    ipsourceAddress              TransportLayerAddress,
    gtpDLTEID                    GTP-TEID,
    iE-Extensions                ProtocolExtensionContainer { {MBSNGUInformationAt5GC-Multicast-ExtIEs} } OPTIONAL,
    ...
}

MBSNGUInformationAt5GC-Multicast-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSNGUInformationAtNGRAN ::= CHOICE {

```



```

    unicast                UP-TNL-Information,
    choice-extension      ProtocolIE-SingleContainer  {{MBSNGUInformationAtNGRAN-ExtIEs}}
}

MBSNGUInformationAtNGRAN-ExtIEs  E1AP-PROTOCOL-IES ::= {
    ...
}

MBSNGUInformationAtNGRAN-Request ::=  ENUMERATED {true, ... }

MBSNGUInformationAtNGRAN-Request-List ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF MBSNGUInformationAtNGRAN-Request-Item

MBSNGUInformationAtNGRAN-Request-Item ::= SEQUENCE {
    mbsAreaSession-ID                MBSAreaSessionID,
    mbsNGUInformationAtNGRAN-Request  MBSNGUInformationAtNGRAN-Request,
    iE-Extensions                    ProtocolExtensionContainer  { { MBSNGUInformationAtNGRAN-Request-Item-ExtIEs } } OPTIONAL,
    ...
}

MBSNGUInformationAtNGRAN-Request-Item-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSSessionAssociatedInfoNonSupportToSupport ::= SEQUENCE {
    ue-Reference-ID                GNB-CU-CP-UE-E1AP-ID,
    pdu-Session-ID                PDU-Session-ID,
    associatedQoSFlowInformationList  MBSSessionAssociatedInformationList,
    iE-Extensions                ProtocolExtensionContainer  { {MBSSessionAssociatedInfoNonSupportToSupport-ExtIEs} }  OPTIONAL,
    ...
}

MBSSessionAssociatedInfoNonSupportToSupport-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSSessionAssociatedInformation ::= SEQUENCE {
    mbsSessionAssociatedInformationList  MBSSessionAssociatedInformationList,
    mbsSessionForwardingAddress        UP-TNL-Information,
    iE-Extensions                    ProtocolExtensionContainer  { {MBSSessionAssociatedInformation-ExtIEs} }  OPTIONAL,
    ...
}

MBSSessionAssociatedInformation-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSSessionAssociatedInformationList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MBSSessionAssociatedInformation-Item

MBSSessionAssociatedInformation-Item ::= SEQUENCE {
    mbs-QoS-Flow-Identifier          QoS-Flow-Identifier,
    associated-unicast-QoS-Flow-Identifier  QoS-Flow-Identifier,
    iE-Extensions                    ProtocolExtensionContainer  { { MBSSessionAssociatedInformation-Item-ExtIEs } }  OPTIONAL,
    ...
}

```

```

MBSSessionAssociatedInformation-Item-ExtIEs    ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MBS-Support-Info-ToAdd-List ::= SEQUENCE (SIZE(1..maxnoofMBSSessionIDs)) OF MBS-Support-Info-ToAdd-Item

MBS-Support-Info-ToAdd-Item ::= SEQUENCE {
  globalMBSSessionID          GlobalMBSSessionID,
  iE-Extensions               ProtocolExtensionContainer { { MBS-Support-Info-ToAdd-Item-ExtIEs } }    OPTIONAL,
  ...
}

MBS-Support-Info-ToAdd-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MBS-Support-Info-ToRemove-List ::= SEQUENCE (SIZE(1..maxnoofMBSSessionIDs)) OF MBS-Support-Info-ToRemove-Item

MBSSessionResourceNotification ::= CHOICE {
  mbs-DL-Data-Arrival          MBS-DL-Data-Arrival,
  inactivity                   MCBearerContext-Inactivity,
  choice-extension             ProtocolIE-SingleContainer {{ MBSSessionResourceNotification-ExtIEs}}
}

MBSSessionResourceNotification-ExtIEs ELAP-PROTOCOL-IES ::= {
  ...
}

MBS-DL-Data-Arrival ::= SEQUENCE {
  dlDataArrival                ENUMERATED {true, ...},
  ppi                          PPI                                OPTIONAL,
  iE-Extensions               ProtocolExtensionContainer { { MBS-DL-Data-Arrival-ExtIEs } }    OPTIONAL,
  ...
}

MBS-DL-Data-Arrival-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MCBearerContext-Inactivity ::= SEQUENCE {
  mcbearerContext-Inactivity-Indication          ENUMERATED {true, ...},
  iE-Extensions               ProtocolExtensionContainer { { MCBearerContext-Inactivity-ExtIEs } }    OPTIONAL,
  ...
}

MCBearerContext-Inactivity-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MBS-Support-Info-ToRemove-Item ::= SEQUENCE {
  globalMBSSessionID          GlobalMBSSessionID,
  iE-Extensions               ProtocolExtensionContainer { { MBS-Support-Info-ToRemove-Item-ExtIEs } }    OPTIONAL,

```

```

}
...
}
MBS-Support-Info-ToRemove-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
...
}
-- MCBearerContextToSetup
MCBearerContextToSetup ::= SEQUENCE {
  snssai SNSSAI,
  mcMRBToSetupList MCMRBSetupConfiguration OPTIONAL,
  requestedAction RequestedAction4AvailNGUTermination OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCBearerContextToSetup-ExtIEs} } OPTIONAL,
  ...
}
MCBearerContextToSetup-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-MBSSessionAssociatedInfoNonSupportToSupport CRITICALITY ignore EXTENSION MBSSessionAssociatedInfoNonSupportToSupport PRESENCE optional}|
  {ID id-MBSAreaSessionID CRITICALITY ignore EXTENSION MBSAreaSessionID PRESENCE optional}|
  {ID id-MCBearerContextInactivityTimer CRITICALITY ignore EXTENSION Inactivity-Timer PRESENCE optional}|
  {ID id-MCBearerContextStatusChange CRITICALITY ignore EXTENSION MCBearerContextStatusChange PRESENCE optional},
  ...
}
MCMRBSetupConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBSetupConfiguration-Item
MCMRBSetupConfiguration-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  mbs-pdcp-config PDCP-Configuration,
  qos-Flow-QoS-Parameter-List QoS-Flow-QoS-Parameter-List,
  qosFlowLevelQoSParameters QoSFlowLevelQoSParameters OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCMRBSetupConfiguration-Item-ExtIEs} } OPTIONAL,
  ...
}
MCMRBSetupConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
...
}
MCBearerContextStatusChange ::= ENUMERATED {suspend, resume, ...}
-- MCBearerContextToSetupResponse
MCBearerContextToSetupResponse ::= SEQUENCE {
  mcBearerContextNGU-TNLInfoatNGRAN MCBearerContextNGU-TNLInfoatNGRAN OPTIONAL,
  mcMRBSetupResponseList MCMRBSetupResponseList OPTIONAL,
  mcMRBFailedList MCMRBFailedList OPTIONAL,
  availableMCMRBConfig MCMRBSetupConfiguration OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCBearerContextToSetupResponse-ExtIEs} } OPTIONAL,
  ...
}

```

```

MCCBearerContextToSetupResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MCCBearerContextNGU-TNLInfoatNGRAN ::= CHOICE {
  locationindependent      MBSNGUInformationAtNGRAN,
  locationdependent        LocationDependentMBSNGUInformationAtNGRAN,
  choice-extension         ProtocolIE-SingleContainer { {MCCBearerContextNGU-TNLInfoatNGRAN-ExtIEs} }
}

MCCBearerContextNGU-TNLInfoatNGRAN-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

MCMRBSetupResponseList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCCMRBSetupResponseList-Item

MCMRBSetupResponseList-Item ::= SEQUENCE {
  mrb-ID                    MRB-ID,
  qosflow-setup             QoS-Flow-List,
  qosflow-failed           QoS-Flow-Failed-List          OPTIONAL,
  mBS-PDCP-COUNT           MBS-PDCP-COUNT                OPTIONAL,
  iE-Extensions            ProtocolExtensionContainer { {MCMRBSetupResponseList-Item-ExtIEs} } OPTIONAL,
  ...
}

MCMRBSetupResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MBS-PDCP-COUNT ::= BIT STRING (SIZE (32))

MCMRBFailedList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBFailedList-Item

MCMRBFailedList-Item ::= SEQUENCE {
  mrb-ID                    MRB-ID,
  cause                     Cause,
  iE-Extensions            ProtocolExtensionContainer { {MCMRBFailedList-Item-ExtIEs} } OPTIONAL,
  ...
}

MCMRBFailedList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCCBearerContextToModify

MCCBearerContextToModify ::= SEQUENCE {
  mcBearerContextNGUTNLInfoat5GC          MCCBearerContextNGUTNLInfoat5GC          OPTIONAL,
  mcBearerContextNGUTnlInfoatNGRANRequest MCCBearerContextNGUTnlInfoatNGRANRequest  OPTIONAL,
  mBSMulticastFlUContextDescriptor        MBSMulticastFlUContextDescriptor        OPTIONAL,
  -- This IE shall be present if either the MC MRB To Setup or Modify List IE or the MC MRB To Remove List IE or both IEs are included.
  requestedAction                          RequestedAction4AvailNGUTermination        OPTIONAL,
}

```

```

    mCMRBToSetupModifyList          MCMRBSetupModifyConfiguration          OPTIONAL,
    mCMRBToRemoveList              MCMRBRemoveConfiguration            OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {MCEBearerContextToModify-ExtIEs} } OPTIONAL,
    ...
}

MCEBearerContextToModify-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-MCForwardingResourceRequest          CRITICALITY ignore  EXTENSION MCForwardingResourceRequest          PRESENCE
optional}|
    {ID id-MCForwardingResourceIndication      CRITICALITY ignore  EXTENSION MCForwardingResourceIndication      PRESENCE
optional}|
    {ID id-MCForwardingResourceRelease        CRITICALITY ignore  EXTENSION MCForwardingResourceRelease        PRESENCE
optional}|
    {ID id-MBSSessionAssociatedInfoNonSupportToSupport  CRITICALITY ignore  EXTENSION MBSSessionAssociatedInfoNonSupportToSupport  PRESENCE
optional}|
    {ID id-MCEBearerContextInactivityTimer     CRITICALITY ignore  EXTENSION Inactivity-Timer                     PRESENCE
optional}|
    {ID id-MCEBearerContextStatusChange       CRITICALITY ignore  EXTENSION MCEBearerContextStatusChange       PRESENCE
optional},
    ...
}

MCEBearerContextNGUTNLInfoat5GC ::= SEQUENCE {
    mbsNGUIInformationAt5GC          MBSNGUIInformationAt5GC,
    mbsAreaSession-ID              MBSAreaSessionID          OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {MCEBearerContextNGUTNLInfoat5GC-ExtIEs} } OPTIONAL,
    ...
}

MCEBearerContextNGUTNLInfoat5GC-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCEBearerContextNGUTnlInfoatNGRANRequest ::= SEQUENCE {
    ngRANNGUTNLRequested            ENUMERATED {requested, ...},
    mbsAreaSession-ID              MBSAreaSessionID          OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {MCEBearerContextNGUTnlInfoatNGRANRequest-ExtIEs} } OPTIONAL,
    ...
}

MCEBearerContextNGUTnlInfoatNGRANRequest-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCMRBSetupModifyConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBSetupModifyConfiguration-Item

MCMRBSetupModifyConfiguration-Item ::= SEQUENCE {
    mrb-ID                          MRB-ID,
    fluTNLatDU                      MCEBearerContextFluTNLInfoatDU          OPTIONAL,
    mbs-pdcp-config                 PDCP-Configuration          OPTIONAL,
    qos-Flow-QoS-Parameter-List     QoS-Flow-QoS-Parameter-List  OPTIONAL,
    mrbQoS                          QoSFlowLevelQoSParameters    OPTIONAL,
}

```

```

    mbs-PDCP-COUNT-Req          MBS-PDCP-COUNT-Req          OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { {MCMRBSetupModifyConfiguration-Item-ExtIEs} } OPTIONAL,
    ...
}

MCMRBSetupModifyConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCBearerContextFlUTNLInfoatDU ::= SEQUENCE {
    mbsFlUInfoatDU              UP-TNL-Information,
    mbsMulticastFlUContextDescriptor MBSMulticastFlUContextDescriptor,
    iE-Extensions              ProtocolExtensionContainer { {MCBearerContextFlUTNLInfoatDU-ExtIEs} } OPTIONAL,
    ...
}

MCBearerContextFlUTNLInfoatDU-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MulticastFlUContextReferenceE1 ::= OCTET STRING (SIZE(4))

MBSMulticastFlUContextDescriptor ::= SEQUENCE {
    multicastFlUContextReferenceE1 MulticastFlUContextReferenceE1,
    mc-FlUCtxtusage                ENUMERATED {ptm, ptp, ptp-retransmission, ptp-forwarding, ...},
    mbsAreaSession                 MBSAreaSessionID          OPTIONAL,
    iE-Extensions                  ProtocolExtensionContainer { { MBSMulticastFlUContextDescriptor-ExtIEs } } OPTIONAL,
    ...
}

MBSMulticastFlUContextDescriptor-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCMRBRemoveConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MRB-ID

MBS-PDCP-COUNT-Req ::= ENUMERATED {true, ... }

-- MCBearerContextToModifyResponse

MCBearerContextToModifyResponse ::= SEQUENCE {
    mcBearerContextNGU-TNLInfoatNGRANModifyResponse MCBearerContextNGU-TNLInfoatNGRANModifyResponse OPTIONAL,
    mbsMulticastFlUContextDescriptor                MBSMulticastFlUContextDescriptor          OPTIONAL,
    -- This IE shall be present if either the MC MRB Setup or Modify Response List IE or the MC MRB Failed List IE or both IEs are included.
    mcMRBModifySetupResponseList                    MCMRBSetupModifyResponseList                      OPTIONAL,
    mcMRBFailedList                                 MCMRBFailedList                                    OPTIONAL,
    availableMCMRBConfig                             MCMRBSetupConfiguration                            OPTIONAL,
    iE-Extensions                                  ProtocolExtensionContainer { {MCBearerContextToModifyResponse-ExtIEs} } OPTIONAL,
    ...
}

```

