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TECHNICAL SPECIFICATION

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E1 Application Protocol (E1AP)
(3GPP TS 37.483 version 17.1.0 Release 17)

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Contents

Foreword

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

[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: "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".

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].

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].

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
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
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 Transmisson
SNPN	Stand-alone Non-Public Network
S-NSSAI	Single Network Slice Selection Assistance Information
TNLA	Transport Network Layer Association
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 *Information Element Name* is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. *E-RAB ID* IE.

Value of an IE When referring to the value of an information element (IE) in the specification the "Value" is written as it is specified in the specification enclosed by quotation marks, e.g. "Value".

5 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.

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
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
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
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
BC Bearer Context Release (gNB-CU-UP initiated)	BC BEARER CONTEXT RELEASE REQUEST

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

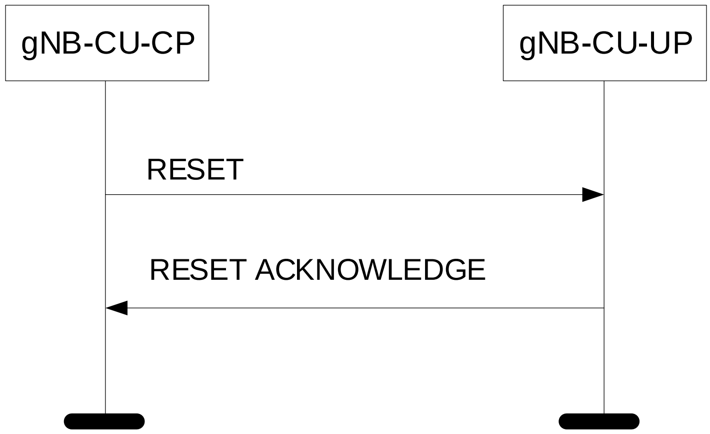

Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU-CP. Successful operation.

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

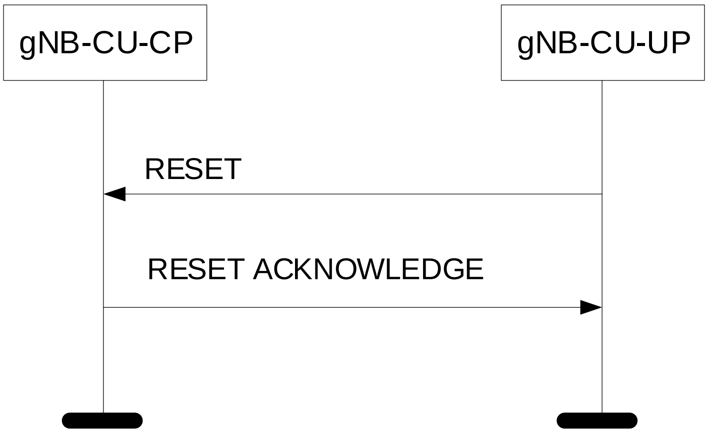

Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-CU-UP. Successful operation.

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

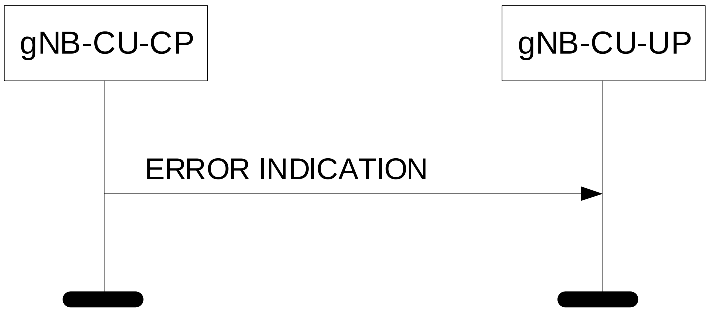

Figure 8.2.2.2-1: Error Indication procedure, gNB-CU-CP originated. Successful operation.

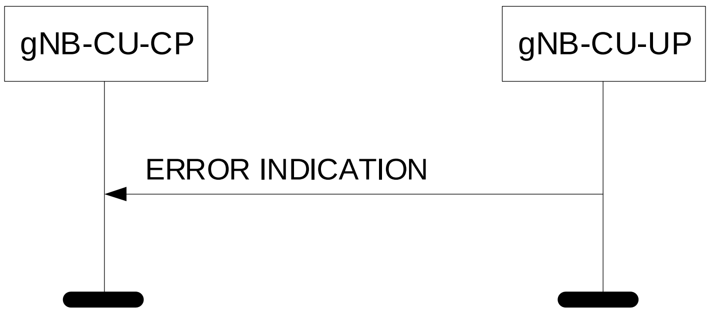

Figure 8.2.2.2-2: Error Indication procedure, gNB-CU-UP originated. Successful operation.

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

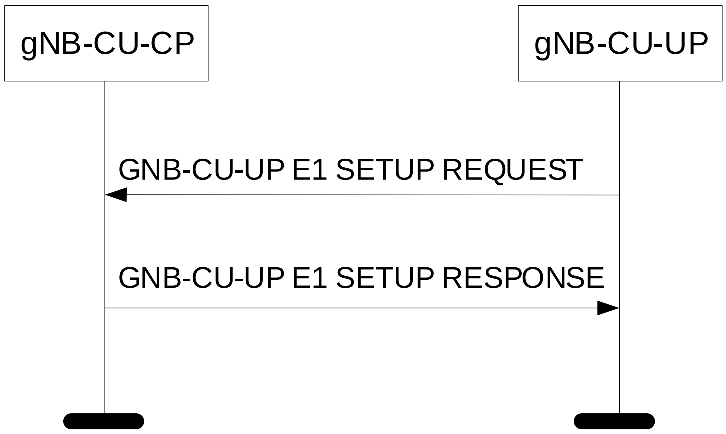

Figure 8.2.3.2-1: gNB-CU-UP E1 Setup procedure: Successful Operation.

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

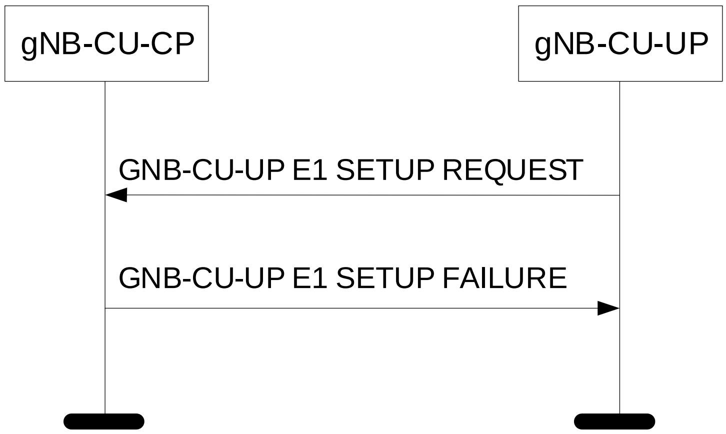

Figure 8.2.3.3-1: gNB-CU-UP E1 Setup procedure: Unsuccessful Operation.

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

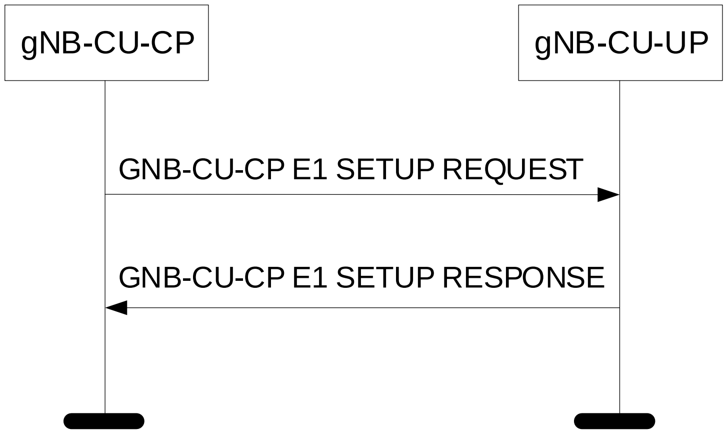

Figure 8.2.4.2-1: gNB-CU-CP E1 Setup procedure: Successful Operation.

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

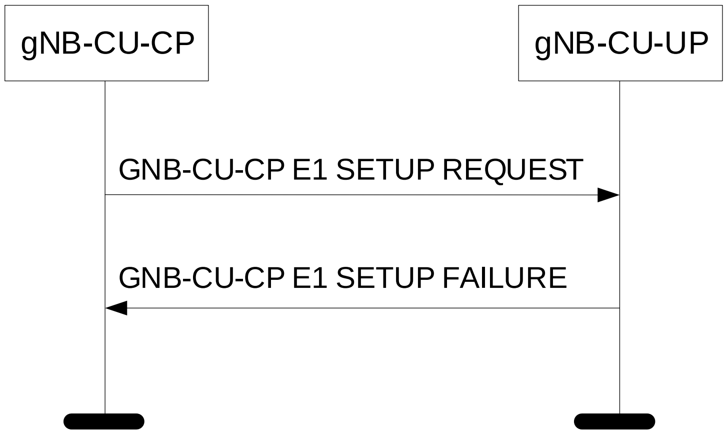

Figure 8.2.4.3-1: gNB-CU-CP E1 Setup procedure: Unsuccessful Operation.

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

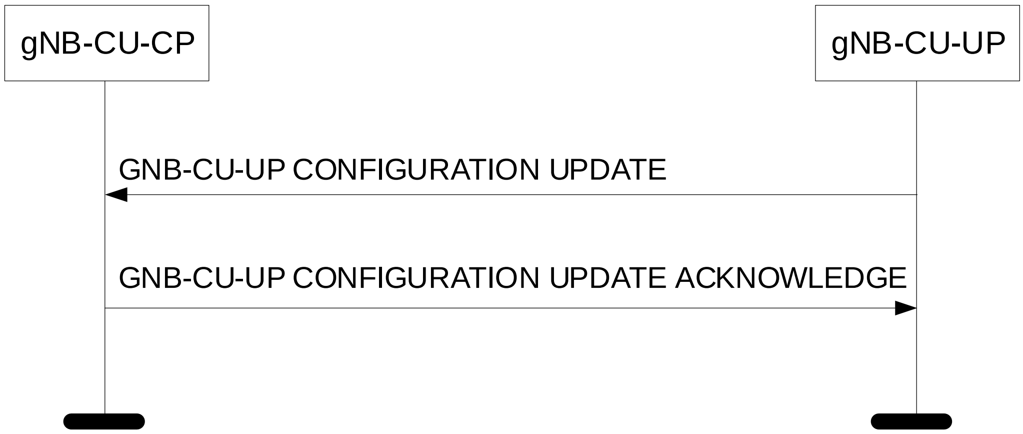

Figure 8.2.5.2-1: gNB-CU-UP Configuration Update procedure: Successful Operation.

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, and the *Endpoint IP address* IE and the *Port Number* IE for both TNL endpoints of the TNL association(s) are included in the *gNB-CU-UP TNLA To Remove List* IE, the gNB-CU-CP shall, if supported, consider that the TNL association(s) indicated by both received TNL endpoints will be removed by the gNB-CU-UP. If the *Endpoint IP address* IE, or the

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

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

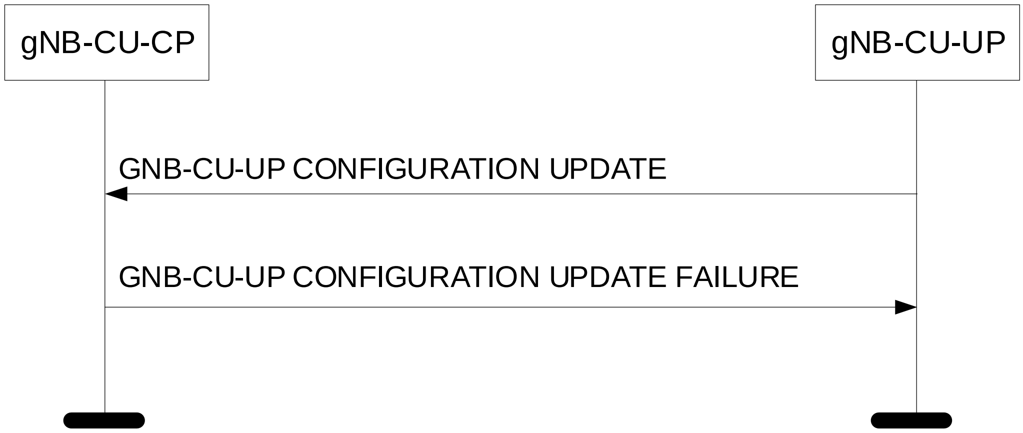

Figure 8.2.5.3-1: gNB-CU-UP Configuration Update procedure: Unsuccessful Operation.

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

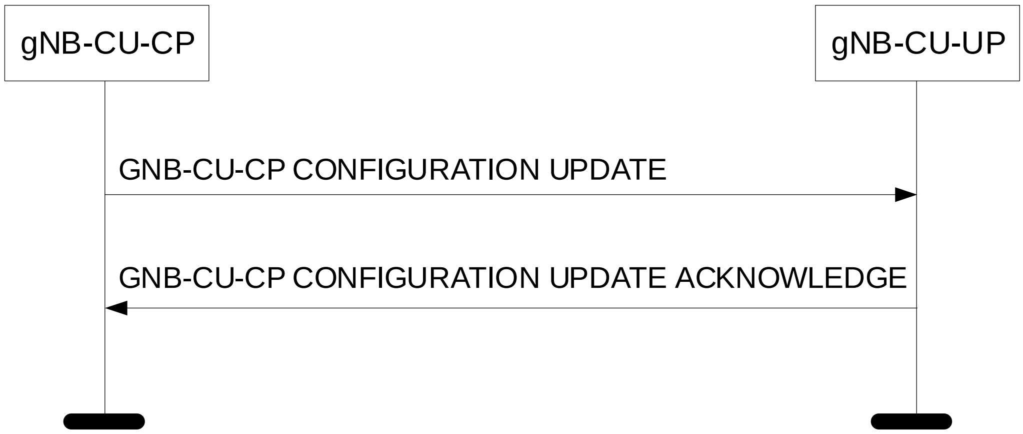

Figure 8.2.6.2-1: gNB-CU-CP Configuration Update procedure: Successful Operation.

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

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 *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

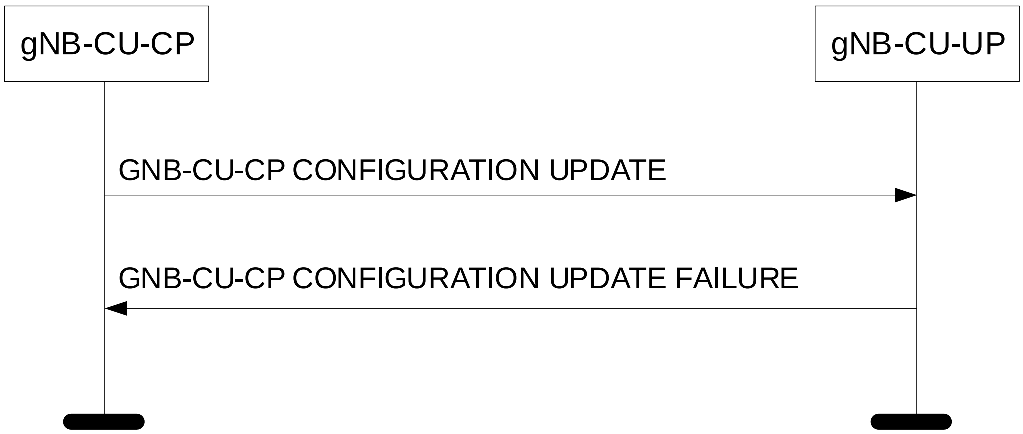

Figure 8.2.6.3-1: gNB-CU-CP Configuration Update procedure: Unsuccessful Operation.