```

MCBearerContextToModifyResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-MCForwardingResourceResponse CRITICALITY ignore EXTENSION MCForwardingResourceResponse PRESENCE optional},
  ...
}

MCBearerContextNGU-TNLInfoatNGRANModifyResponse ::= SEQUENCE {
  mbs-NGU-InfoatNGRAN MBSNGUInformationAtNGRAN,
  mbsAreaSession MBSAreaSessionID OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCBearerContextNGU-TNLInfoatNGRANModifyResponse-ExtIEs} } OPTIONAL,
  ...
}

MCBearerContextNGU-TNLInfoatNGRANModifyResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MCMRBSetupModifyResponseList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBSetupModifyResponseList-Item

MCMRBSetupModifyResponseList-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  qosflow-setup QoS-Flow-List OPTIONAL,
  qosflow-failed QoS-Flow-Failed-List OPTIONAL,
  mcBearerContextFlUTNLInfoatCU UP-TNL-Information OPTIONAL,
  mBS-PDCP-COUNT MBS-PDCP-COUNT OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCMRBSetupModifyResponseList-Item-ExtIEs} } OPTIONAL,
  ...
}

MCMRBSetupModifyResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCBearerContextToModifyRequired

MCBearerContextToModifyRequired ::= SEQUENCE {
  mbsMulticastFLUContextDescriptor MBSMulticastFLUContextDescriptor OPTIONAL,
  -- This IE shall be present if either the MC MRB To Remove List Required IE is included.
  mcMRBToRemoveRequiredList MCMRBRemoveConfiguration OPTIONAL,
  mcMRBToModifyRequiredList MCMRBModifyRequiredConfiguration OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCBearerContextToModifyRequired-ExtIEs} } OPTIONAL,
  ...
}

MCBearerContextToModifyRequired-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-MCForwardingResourceReleaseIndication CRITICALITY ignore EXTENSION MCForwardingResourceReleaseIndication PRESENCE optional},
  ...
}

MCMRBModifyRequiredConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBModifyRequiredConfiguration-Item

MCMRBModifyRequiredConfiguration-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  mBS-PDCP-COUNT MBS-PDCP-COUNT OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCMRBModifyRequiredConfiguration-Item-ExtIEs} } OPTIONAL,

```

```

}
...
}
MCMRBModifyRequiredConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
...
}
-- MCBearerContextToModifyConfirm
MCBearerContextToModifyConfirm ::= SEQUENCE {
  mbsMulticastFLUContextDescriptor MBSMulticastFLUContextDescriptor OPTIONAL,
  mcMRBModifyConfirmList MCMRBModifyConfirmList OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCBearerContextToModifyConfirm-ExtIEs} } OPTIONAL,
  ...
}
MCMRBModifyConfirmList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBModifyConfirmList-Item
MCMRBModifyConfirmList-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  iE-Extensions ProtocolExtensionContainer { { MCMRBModifyConfirmList-Item-ExtIEs} } OPTIONAL,
  ...
}
MCMRBModifyConfirmList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
...
}
MCBearerContextToModifyConfirm-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
...
}
-- MCForwardingResourceRequest
MCForwardingResourceRequest ::= SEQUENCE {
  mcForwardingResourceID MCForwardingResourceID,
  mbsAreaSession-ID MBSAreaSessionID OPTIONAL,
  mrbForwardingResourceRequestList MRBForwardingResourceRequestList OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MCForwardingResourceRequest-ExtIEs} } OPTIONAL,
  ...
}
MCForwardingResourceRequest-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
...
}
MRBForwardingResourceRequestList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MRBForwardingResourceRequest-Item
MRBForwardingResourceRequest-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  mrbProgressRequestType MRB-ProgressInformationType OPTIONAL,
  mrbForwardingAddressRequest ENUMERATED {request, ...} OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {MRBForwardingResourceRequest-Item-ExtIEs} } OPTIONAL,
  ...
}

```



```

}
MRBForwardingResourceRequest-Item-ExtIEs      ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCFForwardingResourceIndication
MCFForwardingResourceIndication ::= SEQUENCE {
  mcForwardingResourceID          MCFForwardingResourceID,
  mrbForwardingResourceIndicationList MRBForwardingResourceIndicationList OPTIONAL,
  mbsSessionAssociatedInformation  MBSsessionAssociatedInformation OPTIONAL,
  iE-Extensions                   ProtocolExtensionContainer { {MCFForwardingResourceIndication-ExtIEs} } OPTIONAL,
  ...
}

MCFForwardingResourceIndication-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MRBForwardingResourceIndicationList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MRBForwardingResourceIndication-Item

MRBForwardingResourceIndication-Item ::= SEQUENCE {
  mrb-ID                          MRB-ID,
  mrb-ProgressInformation         MRB-ProgressInformation OPTIONAL,
  mrbForwardingAddress           UP-TNL-Information OPTIONAL,
  iE-Extensions                   ProtocolExtensionContainer { {MRBForwardingResourceIndication-Item-ExtIEs} } OPTIONAL,
  ...
}

MRBForwardingResourceIndication-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCFForwardingResourceResponse
MCFForwardingResourceResponse ::= SEQUENCE {
  mcForwardingResourceID          MCFForwardingResourceID,
  mrbForwardingResourceResponseList MRBForwardingResourceResponseList OPTIONAL,
  iE-Extensions                   ProtocolExtensionContainer { {MCFForwardingResourceResponse-ExtIEs} } OPTIONAL,
  ...
}

MCFForwardingResourceResponse-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MRBForwardingResourceResponseList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MRBForwardingResourceResponse-Item

MRBForwardingResourceResponse-Item ::= SEQUENCE {
  mrb-ID                          MRB-ID,
  mrb-ProgressInformation         MRB-ProgressInformation OPTIONAL,

```

```
    mrbForwardingAddress      UP-TNL-Information      OPTIONAL,
    iE-Extensions             ProtocolExtensionContainer { {MRBForwardingResourceResponse-Item-ExtIEs} } OPTIONAL,
    ...
}

MRBForwardingResourceResponse-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- MCForwardingResourceRelease

MCForwardingResourceRelease ::= SEQUENCE {
    mcForwardingResourceID      MCForwardingResourceID,
    iE-Extensions             ProtocolExtensionContainer { {MCForwardingResourceRelease-ExtIEs} } OPTIONAL,
    ...
}

MCForwardingResourceRelease-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- MCForwardingResourceReleaseIndication

MCForwardingResourceReleaseIndication ::= SEQUENCE {
    mcForwardingResourceID      MCForwardingResourceID,
    iE-Extensions             ProtocolExtensionContainer { {MCForwardingResourceReleaseIndication-ExtIEs} } OPTIONAL,
    ...
}

MCForwardingResourceReleaseIndication-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MCForwardingResourceID ::= OCTET STRING (SIZE(2))

MDTPollutedMeasurementIndicator ::= ENUMERATED {
    iDC,
    no-IDC,
    ...
}

MRB-ID ::= INTEGER (1..512, ...)

MRB-ProgressInformation ::= SEQUENCE {
    mrb-ProgressInformationSNs  MRB-ProgressInformationSNs,
    mrb-ProgressInformationType MRB-ProgressInformationType,
    iE-Extensions             ProtocolExtensionContainer { {MRB-ProgressInformation-ExtIEs} } OPTIONAL,
    ...
}

MRB-ProgressInformation-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```

MRB-ProgressInformationSNs ::= CHOICE {
    pdcp-SN12          INTEGER (0..4095),
    pdcp-SN18          INTEGER (0..262143),
    choice-extension   ProtocolIE-SingleContainer { { MRB-ProgressInformationSNs-ExtIEs } }
}

MRB-ProgressInformationSNs-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

MRB-ProgressInformationType ::= ENUMERATED {oldest-available, last-delivered, ...}

MRDC-Data-Usage-Report-Item ::= SEQUENCE {
    startTimeStamp      OCTET STRING (SIZE(4)),
    endTimeStamp        OCTET STRING (SIZE(4)),
    usageCountUL        INTEGER (0..18446744073709551615),
    usageCountDL        INTEGER (0..18446744073709551615),
    iE-Extensions       ProtocolExtensionContainer { { MRDC-Data-Usage-Report-Item-ExtIEs } } OPTIONAL,
    ...
}

MRDC-Data-Usage-Report-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MRDC-Usage-Information ::= SEQUENCE {
    data-Usage-per-PDU-Session-Report      Data-Usage-per-PDU-Session-Report      OPTIONAL,
    data-Usage-per-QoS-Flow-List           Data-Usage-per-QoS-Flow-List           OPTIONAL,
    iE-Extensions                           ProtocolExtensionContainer { { MRDC-Usage-Information-ExtIEs } } OPTIONAL,
    ...
}

MRDC-Usage-Information-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

M4Configuration ::= SEQUENCE {
    m4period          M4period,
    m4-links-to-log   Links-to-log,
    iE-Extensions     ProtocolExtensionContainer { { M4Configuration-ExtIEs } } OPTIONAL,
    ...
}

M4Configuration-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-M4ReportAmount      CRITICALITY ignore EXTENSION M4ReportAmount      PRESENCE optional      },
    ...
}

M4period ::= ENUMERATED {ms1024, ms2048, ms5120, ms10240, min1, ... }

M4ReportAmount ::= ENUMERATED { r1, r2, r4, r8, r16, r32, r64, infinity, ... }

M6Configuration ::= SEQUENCE {

```

```

    m6report-Interval    M6report-Interval,
    m6-links-to-log      Links-to-log,
    iE-Extensions        ProtocolExtensionContainer { { M6Configuration-ExtIEs} } OPTIONAL,
    ...
}

M6Configuration-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-M6ReportAmount      CRITICALITY ignore  EXTENSION M6ReportAmount      PRESENCE optional      },
    ...
}

M6ReportAmount ::= ENUMERATED { r1, r2, r4, r8, r16, r32, r64, infinity, ... }

M6report-Interval ::= ENUMERATED { ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480 ,ms40960, min1, min6, min12, min30, ... }

M7Configuration ::= SEQUENCE {
    m7period              M7period,
    m7-links-to-log        Links-to-log,
    iE-Extensions          ProtocolExtensionContainer { { M7Configuration-ExtIEs} } OPTIONAL,
    ...
}

M7Configuration-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-M7ReportAmount      CRITICALITY ignore  EXTENSION M7ReportAmount      PRESENCE optional      },
    ...
}

M7period ::= INTEGER(1..60, ...)

M7ReportAmount ::= ENUMERATED { r1, r2, r4, r8, r16, r32, r64, infinity, ... }

MDT-Activation ::= ENUMERATED {
    immediate-MDT-only,
    immediate-MDT-and-Trace,
    ...
}

MDT-Configuration ::= SEQUENCE {
    mdt-Activation          MDT-Activation,
    mDTMode                 MDTMode,
    iE-Extensions           ProtocolExtensionContainer { { MDT-Configuration-ExtIEs} } OPTIONAL,
    ...
}

MDT-Configuration-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MDTMode ::= CHOICE {
    immediateMDT              ImmediateMDT,
    choice-extension          ProtocolIE-SingleContainer { {MDTMode-ExtIEs}}
}

MDTMode-ExtIEs ELAP-PROTOCOL-IES ::= {
    ...
}

```

```

}

MeasurementsToActivate ::= BIT STRING (SIZE (8))

MDTPLMNList ::= SEQUENCE (SIZE(1..maxnoofMDTPLMNs)) OF PLMN-Identity

MDTPLMNModificationList ::= SEQUENCE (SIZE(0..maxnoofMDTPLMNs)) OF PLMN-Identity

MT-SDT-Information ::= SEQUENCE {
    mT-SDT-Data-Size          MT-SDT-Data-Size,
    iE-Extensions             ProtocolExtensionContainer { {MT-SDT-Information-ExtIEs} } OPTIONAL
}

MT-SDT-Information-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MT-SDT-Information-Request ::= ENUMERATED {true, ...}

MT-SDT-Data-Size ::= INTEGER (1..96000, ...)