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

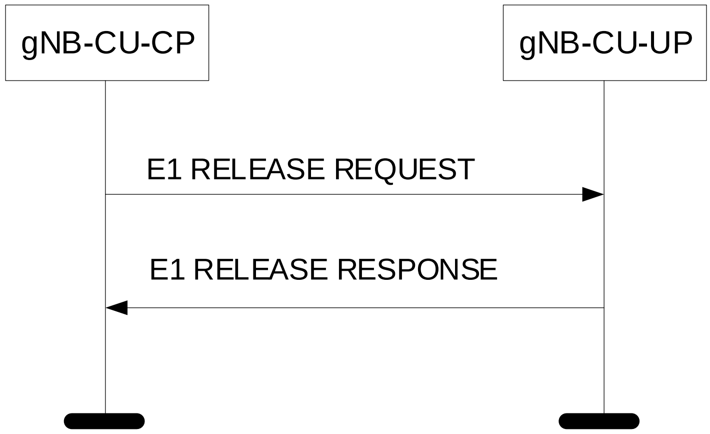

Figure 8.2.7.2.1-1: E1 Release procedure initiated from the gNB-CU-CP. Successful operation.

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

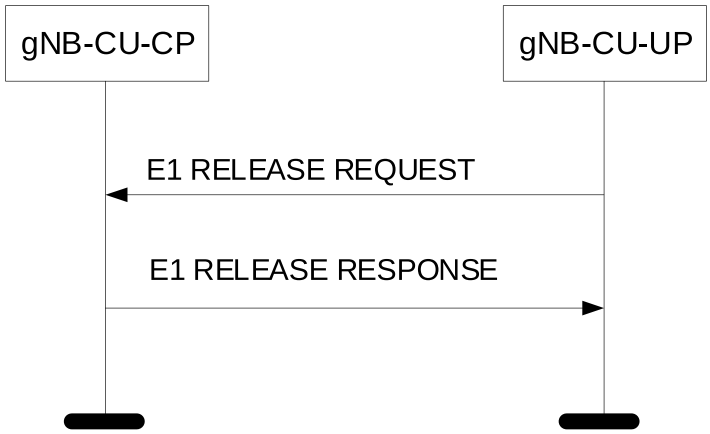

Figure 8.2.7.2.2-1: E1 Release procedure initiated from the gNB-CU-UP. Successful operation.

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

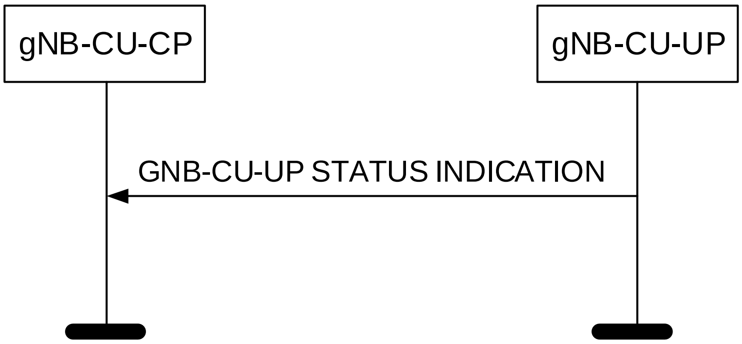

Figure 8.3.7.2-1: DL Data Notification procedure: Successful Operation.

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

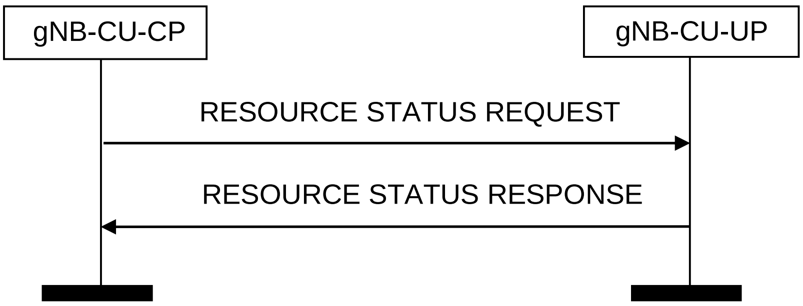

Figure 8.2.9.2-1: Resource Status Reporting Initiation, successful operation

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

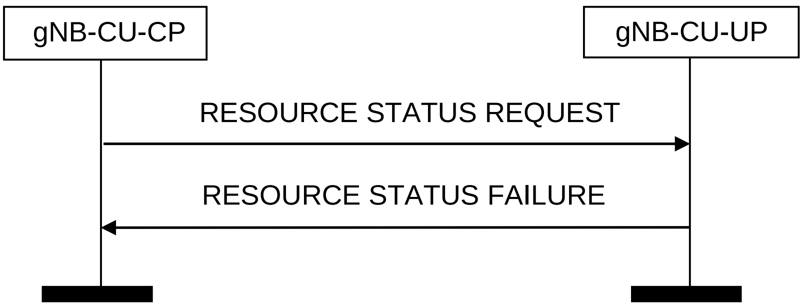

Figure 8.2.9.3-1: Resource Status Reporting Initiation, unsuccessful operation

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

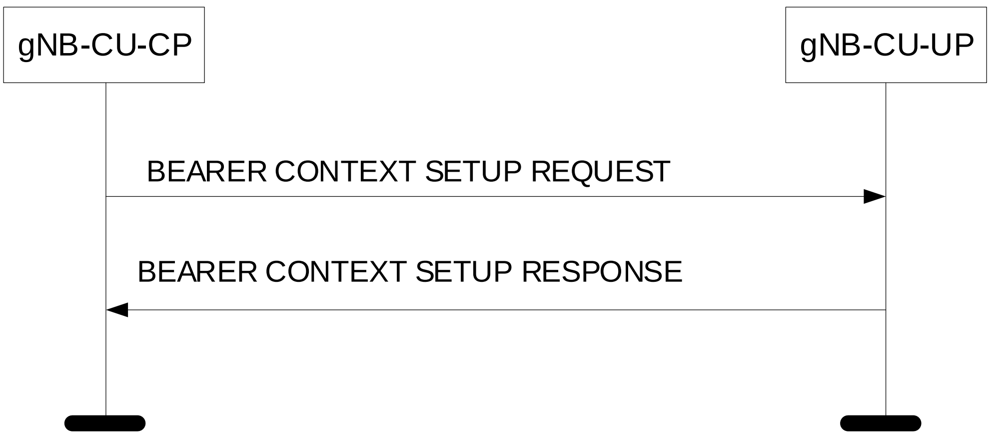

Figure 8.3.1.2-1: Bearer Context Setup procedure: Successful Operation.

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.

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 TS38.300 [8].

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 *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.

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 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 [8].

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].

8.3.1.3 Unsuccessful Operation

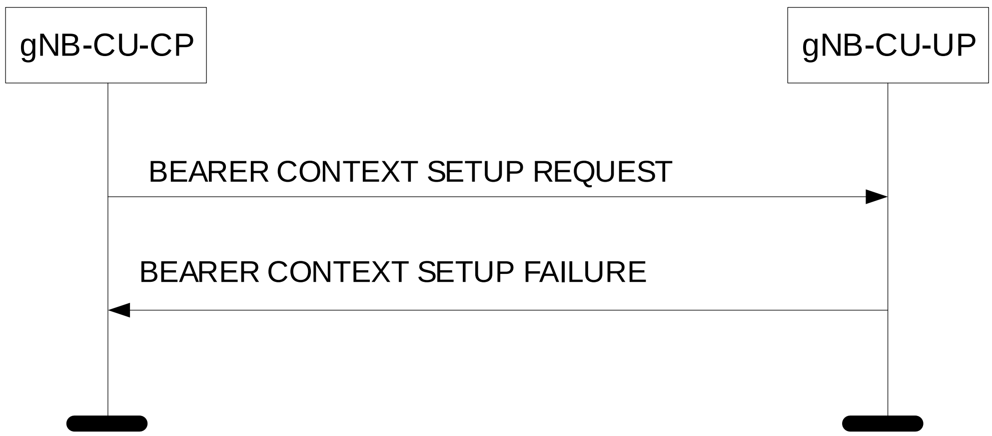

Figure 8.3.1.3-1: Bearer Context Setup procedure: Unsuccessful Operation.

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

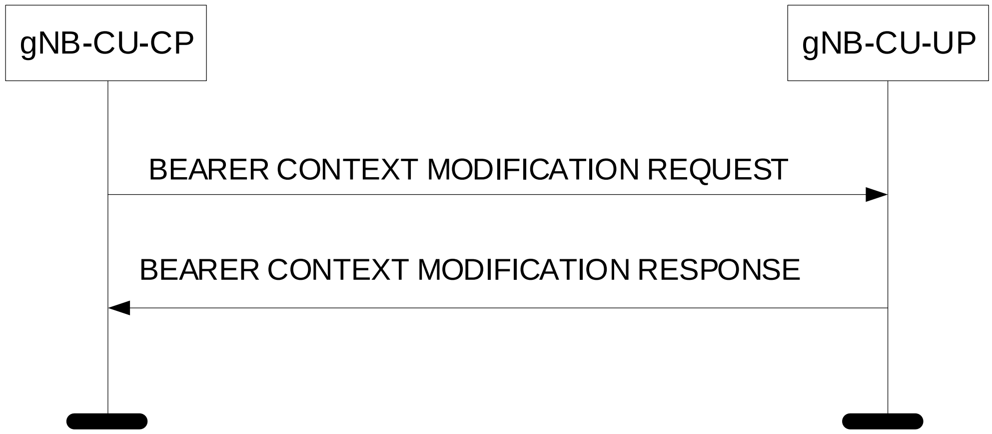

Figure 8.3.2.2-1: Bearer Context Modification procedure: Successful Operation.

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 *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 *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 *Numbe*r *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].

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 specifed 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 [8]. 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 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].

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 includes 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

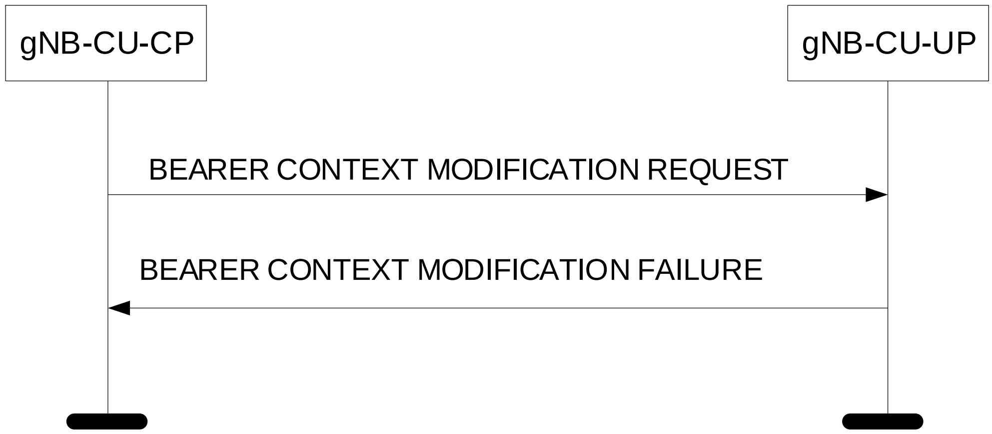

Figure 8.3.2.3-1: Bearer Context Modification procedure: Unsuccessful Operation.

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.

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

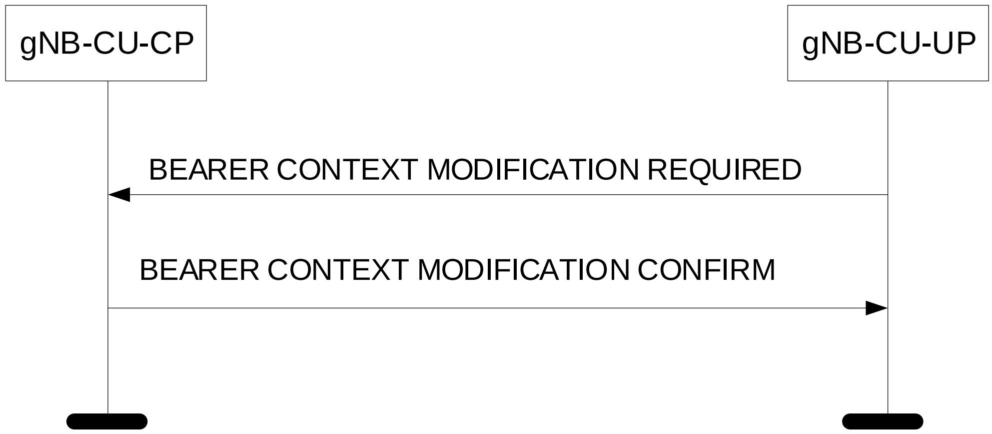

Figure 8.3.3.2-1: Bearer Context Modification Required procedure: Successful Operation.

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.

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

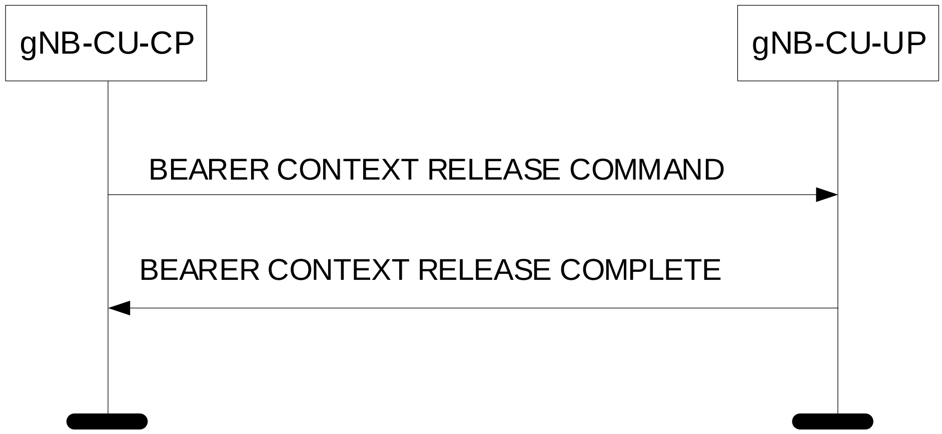

Figure 8.3.4.2-1: Bearer Context Release procedure: Successful Operation.

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 Requset 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

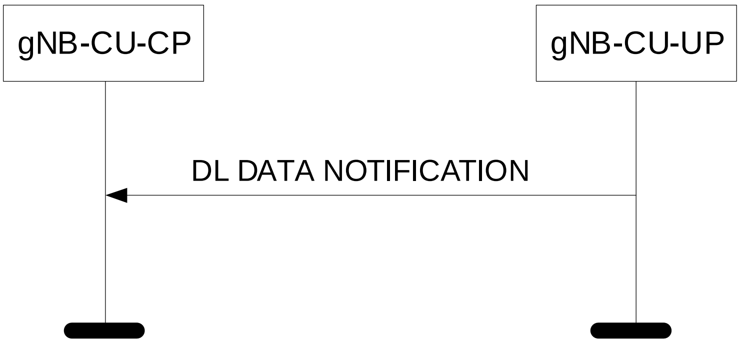

Figure 8.3.7.2-1: DL Data Notification procedure: Successful Operation.

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).

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

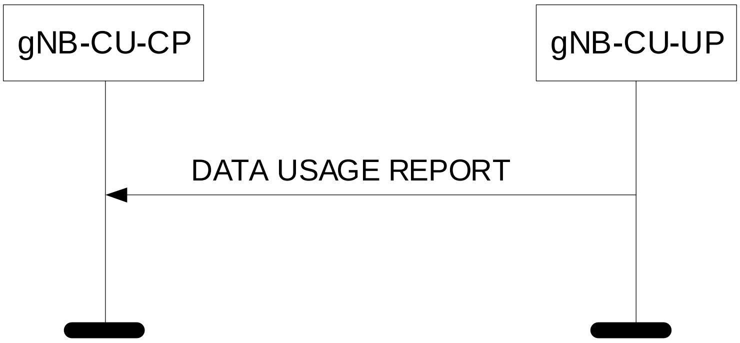

Figure 8.3.8.2-1: Data Usage Report procedure: Successful Operation.

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

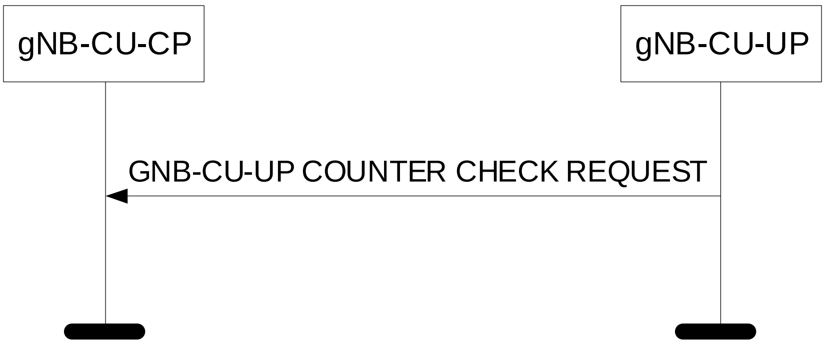

Figure 8.3.9.2-1: gNB-CU-UP Counter Check procedure, successful operation.

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

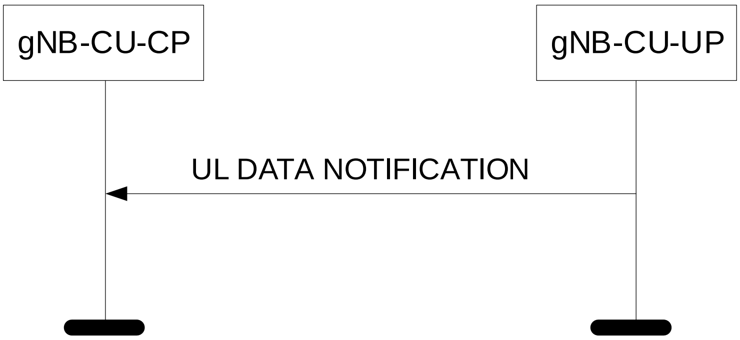

Figure 8.3.10.2-1: UL Data Notification procedure: Successful Operation.

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

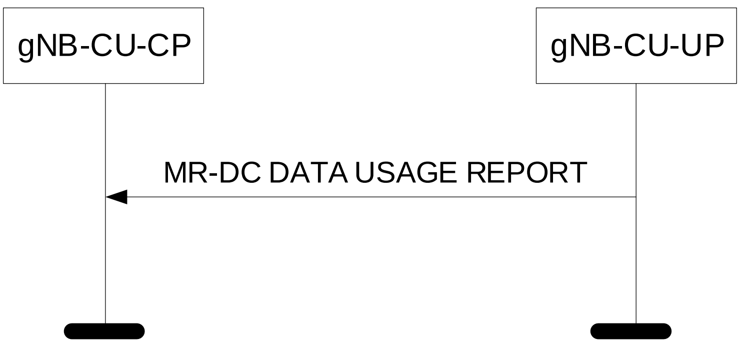

Figure 8.3.11.2-1: MR-DC Data Usage Report procedure: Successful Operation.

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

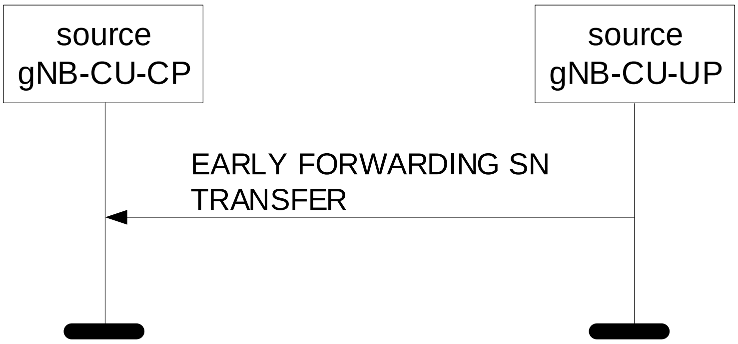

Figure 8.3.12.2-1: Early Forwarding SN Transfer procedure: Successful Operation.

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.

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

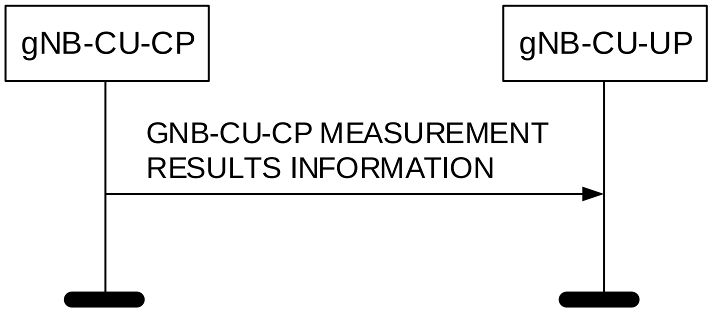

Figure 8.3.13.2-1: GNB-CU-CP Measurement Results Information procedure. Successful operation.

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

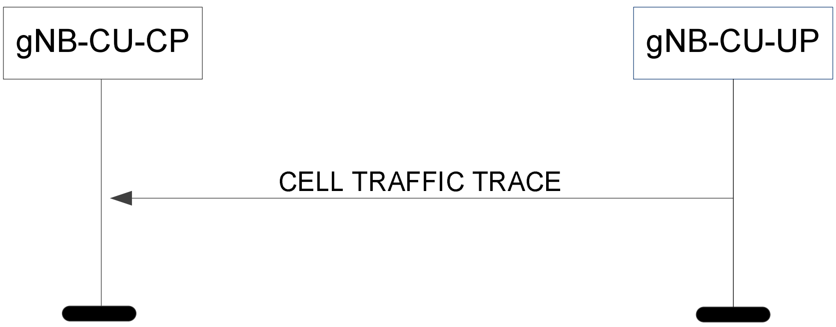

Figure 8.4.3.2-1: Cell Traffic Trace procedure. Successful operation.

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

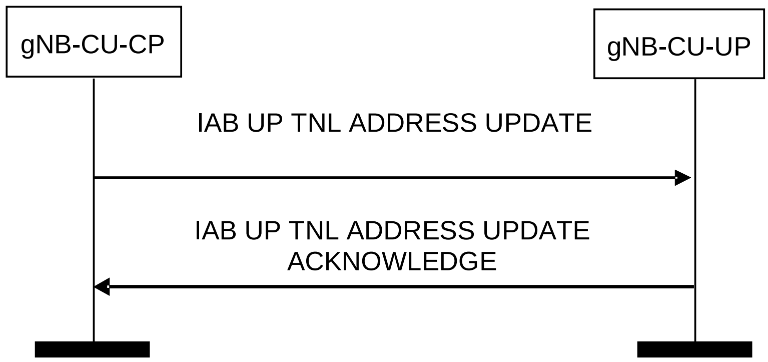

Figure 8.5.1.2-1: IAB UP TNL Address Update procedure: Successful Operation.

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

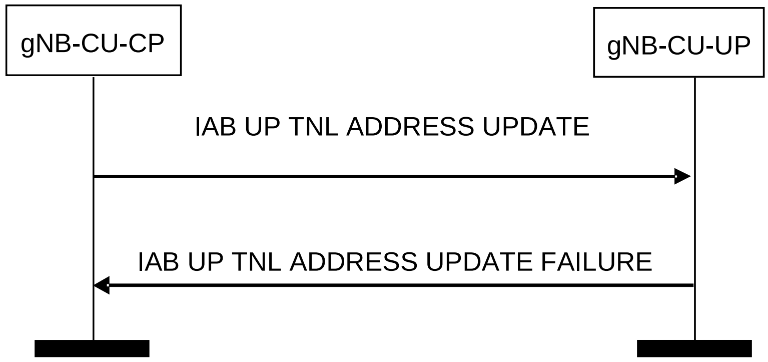

Figure 8.5.1.3-1: IAB UP TNL Address Update procedure: Unsuccessful Operation.

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 resources for a broadcast MBS session in the gNB-CU-UP. The procedure uses MBS associated signalling.

8.6.1.1.2 Successful Operation

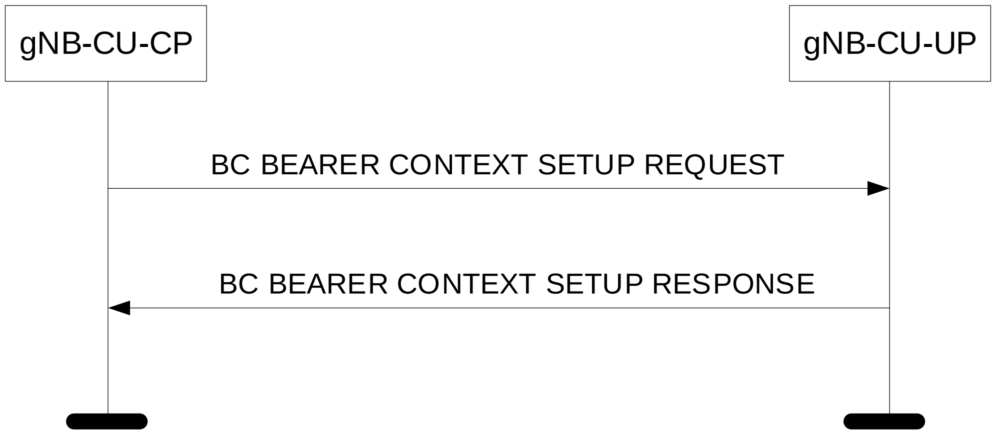

Figure 8.6.1.1.2-1: BC Bearer Context Setup procedure: Successful Operation.

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 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.

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.

8.6.1.1.3 Unsuccessful Operation

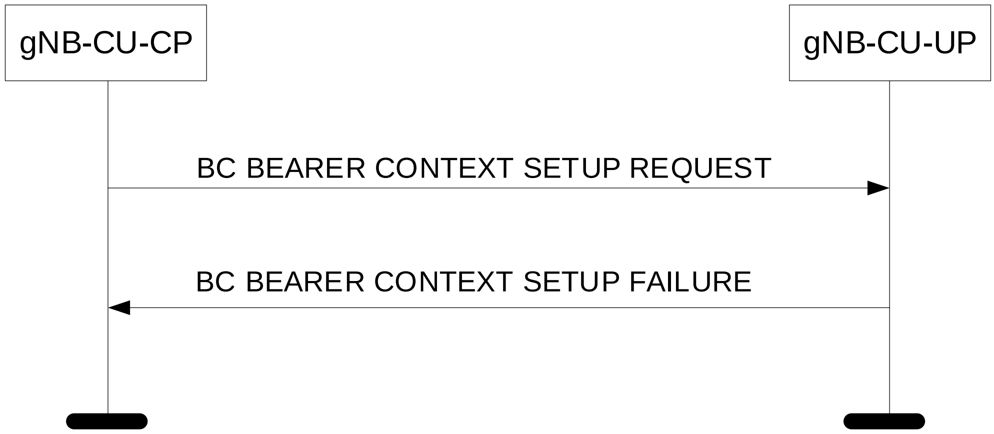

Figure 8.6.1.1.3-1: BC Bearer Context Setup procedure: Unsuccessful Operation.

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.

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 resources for a broadcast MBS session. The procedure uses MBS associated signalling.

8.6.1.2.2 Successful Operation

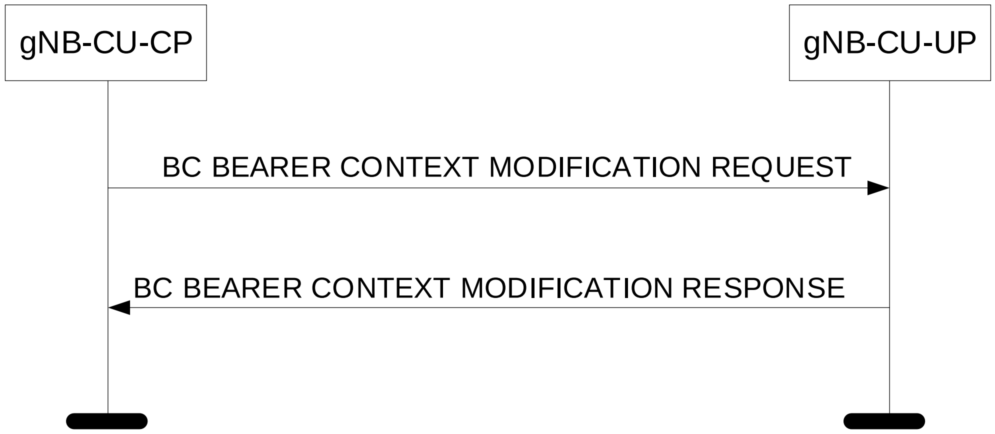

Figure 8.6.1.2.2-1: BC Bearer Context Modification procedure, gNB-CU-CP initiated: Successful Operation.

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 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.

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 MODIFICATION REQUEST message, the gNB-CU-UP shall update the previously received BC Bearer Context NG-U TNL Info at 5GC.

8.6.1.2.3 Unsuccessful Operation

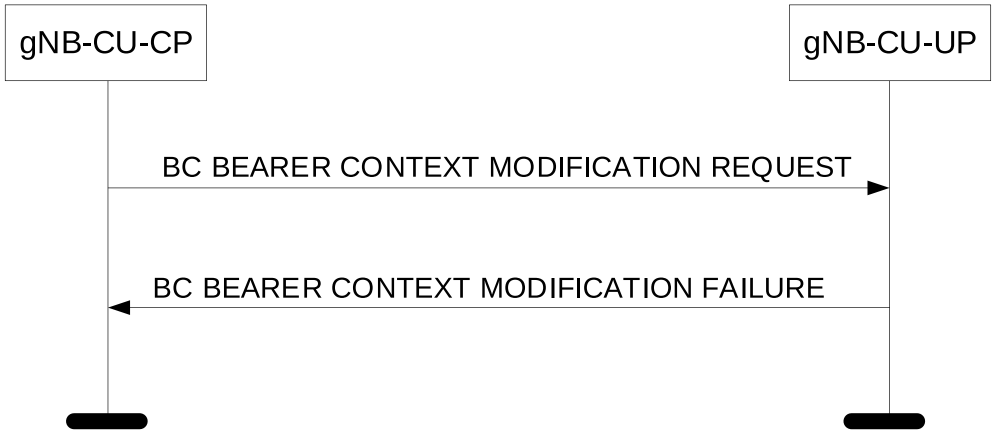

Figure 8.6.1.2.3-1: BC Bearer Context Modification procedure, gNB-CU-CP intiated: Unsuccessful Operation.

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 modify 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

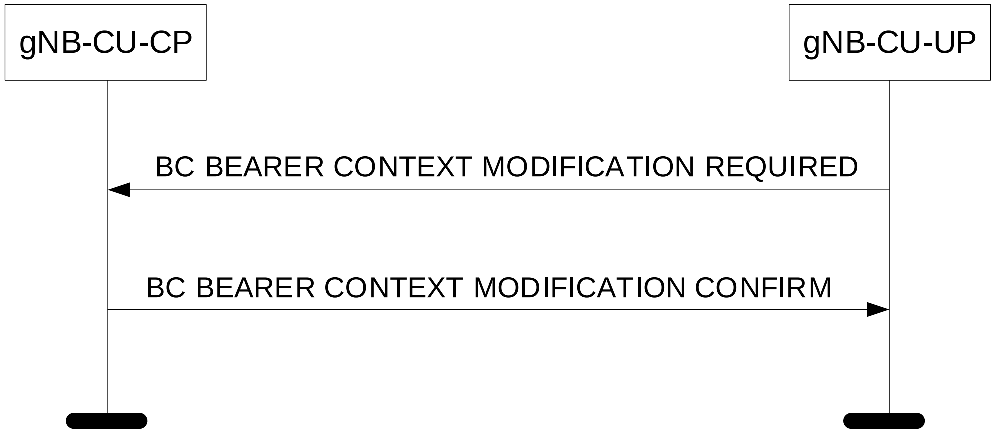

Figure 8.6.1.3.2-1: BC Bearer Context Modification Required procedure, gNB-CU-UP initiated: Successful Operation.

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 resources for the broadcast MBS Session. The procedure uses MBS associated signalling.