MBS-ServiceArea ::= SEQUENCE {
    mBS-ServiceAreaInformationList MBS-ServiceAreaInformationList OPTIONAL,
    iE-Extensions                  ProtocolExtensionContainer { {MBS-ServiceArea-ExtIEs} } OPTIONAL,
    ...
}

MBS-ServiceArea-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MBS-ServiceAreaInformation ::= SEQUENCE {
    mBS-ServiceAreaCellList      MBS-ServiceAreaCellList OPTIONAL,
    mBS-ServiceAreaTAILlist     MBS-ServiceAreaTAILlist OPTIONAL,
    iE-Extensions                ProtocolExtensionContainer { {MBS-ServiceAreaInformation-ExtIEs} } OPTIONAL,
    ...
}

MBS-ServiceAreaInformation-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MBS-ServiceAreaCellList ::= SEQUENCE (SIZE(1.. maxnoofCellsforMBS)) OF NR-CGI

MBS-ServiceAreaTAILlist ::= SEQUENCE (SIZE(1.. maxnoofTAIforMBS)) OF MBS-ServiceAreaTAILlist-Item
MBS-ServiceAreaTAILlist-Item ::= SEQUENCE {
    plmn-ID                      PLMN-Identity,
    fiveGS-TAC                   FiveGS-TAC,
    iE-Extensions                ProtocolExtensionContainer { {MBS-ServiceAreaTAILlist-Item-ExtIEs} } OPTIONAL,
    ...
}

```

```

}
MBS-ServiceAreaTailList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MBS-ServiceAreaInformationList ::= SEQUENCE (SIZE(1..maxnoofMBSServiceAreaInformation)) OF MBS-ServiceAreaInformationItem

MBS-ServiceAreaInformationItem ::= SEQUENCE {
  mBS-AreaSessionID           MBSAreaSessionID,
  mBS-ServiceAreaInformation   MBS-ServiceAreaInformation,
  iE-Extensions                ProtocolExtensionContainer { { MBS-ServiceAreaInformationItem-ExtIEs } } OPTIONAL,
  ...
}
MBS-ServiceAreaInformationItem-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

-- N

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

New-UL-TNL-Information-Required ::= ENUMERATED {
  required,
  ...
}

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

NGRANAllocationAndRetentionPriority-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

NG-RAN-QoS-Support-List ::= SEQUENCE (SIZE(1.. maxnoofNGRANQOSParameters)) OF NG-RAN-QoS-Support-Item

NG-RAN-QoS-Support-Item ::= SEQUENCE {
  non-Dynamic5QIDescriptor Non-Dynamic5QIDescriptor,
  iE-Extensions            ProtocolExtensionContainer { { NG-RAN-QoS-Support-Item-ExtIEs } } OPTIONAL
}

NG-RAN-QoS-Support-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

NID ::= BIT STRING (SIZE (44))

Non-Dynamic5QIDescriptor ::= SEQUENCE {
  fiveQI           INTEGER (0..255, ...),
  qosPriorityLevel QoSPriorityLevel           OPTIONAL,

```

```

    averagingWindow          AveragingWindow          OPTIONAL,
    maxDataBurstVolume       MaxDataBurstVolume       OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { { Non-Dynamic5QIDescriptor-ExtIEs } } OPTIONAL
}

Non-Dynamic5QIDescriptor-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  { ID id-CNPacketDelayBudgetDownlink          CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget PRESENCE optional } |
  { ID id-CNPacketDelayBudgetUplink            CRITICALITY ignore EXTENSION ExtendedPacketDelayBudget PRESENCE optional },
  ...
}

NPNSupportInfo ::= CHOICE {
  sNPN                NPNSupportInfo-SNPN,
  choice-extension    ProtocolIE-SingleContainer { {NPNSupportInfo-ExtIEs}}
}

NPNSupportInfo-ExtIEs ELAP-PROTOCOL-IES ::= {
  ...
}

NPNSupportInfo-SNPN ::= SEQUENCE {
  nID                NID,
  iE-Extensions      ProtocolExtensionContainer { { NPNSupportInfo-SNPN-ExtIEs } } OPTIONAL
}

NPNSupportInfo-SNPN-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

NPNContextInfo ::= CHOICE {
  sNPN                NPNContextInfo-SNPN,
  choice-extension    ProtocolIE-SingleContainer { {NPNContextInfo-ExtIEs}}
}

NPNContextInfo-ExtIEs ELAP-PROTOCOL-IES ::= {
  ...
}

NPNContextInfo-SNPN ::= SEQUENCE {
  nID                NID,
  iE-Extensions      ProtocolExtensionContainer { {NPNContextInfo-SNPN-ExtIEs } } OPTIONAL
}

NPNContextInfo-SNPN-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

NR-Cell-Identity ::= BIT STRING (SIZE(36))

NR-CGI ::= SEQUENCE {
  pLMN-Identity      PLMN-Identity,
  nR-Cell-Identity   NR-Cell-Identity,
  iE-Extensions      ProtocolExtensionContainer { { NR-CGI-ExtIEs } } OPTIONAL
}

```

```

}
NR-CGI-ExtIEs    ELAP-PROTOCOL-EXTENSION ::= {
    ...
}
NR-CGI-Support-List ::= SEQUENCE (SIZE(1.. maxnoofNR CGI)) OF NR-CGI-Support-Item
NR-CGI-Support-Item ::= SEQUENCE {
    nR-CGI    NR-CGI,
    iE-Extensions          ProtocolExtensionContainer { { NR-CGI-Support-Item-ExtIEs } }    OPTIONAL
}
NR-CGI-Support-Item-ExtIEs    ELAP-PROTOCOL-EXTENSION ::= {
    ...
}
Extended-NR-CGI-Support-List ::= SEQUENCE (SIZE(1.. maxnoofExtNR CGI)) OF Extended-NR-CGI-Support-Item
Extended-NR-CGI-Support-Item ::= SEQUENCE {
    nR-CGI    NR-CGI,
    iE-Extensions          ProtocolExtensionContainer { { Extended-NR-CGI-Support-Item-ExtIEs } }    OPTIONAL
}
Extended-NR-CGI-Support-Item-ExtIEs    ELAP-PROTOCOL-EXTENSION ::= {
    ...
}
N6JitterInformation ::= SEQUENCE {
    n6JitterLowerBound    INTEGER (-127..127),
    n6JitterUpperBound    INTEGER (-127..127),
    iE-Extensions          ProtocolExtensionContainer { { N6JitterInformationExtIEs } }    OPTIONAL,
    ...
}
N6JitterInformationExtIEs    ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- O
OutOfOrderDelivery ::= ENUMERATED {
    true,
    ...
}

-- P
PacketDelayBudget ::= INTEGER (0..1023, ...)
PacketErrorRate ::= SEQUENCE {

```



```

    pER-Scalar          PER-Scalar,
    pER-Exponent        PER-Exponent,
    iE-Extensions      ProtocolExtensionContainer { {PacketErrorRate-ExtIEs} } OPTIONAL,
    ...
}

PacketErrorRate-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

PDCP-Configuration ::= SEQUENCE {

    pDCP-SN-Size-UL          PDCP-SN-Size,
    pDCP-SN-Size-DL          PDCP-SN-Size,
    rLC-Mode                  RLC-Mode,
    rOHC-Parameters          ROHC-Parameters          OPTIONAL,
    t-ReorderingTimer        T-ReorderingTimer        OPTIONAL,
    discardTimer              DiscardTimer              OPTIONAL,
    ulDataSplitThreshold      ULDataSplitThreshold      OPTIONAL,
    pDCP-Duplication          PDCP-Duplication          OPTIONAL,
    pDCP-Reestablishment      PDCP-Reestablishment      OPTIONAL,
    pDCP-DataRecovery         PDCP-DataRecovery        OPTIONAL,
    duplication-Activation    Duplication-Activation    OPTIONAL,
    outOfOrderDelivery        OutOfOrderDelivery        OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { { PDCP-Configuration-ExtIEs } } OPTIONAL,
    ...
}

PDCP-Configuration-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-PDCP-StatusReportIndication          CRITICALITY ignore  EXTENSION PDCP-StatusReportIndication          PRESENCE optional }|
    { ID id-AdditionalPDCPduplicationInformation CRITICALITY ignore  EXTENSION AdditionalPDCPduplicationInformation PRESENCE optional }|
    { ID id-EHC-Parameters                       CRITICALITY ignore  EXTENSION EHC-Parameters                       PRESENCE optional }|
    { ID id-UDC-Parameters                       CRITICALITY ignore  EXTENSION UDC-Parameters                       PRESENCE optional }|
    { ID id-DiscardTimerExtended                  CRITICALITY reject  EXTENSION DiscardTimerExtended                  PRESENCE optional }|
    { ID id-PSIbasedDiscardTimer                  CRITICALITY ignore  EXTENSION PSIbasedDiscardTimer                  PRESENCE optional }|
    { ID id-PDCPSNGapReport                       CRITICALITY ignore  EXTENSION PDCPSNGapReport                       PRESENCE optional }|
    ...
}

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

PDCP-COUNT-Reset ::= ENUMERATED {
    true,
    ...
}

PDCP-Count ::= SEQUENCE {
    pDCP-SN          PDCP-SN,
    hFN              HFN,

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    iE-Extensions          ProtocolExtensionContainer { { PDCP-Count-ExtIEs } } OPTIONAL,
    ...
}

PDCP-Count-ExtIEs        ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

PDCP-SN-Status-Request ::= ENUMERATED {
    requested,
    ...
}

PDCP-DataRecovery        ::= ENUMERATED {
    true,
    ...
}

PDCP-Duplication         ::= ENUMERATED {
    true,
    ...
}

PDCP-Reestablishment     ::= ENUMERATED {
    true,
    ...
}

PDU-Session-Resource-Data-Usage-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-Data-Usage-Item

PDU-Session-Resource-Data-Usage-Item ::= SEQUENCE {
    pdu-Session-ID          PDU-Session-ID,
    mRDC-Usage-Information  MRDC-Usage-Information,
    iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Data-Usage-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Data-Usage-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

PDCP-SN ::= INTEGER (0..262143)

PDCP-SN-Size ::= ENUMERATED {
    s-12,
    s-18,
    ...,
    s-7,
    s-15,
    s-16
}

PDCP-SN-Status-Information ::= SEQUENCE {
    pdcpStatusTransfer-UL DRBBStatusTransfer,

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    pdcpStatusTransfer-DL    PDCP-Count,
    iE-Extension             ProtocolExtensionContainer { { PDCP-SN-Status-Information-ExtIEs } } OPTIONAL,
    ...
}

PDCP-StatusReportIndication ::= ENUMERATED {
    downlink,
    uplink,
    both,
    ...
}

PDCP-SN-Status-Information-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBBStatusTransfer ::= SEQUENCE {
    receiveStatusofPDCPSDU BIT STRING (SIZE(1..131072)) OPTIONAL,
    countValue             PDCP-Count,
    iE-Extension           ProtocolExtensionContainer { {DRBBStatusTransfer-ExtIEs} } OPTIONAL,
    ...
}

DRBBStatusTransfer-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-ID ::= INTEGER (0..255)

PDU-Session-Resource-Activity ::= ENUMERATED {
    active,
    not-active,
    ...
}

PDU-Session-Resource-Activity-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Activity-Item

PDU-Session-Resource-Activity-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    pDU-Session-Resource-Activity PDU-Session-Resource-Activity,
    iE-Extensions           ProtocolExtensionContainer { { PDU-Session-Resource-Activity-ItemExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Activity-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-Resource-Confirm-Modified-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Confirm-Modified-Item

PDU-Session-Resource-Confirm-Modified-Item ::= SEQUENCE {

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    pDU-Session-ID          PDU-Session-ID,
    dRB-Confirm-Modified-List-NG-RAN  DRB-Confirm-Modified-List-NG-RAN  OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Confirm-Modified-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Confirm-Modified-Item-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-Resource-Failed-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-Failed-Item

PDU-Session-Resource-Failed-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    cause                   Cause,
    iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Failed-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Failed-Item-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-Resource-Failed-Mod-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-Failed-Mod-Item

PDU-Session-Resource-Failed-Mod-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    cause                   Cause,
    iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Failed-Mod-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Failed-Mod-Item-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-Resource-Failed-To-Modify-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-Failed-To-Modify-Item

PDU-Session-Resource-Failed-To-Modify-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    cause                   Cause,
    iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Failed-To-Modify-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Failed-To-Modify-Item-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-Resource-Modified-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-Modified-Item

PDU-Session-Resource-Modified-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    nG-DL-UP-TNL-Information  UP-TNL-Information  OPTIONAL,

```

```

securityResult SecurityResult OPTIONAL,
pDU-Session-Data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
dRB-Setup-List-NG-RAN DRB-Setup-List-NG-RAN OPTIONAL,
dRB-Failed-List-NG-RAN DRB-Failed-List-NG-RAN OPTIONAL,
dRB-Modified-List-NG-RAN DRB-Modified-List-NG-RAN OPTIONAL,
dRB-Failed-To-Modify-List-NG-RAN DRB-Failed-To-Modify-List-NG-RAN OPTIONAL,
iE-Extensions ProtocolExtensionContainer { { PDU-Session-Resource-Modified-Item-ExtIEs } } OPTIONAL,
...
}

PDU-Session-Resource-Modified-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-redundant-ng-DL-UP-TNL-Information CRITICALITY ignore EXTENSION UP-TNL-Information PRESENCE optional },
  ...
}

PDU-Session-Resource-Required-To-Modify-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Required-To-Modify-Item

PDU-Session-Resource-Required-To-Modify-Item ::= SEQUENCE {
  pDU-Session-ID PDU-Session-ID,
  nG-DL-UP-TNL-Information UP-TNL-Information OPTIONAL,
  dRB-Required-To-Modify-List-NG-RAN DRB-Required-To-Modify-List-NG-RAN OPTIONAL,
  dRB-Required-To-Remove-List-NG-RAN DRB-Required-To-Remove-List-NG-RAN OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { { PDU-Session-Resource-Required-To-Modify-Item-ExtIEs } } OPTIONAL,
  ...
}

PDU-Session-Resource-Required-To-Modify-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-redundant-ng-DL-UP-TNL-Information CRITICALITY ignore EXTENSION UP-TNL-Information PRESENCE optional },
  ...
}

PDU-Session-Resource-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Setup-Item

PDU-Session-Resource-Setup-Item ::= SEQUENCE {
  pDU-Session-ID PDU-Session-ID,
  securityResult SecurityResult OPTIONAL,
  nG-DL-UP-TNL-Information UP-TNL-Information,
  pDU-Session-Data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
  nG-DL-UP-Unchanged ENUMERATED {true, ...} OPTIONAL,
  dRB-Setup-List-NG-RAN DRB-Setup-List-NG-RAN,
  dRB-Failed-List-NG-RAN DRB-Failed-List-NG-RAN OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { { PDU-Session-Resource-Setup-Item-ExtIEs } } OPTIONAL,
  ...
}

PDU-Session-Resource-Setup-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-redundant-ng-DL-UP-TNL-Information CRITICALITY ignore EXTENSION UP-TNL-Information PRESENCE optional } |
  { ID id-RedundantPDU-Session-Information-used CRITICALITY ignore EXTENSION RedundantPDU-Session-Information PRESENCE optional },
  ...
}

PDU-Session-Resource-Setup-Mod-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Setup-Mod-Item