8.6.1.4.2 Successful Operation

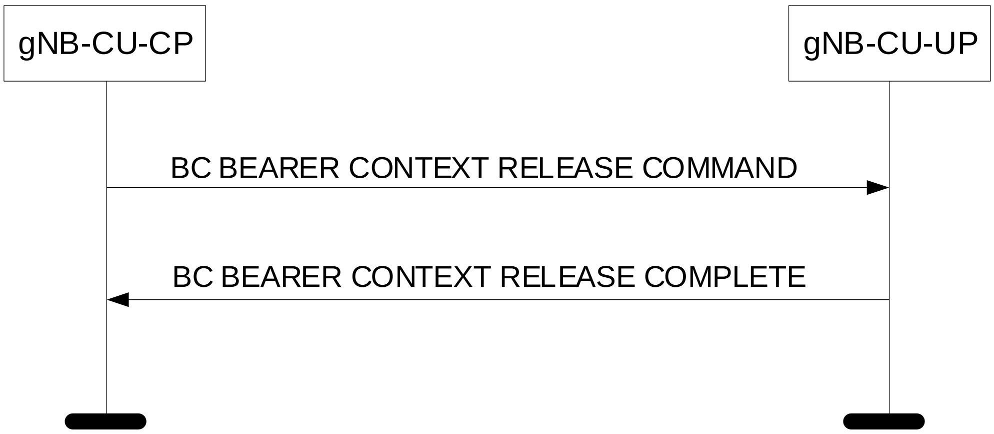

Figure 8.6.1.4.2-1: MC Bearer Context Release procedure: Successful Operation.

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 resources for the 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 intitiated 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 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 resources for a multicast MBS session in the gNB-CU-UP. The procedure uses MBS associated signalling.

8.6.2.1.2 Successful Operation

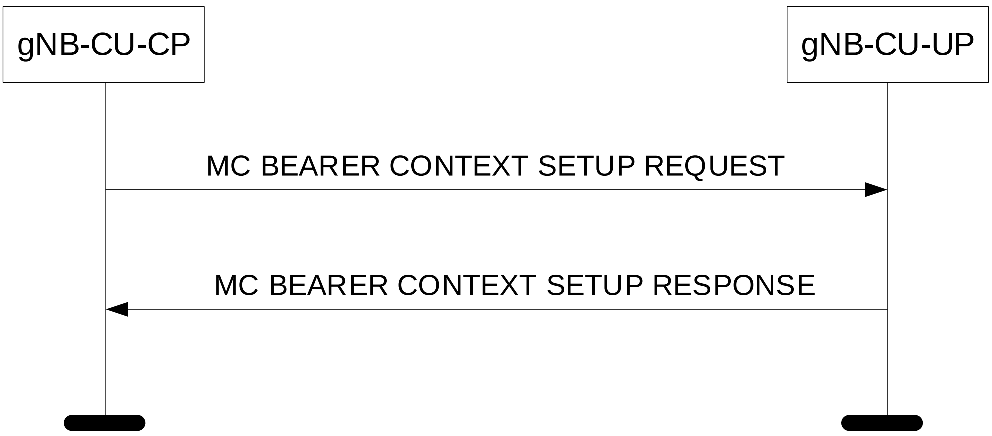

Figure 8.6.2.1.2-1: MC Bearer Context Setup procedure: Successful Operation.

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 resources, it replies to the gNB-CU-CP with the MC BEARER CONTEXT SETUP RESPONSE message.

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 M*C 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 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.

8.6.2.1.3 Unsuccessful Operation

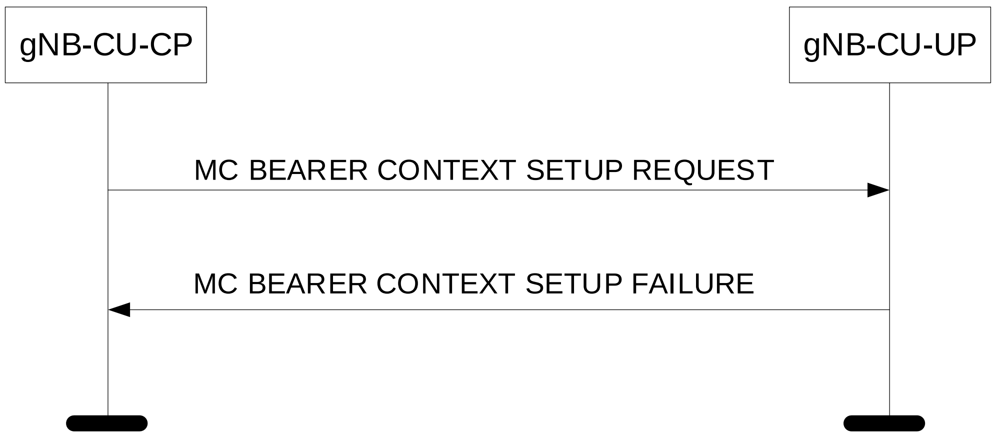

Figure 8.6.2.1.3-1: MC Bearer Context Setup procedure: Unsuccessful Operation.

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

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 resources for a multicast MBS session. The procedure uses MBS associated signalling.

8.6.2.2.2 Successful Operation

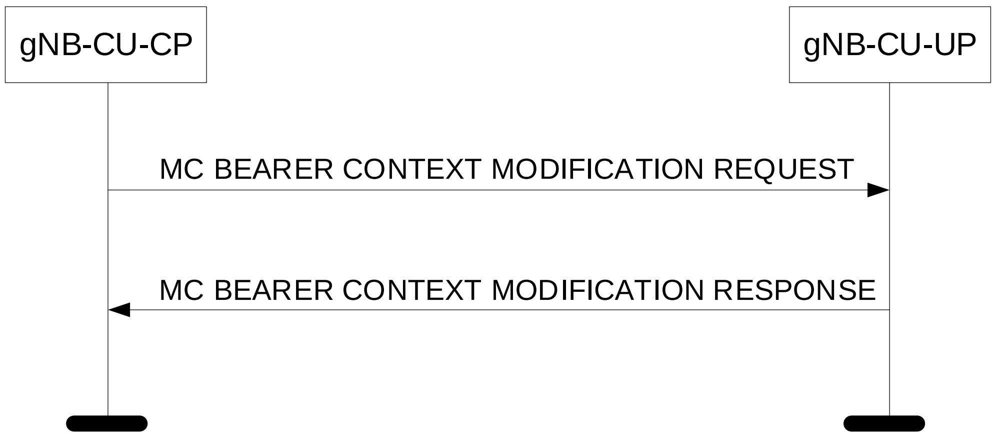

Figure 8.6.2.2.2-1: MC Bearer Context Modification procedure, gNB-CU-CP initiated: Successful Operation.

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.

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 M*C 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 the M*C 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.

8.6.2.2.3 Unsuccessful Operation

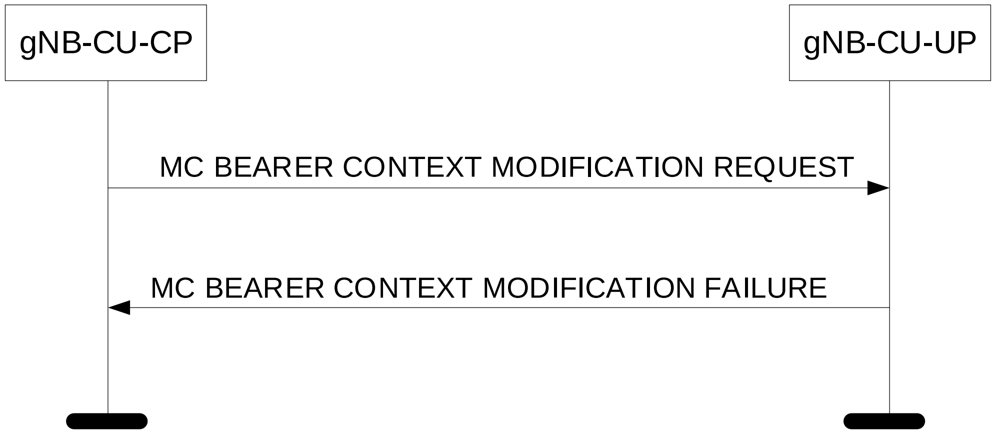

Figure 8.6.2.2.3-1: MC Bearer Context Modification procedure, gNB-CU-CP intiated: Unsuccessful Operation.

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.

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 modify 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

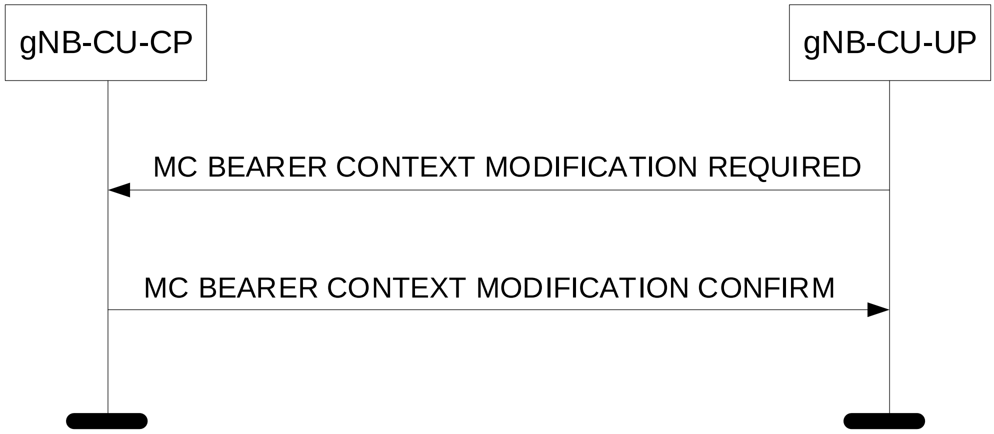

Figure 8.6.2.3.2-1: MC Bearer Context Modification Required procedure, gNB-CU-UP initiated: Successful Operation.

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.

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 resources for the multicast MBS Session. The procedure uses MBS associated signalling.

8.6.2.4.2 Successful Operation

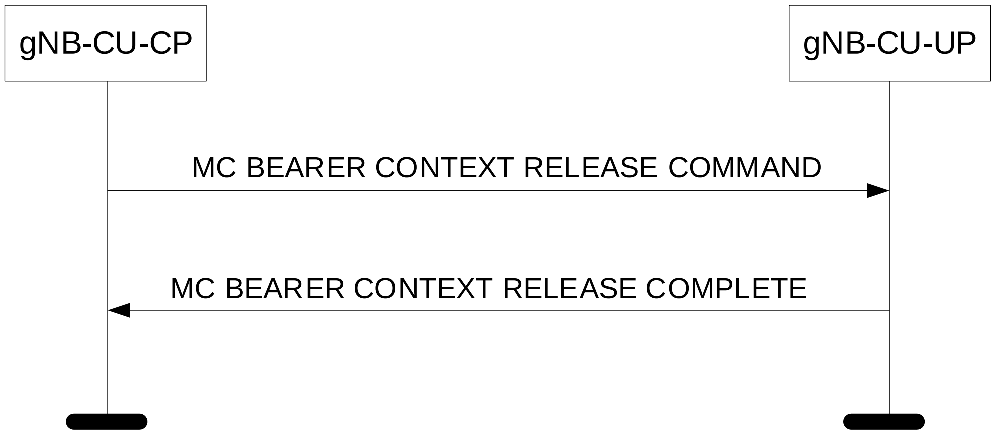

Figure 8.6.2.4.2-1: MC Bearer Context Release procedure: Successful Operation.

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 resources for the 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 intitiated 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 Context Release procedure.

8.6.2.5.3 Abnormal Conditions

Not applicable.

9 Elements for E1AP communication

NOTE: In this section, each occurance of gNB-CU-CP could be replaced by eNB-CP or ng-eNB-CU-CP, and each occurance 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 *Reset Type*	M				YES	reject
>E1 interface						
>>Reset All	M		ENUMERATED (Reset all,…)		-	
>Part of E1 interface						
>>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 E1AP ID	O		9.3.1.4		-	
>>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..<maxnoofSPLMNs>*		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>Extended Slice Support List	O		9.3.1.94	Additional Supported S-NSSAIs per PLMN.	YES	reject
>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	*NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP*	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.	-	-
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		9.3.1.95		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		9.3.1.96		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
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..<maxnoofSPLMNs>*		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>Extended Slice Support List	O		9.3.1.94	Additional Supported S-NSSAIs per PLMN.	YES	reject
>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	*NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP*	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.	-	-
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		9.3.1.95		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		*0..<maxnoofSPLMNs>*		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>Extended Slice Support List	O		9.3.1.94	Additional Supported S-NSSAIs per PLMN.	YES	reject
>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	*NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP*	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.	-	-
gNB-CU-UP Capacity	O		9.3.1.56		YES	ignore
gNB-CU-UP TNLA To Remove List		*0..1*			YES	reject
>gNB-CU-UP TNLA To Remove Item IEs		*1..<maxnoofTNLAssociations>*			-	-
>>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 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
gNB-CU-CP TNLA To Add List		*0..1*			YES	ignore
>gNB-CU-CP TNLA To Add Item IEs		*1..<maxnoofTNLAssociations>*			-	-
>>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..<maxnoofTNLAssociations>*			-	-
>>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..<maxnoofTNLAssociations>*			-	-
>>TNLA Transport Layer Address	M		CP Transport Layer Address 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 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
maxnoofTNLAssociations	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
gNB-CU-CP TNLA Setup List		*0..1*			YES	ignore
>gNB-CU-CP TNLA Setup Item IEs		*1..<maxnoofTNLAssociations>*			-	-
>>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..<maxnoofTNLAssociations>*			-	-
>>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			
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore

Range bound	Explanation
maxnoofTNLAssociations	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

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 Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
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	ignore
Report Characteristics	C-ifRegistrationRequestStart		BITSTRING (SIZE(32))	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 *Registration Request* IE is set to the value “stop”
ifRegistrationRequestStart	This IE shall be present if the *Registration Request* 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 Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
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	C-ifRegistrationRequestStop		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
Cause	M		9.3.1.2	Ignored by the receiver when the Complete Failure Cause Information IE is included	YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Condition	Explanation
ifRegistrationRequestStop	This IE shall be present if the *Registration Request* IE is set to the value "stop"

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	Reject
TNL Available Capacity Indicator	O		9.3.1.72			
HW Capacity Indicator	O		9.3.1.73			

Range bound	Explanation
maxnoofSPLMNs	Maximum no. of Supported PLMN Ids. Value is 12.
maxnoofSliceItems	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
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.	-	-
Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, …, ResumeforSDT)	Indicates the status of the Bearer Context. *NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP*	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 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

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.

9.2.2.2 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 *System*	M				YES	reject
>E-UTRAN						
>>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
>NG-RAN						
>>PDU Session Resource Setup List	M		9.3.3.5		YES	reject
>>PDU Session Resource Failed List	O		9.3.3.6		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.

9.2.2.3 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 ID	M		9.3.1.4		YES	reject
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 *NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP.*	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.	-	-
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 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	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. See description of *sdt-DRB-ContinueROHC-r17* in TS 38.331 [10].	YES	reject
Management Based MDT PLMN Modification List	O		MDT PLMN Modification List 9.3.1.129		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 *System*	O				YES	ignore
>E-UTRAN						
>>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
>NG-RAN						
>>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

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 *System*	M				YES	reject
>E-UTRAN						
>>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 9.3.3.22		YES	reject
>NG-RAN						
>>PDU Session Resource Required To Modify List	O		PDU Session Resource Required To Modify List 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

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 the gNB-CU-CP	YES	ignore

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		*0.. 1*			YES	ignore
>DRB Status Item		*1..<maxnoofDRBs>*			-	-
>>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		*1*		Used if the *Activity Notification Level* IE is set as "DRB" in BEARER CONTEXT SETUP Request message	YES	reject
>>DRB Activity Item		*1 .. <maxnoofDRBs>*			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>DRB Activity	M		ENUMERATED (Active, Not active, …)		-	-
>PDU Session Resource Activity List		*1*		Used if the *Activity Notification Level* IE is set as "PDU Session" in the BEARER CONTEXT SETUP Request message	YES	reject
>>PDU Session Resource Activity Item		*1 .. <maxnoofPDUSessionResource>*			-	-
>>>PDU Session ID	M		9.3.1.21		-	-
>>>PDU Session Resource Activity	M		ENUMERATED (Active, Not active, …)		-	-
>UE Activity	M		ENUMERATED (Active, Not active, …)	Used if the *Activity Notification Level* IE is set as "UE" in the BEARER CONTEXT SETUP Request message	YES	reject

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..<maxnoofPDUSessionResource>*			-	-
>>PDU Session ID	M		9.3.1.21		-	-
>>QoS Flow List	M		9.3.1.12		-	-

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 *System*	M				YES	reject
>E-UTRAN						
>>DRBs Subject to Counter Check List		*1*			YES	ignore
>>>DRBs Subject to Counter Check Item		*1 .. <maxnoofDRBs>*			-	-
>>>>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 [8] 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 [8] for the gNB/ ng-eNB CP-UP separation, or in TS 36.331 [33] for the eNB CP-UP separation.	-	-
>NG-RAN						
>>DRBs Subject to Counter Check List		*1*			YES	ignore
>>>DRBs Subject to Counter Check Item		*1 .. <maxnoofDRBs>*			-	-
>>>>PDU Session ID	M		9.3.1.21		-	-
>>>>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 [8] 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 [8] 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..<maxnoofPDUSessionResource>*			-	-
>>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
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 .. <maxnoofPDUsessions>*			–	
>>PDU Session ID	M		9.3.1.21		–	
>>MR-DC Usage Information	M		9.3.1.63		–	

Range bound	Explanation
maxnoofPDUsessions	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.

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 .. <maxnoofDRBs>*			-	-
>>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
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 .. <maxnoofDRBs>*			EACH	reject
>>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 *Trace Activation* 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 9.2.2.1	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		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	reject
> DL UP TNL Address To Update Item IEs		*1..<maxnoofTNLAddresses>*			-	-
>>Old TNL Address	M		9.3.2.4	The old Transport Layer Address of IAB-DU for DL F1-U GTP tunnel.	-	-
>>New TNL Address	M		9.3.2.4	The new Transport Layer Address of 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..<maxnoofTNLAddresses>*			-	-
>>Old TNL Address	M		9.3.2.4	The old Transport Layer Address of CU-UP for UL F1-U GTP tunnel.	-	-
>>New TNL Address	M		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		9.3.1.23		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 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

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 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 broadcast MBS Session Resource 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 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 a broadcast MBS Session Resource 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 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 modification of the requested broadcast MBS Session Resource 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 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 modification of the broadcast MBS Session Resource 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 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 request the modification of a broadcast MBS Session Resource 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 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 modification of the requested modification of a broadcast MBS Session Resource 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 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 a broadcast MBS Session Resource 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 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 broadcast MBS Session Resource 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 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

9.2.5.1.11 BC BEARER CONTEXT RELEASE REQUEST

This message is sent by the gNB-CU-UP to request the release of a broadcast MBS Session Resource 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 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 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 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 the multicast MBS Session Resource 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 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 a multicast MBS Session Resource 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 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 modification of the requested multicast MBS Session Resource 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 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 modification of the multicast MBS Session Resource 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 MBS E1AP ID	M		9.3.1.106		YES	reject
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 request the modification of a multicast MBS Session Resource 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 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 modification of the requested modification of a multicast MBS Session Resource 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 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 a multicast MBS Session Resource 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 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 the multicast MBS Session Resource 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 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 the multicast MBS Session Resource 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 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

9.3 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 *Cause Group*	M			
>*Radio Network Layer*				
>>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, 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)	
>Transport Layer				
>>Transport Layer Cause	M		ENUMERATED (Unspecified, Transport Resource Unavailable, …, Unknown TNL address for IAB)	
>Protocol				
>>Protocol Cause	M		ENUMERATED (Transfer Syntax Error, Abstract Syntax Error (Reject), Abstract Syntax Error (Ignore and Notify), Message not Compatible with Receiver State, Semantic Error, Abstract Syntax Error (Falsely Constructed Message), Unspecified, …)	
>Misc				
>>Miscellaneous Cause	M		ENUMERATED (Control Processing Overload, Not enough User Plane Processing Resources, Hardware Failure, O&M Intervention, Unspecified, …)	

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

Radio Network Layer cause	Meaning
Unspecified	Sent for radio network layer cause when none of the specified cause values applies.
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 unknow.
Multiple DRB ID Instances	The action failed because multiple instances of the same DRB had been provided.
Unknown DRB ID	The action failed because the DRB ID is unknow.
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 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.

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.
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		*0 .. <maxnoofErrors>*		
>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))	- digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n -The PLMN identity consists of 3 digits from MCC followed by either -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).

9.3.1.8 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..<maxnoofSliceItems>*			-	-
>S-NSSAI	M		9.3.1.9		-	

Range bound	Explanation
maxnoofSliceItems	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))	
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..<maxnoofCellGroups>*			-	-
>>Cell Group ID	M		INTEGER (0..3, …)	Cell group ID 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 [21].	-	-
>>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..<maxnoofQoSflows>*			-	-
>>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

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..<maxnoofUPParameters>*			-	-
>>UP Transport Layer Information	M		9.3.2.1		-	-
>>Cell Group ID	M		INTEGER (0..3, …)	Cell group ID as defined 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

Range bound	Explanation
maxnoofUPParameters	Maximum no. of UP parameters (e.g., GTP tunnels) for a DRB. 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, ...)	Corresponds to the *DRB-Identity* 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	E-UTRAN Allocation and Retention Priority	–	–
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 Rate Downlink	M		Bit Rate 9.3.1.20	Maximum Bit Rate 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-ifIntegrityProtectionrequiredorpreferred		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 *Integrity Protection Indication* IE within the *Security Indication* 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..<maxnoofQoSFlows>*			-	-
>>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, 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

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 Indicator (PPI)	O		9.3.1.55		-	
RDI	O		ENUMERATED (enabled, …)	Indicates whether Reflective QoS flow to DRB mapping should 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

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 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 [9]. 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 [9]. 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 *Extended Packet Delay Budget* 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 *Delay Critical* IE is set to “delay critical” and is ignored otherwise.	-	-
Extended Packet Delay Budget	O		Extended Packet Delay Budget 9.3.1.79	Packet Delay Budget is specified in TS 23.501 [9]	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 [9]. 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 [9]. This IE may be present in case of GBR QoS flows and is ignored otherwise.	YES	ignore

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

9.3.1.29 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 (1..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 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 Loass 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	

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 Cellg 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..<maxnoofUPParameters>*			-	-
>>Cell Group ID	M		INTEGER (0..3, …)	Cell group ID 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 *PDCP Configuration* IE.
>HFN	M		INTEGER (0 .. $2^{32-PDCP\_SN\_Size}$-1)	The PDCP SN Size is provided in the *PDCP Configuration* IE.

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..<maxnoofNRCGI>*		
>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..<maxnoofEUTRNQOSParameters>*		
>>E-UTRAN QoS	M		9.3.1.17	
NG-RAN QoS Support List	O			
>NG-RAN QoS Support Item		*1..<maxnoofNGRANQOSParameters>*		
>>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. For more information see *PDCP-Config 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 *DRB To Modify List* 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. For more information see *PDCP-Config 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 *DRB To Modify List* IE in the BEARER CONTEXT MODIFICATION REQUEST 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 *PDCP-Config 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 *DRB To Modify List* 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 *Discard Timer Extended* 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 "*Additional PDCP duplication Information*" 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 outOfOrderDelivery specified in TS 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

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. For more information see *SDAP-Config IE* 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. For more information see *SDAP-Config IE* 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. For more information see *SDAP-Config IE* in TS 38.331 [10].

9.3.1.40 ROHC Parameters

This IE carries the ROCH parameters for header compressions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice ROHC Parameters	M			For more information see *PDCP-Config 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.
>ROHC				
>>max CID	M		INTEGER (0..16383)	See description of maxCID inTS 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. See description of supportedROHC-Profiles in PDCP-Parameters 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, …)	See description of drb-ContinueROHC inTS 38.331 [10]
>uplinkOnlyROHC				
>>max CID	M		INTEGER (0..16383)	See description of maxCID inTS 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 4 = profile0x0006. See description of supportedROHC-Profiles in PDCP-Parameters 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, …)	See description of drb-ContinueROHC inTS 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 *ms*. For more information see *PDCP-Config 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.

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 *ms*. For more information see *PDCP-Config 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.

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. For more information see *PDCP-Config 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.

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 .. <maxnoofDRBs>			-	-
>DRB ID	M		9.3.1.16		-	-
> RAT Type	M		ENUMERATED (NR, …, E-UTRA)		-	-
>DRB Usage Report List		1			-	-
>>DRB Usage Report Item		1.. <maxnooftimeperiods>			-	-
>>>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.	-	-
>>>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..<maxnoofQoSFlows>*			-	-
>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 (1..127, …)	Values ordered in decreasing order of priority i.e. with 1 as the highest priority and 127 as the lowest priority.

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, …)	

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 *seconds*.

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 [8].

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. 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..<maxnoofQoSFlows>*			–	
>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 Indication	M		ENUMERATED (ul, dl, ...)	Indicates that only the uplink or 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 *PDCP-Config 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.

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..<maxnoofQoSFlows>*			–	
>>QoS Flow Indicator	M		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
maxnoofQoSFlows	Maximum no. of QoS flows allowed within one PDU session. Value is 64.

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..<maxnooftimeperiods>*		
>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 *Usage Count UL* IE and *Usage Count DL* 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 *Usage Count UL* IE and *Usage Count DL* 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 [9] 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 *Network Instance* 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, minimumWithoutVendorSpecificExtension, mediumWithoutVendorSpecificExtension, maximumWithoutVendorSpecificExtension, …)	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.	-	-
Trace Collection Entity URI	O		9.3.2.8	For Streaming based Reporting. Defined in TS 32.422 [24] Replaces Trace Collection Entity IP Address if present.	YES	ignore
MDT Configuration	O		9.3.1.85		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..<maxnoofDRBs>*			-	
>>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..< maxnoofQoSFlows >			-	
>>>>QoS Flow Identifier	M		9.3.1.24		-	
>>>>QoS Flow Released In Session	O		ENUMERATED (released in session, not released in session, …)	Indicates if the 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 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

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 [9].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Burst Arrival Time	M		OCTET STRING	Encoded in the same format as the *ReferenceTime* IE as defined in TS 38.331 [10]. The value is truncated to 1 us granularity.

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 (0..65535, …)	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 *NPN Support Information*	M			
>*NPN Support Information -SNPN*				
>>NID	M		9.3.1.82	This IE is associated with the PLMN Identity and the Slice Support List contained in the *Supported PLMNs* 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 *NPN Context Information*	M			
>*SNPN Information*				
>>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 *MDT Mode*	M			
>Immediate MDT				
>>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 *Measurements to Activate* IE has the fourth bit set to "1".
ifM6	This IE shall be present if the Measurements to Activate IE has the seventh bit set to "1".
ifM7	This IE shall be present if the Measurements to Activate IE has the eighth bit set to "1".

9.3.1.86 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, 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		*1..<maxnoofMDTPLMNs>*		
>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, … }	See description of ehc-CID-Length 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 }	See description of drb-ContinueEHC-DL 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.	-	-
>maxCID-EHC-DL	O		INTEGER(1..32767, …)	Indicate the maximum number of DL EHC contexts that can be established for the DRB. The total value of maxCID-EHC-DL plus maxCID-EHC-UL(as specified in TS 38.331) across all bearers for the UE should be less than or equal to the value of maxNumberEHC-Contexts parameter as indicated by the UE.	YES	ignore
EHC Uplink	O				-	-

>drb-ContinueEHC-UL	M		ENUMERATED { true, …, false }	See description of drb-ContinueEHC-UL 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.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE *Early Forwarding*	M			
>First DL COUNT				
>>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
>DL Discarding				
>>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
Alternative QoS Parameters Item		*1..<maxnoofQoSParaSets>*		
>Alternative QoS Parameters Index	M		INTEGER (1..8,..)	
>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	

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		*1..<maxnoofExtSliceItems>*			-	
>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, …))		-	
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..*<maxnoofExtNRCGI>*		
>NR CGI	M		9.3.1.14	

Range bound	Explanation
maxnoofExtNRCGI	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		9.3.2.4	
>IAB-DU IP Address	M		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 [9] in the downlink direction.

Range bound	Explanation
*maxnoofSMBRValues*maxnoofAllowedS-NSSAIs	Maximum no. of SLICE MAXIMUM BIT RATE values for a UE. Value is 8Maximum 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
Buffer Size	M		ENUMERATED (kbyte2, kbyte4, kbyte8, …)	Indicates the buffer size applied for UDC. For more information see *PDCP-Config 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.
Dictionary	O		ENUMERATED (sip-SDP, operator, …)	Indicates which pre-defined dictionary is used for UDC. For more information see *PDCP-Config 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.
Continue UDC	O		ENUMERATED (true, …)	For more information see description of *drb-ContinueUDC* IE in TS 38.331 [10].

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 UE 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 UE 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 the MBS Service.

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..<maxnoofMBS SessionIDs>*		
>>Global MBS Session ID	M		9.3.1.108	
MBS Support Information To Remove List		*0..1*		
>MBS Support Information To Remove Item		*1..<maxnoofMBS SessionIDs>*		
>>Global MBS Session ID	M		9.3.1.108	

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 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
CHOICE *MBS Session Type*				
>location independent				
>>MBS NG-U Information at 5GC	M		9.3.1.113	
>location dependent				
>>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 *MBS NG-U Transport*				
>multicast				
>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	
>unicast				
>>Unicast NG-U UL Transport Layer Information			UP Transport Layer Information 9.3.2.1	

9.3.1.114 BC MRB Setup Configuration

This IE contains MRB configuration information for a BC Bearer Context Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BC MRB To Setup List		*1..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	
>SDAP Configuration	M		9.3.1.39	
>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 a UE. Value is 32.

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, ...)	

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 *MBS Session Type*	M			
>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.

9.3.1.117 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 *MBS NG-U Transport*	M			
>unicast				
>>Shared NG-U DL Transport Layer Information	M		UP Transport Layer Information 9.3.2.1	

Range bound	Explanation
maxnoofMBSAreaSessionIDs	Maximum no. of MBS Area Session IDs. Value is 256.

9.3.1.118 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 *MBS Session Type*	M			
>location independent				
>>MBS F1-U Information at CU	M		UP Transport Layer Information 9.3.2.1	
>location dependent				
>>Location dependent MBS F1-U Information at CU		*1..<maxnoofMBSAreaSessionIDs>*		
>>>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
CHOICE *MBS Session Type*	M			
>location independent				
>>MBS F1-U Information at DU	M		UP Transport Layer Information 9.3.2.1	
>location dependent				
>>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	

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 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	
>SDAP Configuration	M		9.3.1.39	
>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 a UE. 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 *MBS Session Type*	M			
>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 both, shared NG-U multicast and unicast 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 CU 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 information about the multicast F1-U tunnel type, providing multicast data for either the whole DU, or for a single cell or for an MBS Area Session ID.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE *MC F1-U tunnel type*	M		UP Transport Layer Information 9.3.2.1	
>DU			NULL	
>MBS Area Session				
>>MBS Area Session ID	M		9.3.1.111	To support per MBS Area Session F1-U tunnels and being able to refer to it.
>Cell				
>>DU Cell Reference	M		9.3.1.109	To support per cell F1-U tunnels and being able to refer to it.
>ptp retransmission				
>>MBS PTP UE Reference	M		9.3.1.126	UE reference for a F1-U bearer established for issuing a PDCP Status Report and subsequent retransmission
>ptp-only MRB				
>>MBS PTP UE Reference	M		9.3.1.126	UE reference for a F1-U bearer established for support of an ptp-only MRB configuration

9.3.1.126 MBS PTP UE Reference

This IE contains information to associate an F1-U bearer established for a UE for either retransmitting PDCP PDUs or to support a ptp-only MRB configuration.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Reference ID	M		INTEGER (0..65535, ...)	
DU Cell Index	M		INTEGER (1..512)	

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 *ms*. For more information see *DiscardTimerExt-r16 or DiscardTimerExt2-r17* in *PDCP-Config* IE 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		*0..<maxnoofMDTPLMNs>*		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.