PDU-Session-Resource-Setup-Mod-Item ::= SEQUENCE {

```

```

pDU-Session-ID          PDU-Session-ID,
securityResult          SecurityResult          OPTIONAL,
nG-DL-UP-TNL-Information UP-TNL-Information,
pDU-Session-Data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
dRB-Setup-Mod-List-NG-RAN DRB-Setup-Mod-List-NG-RAN,
dRB-Failed-Mod-List-NG-RAN DRB-Failed-Mod-List-NG-RAN          OPTIONAL,
iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Setup-Mod-Item-ExtIEs } }
OPTIONAL,
...
}

PDU-Session-Resource-Setup-Mod-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  { ID id-redundant-nG-DL-UP-TNL-Information  CRITICALITY ignore EXTENSION  UP-TNL-Information PRESENCE optional },
  ...
}

PDU-Session-Resource-To-Modify-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-To-Modify-Item

PDU-Session-Resource-To-Modify-Item ::= SEQUENCE {
  pDU-Session-ID          PDU-Session-ID,
  securityIndication      SecurityIndication          OPTIONAL,
  pDU-Session-Resource-DL-AMBR BitRate          OPTIONAL,
  nG-UL-UP-TNL-Information UP-TNL-Information          OPTIONAL,
  pDU-Session-Data-Forwarding-Information-Request Data-Forwarding-Information-Request OPTIONAL,
  pDU-Session-Data-Forwarding-Information Data-Forwarding-Information OPTIONAL,
  pDU-Session-Inactivity-Timer Inactivity-Timer          OPTIONAL,
  networkInstance        NetworkInstance          OPTIONAL,
  dRB-To-Setup-List-NG-RAN DRB-To-Setup-List-NG-RAN          OPTIONAL,
  dRB-To-Modify-List-NG-RAN DRB-To-Modify-List-NG-RAN          OPTIONAL,
  dRB-To-Remove-List-NG-RAN DRB-To-Remove-List-NG-RAN          OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-To-Modify-Item-ExtIEs } } OPTIONAL,
  ...
}

PDU-Session-Resource-To-Modify-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  {ID id-SNSSAI          CRITICALITY reject EXTENSION SNSSAI          PRESENCE optional}|
  {ID id-CommonNetworkInstance CRITICALITY ignore EXTENSION CommonNetworkInstance PRESENCE optional}|
  }|
  {ID id-redundant-nG-UL-UP-TNL-Information CRITICALITY ignore EXTENSION  UP-TNL-Information PRESENCE optional }|
  {ID id-RedundantCommonNetworkInstance CRITICALITY ignore EXTENSION  CommonNetworkInstance PRESENCE optional }|
  {ID id-DataForwardingtoE-UTRANInformationList CRITICALITY ignore EXTENSION  DataForwardingtoE-UTRANInformationList PRESENCE optional }|
  {ID id-SecurityIndicationModify CRITICALITY ignore EXTENSION  SecurityIndication PRESENCE optional }|
  {ID id-Secondary-PDU-Session-Data-Forwarding-Information CRITICALITY ignore EXTENSION  Data-Forwarding-Information PRESENCE optional }|
  {ID id-UserPlaneFailureIndication CRITICALITY ignore EXTENSION  UserPlaneFailureIndication PRESENCE optional }|
  },
  ...
}

PDU-Session-Resource-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-To-Remove-Item

PDU-Session-Resource-To-Remove-Item ::= SEQUENCE {
  pDU-Session-ID          PDU-Session-ID,
  iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-To-Remove-Item-ExtIEs } } OPTIONAL,
  ...
}

```

```

}

PDU-Session-Resource-To-Remove-Item-ExtIEs      ELAP-PROTOCOL-EXTENSION ::= {
  {ID id-Cause          CRITICALITY ignore EXTENSION Cause          PRESENCE optional}|
  {ID id-UserPlaneErrorIndicator  CRITICALITY ignore EXTENSION UserPlaneErrorIndicator  PRESENCE optional},
  ...
}

PDU-Session-Resource-To-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-To-Setup-Item

PDU-Session-Resource-To-Setup-Item ::= SEQUENCE {
  pDU-Session-ID          PDU-Session-ID,
  pDU-Session-Type        PDU-Session-Type,
  sNSSAI                  SNSSAI,
  securityIndication      SecurityIndication,
  pDU-Session-Resource-DL-AMBR      BitRate          OPTIONAL,
  nG-UL-UP-TNL-Information      UP-TNL-Information,
  pDU-Session-Data-Forwarding-Information-Request      Data-Forwarding-Information-Request      OPTIONAL,
  pDU-Session-Inactivity-Timer      Inactivity-Timer      OPTIONAL,
  existing-Allocated-NG-DL-UP-TNL-Info      UP-TNL-Information      OPTIONAL,
  networkInstance          NetworkInstance      OPTIONAL,
  dRB-To-Setup-List-NG-RAN      DRB-To-Setup-List-NG-RAN,
  iE-Extensions            ProtocolExtensionContainer { { PDU-Session-Resource-To-Setup-Item-ExtIEs } } OPTIONAL,
  ...
}

PDU-Session-Resource-To-Setup-Item-ExtIEs      ELAP-PROTOCOL-EXTENSION ::= {
  { ID id-CommonNetworkInstance          CRITICALITY ignore EXTENSION CommonNetworkInstance          PRESENCE optional
  }|
  { ID id-redundant-nG-UL-UP-TNL-Information      CRITICALITY ignore EXTENSION      UP-TNL-Information          PRESENCE optional }|
  { ID id-RedundantCommonNetworkInstance      CRITICALITY ignore EXTENSION      CommonNetworkInstance          PRESENCE optional }|
  { ID id-RedundantPDUSessionInformation      CRITICALITY ignore EXTENSION      RedundantPDUSessionInformation      PRESENCE optional }|
  {ID id-SpecialTriggeringPurpose          CRITICALITY ignore EXTENSION      SpecialTriggeringPurpose          PRESENCE optional},
  ...
}

PDU-Session-Resource-To-Setup-Mod-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-To-Setup-Mod-Item

PDU-Session-Resource-To-Setup-Mod-Item ::= SEQUENCE {
  pDU-Session-ID          PDU-Session-ID,
  pDU-Session-Type        PDU-Session-Type,
  sNSSAI                  SNSSAI,
  securityIndication      SecurityIndication,
  pDU-Session-Resource-AMBR      BitRate          OPTIONAL,
  nG-UL-UP-TNL-Information      UP-TNL-Information,
  pDU-Session-Data-Forwarding-Information-Request      Data-Forwarding-Information-Request      OPTIONAL,
  pDU-Session-Inactivity-Timer      Inactivity-Timer      OPTIONAL,
  dRB-To-Setup-Mod-List-NG-RAN      DRB-To-Setup-Mod-List-NG-RAN,
  iE-Extensions            ProtocolExtensionContainer { { PDU-Session-Resource-To-Setup-Mod-Item-ExtIEs } }
  OPTIONAL,
  ...
}

PDU-Session-Resource-To-Setup-Mod-Item-ExtIEs      ELAP-PROTOCOL-EXTENSION ::= {

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```

    {ID id-NetworkInstance          CRITICALITY ignore EXTENSION NetworkInstance          PRESENCE optional}|
    {ID id-CommonNetworkInstance    CRITICALITY ignore EXTENSION CommonNetworkInstance PRESENCE optional}|
    {ID id-redundant-nG-UL-UP-TNL-Information    CRITICALITY ignore EXTENSION UP-TNL-Information    PRESENCE optional }|
    {ID id-RedundantCommonNetworkInstance    CRITICALITY ignore EXTENSION CommonNetworkInstance PRESENCE optional }|
    {ID id-SpecialTriggeringPurpose          CRITICALITY ignore EXTENSION SpecialTriggeringPurpose          PRESENCE optional},
    ...
}

PDU-Session-To-Notify-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) OF PDU-Session-To-Notify-Item

PDU-Session-To-Notify-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    qoS-Flow-List           QoS-Flow-List,
    iE-Extensions           ProtocolExtensionContainer { { PDU-Session-To-Notify-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-To-Notify-Item-ExtIEs          E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDU-Session-Type ::= ENUMERATED {
    ipv4,
    ipv6,
    ipv4v6,
    ethernet,
    unstructured,
    ...
}

PDUSetbasedHandlingIndicator ::= ENUMERATED {supported, ...}

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

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

PPI ::= INTEGER (0..7, ...)

PriorityLevel ::= INTEGER { spare (0), highest (1), lowest (14), no-priority (15) } (0..15)

Pre-emptionCapability ::= ENUMERATED {
    shall-not-trigger-pre-emption,
    may-trigger-pre-emption
}

Pre-emptionVulnerability ::= ENUMERATED {
    not-pre-emptable,
    pre-emptable
}

PrivacyIndicator ::= ENUMERATED {
    immediate-MDT,
    logged-MDT,
    ...
}

```



```

}
PDUSetQoSParameters ::= SEQUENCE {
    ulPDUSetQoSInformation PDUSetQoSInformation OPTIONAL,
    dlPDUSetQoSInformation PDUSetQoSInformation OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { { PDUSetQoSParameters-ExtIEs } } OPTIONAL
}

PDUSetQoSParameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

PDUSetQoSInformation ::= SEQUENCE {
    pduSetDelayBudget          ExtendedPacketDelayBudget          OPTIONAL,
    pduSetErrorRate            PacketErrorRate                    OPTIONAL,
    pduSetIntegratedHandlingInformation ENUMERATED {true, false, ...} OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { PDUSetQoSInformation-ExtIEs } } OPTIONAL
}

PDUSetQoSInformation-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- Q

QCI ::= INTEGER (0..255)

QoS-Characteristics ::= CHOICE {
    non-Dynamic-5QI          Non-Dynamic5QIDescriptor,
    dynamic-5QI              Dynamic5QIDescriptor,
    choice-extension         ProtocolIE-SingleContainer {{QoS-Characteristics-ExtIEs}}
}

QoS-Characteristics-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

QoS-Flow-Identifier ::= INTEGER (0..63)

QoS-Flow-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Item

QoS-Flow-Item ::= SEQUENCE {
    qos-Flow-Identifier       QoS-Flow-Identifier,
    iE-Extensions              ProtocolExtensionContainer { { QoS-Flow-Item-ExtIEs } } OPTIONAL,
    ...
}

QoS-Flow-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-QoSFlowMappingIndication CRITICALITY ignore EXTENSION QoS-Flow-Mapping-Indication PRESENCE optional}|
    {ID id-DataForwardingSourceIPAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional}|
    {ID id-ECNMarkingorCongestionInformationReportingStatus CRITICALITY ignore EXTENSION ECNMarkingorCongestionInformationReportingStatus PRESENCE optional},
    ...
}

```

```

QoS-Flow-Failed-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Failed-Item

QoS-Flow-Failed-Item ::= SEQUENCE {
    qos-Flow-Identifier      QoS-Flow-Identifier,
    cause                   Cause,
    iE-Extensions           ProtocolExtensionContainer { { QoS-Flow-Failed-Item-ExtIEs } } OPTIONAL,
    ...
}

QoS-Flow-Failed-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

QoS-Flow-Mapping-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Mapping-Item

QoS-Flow-Mapping-Item ::= SEQUENCE {
    qos-Flow-Identifier      QoS-Flow-Identifier,
    qosFlowMappingIndication QoS-Flow-Mapping-Indication OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { QoS-Flow-Mapping-Item-ExtIEs } } OPTIONAL,
    ...
}

QoS-Flow-Mapping-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

QoS-Flow-Mapping-Indication ::= ENUMERATED {ul, dl, ...}

QoS-Flows-DRB-Remapping ::= ENUMERATED {update, source-configuration, ...}

QoS-Parameters-Support-List ::= SEQUENCE {
    eUTRAN-QoS-Support-List EUTRAN-QoS-Support-List OPTIONAL,
    nG-RAN-QoS-Support-List NG-RAN-QoS-Support-List OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { QoS-Parameters-Support-List-ItemExtIEs } } OPTIONAL,
    ...
}

QoS-Parameters-Support-List-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

QoSPriorityLevel ::= INTEGER (0..127, ...)

QoS-Flow-QoS-Parameter-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-QoS-Parameter-Item

QoS-Flow-QoS-Parameter-Item ::= SEQUENCE {
    qos-Flow-Identifier      QoS-Flow-Identifier,
    qosFlowLevelQoSParameters QoSFlowLevelQoSParameters,
    qosFlowMappingIndication QoS-Flow-Mapping-Indication OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { QoS-Flow-QoS-Parameter-Item-ExtIEs } } OPTIONAL,
    ...
}

```

```

QoS-Flow-QoS-Parameter-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-RedundantQoSFlowIndicator        CRITICALITY ignore EXTENSION RedundantQoSFlowIndicator        PRESENCE optional}|
  {ID id-TSCTrafficCharacteristics        CRITICALITY ignore EXTENSION TSCTrafficCharacteristics        PRESENCE optional}|
  {ID id-ECNMarkingorCongestionInformationReportingRequest CRITICALITY ignore EXTENSION ECNMarkingorCongestionInformationReportingRequest PRESENCE optional},
  ...
}

QoSFlowLevelQoSParameters ::= SEQUENCE {
  qoS-Characteristics          QoS-Characteristics,
  nGRANAllocationRetentionPriority NGRANAllocationAndRetentionPriority,
  gBR-QoS-Flow-Information      GBR-QoSFlowInformation          OPTIONAL,
  reflective-QoS-Attribute       ENUMERATED {subject-to, ...}      OPTIONAL,
  additional-QoS-Information     ENUMERATED {more-likely, ...}    OPTIONAL,
  paging-Policy-Index           INTEGER (1..8, ...)          OPTIONAL,
-- The paging-Policy-Index IE is not used in this version of the specification.
  reflective-QoS-Indicator       ENUMERATED {enabled, ...}      OPTIONAL,
  iE-Extensions                 ProtocolExtensionContainer { { QoSFlowLevelQoSParameters-ExtIEs } } OPTIONAL
}

QoSFlowLevelQoSParameters-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-QoSMonitoringRequest          CRITICALITY ignore EXTENSION QoSMonitoringRequest          PRESENCE optional}|
  {ID id-MCG-OfferedGBRQoSFlowInfo     CRITICALITY ignore EXTENSION GBR-QoSFlowInformation          PRESENCE optional}|
  {ID id-QoSMonitoringReportingFrequency CRITICALITY ignore EXTENSION QoSMonitoringReportingFrequency PRESENCE optional}|
  {ID id-QoSMonitoringDisabled         CRITICALITY ignore EXTENSION QoSMonitoringDisabled         PRESENCE optional}|
  {ID id-DataForwardingSourceIPAddress  CRITICALITY ignore EXTENSION TransportLayerAddress          PRESENCE optional}|
  {ID id-PDUSetQoSParameters           CRITICALITY ignore EXTENSION PDUSetQoSParameters           PRESENCE optional},
  ...
}

QoSMonitoringRequest ::= ENUMERATED {ul, dl, both}

QoSMonitoringReportingFrequency ::= INTEGER (1..1800, ...)