9.3.2 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 *Transport Layer Information*	M			
>GTP Tunnel				
>>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 *CP Transport Layer Information*						
>Endpoint-IP-address					-	-
>> Endpoint IP address	M		Transport Layer 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 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		*0..1*		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		*1..<maxnoofQoSflows>*			-	-
>>QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24		-	-

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		0..1		
>Transport UP Layer Addresses Info to Add Item		*1..<maxnoofTLAs>*		
>>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		*0..1*		
>>>GTP Transport Layer Addresses To Add Item		*1..<maxnoofGTPTLAs>*		
>>>>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		*0..1*		
>Transport UP Layer Addresses Info to Remove Item		*1..<maxnoofTLAs>*		
>>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		*0..1*		
>>>GTP Transport Layer Addresses To Remove Item		*1..<maxnoofGTPTLAs>*		
>>>>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)

9.3.3 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		*1..<maxnoofDRBs>*			-	-
>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 DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1	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 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		*1..<maxnoofPDUSessionResource>*			-	-
>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 *Common Network Instance* IE is included.	YES	ignore
>Common Network Instance	O		9.3.1.66		YES	ignore
>DRB To Setup List		*1*			-	-
>>DRB To Setup Item		*1..<maxnoofDRBs>*			-	-
>>>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 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		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
>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

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		*1..<maxnoofDRBs>*			-	-
>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		*1..<maxnoofDRBs>*		
>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		*1..<maxnoofPDUSessionResource>*			-	-
>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	Providing forwarding info from the target gNB-CU-UP.	-	-
>NG DL UP Unchanged	O		ENUMERATED (True, …)		-	-
>DRB Setup List		*1*			-	-
>>DRB Setup Item		*1..<maxnoofDRBs>*			-	-
>>>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		Flow Failed List 9.3.1.45		-	-
>DRB Failed List		*0.. 1*			-	-
>>DRB Failed Item		*1..<maxnoofDRBs>*			-	-
>>>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		9.3.1.80		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.

9.3.3.6 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..<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.

9.3.3.7 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..<maxnoofDRBs>*			-	-
>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		*1..<maxnoofDRBs>*		
>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	
>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		*1..<maxnoofDRBs>*		
>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		*1..<maxnoofPDUSessionResource>*			-	-
>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.	-	-
>Network Instance	O		9.3.1.62		-	-
>Common Network Instance	O		9.3.1.66		YES	ignore
>DRB To Setup List		*1*			-	-
>>DRB To Setup Item		*1..<maxnoofDRBs>*			-	-
>>>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 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		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
>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

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.

9.3.3.11 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		*1..<maxnoofPDUSessionResource>*			-	-
>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 source 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 *Common Network Instance* IE is included.	YES	ignore
>Common Network Instance	O		9.3.1.66		YES	ignore
>DRB To Setup List		*0..1*			-	-
>>DRB To Setup Item		*1..<maxnoofDRBs>*			-	-
>>>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		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	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
>DRB To Modify List		*0.. 1*			-	-
>>DRB To Modify Item		*1..<maxnoofDRBs>*			-	-
>>>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 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	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 SDAP end markers, as described in TS 38.300 [8].	YES	reject
>>>DRB QoS	O		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
>DRB To Remove List		*0.. 1*			-	-
>>DRB To Remove Item		*1..<maxnoofDRBs>*			-	-
>>>DRB ID	M		9.3.1.16		-	-
>S-NSSAI	O		9.3.1.9		YES	reject
>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..<maxnoofDataForwardingTunneltoE-UTRAN>*			-	-
>>>Data forwarding tunnel information	M		UP Transport Layer Information 9.3.2.1		-	-
>>>QoS Flows to be forwarded List		*1*			-	-
>>>>QoS Flows to be forwarded Item		*1..<maxnoofQoSflows>*			-	-

>>>>>QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24		-	-
>Security Indication Modify	O		Security Indication 9.3.1.23		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..<maxnoofPDUSessionResource>*			-	-
>PDU Session ID	M		9.3.1.21		-	-
>Cause	O		9.3.1.2		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..<maxnoofDRBs>*			-	-
>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		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		*1..<maxnoofDRBs>*		
>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		*1..<maxnoofDRBs>*		
>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		*1..<maxnoofDRBs>*		
>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		*1..<maxnoofPDUSessionResource>*			-	-
>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		*1*			-	-
>>DRB Setup Item		*1..<maxnoofDRBs>*			-	-
>>>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		Flow Failed List 9.3.1.45		-	-
>DRB Failed List		*0.. 1*			-	-
>>DRB Failed Item		*1..<maxnoofDRBs>*			-	-
>>>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.

9.3.3.18 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		*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.

9.3.3.19 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		*1..<maxnoofPDUSessionResource>*			-	
>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		*0.. 1*			-	
>>DRB Setup Item		*1..<maxnoofDRBs>*			-	
>>>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		Flow Failed List 9.3.1.45		-	
>DRB Failed List		*0.. 1*			-	
>>DRB Failed Item		*1..<maxnoofDRBs>*			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>DRB Modified List		*0.. 1*			-	
>>DRB Modified Item		*1..<maxnoofDRBs>*			-	
>>>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		-	
>>>Flow Failed List	O		Flow Failed List 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..<maxnoofDRBs>*			-	-
>>>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 Related Configuration	O		9.3.1.34	
>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		*1..<maxnoofDRBs>*		
>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		*1..<maxnoofPDUSessionResource>*			-	-
>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		*0.. 1*			-	-
>>DRB To Modify Item		*1..<maxnoofDRBs>*			-	-
>>>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		*0.. 1*			-	-
>>DRB To Remove Item		*1..<maxnoofDRBs>*			-	-
>>>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.

9.3.3.24 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		*1..<maxnoofDRBs>*		
>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 *gNB-CU-UP Cell Group Related Configuration* 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		*1..<maxnoofPDUSessionResource>*		
>PDU Session ID	M		9.3.1.21	
>DRB Modified List		*0.. 1*		
>>DRB Modified Item		*1..<maxnoofDRBs>*		
>>>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 *gNB-CU-UP Cell Group Related Configuration* IE (e.g., UL Configuration).

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.

9.3.3.26 BC Bearer Context To Setup

This IE contains MBS session resource related information used to request BC Bearer Context 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	M		9.3.1.112	
BC MRB To Setup List	M		BC MRB Setup Configuration 9.3.1.114	
Requested Action for Available Shared NG-U Termination	O		9.3.1.115	

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
BC Bearer Context NG-U TNL Info at NG-RAN	O		9.3.1.116	
BC MRB Setup Response List		*1..<maxnoofMRBs>*		
>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	
BC MRB Failed List		*0..<maxnoofMRBs>*		
>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 a UE. Value is 32.

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
BC Bearer Context NG-U TNL Info at 5GC To Setup or Modify	O		BC Bearer Context NG-U TNL Info at 5GC 9.3.1.112	
BC MRB To Setup List	O		BC MRB Setup Configuration 9.3.1.114	
BC MRB To Modify List		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	
>BC Bearer Context F1-U TNL Info at DU	O		9.3.1.119	
>SDAP Configuration	O		9.3.1.39	
>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.
BC MRB To Remove List		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for a UE. 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
BC Bearer Context NG-U TNL Info at NG-RAN	O		9.3.1.116	
BC MRB Setup or Modify Response List		*1..<maxnoofMRBs>*		
>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	
BC MRB Failed List		*0..<maxnoofMRBs>*		
>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 a UE. Value is 32.

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 a UE. 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 Context Setup.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
S-NSSAI	M		9.3.1.9	
MC MRB To Setup List	M		MC MRB Setup Configuration 9.3.1.120	
Requested Action for Available Shared NG-U Termination	O		9.3.1.115	

9.3.3.33 MC Bearer Context To Setup Response

This IE contains MBS session resource related information used to confirm MC Bearer Context 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		*1..<maxnoofMRBs>*		
>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 Initial HFN and Reference PDCP SN	O		BIT STRING (32)	Refer to the *multicastHFN-AndRefSN* IE as specified in the TS 38.331 [10].
MC MRB Failed List		*0..<maxnoofMRBs>*		
>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 a UE. 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
MC Bearer Context NG-U TNL Info at 5GC	O		9.3.1.122	
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-ifSetupOrRemove		9.3.1.125	
MC MRB To Setup or Modify List		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	
>MC Bearer Context F1-U TNL Info at DU	O		9.3.1.124	
>SDAP Configuration	O		9.3.1.39	
>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 Initial HFN and Reference PDCP SN Request	O		ENUMERATED (true, ...)	Indicates the MBS initial HFN and reference PDCP SN is requested.
MC MRB To Remove List		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for a UE. Value is 32.

Condition	Explanation
ifSetupOrRemove	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.

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
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		*0..<maxnoofMRBs>*		
>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 Initial HFN and Reference PDCP SN	O		BIT STRING (32)	Refer to the *multicastHFN-AndRefSN* IE as specified in the TS 38.331 [10].
MC MRB Failed List		*0..<maxnoofMRBs>*		
>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.

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for a UE. Value is 32.

Condition	Explanation
ifSetupOrFailed	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.

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
MBS Multicast F1-U Context Descriptor	C-ifRemoved		9.3.1.125	
MC MRB To Remove List Required		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	
MC MRB To Modify List Required		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	
>MBS Initial HFN and Reference PDCP SN	O		BIT STRING (32)	Refer to the *multicastHFN-AndRefSN* IE as specified in the TS 38.331 [10].

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for a UE. Value is 32.

Condition	Explanation
ifRemove	This IE shall be present if either the *MC MRB To Remove List Required* 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		*0..<maxnoofMRBs>*		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for a UE. Value is 32.

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
--
-- **************************************************************

E1AP-PDU-Descriptions {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-PDU-Descriptions (0) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    Criticality,
    ProcedureCode

FROM E1AP-CommonDataTypes
    Reset,
    ResetAcknowledge,
    ErrorIndication,
    GNB-CU-UP-E1SetupRequest,
    GNB-CU-UP-E1SetupResponse,
    GNB-CU-UP-E1SetupFailure,
    GNB-CU-CP-E1SetupRequest,
    GNB-CU-CP-E1SetupResponse,
    GNB-CU-CP-E1SetupFailure,
    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,
    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-E1Setup,
```

```
    id-gNB-CU-UP-ConfigurationUpdate,
    id-gNB-CU-CP-ConfigurationUpdate,
    id-e1Release,
    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-MCBearerContextRelease,
    id-MCBearerContextReleaseRequest

FROM E1AP-Constants;

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

E1AP-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
--
-- **************************************************************

E1AP-PDU ::= CHOICE {
    initiatingMessage       InitiatingMessage,
    successfulOutcome       SuccessfulOutcome,
    unsuccessfulOutcome     UnsuccessfulOutcome,
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode           E1AP-ELEMENTARY-PROCEDURE.&procedureCode        ({E1AP-ELEMENTARY-PROCEDURES}),
    criticality             E1AP-ELEMENTARY-PROCEDURE.&criticality          ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value                   E1AP-ELEMENTARY-PROCEDURE.&InitiatingMessage    ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode           E1AP-ELEMENTARY-PROCEDURE.&procedureCode        ({E1AP-ELEMENTARY-PROCEDURES}),
    criticality             E1AP-ELEMENTARY-PROCEDURE.&criticality          ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value                   E1AP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome    ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode           E1AP-ELEMENTARY-PROCEDURE.&procedureCode        ({E1AP-ELEMENTARY-PROCEDURES}),
    criticality             E1AP-ELEMENTARY-PROCEDURE.&criticality          ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value                   E1AP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome  ({E1AP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

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

E1AP-ELEMENTARY-PROCEDURES E1AP-ELEMENTARY-PROCEDURE ::= {
    E1AP-ELEMENTARY-PROCEDURES-CLASS-1          |
    E1AP-ELEMENTARY-PROCEDURES-CLASS-2          ,

    ...
}

E1AP-ELEMENTARY-PROCEDURES-CLASS-1 E1AP-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                       |
    bCBearerContextSetup                         |
    bCBearerContextModification                  |
    bCBearerContextModificationRequired          |
    bCBearerContextRelease                       |
    mCBearerContextSetup                         |
    mCBearerContextModification                  |
    mCBearerContextModificationRequired          |
    mCBearerContextRelease                       ,
    ...
}

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                       |
    bCBearerContextReleaseRequest            |
    mCBearerContextReleaseRequest            ,
    ...
}

-- **************************************************************
--
-- 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 E1AP-ELEMENTARY-PROCEDURE ::= {
```

```
    INITIATING MESSAGE      GNB-CU-UP-CounterCheckRequest
    PROCEDURE CODE          id-gNB-CU-UP-CounterCheck
    CRITICALITY             ignore
}

gNB-CU-UP-StatusIndication  E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-UP-StatusIndication
    PROCEDURE CODE          id-gNB-CU-UP-StatusIndication
    CRITICALITY         ignore
}

privateMessage E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      PrivateMessage
    PROCEDURE CODE          id-privateMessage
    CRITICALITY             ignore
}

gNB-CU-CPMeasurementResultsInformation E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-CPMeasurementResultsInformation
    PROCEDURE CODE          id-gNB-CU-CPMeasurementResultsInformation
    CRITICALITY             ignore
}

mRDC-DataUsageReport    E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      MRDC-DataUsageReport
    PROCEDURE CODE          id-mRDC-DataUsageReport
    CRITICALITY             ignore
}

deactivateTrace E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      DeactivateTrace
    PROCEDURE CODE          id-DeactivateTrace
    CRITICALITY             ignore
}

traceStart E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      TraceStart
    PROCEDURE CODE          id-TraceStart
    CRITICALITY             ignore
}

resourceStatusReportingInitiation E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ResourceStatusRequest
    SUCCESSFUL OUTCOME      ResourceStatusResponse
    UNSUCCESSFUL OUTCOME    ResourceStatusFailure
    PROCEDURE CODE          id-resourceStatusReportingInitiation
    CRITICALITY             reject
}

resourceStatusReporting E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ResourceStatusUpdate
    PROCEDURE CODE          id-resourceStatusReporting
    CRITICALITY             ignore
}
```

```
iAB-UPTNLAddressUpdate E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      IAB-UPTNLAddressUpdate
    SUCCESSFUL OUTCOME      IAB-UPTNLAddressUpdateAcknowledge
    UNSUCCESSFUL OUTCOME    IAB-UPTNLAddressUpdateFailure
    PROCEDURE CODE          id-iAB-UPTNLAddressUpdate
    CRITICALITY             reject
}

cellTrafficTrace E1AP-ELEMENTARY-PROCEDURE ::={
    INITIATING MESSAGE CellTrafficTrace
    PROCEDURE CODE      id-CellTrafficTrace
    CRITICALITY         ignore
}

earlyForwardingSNTransfer E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      EarlyForwardingSNTransfer
    PROCEDURE CODE          id-earlyForwardingSNTransfer
    CRITICALITY             ignore
}

iABPSKNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      IABPSKNotification
    PROCEDURE CODE          id-iABPSKNotification
    CRITICALITY             reject
}

bCBearerContextSetup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BCBearerContextSetupRequest
    SUCCESSFUL OUTCOME      BCBearerContextSetupResponse
    UNSUCCESSFUL OUTCOME        BCBearerContextSetupFailure
    PROCEDURE CODE          id-BCBearerContextSetup
    CRITICALITY             reject
}

bCBearerContextModification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BCBearerContextModificationRequest
    SUCCESSFUL OUTCOME      BCBearerContextModificationResponse
    UNSUCCESSFUL OUTCOME        BCBearerContextModificationFailure
    PROCEDURE CODE          id-BCBearerContextModification
    CRITICALITY             reject
}

bCBearerContextModificationRequired E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BCBearerContextModificationRequired
    SUCCESSFUL OUTCOME      BCBearerContextModificationConfirm
    PROCEDURE CODE          id-BCBearerContextModificationRequired
    CRITICALITY             reject
}

bCBearerContextRelease E1AP-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
}

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 E1AP
--
-- **************************************************************

E1AP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS

    Cause,
    CriticalityDiagnostics,
    GNB-CU-CP-MBS-E1AP-ID,
    GNB-CU-UP-MBS-E1AP-ID,
    GNB-CU-CP-UE-E1AP-ID,
    GNB-CU-UP-UE-E1AP-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,
```

```
	ExtendedSliceSupportList,
	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,
    MBSMulticastF1UContextDescriptor,
    GNB-CU-UP-MBS-Support-Info,
    SDTContinueROHC,
    MDTPLMNModificationList