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

QoS-Flow-Removed-Item ::= SEQUENCE {
  qoS-Flow-Identifier          QoS-Flow-Identifier,
  qoS-Flow-Released-In-Session ENUMERATED {released-in-session, not-released-in-session, ...} OPTIONAL,
  qoS-Flow-Accumulated-Session-Time OCTET STRING (SIZE(5))          OPTIONAL,
  iE-Extensions                 ProtocolExtensionContainer { { QoS-Flow-Removed-Item-ExtIEs } } OPTIONAL,
  ...
}

QoS-Flow-Removed-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

QoS-Flows-to-be-forwarded-List ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flows-to-be-forwarded-Item

QoS-Flows-to-be-forwarded-Item ::= SEQUENCE {
  qoS-Flow-Identifier          QoS-Flow-Identifier,
  iE-Extensions                 ProtocolExtensionContainer { { QoS-Flows-to-be-forwarded-Item-ExtIEs } } OPTIONAL,
}

```

```

}
...
}
QoS-Flows-to-be-forwarded-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
...
}
QoS-Mapping-Information ::= SEQUENCE {
dscp BIT STRING (SIZE(6)) OPTIONAL,
flow-label BIT STRING (SIZE(20)) OPTIONAL,
...
}

DataForwardingtoNG-RANQoSFlowInformationList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF DataForwardingtoNG-RANQoSFlowInformationList-Item

DataForwardingtoNG-RANQoSFlowInformationList-Item ::= SEQUENCE {
qoS-Flow-Identifier QoS-Flow-Identifier,
iE-Extensions ProtocolExtensionContainer { { DataForwardingtoNG-RANQoSFlowInformationList-Item-ExtIEs } } OPTIONAL,
...
}

DataForwardingtoNG-RANQoSFlowInformationList-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
...
}

-- R

RANUEID ::= OCTET STRING (SIZE (8))

RAT-Type ::= ENUMERATED {
e-UTRA,
nR,
...
}

RedundantQoSFlowIndicator ::= ENUMERATED {true,false}

RedundantPDUSessionInformation ::= SEQUENCE {
rSN RSN,
iE-Extensions ProtocolExtensionContainer { {RedundantPDUSessionInformation-ExtIEs} } OPTIONAL,
...
}

RedundantPDUSessionInformation-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
{ID id-PDUSession-PairID CRITICALITY ignore EXTENSION PDUSession-PairID PRESENCE optional },
...
}

RSN ::= ENUMERATED {v1, v2, ...}

RetainabilityMeasurementsInfo ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Removed-Item

RegistrationRequest ::= ENUMERATED {
start,

```

```

    stop,
    ...
}

ReportCharacteristics ::= BIT STRING (SIZE(36))

ReportingPeriodicity ::= ENUMERATED {
    ms500, ms1000, ms2000, ms5000, ms10000, ms20000, ms30000, ms40000, ms50000, ms60000, ms70000, ms80000, ms90000, ms100000, ms110000, ms120000,
    ...
}

RequestedAction4AvailNGUTermination ::= ENUMERATED {
    apply-available-configuration,
    apply-requested-configuration,
    ...,
    apply-available-configuration-if-same-as-requested
}

RLC-Mode ::= ENUMERATED {
    rlc-tm,
    rlc-am,
    rlc-um-bidirectional,
    rlc-um-unidirectional-ul,
    rlc-um-unidirectional-dl,
    ...
}

ROHC-Parameters ::= CHOICE {
    rOHC                ROHC,
    uPlinkOnlyROHC      UplinkOnlyROHC,
    choice-Extension    ProtocolIE-SingleContainer { { ROHC-Parameters-ExtIEs } }
}

ROHC-Parameters-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

ROHC ::= SEQUENCE {
    maxCID                INTEGER (0..16383, ...),
    rOHC-Profiles         INTEGER (0..511, ...),
    continueROHC          ENUMERATED {true, ...} OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { { ROHC-ExtIEs } } OPTIONAL
}

ROHC-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```

-- S

```

SDT-data-size-threshold ::= INTEGER (1.. 192000, ...)

SDT-data-size-threshold-Crossed ::= ENUMERATED {true, ...}

SCGActivationStatus ::= ENUMERATED { scg-activated, scg-deactivated, ...}

SecurityAlgorithm ::= SEQUENCE {
    cipheringAlgorithm      CipheringAlgorithm,
    integrityProtectionAlgorithm  IntegrityProtectionAlgorithm  OPTIONAL,
    iE-Extensions          ProtocolExtensionContainer { { SecurityAlgorithm-ExtIEs } } OPTIONAL,
    ...
}

SecurityAlgorithm-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

SecurityIndication ::= SEQUENCE {
    integrityProtectionIndication      IntegrityProtectionIndication,
    confidentialityProtectionIndication  ConfidentialityProtectionIndication,
    maximumIPdataRate                  MaximumIPdataRate                  OPTIONAL,
    -- This IE shall be present if the Integrity Protection Indication IE within the Security Indication IE is set to "required" or "preferred".--
    iE-Extensions          ProtocolExtensionContainer { {SecurityIndication-ExtIEs} } OPTIONAL,
    ...
}

SecurityIndication-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

SecurityInformation ::= SEQUENCE {
    securityAlgorithm      SecurityAlgorithm,
    uPSecuritykey          UPSecuritykey,
    iE-Extensions          ProtocolExtensionContainer { { SecurityInformation-ExtIEs } } OPTIONAL,
    ...
}

SecurityInformation-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

SecurityResult ::= SEQUENCE {
    integrityProtectionResult      IntegrityProtectionResult,
    confidentialityProtectionResult  ConfidentialityProtectionResult,
    iE-Extensions          ProtocolExtensionContainer { {SecurityResult-ExtIEs} } OPTIONAL,
    ...
}

SecurityResult-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

Slice-Support-List ::= SEQUENCE (SIZE(1.. maxnoofSliceItems)) OF Slice-Support-Item

```

```
Slice-Support-Item ::= SEQUENCE {
    sNSSAI SNSSAI,
    iE-Extensions ProtocolExtensionContainer { { Slice-Support-Item-ExtIEs } } OPTIONAL
}

Slice-Support-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

SNSSAI ::= SEQUENCE {
    sST OCTET STRING (SIZE(1)),
    sD OCTET STRING (SIZE(3)) OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { SNSSAI-ExtIEs } } OPTIONAL,
    ...
}

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

SDAP-Configuration ::= SEQUENCE {
    defaultDRB DefaultDRB,
    sDAP-Header-UL SDAP-Header-UL,
    sDAP-Header-DL SDAP-Header-DL,
    iE-Extensions ProtocolExtensionContainer { { SDAP-Configuration-ExtIEs } } OPTIONAL,
    ...
}

SDAP-Configuration-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

SDAP-Header-DL ::= ENUMERATED {
    present,
    absent,
    ...
}

SDAP-Header-UL ::= ENUMERATED {
    present,
    absent,
    ...
}

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

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

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

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

SurvivalTime ::= INTEGER (0..1920000, ...)
```

```

SpecialTriggeringPurpose ::= ENUMERATED {
    indirect-data-forwarding,
    ...
}

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

-- T

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

TNLAssociationUsage ::= ENUMERATED {
    ue,
    non-ue,
    both,
    ...
}

TNL-AvailableCapacityIndicator ::= SEQUENCE {
    dL-TNL-OfferedCapacity      INTEGER (0..16777216, ...),
    dL-TNL-AvailableCapacity    INTEGER (0..100, ...),
    uL-TNL-OfferedCapacity      INTEGER (0..16777216, ...),
    uL-TNL-AvailableCapacity    INTEGER (0..100, ...),
    iE-Extensions               ProtocolExtensionContainer { { TNL-AvailableCapacityIndicator-ExtIEs } } OPTIONAL,
    ...
}

TNL-AvailableCapacityIndicator-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

TSCTrafficCharacteristics ::= SEQUENCE {
    tSCTrafficCharacteristicsUL      TSCAssistanceInformation          OPTIONAL,
    tSCTrafficCharacteristicsDL      TSCAssistanceInformation          OPTIONAL,
    iE-Extensions                    ProtocolExtensionContainer { { TSCTrafficCharacteristics-ExtIEs } } OPTIONAL
}

TSCTrafficCharacteristics-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

TSCAssistanceInformation ::= SEQUENCE {
    periodicity                      Periodicity,
    burstArrivalTime                 BurstArrivalTime          OPTIONAL,
    iE-Extensions                    ProtocolExtensionContainer { { TSCAssistanceInformation-ExtIEs } } OPTIONAL
}

TSCAssistanceInformation-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-SurvivalTime              CRITICALITY ignore          EXTENSION SurvivalTime          PRESENCE optional}}
    {ID id-N6JitterInformation       CRITICALITY ignore          EXTENSION N6JitterInformation    PRESENCE optional}},
    ...

```



```

}

Periodicity                ::= INTEGER (1..640000, ...)

BurstArrivalTime           ::= OCTET STRING

TraceActivation ::= SEQUENCE {
    traceID                  TraceID,
    interfacesToTrace        InterfacesToTrace,
    traceDepth               TraceDepth,
    traceCollectionEntityIPAddress TransportLayerAddress,
    iE-Extensions            ProtocolExtensionContainer { {TraceActivation-ExtIEs} } OPTIONAL,
    ...
}

TraceActivation-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-MDTConfiguration    CRITICALITY ignore EXTENSION MDT-Configuration    PRESENCE    optional }|
    { ID id-TraceCollectionEntityURI CRITICALITY ignore EXTENSION URIaddress    PRESENCE    optional},
    ...
}

TraceDepth ::= ENUMERATED {
    minimum,
    medium,
    maximum,
    minimumWithoutVendorSpecificExtension,
    mediumWithoutVendorSpecificExtension,
    maximumWithoutVendorSpecificExtension,
    ...
}

TraceID ::= OCTET STRING (SIZE(8))

TransportLayerAddress      ::= BIT STRING (SIZE(1..160, ...))

TransactionID             ::= INTEGER (0..255, ...)

T-Reordering              ::= ENUMERATED {ms0, ms1, ms2, ms4, ms5, ms8, ms10, ms15, ms20, ms30, ms40, ms50, ms60, ms80, ms100, ms120, ms140, ms160, ms180,
ms200, ms220, ms240, ms260, ms280, ms300, ms500, ms750, ms1000, ms1250, ms1500, ms1750, ms2000, ms2250, ms2500, ms2750, ms3000, ...}

T-ReorderingTimer ::= SEQUENCE {
    t-Reordering            T-Reordering,
    iE-Extensions            ProtocolExtensionContainer { { T-ReorderingTimer-ExtIEs } } OPTIONAL,
    ...
}

T-ReorderingTimer-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

```

```

}

Transport-Layer-Address-Info ::= SEQUENCE {
    transport-UP-Layer-Addresses-Info-To-Add-List  Transport-UP-Layer-Addresses-Info-To-Add-List OPTIONAL,
    transport-UP-Layer-Addresses-Info-To-Remove-List  Transport-UP-Layer-Addresses-Info-To-Remove-List OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { Transport-Layer-Address-Info-ExtIEs } } OPTIONAL,
    ...
}

Transport-Layer-Address-Info-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Transport-UP-Layer-Addresses-Info-To-Add-List ::= SEQUENCE (SIZE(1.. maxnoofTLAs)) OF Transport-UP-Layer-Addresses-Info-To-Add-Item

Transport-UP-Layer-Addresses-Info-To-Add-Item ::= SEQUENCE {
    iP-SecTransportLayerAddress      TransportLayerAddress,
    gTPTransportLayerAddressesToAdd      GTPTLAs OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { Transport-UP-Layer-Addresses-Info-To-Add-ItemExtIEs } } OPTIONAL,
    ...
}

Transport-UP-Layer-Addresses-Info-To-Add-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Transport-UP-Layer-Addresses-Info-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofTLAs)) OF Transport-UP-Layer-Addresses-Info-To-Remove-Item

Transport-UP-Layer-Addresses-Info-To-Remove-Item ::= SEQUENCE {
    iP-SecTransportLayerAddress      TransportLayerAddress,
    gTPTransportLayerAddressesToRemove      GTPTLAs OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { Transport-UP-Layer-Addresses-Info-To-Remove-ItemExtIEs } } OPTIONAL,
    ...
}

Transport-UP-Layer-Addresses-Info-To-Remove-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- U

UDC-Parameters ::= SEQUENCE {
    bufferSize      BufferSize,
    dictionary      Dictionary OPTIONAL,
    continueUDC      ENUMERATED {true, ...} OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { UDC-Parameters-ExtIEs } } OPTIONAL
}

UDC-Parameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-VersionID CRITICALITY ignore EXTENSION INTEGER (0..15) PRESENCE optional},
    ...
}

UE-Activity ::= ENUMERATED {
    active,

```

```

    not-active,
    ...
}

UE-associatedLogicalE1-ConnectionItem ::= SEQUENCE {
    gNB-CU-CP-UE-ElAP-ID          GNB-CU-CP-UE-ElAP-ID          OPTIONAL,
    gNB-CU-UP-UE-ElAP-ID          GNB-CU-UP-UE-ElAP-ID          OPTIONAL,
    iE-Extensions                  ProtocolExtensionContainer { { UE-associatedLogicalE1-ConnectionItemExtIEs } } OPTIONAL,
    ...
}

UE-associatedLogicalE1-ConnectionItemExtIEs ElAP-PROTOCOL-EXTENSION ::= {
    ...
}

UESliceMaximumBitRateList ::= SEQUENCE (SIZE(1.. maxnoofSMBRValues)) OF UESliceMaximumBitRateItem
UESliceMaximumBitRateItem ::= SEQUENCE {
    sNSSAI                          SNSSAI,
    uESliceMaximumBitRateDL          BitRate,
    iE-Extensions                    ProtocolExtensionContainer { { UESliceMaximumBitRateItem-ExtIEs } } OPTIONAL,
    ...
}

UESliceMaximumBitRateItem-ExtIEs ElAP-PROTOCOL-EXTENSION ::= {
    ...
}

UL-Configuration ::= ENUMERATED {
    no-data,
    shared,
    only,
    ...
}

ULUPTNLAddressToUpdateItem ::= SEQUENCE {
    oldTNLAddress                    TransportLayerAddress,
    newTNLAddress                    TransportLayerAddress,
    iE-Extensions                    ProtocolExtensionContainer { { ULUPTNLAddressToUpdateItemExtIEs } } OPTIONAL,
    ...
}

ULUPTNLAddressToUpdateItemExtIEs ElAP-PROTOCOL-EXTENSION ::= {
    ...
}

ULDataSplitThreshold ::= ENUMERATED {b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800, b25600, b51200, b102400, b204800, b409600,
b819200, b1228800, b1638400, b2457600, b3276800, b4096000, b4915200, b5734400, b6553600, infinity, ...}

UP-Parameters ::= SEQUENCE (SIZE(1.. maxnoofUPParameters)) OF UP-Parameters-Item

UP-Parameters-Item ::= SEQUENCE {
    uP-TNL-Information                UP-TNL-Information,
    cell-Group-ID                    Cell-Group-ID,
    iE-Extensions                    ProtocolExtensionContainer { { UP-Parameters-Item-ExtIEs } } OPTIONAL,

```

```

}
...
}
UP-Parameters-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  {ID id-QoS-Mapping-Information  CRITICALITY reject  EXTENSION QoS-Mapping-Information  PRESENCE optional}|
  {ID id-IndirectPathIndication  CRITICALITY ignore  EXTENSION IndirectPathIndication  PRESENCE optional},
  ...
}
UPSecuritykey ::= SEQUENCE {
  encryptionKey      EncryptionKey,
  integrityProtectionKey  IntegrityProtectionKey  OPTIONAL,
  iE-Extensions      ProtocolExtensionContainer { { UPLinkOnlyROHC-ExtIEs } } OPTIONAL,
  ...
}
UPSecuritykey-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}
UP-TNL-Information ::= CHOICE {
  gTPTunnel      GTP Tunnel,
  choice-extension  ProtocolIE-SingleContainer {{UP-TNL-Information-ExtIEs}}
}
UP-TNL-Information-ExtIEs  ELAP-PROTOCOL-IES ::= {
  ...
}
UplinkOnlyROHC ::= SEQUENCE {
  maxCID          INTEGER (0..16383, ...),
  rOHC-Profiles   INTEGER (0..511, ...),
  continueROHC    ENUMERATED {true, ...} OPTIONAL,
  iE-Extensions   ProtocolExtensionContainer { { UplinkOnlyROHC-ExtIEs } } OPTIONAL
}
UplinkOnlyROHC-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}
URIaddress ::= VisibleString
UserPlaneErrorIndicator ::= ENUMERATED {
  gTP-U-error-indication-received,
  ...
}
UEInactivityInformation ::= INTEGER (1..7200, ...)
UserPlaneFailureIndication ::= SEQUENCE {
  userPlaneFailureType  UserPlaneFailureType,
  nG-DL-UP-TNL-Information  UP-TNL-Information,
  nG-UL-UP-TNL-Information  UP-TNL-Information,
}

```

```

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

UserPlaneFailureIndication-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

UserPlaneFailureType ::= ENUMERATED {
    gtp-u-error-indication-received,
    up-path-failure,
    ...
}

-- V
-- W
-- X
-- Y
-- Z

END
-- ASN1STOP

```

9.4.6 Common Definitions

```

-- ASN1START
-- *****
--
-- Common definitions
--
-- *****

ElAP-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-CommonDataTypes (3)}

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

maxPrivateIEs                INTEGER ::= 65535
maxProtocolExtensions        INTEGER ::= 65535

```

```

maxProtocolIEs                INTEGER ::= 65535

-- *****
--
-- Common Data Types
--
-- *****

Criticality ::= ENUMERATED { reject, ignore, notify }

Presence ::= ENUMERATED { optional, conditional, mandatory }

PrivateIE-ID ::= CHOICE {
    local      INTEGER (0..maxPrivateIEs),
    global     OBJECT IDENTIFIER
}

ProcedureCode ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..maxProtocolExtensions)

ProtocolIE-ID ::= INTEGER (0..maxProtocolIEs)

TriggeringMessage ::= ENUMERATED { initiating-message, successful-outcome, unsuccessful-outcome}

END
-- ASN1STOP

```

9.4.7 Constant Definitions

```

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

ElAP-Constants {
    itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
    ngran-access (22) modules (3) elap (5) version1 (1) elap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    ProcedureCode,
    ProtocolIE-ID

FROM ElAP-CommonDataTypes;

```

```

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

id-reset ProcedureCode ::= 0
id-errorIndication ProcedureCode ::= 1
id-privateMessage ProcedureCode ::= 2
id-gNB-CU-UP-E1Setup ProcedureCode ::= 3
id-gNB-CU-CP-E1Setup ProcedureCode ::= 4
id-gNB-CU-UP-ConfigurationUpdate ProcedureCode ::= 5
id-gNB-CU-CP-ConfigurationUpdate ProcedureCode ::= 6
id-e1Release ProcedureCode ::= 7
id-bearerContextSetup ProcedureCode ::= 8
id-bearerContextModification ProcedureCode ::= 9
id-bearerContextModificationRequired ProcedureCode ::= 10
id-bearerContextRelease ProcedureCode ::= 11
id-bearerContextReleaseRequest ProcedureCode ::= 12
id-bearerContextInactivityNotification ProcedureCode ::= 13
id-dLDataNotification ProcedureCode ::= 14
id-dataUsageReport ProcedureCode ::= 15
id-gNB-CU-UP-CounterCheck ProcedureCode ::= 16
id-gNB-CU-UP-StatusIndication ProcedureCode ::= 17
id-uLDataNotification ProcedureCode ::= 18
id-mRDC-DataUsageReport ProcedureCode ::= 19
id-TraceStart ProcedureCode ::= 20
id-DeactivateTrace ProcedureCode ::= 21
id-resourceStatusReportingInitiation ProcedureCode ::= 22
id-resourceStatusReporting ProcedureCode ::= 23
id-iAB-UPTNLAddressUpdate ProcedureCode ::= 24
id-CellTrafficTrace ProcedureCode ::= 25
id-earlyForwardingSNTransfer ProcedureCode ::= 26
id-gNB-CU-CPMeasurementResultsInformation ProcedureCode ::= 27
id-iABPSKNotification ProcedureCode ::= 28
id-BCBearerContextSetup ProcedureCode ::= 29
id-BCBearerContextModification ProcedureCode ::= 30
id-BCBearerContextModificationRequired ProcedureCode ::= 31
id-BCBearerContextRelease ProcedureCode ::= 32
id-BCBearerContextReleaseRequest ProcedureCode ::= 33
id-MCBearerContextSetup ProcedureCode ::= 34
id-MCBearerContextModification ProcedureCode ::= 35
id-MCBearerContextModificationRequired ProcedureCode ::= 36
id-MCBearerContextRelease ProcedureCode ::= 37
id-MCBearerContextReleaseRequest ProcedureCode ::= 38
id-MCBearerNotification ProcedureCode ::= 39

-- *****
--
-- Lists
--
-- *****

```

maxnoofErrors	INTEGER ::= 256
maxnoofSPLMNs	INTEGER ::= 12
maxnoofSliceItems	INTEGER ::= 1024
maxnoofIndividuelelConnectionsToReset	INTEGER ::= 65536
maxnoofEUTRANQOSParameters	INTEGER ::= 256
maxnoofNGRANQOSParameters	INTEGER ::= 256
maxnoofDRBs	INTEGER ::= 32
maxnoofNR CGI	INTEGER ::= 512
maxnoofPDUSessionResource	INTEGER ::= 256
maxnoofQoSFlows	INTEGER ::= 64
maxnoofUPParameters	INTEGER ::= 8
maxnoofCellGroups	INTEGER ::= 4
maxnooftimeperiods	INTEGER ::= 2
maxnoofTNLAssociations	INTEGER ::= 32
maxnoofTLAs	INTEGER ::= 16
maxnoofGTPTLAs	INTEGER ::= 16
maxnoofTNLAddresses	INTEGER ::= 8
maxnoofMDTPLMNs	INTEGER ::= 16
maxnoofQoSParaSets	INTEGER ::= 8
maxnoofExtSliceItems	INTEGER ::= 65535
maxnoofDataForwardingTunneltoE-UTRAN	INTEGER ::= 256
maxnoofExtNR CGI	INTEGER ::= 16384
maxnoofPSKs	INTEGER ::= 256
maxnoofECGI	INTEGER ::= 512
maxnoofSMBRValues	INTEGER ::= 8
maxnoofMBSAreaSessionIDs	INTEGER ::= 256
maxnoofSharedNG-UTerminations	INTEGER ::= 8
maxnoofMRBs	INTEGER ::= 32
maxnoofMBSSessionIDs	INTEGER ::= 512
maxnoofCellsforMBS	INTEGER ::= 512
maxnoofTAIforMBS	INTEGER ::= 512
maxnoofMBSServiceAreaInformation	INTEGER ::= 256
maxnoofDUs	INTEGER ::= 512
-- *****	
--	
-- IEs	
--	
-- *****	
id-Cause	ProtocolIE-ID ::= 0
id-CriticalityDiagnostics	ProtocolIE-ID ::= 1
id-gNB-CU-CP-UE-ElAP-ID	ProtocolIE-ID ::= 2
id-gNB-CU-UP-UE-ElAP-ID	ProtocolIE-ID ::= 3
id-ResetType	ProtocolIE-ID ::= 4
id-UE-associatedLogicalEl-ConnectionItem	ProtocolIE-ID ::= 5
id-UE-associatedLogicalEl-ConnectionListResAck	ProtocolIE-ID ::= 6
id-gNB-CU-UP-ID	ProtocolIE-ID ::= 7
id-gNB-CU-UP-Name	ProtocolIE-ID ::= 8
id-gNB-CU-CP-Name	ProtocolIE-ID ::= 9
id-CNSupport	ProtocolIE-ID ::= 10
id-SupportedPLMNs	ProtocolIE-ID ::= 11
id-TimeToWait	ProtocolIE-ID ::= 12

id-SecurityInformation	ProtocolIE-ID ::= 13
id-UEDLAggregateMaximumBitRate	ProtocolIE-ID ::= 14
id-System-BearerContextSetupRequest	ProtocolIE-ID ::= 15
id-System-BearerContextSetupResponse	ProtocolIE-ID ::= 16
id-BearerContextStatusChange	ProtocolIE-ID ::= 17
id-System-BearerContextModificationRequest	ProtocolIE-ID ::= 18
id-System-BearerContextModificationResponse	ProtocolIE-ID ::= 19
id-System-BearerContextModificationConfirm	ProtocolIE-ID ::= 20
id-System-BearerContextModificationRequired	ProtocolIE-ID ::= 21
id-DRB-Status-List	ProtocolIE-ID ::= 22
id-ActivityNotificationLevel	ProtocolIE-ID ::= 23
id-ActivityInformation	ProtocolIE-ID ::= 24
id-Data-Usage-Report-List	ProtocolIE-ID ::= 25
id-New-UL-TNL-Information-Required	ProtocolIE-ID ::= 26
id-GNB-CU-CP-TNLA-To-Add-List	ProtocolIE-ID ::= 27
id-GNB-CU-CP-TNLA-To-Remove-List	ProtocolIE-ID ::= 28
id-GNB-CU-CP-TNLA-To-Update-List	ProtocolIE-ID ::= 29
id-GNB-CU-CP-TNLA-Setup-List	ProtocolIE-ID ::= 30
id-GNB-CU-CP-TNLA-Failed-To-Setup-List	ProtocolIE-ID ::= 31
id-DRB-To-Setup-List-EUTRAN	ProtocolIE-ID ::= 32
id-DRB-To-Modify-List-EUTRAN	ProtocolIE-ID ::= 33
id-DRB-To-Remove-List-EUTRAN	ProtocolIE-ID ::= 34
id-DRB-Required-To-Modify-List-EUTRAN	ProtocolIE-ID ::= 35
id-DRB-Required-To-Remove-List-EUTRAN	ProtocolIE-ID ::= 36
id-DRB-Setup-List-EUTRAN	ProtocolIE-ID ::= 37
id-DRB-Failed-List-EUTRAN	ProtocolIE-ID ::= 38
id-DRB-Modified-List-EUTRAN	ProtocolIE-ID ::= 39
id-DRB-Failed-To-Modify-List-EUTRAN	ProtocolIE-ID ::= 40
id-DRB-Confirm-Modified-List-EUTRAN	ProtocolIE-ID ::= 41
id-PDU-Session-Resource-To-Setup-List	ProtocolIE-ID ::= 42
id-PDU-Session-Resource-To-Modify-List	ProtocolIE-ID ::= 43
id-PDU-Session-Resource-To-Remove-List	ProtocolIE-ID ::= 44
id-PDU-Session-Resource-Required-To-Modify-List	ProtocolIE-ID ::= 45
id-PDU-Session-Resource-Setup-List	ProtocolIE-ID ::= 46
id-PDU-Session-Resource-Failed-List	ProtocolIE-ID ::= 47
id-PDU-Session-Resource-Modified-List	ProtocolIE-ID ::= 48
id-PDU-Session-Resource-Failed-To-Modify-List	ProtocolIE-ID ::= 49
id-PDU-Session-Resource-Confirm-Modified-List	ProtocolIE-ID ::= 50
id-DRB-To-Setup-Mod-List-EUTRAN	ProtocolIE-ID ::= 51
id-DRB-Setup-Mod-List-EUTRAN	ProtocolIE-ID ::= 52
id-DRB-Failed-Mod-List-EUTRAN	ProtocolIE-ID ::= 53
id-PDU-Session-Resource-Setup-Mod-List	ProtocolIE-ID ::= 54
id-PDU-Session-Resource-Failed-Mod-List	ProtocolIE-ID ::= 55
id-PDU-Session-Resource-To-Setup-Mod-List	ProtocolIE-ID ::= 56
id-TransactionID	ProtocolIE-ID ::= 57
id-Serving-PLMN	ProtocolIE-ID ::= 58
id-UE-Inactivity-Timer	ProtocolIE-ID ::= 59
id-System-GNB-CU-UP-CounterCheckRequest	ProtocolIE-ID ::= 60
id-DRBs-Subject-To-Counter-Check-List-EUTRAN	ProtocolIE-ID ::= 61
id-DRBs-Subject-To-Counter-Check-List-NG-RAN	ProtocolIE-ID ::= 62
id-PPI	ProtocolIE-ID ::= 63
id-gNB-CU-UP-Capacity	ProtocolIE-ID ::= 64
id-GNB-CU-UP-OverloadInformation	ProtocolIE-ID ::= 65
id-UEDLMaximumIntegrityProtectedDataRate	ProtocolIE-ID ::= 66