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-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-E1AP-ID,
	id-GNB-CU-UP-MBS-E1AP-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-MBSMulticastF1UContextDescriptor,
	id-gNB-CU-UP-MBS-Support-Info,
	id-SDTContinueROHC,
	id-ManagementBasedMDTPLMNModificationList,

	maxnoofErrors,
	maxnoofSPLMNs,
	maxnoofDRBs,
	maxnoofTNLAssociations,
	maxnoofIndividualE1ConnectionsToReset,
	maxnoofTNLAddresses,
	maxnoofPSKs


FROM E1AP-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 },
    ...
}

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

-- **************************************************************
--
-- 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 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-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.. maxnoofTNLAssociations))	OF GNB-CU-CP-TNLA-To-Add-Item
GNB-CU-CP-TNLA-To-Remove-List	::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) OF GNB-CU-CP-TNLA-To-Remove-Item
GNB-CU-CP-TNLA-To-Update-List		::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) 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 E1AP-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.. maxnoofTNLAssociations)) OF GNB-CU-CP-TNLA-Setup-Item
GNB-CU-CP-TNLA-Failed-To-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAssociations)) 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  },
    ...
}

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

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  },
    ...
```

```
}

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 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 ignore  TYPE GNB-CU-UP-UE-E1AP-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 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-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},
    ...
}

System-BearerContextModificationRequest ::= CHOICE {
    e-UTRAN-BearerContextModificationRequest        ProtocolIE-Container            {{EUTRAN-BearerContextModificationRequest}},
    nG-RAN-BearerContextModificationRequest         ProtocolIE-Container            {{NG-RAN-BearerContextModificationRequest}},
    choice-extension                                ProtocolIE-SingleContainer      {{System-BearerContextModificationRequest-ExtIEs}}
}

System-BearerContextModificationRequest-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

EUTRAN-BearerContextModificationRequest E1AP-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 E1AP-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 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-BearerContextModificationResponse	CRITICALITY ignore	TYPE System-BearerContextModificationResponse	PRESENCE optional  },
	...
}

System-BearerContextModificationResponse	::= CHOICE {
	e-UTRAN-BearerContextModificationResponse			ProtocolIE-Container {{EUTRAN-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 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-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 E1AP-PROTOCOL-IES ::= {
    ...
}

EUTRAN-BearerContextModificationRequired E1AP-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 E1AP-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	},
	...
}

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 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-ActivityInformation             CRITICALITY reject  TYPE ActivityInformation          PRESENCE mandatory },
    ...
}


-- **************************************************************
--
-- DL DATA NOTIFICATION
--
-- **************************************************************

-- **************************************************************
--
-- DL Data Notification
--
-- **************************************************************

DLDataNotification ::= SEQUENCE {
```

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

DLDataNotificationIEs 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-PPI                             CRITICALITY ignore  TYPE PPI                         PRESENCE optional }|
    { ID id-PDU-Session-To-Notify-List      CRITICALITY ignore  TYPE PDU-Session-To-Notify-List  PRESENCE optional },
    ...
}

-- **************************************************************

-- **************************************************************
--
-- UL Data Notification
--
-- **************************************************************

ULDataNotification ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { ULDataNotificationIEs } },
    ...
}

ULDataNotificationIEs 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-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 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-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 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-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 E1AP-PROTOCOL-IES::= {
    ...
}

EUTRAN-GNB-CU-UP-CounterCheckRequest E1AP-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 E1AP-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 optional}|
		{ ID id-RegistrationRequest			CRITICALITY reject	TYPE RegistrationRequest		PRESENCE mandatory}|
		{ ID id-ReportCharacteristics			CRITICALITY reject	TYPE ReportCharacteristics	PRESENCE conditional}|
		{ ID id-ReportingPeriodicity			CRITICALITY reject	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 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 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 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 optional}|
        { ID id-TNL-AvailableCapacityIndicator      CRITICALITY ignore      TYPE                        TNL-AvailableCapacityIndicator   PRESENCE 
optional}|
```

```
	{ ID id-HW-CapacityIndicator				CRITICALITY ignore	TYPE 				HW-CapacityIndicator		PRESENCE mandatory},

	...
}

-- **************************************************************
--
-- IAB UP TNL ADDRESS UPDATE
--
-- **************************************************************

-- **************************************************************
--
-- IAB UP TNL Address Update
--
-- **************************************************************

IAB-UPTNLAddressUpdate	::= SEQUENCE {
	protocolIEs			ProtocolIE-Container		{ { IAB-UPTNLAddressUpdateIEs} },
	...
}

IAB-UPTNLAddressUpdateIEs E1AP-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 E1AP-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 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 },
	...
}

-- **************************************************************
--
-- EARLY FORWARDING SN TRANSFER
--
-- **************************************************************

-- **************************************************************
--
-- Early Forwarding SN Transfer
--
-- **************************************************************

EarlyForwardingSNTransfer ::= SEQUENCE {
	protocolIEs		ProtocolIE-Container		{ { EarlyForwardingSNTransferIEs } },
	...
}

EarlyForwardingSNTransferIEs 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-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 E1AP-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	},
	...
}

-- **************************************************************
--
-- 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 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   }|
    { 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 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-BCBearerContextToModifyRequired CRITICALITY reject  TYPE    BCBearerContextToModifyRequired PRESENCE mandatory   },
    ...
}

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

```
-- BC BEARER CONTEXT MODIFICATION CONFIRM
--
-- **************************************************************

BCBearerContextModificationConfirm ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { BCBearerContextModificationConfirmIEs } },
    ...
}

BCBearerContextModificationConfirmIEs 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-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 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   },
    ...
}

-- **************************************************************
--
-- BC BEARER CONTEXT RELEASE COMPLETE
--
-- **************************************************************

BCBearerContextReleaseComplete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { BCBearerContextReleaseCompleteIEs } },
    ...
}

BCBearerContextReleaseCompleteIEs 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 },
	...
}

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

-- **************************************************************
--
-- MC BEARER CONTEXT MODIFICATION
--
-- **************************************************************

-- **************************************************************
--
-- MC BEARER CONTEXT MODIFICATION REQUEST
--
-- **************************************************************

MCBearerContextModificationRequest ::= SEQUENCE {
	protocolIEs		ProtocolIE-Container		{ { MCBearerContextModificationRequestIEs } },
	...
}
```

```
MCBearerContextModificationRequestIEs 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-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-MBSMulticastF1UContextDescriptor    CRITICALITY reject  TYPE    MBSMulticastF1UContextDescriptor  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-E1AP-ID           CRITICALITY reject  TYPE    GNB-CU-UP-MBS-E1AP-ID           PRESENCE mandatory   }|
    { ID id-MCBearerContextToModifyRequired CRITICALITY ignore  TYPE    MCBearerContextToModifyRequired PRESENCE mandatory   },
    ...
}

-- **************************************************************
--
-- MC BEARER CONTEXT MODIFICATION CONFIRM
--
-- **************************************************************

MCBearerContextModificationConfirm ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { { MCBearerContextModificationConfirmIEs } },
    ...
}

MCBearerContextModificationConfirmIEs 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-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 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 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   },
    ...
}