id-PDU-Session-To-Notify-List	ProtocolIE-ID ::= 67
id-PDU-Session-Resource-Data-Usage-List	ProtocolIE-ID ::= 68
id-SNSSAI	ProtocolIE-ID ::= 69
id-DataDiscardRequired	ProtocolIE-ID ::= 70
id-OldQoSFlowMap-ULendmarkerexpected	ProtocolIE-ID ::= 71
id-DRB-QoS	ProtocolIE-ID ::= 72
id-GNB-CU-UP-TNLA-To-Remove-List	ProtocolIE-ID ::= 73
id-endpoint-IP-Address-and-Port	ProtocolIE-ID ::= 74
id-TNLAssociationTransportLayerAddressgNBCUUP	ProtocolIE-ID ::= 75
id-RANUEID	ProtocolIE-ID ::= 76
id-GNB-DU-ID	ProtocolIE-ID ::= 77
id-CommonNetworkInstance	ProtocolIE-ID ::= 78
id-NetworkInstance	ProtocolIE-ID ::= 79
id-QoSFlowMappingIndication	ProtocolIE-ID ::= 80
id-TraceActivation	ProtocolIE-ID ::= 81
id-TraceID	ProtocolIE-ID ::= 82
id-SubscriberProfileIDforRFP	ProtocolIE-ID ::= 83
id-AdditionalRRMPriorityIndex	ProtocolIE-ID ::= 84
id-RetainabilityMeasurementsInfo	ProtocolIE-ID ::= 85
id-Transport-Layer-Address-Info	ProtocolIE-ID ::= 86
id-QoSMonitoringRequest	ProtocolIE-ID ::= 87
id-PDCP-StatusReportIndication	ProtocolIE-ID ::= 88
id-gNB-CU-CP-Measurement-ID	ProtocolIE-ID ::= 89
id-gNB-CU-UP-Measurement-ID	ProtocolIE-ID ::= 90
id-RegistrationRequest	ProtocolIE-ID ::= 91
id-ReportCharacteristics	ProtocolIE-ID ::= 92
id-ReportingPeriodicity	ProtocolIE-ID ::= 93
id-TNL-AvailableCapacityIndicator	ProtocolIE-ID ::= 94
id-HW-CapacityIndicator	ProtocolIE-ID ::= 95
id-RedundantCommonNetworkInstance	ProtocolIE-ID ::= 96
id-redundant-nG-UL-UP-TNL-Information	ProtocolIE-ID ::= 97
id-redundant-nG-DL-UP-TNL-Information	ProtocolIE-ID ::= 98
id-RedundantQoSFlowIndicator	ProtocolIE-ID ::= 99
id-TSCTrafficCharacteristics	ProtocolIE-ID ::= 100
id-CNPacketDelayBudgetDownlink	ProtocolIE-ID ::= 101
id-CNPacketDelayBudgetUplink	ProtocolIE-ID ::= 102
id-ExtendedPacketDelayBudget	ProtocolIE-ID ::= 103
id-AdditionalPDCPduplicationInformation	ProtocolIE-ID ::= 104
id-RedundantPDUSessionInformation	ProtocolIE-ID ::= 105
id-RedundantPDUSessionInformation-used	ProtocolIE-ID ::= 106
id-QoS-Mapping-Information	ProtocolIE-ID ::= 107
id-DLUPTNLAddressToUpdateList	ProtocolIE-ID ::= 108
id-ULUPTNLAddressToUpdateList	ProtocolIE-ID ::= 109
id-NPNSupportInfo	ProtocolIE-ID ::= 110
id-NPNContextInfo	ProtocolIE-ID ::= 111
id-MDTConfiguration	ProtocolIE-ID ::= 112
id-ManagementBasedMDTPLMNList	ProtocolIE-ID ::= 113
id-TraceCollectionEntityIPAddress	ProtocolIE-ID ::= 114
id-PrivacyIndicator	ProtocolIE-ID ::= 115
id-TraceCollectionEntityURI	ProtocolIE-ID ::= 116
id-URIaddress	ProtocolIE-ID ::= 117
id-EHC-Parameters	ProtocolIE-ID ::= 118
id-DRBs-Subject-To-Early-Forwarding-List	ProtocolIE-ID ::= 119
id-DAPSRequestInfo	ProtocolIE-ID ::= 120

id-CHOInitiation	ProtocolIE-ID ::= 121
id-EarlyForwardingCOUNTReg	ProtocolIE-ID ::= 122
id-EarlyForwardingCOUNTInfo	ProtocolIE-ID ::= 123
id-AlternativeQoSParaSetList	ProtocolIE-ID ::= 124
id-ExtendedSliceSupportList	ProtocolIE-ID ::= 125
id-MCG-OfferedGBRQoSFlowInfo	ProtocolIE-ID ::= 126
id-Number-of-tunnels	ProtocolIE-ID ::= 127
id-DRB-Measurement-Results-Information-List	ProtocolIE-ID ::= 128
id-Extended-GNB-CU-CP-Name	ProtocolIE-ID ::= 129
id-Extended-GNB-CU-UP-Name	ProtocolIE-ID ::= 130
id-DataForwardingtoE-UTRANInformationList	ProtocolIE-ID ::= 131
id-QoSMonitoringReportingFrequency	ProtocolIE-ID ::= 132
id-QoSMonitoringDisabled	ProtocolIE-ID ::= 133
id-AdditionalHandoverInfo	ProtocolIE-ID ::= 134
id-Extended-NR-CGI-Support-List	ProtocolIE-ID ::= 135
id-DataForwardingtoNG-RANQoSFlowInformationList	ProtocolIE-ID ::= 136
id-MaxCIDEHCDL	ProtocolIE-ID ::= 137
id-ignoreMappingRuleIndication	ProtocolIE-ID ::= 138
id-DirectForwardingPathAvailability	ProtocolIE-ID ::= 139
id-EarlyDataForwardingIndicator	ProtocolIE-ID ::= 140
id-QoSFlowsDRBRemapping	ProtocolIE-ID ::= 141
id-DataForwardingSourceIPAddress	ProtocolIE-ID ::= 142
id-SecurityIndicationModify	ProtocolIE-ID ::= 143
id-IAB-Donor-CU-UPPSKInfo	ProtocolIE-ID ::= 144
id-ECGI-Support-List	ProtocolIE-ID ::= 145
id-MDTPollutedMeasurementIndicator	ProtocolIE-ID ::= 146
id-M4ReportAmount	ProtocolIE-ID ::= 147
id-M6ReportAmount	ProtocolIE-ID ::= 148
id-M7ReportAmount	ProtocolIE-ID ::= 149
id-UESliceMaximumBitRateList	ProtocolIE-ID ::= 150
id-PDUSession-PairID	ProtocolIE-ID ::= 151
id-SurvivalTime	ProtocolIE-ID ::= 152
id-UDC-Parameters	ProtocolIE-ID ::= 153
id-SCGActivationStatus	ProtocolIE-ID ::= 154
id-GNB-CU-CP-MBS-ElAP-ID	ProtocolIE-ID ::= 155
id-GNB-CU-UP-MBS-ElAP-ID	ProtocolIE-ID ::= 156
id-GlobalMBSSESSIONID	ProtocolIE-ID ::= 157
id-BCBearerContextToSetup	ProtocolIE-ID ::= 158
id-BCBearerContextToSetupResponse	ProtocolIE-ID ::= 159
id-BCBearerContextToModify	ProtocolIE-ID ::= 160
id-BCBearerContextToModifyResponse	ProtocolIE-ID ::= 161
id-BCBearerContextToModifyRequired	ProtocolIE-ID ::= 162
id-BCBearerContextToModifyConfirm	ProtocolIE-ID ::= 163
id-MCBearerContextToSetup	ProtocolIE-ID ::= 164
id-MCBearerContextToSetupResponse	ProtocolIE-ID ::= 165
id-MCBearerContextToModify	ProtocolIE-ID ::= 166
id-MCBearerContextToModifyResponse	ProtocolIE-ID ::= 167
id-MCBearerContextToModifyRequired	ProtocolIE-ID ::= 168
id-MCBearerContextToModifyConfirm	ProtocolIE-ID ::= 169
id-MBSMulticastFLUContextDescriptor	ProtocolIE-ID ::= 170
id-gNB-CU-UP-MBS-Support-Info	ProtocolIE-ID ::= 171
id-SecurityIndication	ProtocolIE-ID ::= 172
id-SecurityResult	ProtocolIE-ID ::= 173
id-SDTContinueROHC	ProtocolIE-ID ::= 174

id-SDTindicatorSetup	ProtocolIE-ID ::= 175
id-SDTindicatorMod	ProtocolIE-ID ::= 176
id-DiscardTimerExtended	ProtocolIE-ID ::= 177
id-ManagementBasedMDTPLMNModificationList	ProtocolIE-ID ::= 178
id-MCForwardingResourceRequest	ProtocolIE-ID ::= 179
id-MCForwardingResourceIndication	ProtocolIE-ID ::= 180
id-MCForwardingResourceResponse	ProtocolIE-ID ::= 181
id-MCForwardingResourceRelease	ProtocolIE-ID ::= 182
id-MCForwardingResourceReleaseIndication	ProtocolIE-ID ::= 183
id-PDCP-COUNT-Reset	ProtocolIE-ID ::= 184
id-MBSSessionAssociatedInfoNonSupportToSupport	ProtocolIE-ID ::= 185
id-VersionID	ProtocolIE-ID ::= 186
id-InactivityInformationRequest	ProtocolIE-ID ::= 187
id-UEInactivityInformation	ProtocolIE-ID ::= 188
id-MBSAreaSessionID	ProtocolIE-ID ::= 189
id-Secondary-PDU-Session-Data-Forwarding-Information	ProtocolIE-ID ::= 190
id-MBSSessionResourceNotification	ProtocolIE-ID ::= 191
id-MCBearerContextInactivityTimer	ProtocolIE-ID ::= 192
id-MCBearerContextStatusChange	ProtocolIE-ID ::= 193
id-MT-SDT-Information	ProtocolIE-ID ::= 194
id-MT-SDT-Information-Request	ProtocolIE-ID ::= 195
id-SDT-data-size-threshold	ProtocolIE-ID ::= 196
id-SDT-data-size-threshold-Crossed	ProtocolIE-ID ::= 197
id-SpecialTriggeringPurpose	ProtocolIE-ID ::= 198
id-AssociatedSessionID	ProtocolIE-ID ::= 199
id-MBS-ServiceArea	ProtocolIE-ID ::= 200
id-PDUSetQoSParameters	ProtocolIE-ID ::= 201
id-N6JitterInformation	ProtocolIE-ID ::= 202
id-ECNMarkingorCongestionInformationReportingRequest	ProtocolIE-ID ::= 203
id-ECNMarkingorCongestionInformationReportingStatus	ProtocolIE-ID ::= 204
id-PDUSetbasedHandlingIndicator	ProtocolIE-ID ::= 205
id-IndirectPathIndication	ProtocolIE-ID ::= 206
id-FLUTunnelNotEstablished	ProtocolIE-ID ::= 207
id-FLU-TNL-InfoToAdd-List	ProtocolIE-ID ::= 208
id-FLU-TNL-InfoAdded-List	ProtocolIE-ID ::= 209
id-FLU-TNL-InfoToAddOrModify-List	ProtocolIE-ID ::= 210
id-FLU-TNL-InfoAddedOrModified-List	ProtocolIE-ID ::= 211
id-FLU-TNL-InfoToRelease-List	ProtocolIE-ID ::= 212
id-BroadcastFLU-ContextReferenceE1	ProtocolIE-ID ::= 213
id-PSIbasedDiscardTimer	ProtocolIE-ID ::= 214
id-UserPlaneErrorIndicator	ProtocolIE-ID ::= 215
id-MaximumDataBurstVolume	ProtocolIE-ID ::= 216
id-BCBearerContextNGU-TNLInfoatNGRAN-Request	ProtocolIE-ID ::= 217
id-PDCPSNGapReport	ProtocolIE-ID ::= 218
id-UserPlaneFailureIndication	ProtocolIE-ID ::= 219

END

-- ASN1STOP

9.4.8 Container Definitions

```

-- ASN1START
-- *****
--
-- Container definitions
--
-- *****

ElAP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    maxPrivateIEs,
    maxProtocolExtensions,
    maxProtocolIEs,
    Criticality,
    Presence,
    PrivateIE-ID,
    ProtocolIE-ID

FROM ElAP-CommonDataTypes;

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

ElAP-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 Extensions
--
-- *****

E1AP-PROTOCOL-EXTENSION ::= CLASS {
    &id                ProtocolIE-ID        UNIQUE,
    &criticality        Criticality,
    &Extension,
    &presence            Presence
}
WITH SYNTAX {
    ID                &id
    CRITICALITY        &criticality
    EXTENSION          &Extension
    PRESENCE           &presence
}

-- *****
--
-- Class Definition for Private IEs
--
-- *****

E1AP-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 { E1AP-PROTOCOL-IES : IEsSetParam } ::=
    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-Field { {IEsSetParam} }

ProtocolIE-SingleContainer { E1AP-PROTOCOL-IES : IEsSetParam } ::=
    ProtocolIE-Field { {IEsSetParam} }

ProtocolIE-Field { E1AP-PROTOCOL-IES : IEsSetParam } ::= SEQUENCE {
    id                E1AP-PROTOCOL-IES.&id        ( {IEsSetParam} ),

```

```
    criticality    E1AP-PROTOCOL-IES.&criticality    ({IEsSetParam}@id}),
    value         E1AP-PROTOCOL-IES.&Value         ({IEsSetParam}@id)
}

-- *****
--
-- Container Lists for Protocol IE Containers
--
-- *****

ProtocolIE-ContainerList { INTEGER : lowerBound, INTEGER : upperBound, E1AP-PROTOCOL-IES : IEsSetParam } ::=
    SEQUENCE (SIZE (lowerBound..upperBound)) OF
        ProtocolIE-Container {{IEsSetParam}}

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

ProtocolExtensionContainer { E1AP-PROTOCOL-EXTENSION : ExtensionSetParam } ::=
    SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
        ProtocolExtensionField {{ExtensionSetParam}}

ProtocolExtensionField { E1AP-PROTOCOL-EXTENSION : ExtensionSetParam } ::= SEQUENCE {
    id                E1AP-PROTOCOL-EXTENSION.&id                ({ExtensionSetParam}),
    criticality       E1AP-PROTOCOL-EXTENSION.&criticality       ({ExtensionSetParam}@id}),
    extensionValue    E1AP-PROTOCOL-EXTENSION.&Extension         ({ExtensionSetParam}@id)
}

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

PrivateIE-Container { E1AP-PRIVATE-IES : IEsSetParam } ::=
    SEQUENCE (SIZE (1..maxPrivateIEs)) OF
        PrivateIE-Field {{IEsSetParam}}

PrivateIE-Field { E1AP-PRIVATE-IES : IEsSetParam } ::= SEQUENCE {
    id                E1AP-PRIVATE-IES.&id                ({IEsSetParam}),
    criticality       E1AP-PRIVATE-IES.&criticality       ({IEsSetParam}@id}),
    value             E1AP-PRIVATE-IES.&Value             ({IEsSetParam}@id)
}

END
-- ASN1STOP
```

9.5 Message Transfer Syntax

E1AP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax, as specified in ITU-T Recommendation X.691 [7].

9.6 Timers

10 Handling of unknown, unforeseen and erroneous protocol data

Section 10 of TS 38.413 [6] 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
2022-01	R3#114b-e	R3-221121	-	-	-	Text transferred from TS 38.463 v16.8.0 with no changes. Capture LTE_NR_arch_evo_enh-Core endorsed BL CRs and agreed TPs	0.0.1
2022-02	R3#115-e	R3-221645	-	-	-	Submitted to RAN#115-e	0.1.0
2022-02	R3#115-e	R3-222578	-	-	-	Change the date of specification release	0.1.1
2022-03	RAN#95-e	RP-220798	-	-	-	Version submitted for approval in RAN#95-e	1.0.0
2022-03	RAN#95-e	RP-220851	-	-	-	Agreed Rel-16/17 CRs from other WIs are merged. Including REL-16 38.463 changes of: R3-221223 of RP-220276, R3-221253 of RP-220278, R3-220836 of RP-220277, R3-221707 of RP-220282, R3-222108 of RP-220279, R3-222844 of RP-220279. and REL-17 38.463 changes of: R3-221516 of RP-220218, R3-221550 of RP-220221, R3-221598 of RP-220232, R3-221617 of RP-220294, R3-222541 of RP-220223, R3-222613 of RP-220234, R3-222906 of RP-220218, R3-222930 of RP-220224, RP-220927, R3-222986 of RP-220233.	1.1.0
2022-03	RAN#95-e					Promotion to Release 17 without technical change	17.0.0
2022-06	RAN#96	RP-221138	0001	1	F	Correction of UDC in CP-UP Split architecture	17.1.0
2022-06	RAN#96	RP-221132	0002	2	F	Extended PDCP Discard Timer over E1 interface	17.1.0
2022-06	RAN#96	RP-221154	0004	1	A	Correction on EHC parameters	17.1.0
2022-06	RAN#96	RP-221140	0005	1	F	Correction on enhanced eNB architecture evolution	17.1.0
2022-06	RAN#96	RP-221134	0007	1	F	Correction on configuration of initial value of HFN and reference SN	17.1.0
2022-06	RAN#96	RP-221150	0008	1	A	Dynamic ACL over E1 CR 37.483	17.1.0
2022-06	RAN#96	RP-221134	0009	1	F	MBS E1AP corrections	17.1.0
2022-06	RAN#96	RP-221149	0010	2	A	Correction on IAB PSK generation	17.1.0
2022-06	RAN#96	RP-221134	0013	3	F	Correction of MBS shared NG-U termination	17.1.0
2022-06	RAN#96	RP-221145	0014	1	D	E1AP Rapporteur Corrections	17.1.0
2022-06	RAN#96	RP-221134	0015	1	F	Correction on NR MBS in E1AP	17.1.0
2022-06	RAN#96	RP-221141	0016	1	F	Correction on update management based MDT user consent	17.1.0
2022-06	RAN#96	RP-221134	0019	-	F	NR MBS E1AP asn.1 correction	17.1.0
2022-06	RAN#96	RP-221135	0020	1	F	Correction for E1AP on SCG (de)activation	17.1.0
2022-09	RAN#97-e	RP-222201	0027	1	A	Correction on Missing Criticality Diagnostics over E1AP	17.2.0
2022-09	RAN#97-e	RP-222188	0030	1	F	Correction of shared CU UP codepoints	17.2.0
2022-09	RAN#97-e	RP-222188	0031	1	F	Further Corrections for NR MBS	17.2.0
2022-09	RAN#97-e	RP-222188	0032	-	F	E1AP ASN.1 correction on MCBearerContextToModify	17.2.0
2022-09	RAN#97-e	RP-222188	0034	1	F	Introduction of MBS specific cause values	17.2.0
2022-09	RAN#97-e	RP-222188	0035	1	F	Correction on Maximum number of MRBs	17.2.0
2022-09	RAN#97-e	RP-222188	0037	2	F	Correction for the MBS multicast data forwarding	17.2.0
2022-09	RAN#97-e	RP-222188	0038	1	F	Corrections for the establishment of F1-U ptp retransmission tunnels	17.2.0
2022-12	RAN#98	RP-222891	0026	4	A	PDCP COUNT reset in CU-UP for inter-gNB-DU Handover	17.3.0
2022-12	RAN#98	RP-222882	0042	3	F	Clarification on initialRX-DELIV over E1AP	17.3.0
2022-12	RAN#98	RP-222882	0043	2	F	Correction on non-MBS-supporting to MBS-supporting handover on TS 37.483	17.3.0
2022-12	RAN#98	RP-222882	0046	1	F	MC Bearer Context Setup without MBS QoS flow information available	17.3.0
2023-03	RAN#99	RP-230583	0049	-	F	Correction on providing MBS Session Associated Information	17.4.0
2023-03	RAN#99	RP-230595	0050	-	A	Mandatory extension container in E1AP Resource Status Update	17.4.0
2023-03	RAN#99	RP-230594	0051	1	F	E1AP corrections of references to RRC	17.4.0
2023-06	RAN#100	RP-231081	0055	1	A	Alignment of the tabular and ASN.1 definitions for the Resource Status Update	17.5.0
2023-06	RAN#100	RP-231075	0056	1	A	Corrections on TNL association addition, update and removal (E1)	17.5.0
2023-06	RAN#100	RP-231073	0057	1	F	Correction of Burst Arrival Time semantics description	17.5.0
2023-06	RAN#100	RP-231074	0058	1	F	Correction on NG-U tunnel aspect for MBS session	17.5.0
2023-06	RAN#100	RP-231075	0059	2	F	Correction of Priority Level	17.5.0
2023-06	RAN#100	RP-231068	0060	2	F	Correction of RAT type in Data Usage Report List for Rel-17	17.5.0
2023-06	RAN#100	RP-231081	0061	2	A	Correction on RESOURCE STATUS FAILURE message over E1 in Rel-17	17.5.0
2023-06	RAN#100	RP-231084	0062	2	F	Correction of Extended Packet Delay Budget	17.5.0
2023-06	RAN#100	RP-231070	0063	2	A	Correction of Paging Priority Indicator in QoS Flow Level QoS Parameters	17.5.0
2023-06	RAN#100	RP-231082	0064	4	F	Correction to UDC Parameters in E1AP	17.5.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2023-06	RAN#100	RP-231074	0065	0	F	Correction of MRB Setup Configuration over E1	17.5.0
2023-09	RAN#101	RP-231902	0067	0	F	UDC Parameters over E1	17.6.0
2023-09	RAN#101	RP-231895	0068	2	A	Inactive Time Signaling over E1 for Mobility	17.6.0
2023-09	RAN#101	RP-231897	0069	1	F	Correction of Location Dependent Service	17.6.0
2023-09	RAN#101	RP-231895	0072	2	A	Correction of data forwarding for split PDU session	17.6.0
2023-09	RAN#101	RP-231897	0073	0	F	Correction on MBS Session Forwarding Address	17.6.0
2023-12	RAN#102	RP-233849	0079	3	F	Correction on Temp no data and DL data arrival for Activate Multicast Session	17.7.0
2023-12	RAN#102	RP-233847	0089	1	A	Correction on Resource Status Request	17.7.0
2023-12	RAN#102	RP-233849	0094	1	F	ASN.1 and tabular alignment for Multicast related message	17.7.0
2023-12	RAN#102	RP-233852	0096	1	F	Correction on Bearer Context Status Change	17.7.0
2023-12	RAN#102	RP-233819	0054	9	B	Introduction of MT-SDT	18.0.0
2023-12	RAN#102	RP-233844	0086	2	F	Correction of Transport Addresses	18.0.0
2023-12	RAN#102	RP-233844	0095	3	B	Avoiding unnecessary setup of DRB(s) in indirect data forwarding [Indirect Data forwarding]	18.0.0
2023-12	RAN#102	RP-233829	0077	4	B	Introduction of NR MBS enhancements	18.0.0
2023-12	RAN#102	RP-233830	0078	4	B	Introducing enhancement for NR XR	18.0.0
2023-12	RAN#102	RP-233823	0088	3	B	Support of NR SL relay enhancements	18.0.0
2023-12	RAN#102	RP-233818	0097	0	B	on subsequent CPAC	18.0.0
2024-03	RAN#103	RP-240633	0100	3	F	Correction of MBS ASN1	18.1.0
2024-03	RAN#103	RP-240627	0102	2	F	Correction on the MT-SDT Data Size within MT-SDT information in TS37.483	18.1.0
2024-03	RAN#103	RP-240634	0104	2	F	Introduction of separate uplink and downlink PDU set QoS parameters	18.1.0
2024-03	RAN#103	RP-240646	0105	1	F	Clarification on data forwarding information provision for indirect data forwarding	18.1.0
2024-03	RAN#103	RP-240644	0112	2	A	Correction on multiple F1-U tunnels per broadcast MRB	18.1.0
2024-03	RAN#103	RP-240634	0113	2	F	Correction on PSI based discard	18.1.0
2024-03	RAN#103	RP-240617	0118	1	D	Rapporteur's editorial corrections for E1AP	18.1.0
2024-03	RAN#103	RP-240634	0119	2	F	Correction to include indication of End of Data Burst during data forwarding	18.1.0
2024-03	RAN#103	RP-240633	0123	1	F	Correction on MBS RAN Sharing	18.1.0
2024-06	RAN#104	RP-241113	0111	3	F	Correction of handling GTP-U Error Indication	18.2.0
2024-06	RAN#104	RP-241112	0114	3	F	Correction on indirect Data forwarding [Indirect Data forwarding]	18.2.0
2024-06	RAN#104	RP-241105	0128	2	F	Correction on MDBV for alternative QoS	18.2.0
2024-06	RAN#104	RP-241113	0132	1	D	Rapporteur's editorial corrections for E1AP	18.2.0
2024-06	RAN#104	RP-241104	0133	1	F	Restoration of N3mb Failure for MBS broadcast	18.2.0
2024-06	RAN#104	RP-241112	0134	1	F	Correction on indirect data forwarding [Indirect Data forwarding]	18.2.0
2024-06	RAN#104	RP-241105	0135	2	F	Support of PDCP SN Gap Report	18.2.0
2024-06	RAN#104	RP-241113	0136	2	F	Correction of Recovery of Split PDU Session	18.2.0

History

Document history		
V18.1.0	May 2024	Publication
V18.2.0	August 2024	Publication