END
-- ASN1STOP
```

9.4.5 Information Element Definitions

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

E1AP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-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-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,
    maxnoofMBSAreaSessionIDs,
    maxnoofSharedNG-UTerminations,
    maxnoofMRBs,
    maxnoofMBSSessionIDs,
    maxnoofQoSParaSets,
    maxnoofErrors,
    maxnoofSliceItems,
    maxnoofEUTRANQOSParameters,
    maxnoofNGRANQOSParameters,
    maxnoofDRBs,
    maxnoofPDUSessionResource,
    maxnoofQoSFlows,
    maxnoofUPParameters,
    maxnoofCellGroups,
    maxnooftimeperiods,
    maxnoofNRCGI,
    maxnoofTLAs,
    maxnoofGTPTLAs,
    maxnoofSPLMNs,
    maxnoofMDTPLMNs,
    maxnoofExtSliceItems,
    maxnoofDataForwardingTunneltoE-UTRAN,
    maxnoofExtNRCGI,
    maxnoofECGI,
    maxnoofSMBRValues

FROM E1AP-Constants

    Criticality,
    ProcedureCode,
    ProtocolIE-ID,
    TriggeringMessage

FROM E1AP-CommonDataTypes
```

```
    ProtocolExtensionContainer{},
    ProtocolIE-SingleContainer{},
    E1AP-PROTOCOL-EXTENSION,
    E1AP-PROTOCOL-IES


FROM E1AP-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 E1AP-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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- B

-- BCBearerContextToSetup

BCBearerContextToSetup ::= SEQUENCE {
    snssai                              SNSSAI,
    bcBearerContextNGU-TNLInfoat5GC     BCBearerContextNGU-TNLInfoat5GC,
    bcMRBToSetupList                        BCMRBSetupConfiguration,
    requestedAction                                 RequestedAction4AvailNGUTermination     OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {BCBearerContextToSetup-ExtIEs} }  OPTIONAL,
    ...
}

BCBearerContextToSetup-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}


BCBearerContextNGU-TNLInfoat5GC::= CHOICE {
    locationindependent             MBSNGUInformationAt5GC,
    locationdependent               LocationDependentMBSNGUInformationAt5GC,
    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,
    sdap-config                     SDAP-Configuration,
    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 ::= {
    ...
}

-- 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,
    bcBearerContextF1U-TNLInfoatCU      BCBearerContextF1U-TNLInfoatCU,
    iE-Extensions       ProtocolExtensionContainer { {BCMRBSetupResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

BCMRBSetupResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BCBearerContextF1U-TNLInfoatCU ::= CHOICE {
    locationindependent             MBSF1UInformationAtCU,
    locationdependent               LocationDependentMBSF1UInformationAtCU,
    choice-extension    ProtocolIE-SingleContainer  {{BCBearerContextF1U-TNLInfoatCU-ExtIEs}}
}

BCBearerContextF1U-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 ::= {
    ...
}

BCMRBModifyConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBModifyConfiguration-Item

BCMRBModifyConfiguration-Item ::= SEQUENCE {
    mrb-ID                          MRB-ID,
    bcBearerContextF1U-TNLInfoatDU  BCBearerContextF1U-TNLInfoatDU  OPTIONAL,
    sdap-config                     SDAP-Configuration              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 ::= {
    ...
}

BCBearerContextF1U-TNLInfoatDU ::= CHOICE {
    locationindependent             MBSF1UInformationAtDU,
    locationdependent               LocationDependentMBSF1UInformationAtDU,
    choice-extension    ProtocolIE-SingleContainer  {{BCBearerContextF1U-TNLInfoatDU-ExtIEs}}
}

BCBearerContextF1U-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,
    bcBearerContextF1U-TNLInfoatCU      BCBearerContextF1U-TNLInfoatCU      OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {BCMRBSetupModifyResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

BCMRBSetupModifyResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}


-- 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 E1AP-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-e1ap-id,
    unknown-or-already-allocated-gnb-cu-up-ue-e1ap-id,
    unknown-or-inconsistent-pair-of-ue-e1ap-id,
    interaction-with-other-procedure,
    pPDCP-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
}

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},
    ...
}

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}

DLDiscarding ::= SEQUENCE {
    dLDiscardingCountVal            PDCP-Count,
    iE-Extensions                   ProtocolExtensionContainer { { DLDiscarding-ExtIEs } }      OPTIONAL
}

DLDiscarding-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DLUPTNLAddressToUpdateItem  ::= SEQUENCE {
    oldTNLAdress                        TransportLayerAddress,
    newTNLAdress                        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-D1-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},
	...
}

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},
    ...
}

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     E1AP-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},
    ...
}

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 E1AP-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,
    averagingWindow                     AveragingWindow                                     OPTIONAL,
    maxDataBurstVolume                  MaxDataBurstVolume                                  OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { Dynamic5QIDescriptor-ExtIEs } } OPTIONAL
}

Dynamic5QIDescriptor-ExtIEs E1AP-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 E1AP-PROTOCOL-IES ::= {
    ...
}

EarlyForwardingCOUNTReq ::= ENUMERATED { first-dl-count, dl-discarding, ...}

EHC-Common-Parameters ::= SEQUENCE {
```

```
	ehc-CID-Length							ENUMERATED { bits7, bits15, ...},
	iE-Extensions							ProtocolExtensionContainer { { EHC-Common-Parameters-ExtIEs } }		OPTIONAL
}

EHC-Common-Parameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
	...
}

EHC-Downlink-Parameters ::= SEQUENCE {
	drb-ContinueEHC-DL						ENUMERATED {true, ..., false},
	iE-Extensions							ProtocolExtensionContainer { { EHC-Downlink-Parameters-ExtIEs } }	OPTIONAL
}

EHC-Downlink-Parameters-ExtIEs E1AP-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, ...)

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 E1AP-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    E1AP-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  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

EUTRAN-QoS  ::= SEQUENCE {
    qCI                                     QCI,
    eUTRANallocationAndRetentionPriority    EUTRANAllocationAndRetentionPriority,
    gbrQosInformation                       GBR-QosInformation                                    OPTIONAL,
    iE-Extensions                           ProtocolExtensionContainer { { EUTRAN-QoS-ExtIEs } }  OPTIONAL,
    ...
}

EUTRAN-QoS-ExtIEs E1AP-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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- G

GlobalMBSSessionID ::= SEQUENCE {
    tmgi    OCTET STRING (SIZE(6)),
    nid     NID                    OPTIONAL,
    iE-Extensions                      ProtocolExtensionContainer { { GlobalMBSSessionID-ExtIEs } } OPTIONAL,
    ...
}

GlobalMBSSessionID-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 E1AP-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 E1AP-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 E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-TNLAssociationTransportLayerAddressgNBCUUP   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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-UP-TNLA-To-Remove-Item::= SEQUENCE {
    tNLAssociationTransportLayerAddress         CP-TNL-Information,
    tNLAssociationTransportLayerAddressgNBCUCP  CP-TNL-Information      OPTIONAL,
    iE-Extensions                           ProtocolExtensionContainer { { GNB-CU-UP-TNLA-To-Remove-Item-ExtIEs} } OPTIONAL
}

GNB-CU-UP-TNLA-To-Remove-Item-ExtIEs E1AP-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 E1AP-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 E1AP-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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

GTPTunnel-ExtIEs E1AP-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 } },
    ...
}

HW-CapacityIndicator-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- I

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,
```

```
    measurementSix              M6Configuration     OPTIONAL,
    measurementSeven            M7Configuration     OPTIONAL,
    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-UPIPAddress        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

-- 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 ::= {
    ...
}

LocationDependentMBSF1UInformationAtCU ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSF1UInformationAtCU-Item

LocationDependentMBSF1UInformationAtCU-Item ::= SEQUENCE {
    mbsAreaSession-ID               MBSAreaSessionID,
    mbs-f1u-info-at-CU              UP-TNL-Information,
    iE-Extensions                   ProtocolExtensionContainer  { { LocationDependentMBSF1UInformationAtCU-Item-ExtIEs } }  OPTIONAL,
```

```
    ...
}

LocationDependentMBSF1UInformationAtCU-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

LocationDependentMBSF1UInformationAtDU ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSF1UInformationAtDU-Item

LocationDependentMBSF1UInformationAtDU-Item ::= SEQUENCE {
    mbsAreaSession-ID               MBSAreaSessionID,
    mbs-f1u-info-at-DU              UP-TNL-Information,
    iE-Extensions                   ProtocolExtensionContainer  { { LocationDependentMBSF1UInformationAtDU-Item-ExtIEs } }  OPTIONAL,
    ...
}

LocationDependentMBSF1UInformationAtDU-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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, ...)

MBSF1UInformationAtCU ::= SEQUENCE {
    mbs-f1u-info-at-CU              UP-TNL-Information,
    iE-Extensions                   ProtocolExtensionContainer  { { MBSF1UInformationAtCU-ExtIEs } } OPTIONAL,
    ...
}

MBSF1UInformationAtCU-ExtIEs        E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSF1UInformationAtDU ::= SEQUENCE {
    mbs-f1u-info-at-DU              UP-TNL-Information,
    iE-Extensions                   ProtocolExtensionContainer  { { MBSF1UInformationAtDU-ExtIEs } } OPTIONAL,
    ...
}

MBSF1UInformationAtDU-ExtIEs        E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSNGUInformationAt5GC ::= CHOICE {
    multicast               MBSNGUInformationAt5GC-Multicast,
    unicast                 UP-TNL-Information,
    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 ::= {
    ...
```

```
}

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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBS-Support-Info-ToRemove-List ::= SEQUENCE (SIZE(1..maxnoofMBSSessionIDs)) OF MBS-Support-Info-ToRemove-Item

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,
    requestedAction                                 RequestedAction4AvailNGUTermination     OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCBearerContextToSetup-ExtIEs} }  OPTIONAL,
    ...
}

MCBearerContextToSetup-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCMRBSetupConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBSetupConfiguration-Item

MCMRBSetupConfiguration-Item ::= SEQUENCE {
    mrb-ID                          MRB-ID,
    sdap-config                     SDAP-Configuration,
    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 ::= {
    ...
```

```
}


-- MCBearerContextToSetupResponse

MCBearerContextToSetupResponse ::= SEQUENCE {
    mcBearerContextNGU-TNLInfoatNGRAN           MCBearerContextNGU-TNLInfoatNGRAN           OPTIONAL,
    mcMRBSetupResponseList                  MCMRBSetupResponseList,
    mcMRBFailedList                         MCMRBFailedList                         OPTIONAL,
    availableMCMRBConfig                        MCMRBSetupConfiguration                OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCBearerContextToSetupResponse-ExtIEs} }  OPTIONAL,
    ...
}

MCBearerContextToSetupResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCBearerContextNGU-TNLInfoatNGRAN::= CHOICE {
    locationindependent             MBSNGUInformationAtNGRAN,
    locationdependent               LocationDependentMBSNGUInformationAtNGRAN,
    choice-extension    ProtocolIE-SingleContainer  {{MCBearerContextNGU-TNLInfoatNGRAN-ExtIEs}}
}

MCBearerContextNGU-TNLInfoatNGRAN-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

MCMRBSetupResponseList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBSetupResponseList-Item

MCMRBSetupResponseList-Item ::= SEQUENCE {
    mrb-ID                              MRB-ID,
    qosflow-setup                       QoS-Flow-List,
    qosflow-failed                      QoS-Flow-Failed-List        OPTIONAL,
    mBSInitialHFNRefSN                  MBS-Initial-HFN-Ref-SN      OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCMRBSetupResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

MCMRBSetupResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBS-Initial-HFN-Ref-SN  ::= 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 ::= {
    ...
}


-- MCBearerContextToModify

MCBearerContextToModify ::= SEQUENCE {
    mcBearerContextNGUTNLInfoat5GC                  MCBearerContextNGUTNLInfoat5GC              OPTIONAL,
    mcBearerContextNGUTnlInfoatNGRANRequest         MCBearerContextNGUTnlInfoatNGRANRequest     OPTIONAL,
    mbsMulticastF1UContextDescriptor                    MBSMulticastF1UContextDescriptor            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.
    mcMRBToSetupModifyList                          MCMRBSetupModifyConfiguration               OPTIONAL,
    mcMRBToRemoveList                               MCMRBRemoveConfiguration                     OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCBearerContextToModify-ExtIEs} } OPTIONAL,
    ...
}

MCBearerContextToModify-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCBearerContextNGUTNLInfoat5GC ::= SEQUENCE {
    mbsNGUInformationAt5GC          MBSNGUInformationAt5GC,
    mbsAreaSession-ID               MBSAreaSessionID        OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCBearerContextNGUTNLInfoat5GC-ExtIEs} }  OPTIONAL,
    ...
}

MCBearerContextNGUTNLInfoat5GC-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}


MCBearerContextNGUTnlInfoatNGRANRequest ::= SEQUENCE {
    ngRANNGUTNLRequested                ENUMERATED {requested, ...},
    mbsAreaSession-ID               MBSAreaSessionID        OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCBearerContextNGUTnlInfoatNGRANRequest-ExtIEs} } OPTIONAL,
    ...
}

MCBearerContextNGUTnlInfoatNGRANRequest-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}


MCMRBSetupModifyConfiguration ::= SEQUENCE {
    mrb-ID                          MRB-ID,
    f1uTNLatDU                      MCBearerContextF1UTNLInfoatDU       OPTIONAL,
    sdap-config                     SDAP-Configuration              OPTIONAL,
    mbs-pdcp-config                 PDCP-Configuration              OPTIONAL,
    qoS-Flow-QoS-Parameter-List     QoS-Flow-QoS-Parameter-List     OPTIONAL,
    mrbQoS                          QoSFlowLevelQoSParameters       OPTIONAL,
    mbsInitialHFNRefSNReq           MBS-Initial-HFN-Ref-SN-Req      OPTIONAL,
```

```
    iE-Extensions       ProtocolExtensionContainer { {MCMRBSetupModifyConfiguration-ExtIEs} }   OPTIONAL,
    ...
}

MCMRBSetupModifyConfiguration-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MCBearerContextF1UTNLInfoatDU ::= SEQUENCE {
    mbsF1UInfoatDU                      UP-TNL-Information,
    mbsMulticastF1UContextDescriptor    MBSMulticastF1UContextDescriptor,
    iE-Extensions       ProtocolExtensionContainer { {MCBearerContextF1UTNLInfoatDU-ExtIEs} }   OPTIONAL,
    ...
}

MCBearerContextF1UTNLInfoatDU-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSMulticastF1UContextDescriptor ::= CHOICE {
    du                  NULL,
    mbsAreaSession      MBSAreaSessionID,
    cell                MCDUCellReference,
    ptp-retransmission  MBSPTPUEReference,
    ptp-only-MRB            MBSPTPUEReference,
    choice-extension        ProtocolIE-SingleContainer  {{MBSMulticastF1UContextDescriptor-ExtIEs}}
}

MBSMulticastF1UContextDescriptor-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

MCDUCellReference ::= SEQUENCE {
    du-CellIndex            INTEGER (1..512),
    nr-CGI              NR-CGI,
    iE-Extensions       ProtocolExtensionContainer { {MCDUCellReference-ExtIEs} }   OPTIONAL,
    ...
}

MCDUCellReference-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSPTPUEReference::= SEQUENCE {
    ueReferenceID       INTEGER (0..65535, ...),
    du-CellIndex            INTEGER (1..512),
    iE-Extensions       ProtocolExtensionContainer { {MBSPTPUEReference-ExtIEs} }   OPTIONAL,
    ...
}

MBSPTPUEReference-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
MCMRBRemoveConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MRB-ID

MBS-Initial-HFN-Ref-SN-Req ::=  ENUMERATED {true, ... }


-- MCBearerContextToModifyResponse

MCBearerContextToModifyResponse ::= SEQUENCE {
    mcBearerContextNGU-TNLInfoatNGRANModifyResponse MCBearerContextNGU-TNLInfoatNGRANModifyResponse     OPTIONAL,
    mbsMulticastF1UContextDescriptor                    MBSMulticastF1UContextDescriptor            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 ::= {
    ...
}

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,
    mcBearerContextF1UTNLInfoatCU       UP-TNL-Information      OPTIONAL,
    mBSInitialHFNRefSN                  MBS-Initial-HFN-Ref-SN  OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {MCMRBSetupModifyResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

MCMRBSetupModifyResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- MCBearerContextToModifyRequired

MCBearerContextToModifyRequired ::= SEQUENCE {
    mbsMulticastF1UContextDescriptor                    MBSMulticastF1UContextDescriptor            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 ::= {
    ...
}

MCMRBModifyRequiredConfiguration ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF MCMRBModifyRequiredConfiguration-Item

MCMRBModifyRequiredConfiguration-Item ::= SEQUENCE {
    mrb-ID                          MRB-ID,
    mBSInitialHFNRefSN                  MBS-Initial-HFN-Ref-SN  OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { { MCMRBModifyRequiredConfiguration-Item-ExtIEs} }  OPTIONAL,
    ...
}

MCMRBModifyRequiredConfiguration-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

-- MCBearerContextToModifyConfirm

MCBearerContextToModifyConfirm ::= SEQUENCE {
    mbsMulticastF1UContextDescriptor                    MBSMulticastF1UContextDescriptor             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 ::= {
    ...
}

MDTPollutedMeasurementIndicator ::= ENUMERATED {
    iDC,
    no-IDC,
    ...
}
```

```
MRB-ID  ::= INTEGER (1..512, ...)

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 E1AP-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 E1AP-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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MDTMode ::= CHOICE {
    immediateMDT                ImmediateMDT,
    choice-extension    ProtocolIE-SingleContainer  {{MDTMode-ExtIEs}}
}

MDTMode-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

MeasurementsToActivate ::= BIT STRING (SIZE (8))

MDTPLMNList ::= SEQUENCE (SIZE(1..maxnoofMDTPLMNs)) OF PLMN-Identity

MDTPLMNModificationList ::= SEQUENCE (SIZE(0..maxnoofMDTPLMNs)) OF PLMN-Identity

-- 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 E1AP-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 E1AP-PROTOCOL-IES ::= {
    ...
}

NPNSupportInfo-SNPN ::= SEQUENCE {
    nID                     NID,
```

```
    iE-Extensions           ProtocolExtensionContainer { { NPNSupportInfo-SNPN-ExtIEs } }   OPTIONAL
}


NPNSupportInfo-SNPN-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

NPNContextInfo ::= CHOICE {
    sNPN                NPNContextInfo-SNPN,
    choice-extension    ProtocolIE-SingleContainer  {{NPNContextInfo-ExtIEs}}
}

NPNContextInfo-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

NPNContextInfo-SNPN ::= SEQUENCE {
    nID                     NID,
    iE-Extensions           ProtocolExtensionContainer { {NPNContextInfo-SNPN-ExtIEs } }    OPTIONAL
}

NPNContextInfo-SNPN-ExtIEs  E1AP-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   E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

NR-CGI-Support-List ::= SEQUENCE (SIZE(1.. maxnoofNRCGI)) 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  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

Extended-NR-CGI-Support-List ::= SEQUENCE (SIZE(1.. maxnoofExtNRCGI)) 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 E1AP-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},
	...
}

PDCP-Count	::= SEQUENCE {
	pDCP-SN			PDCP-SN,
	hFN				HFN,
	iE-Extensions					ProtocolExtensionContainer	{ { PDCP-Count-ExtIEs } } OPTIONAL,
	...
}

PDCP-Count-ExtIEs		E1AP-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	E1AP-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,
    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)

PDUSession-PairID ::= INTEGER (0..255, ...)

PDU-Session-Resource-Activity   ::= ENUMERATED {
    active,
    not-active,
    ...
}

PDU-Session-Resource-Activity-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) 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.. maxnoofPDUSessionResource)) OF PDU-Session-Resource-Confirm-Modified-Item

PDU-Session-Resource-Confirm-Modified-Item  ::= SEQUENCE {
    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.. maxnoofPDUSessionResource)) 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.. maxnoofPDUSessionResource)) 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-RedundantPDUSessionInformation-used     CRITICALITY ignore  EXTENSION   RedundantPDUSessionInformation  PRESENCE optional },
    ...
}

PDU-Session-Resource-Setup-Mod-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) 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      E1AP-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.. maxnoofPDUSessionResource)) 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      E1AP-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 },
    ...
}
```

```
PDU-Session-Resource-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofPDUSessionResource)) 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      E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-Cause        CRITICALITY ignore  EXTENSION Cause     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       E1AP-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 },
    ...
}

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       E1AP-PROTOCOL-EXTENSION ::= {
    {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 },
    ...
}

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,
    ...
}

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,
```

```
	...
}

-- 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},
	...
}

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},
    ...
}

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-Indicator                 INTEGER (1..8,  ...)                        OPTIONAL,
    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},
    ...
}

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 E1AP-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 E1AP-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 E1AP-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,
    ...
}

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

SCGActivationStatus ::=     ENUMERATED { scg-activated, scg-deactivated, ...}

SecurityAlgorithm   ::= SEQUENCE {
    cipheringAlgorithm              CipheringAlgorithm,
    integrityProtectionAlgorithm    IntegrityProtectionAlgorithm    OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { { SecurityAlgorithm-ExtIEs } } OPTIONAL,
    ...
}

SecurityAlgorithm-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SecurityIndication ::= SEQUENCE {
    integrityProtectionIndication           IntegrityProtectionIndication,
    confidentialityProtectionIndication     ConfidentialityProtectionIndication,
    maximumIPdatarate                           MaximumIPdatarate                           OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {SecurityIndication-ExtIEs} }  OPTIONAL,
    ...
}

SecurityIndication-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SecurityInformation ::= SEQUENCE {
    securityAlgorithm           SecurityAlgorithm,
    uPSecuritykey               UPSecuritykey,
```

```
    iE-Extensions               ProtocolExtensionContainer { { SecurityInformation-ExtIEs } }   OPTIONAL,
    ...
}

SecurityInformation-ExtIEs  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SecurityResult ::= SEQUENCE {
    integrityProtectionResult           IntegrityProtectionResult,
    confidentialityProtectionResult     ConfidentialityProtectionResult,
    iE-Extensions                       ProtocolExtensionContainer { {SecurityResult-ExtIEs} }  OPTIONAL,
    ...
}

SecurityResult-ExtIEs E1AP-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   E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

SNSSAI ::= SEQUENCE {
    sST         OCTET STRING (SIZE(1)),
    sD          OCTET STRING (SIZE(3))  OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { SNSSAI-ExtIEs } }    OPTIONAL,
    ...
}

SNSSAI-ExtIEs   E1AP-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   E1AP-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, ...)

-- 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 } },
    ...
}

TNL-AvailableCapacityIndicator-ExtIEs   E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

TSCTrafficCharacteristics       ::= SEQUENCE {
    tSCTrafficCharacteristicsUL             TSCTrafficInformation           OPTIONAL,
    tSCTrafficCharacteristicsDL             TSCTrafficInformation           OPTIONAL,
    iE-Extensions                           ProtocolExtensionContainer { { TSCTrafficCharacteristics-ExtIEs } }  OPTIONAL
}

TSCTrafficCharacteristics-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
TSCTrafficInformation           ::= SEQUENCE {
    periodicity                     Periodicity,
    burstArrivalTime                        BurstArrivalTime                OPTIONAL,
    iE-Extensions                           ProtocolExtensionContainer { { TSCTrafficInformation-ExtIEs } }  OPTIONAL
}

TSCTrafficInformation-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-SurvivalTime     CRITICALITY ignore      EXTENSION SurvivalTime      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 E1AP-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    E1AP-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 ::= {
    ...
}

UE-Activity ::= ENUMERATED  {
    active,
    not-active,
    ...
}

UE-associatedLogicalE1-ConnectionItem ::= SEQUENCE {
    gNB-CU-CP-UE-E1AP-ID        GNB-CU-CP-UE-E1AP-ID     OPTIONAL,
    gNB-CU-UP-UE-E1AP-ID        GNB-CU-UP-UE-E1AP-ID     OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { UE-associatedLogicalE1-ConnectionItemExtIEs} } OPTIONAL,
    ...
}

UE-associatedLogicalE1-ConnectionItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UESliceMaximumBitRateList ::= SEQUENCE (SIZE(1.. maxnoofSMBRValues)) OF UESliceMaximumBitRateItem
UESliceMaximumBitRateItem ::= SEQUENCE {
    sNSSAI                      SNSSAI,
    uESliceMaximumBitRateDL     BitRate,
    iE-Extensions       ProtocolExtensionContainer { { UESliceMaximumBitRateItem-ExtIEs} } OPTIONAL,
    ...
}

UESliceMaximumBitRateItem-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UL-Configuration    ::= ENUMERATED  {
    no-data,
    shared,
    only,
    ...
}

ULUPTNLAddressToUpdateItem  ::= SEQUENCE {
    oldTNLAdress                        TransportLayerAddress,
    newTNLAdress                        TransportLayerAddress,
    iE-Extensions   ProtocolExtensionContainer { { ULUPTNLAddressToUpdateItemExtIEs } } OPTIONAL,
    ...
}

ULUPTNLAddressToUpdateItemExtIEs    E1AP-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   E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-QoS-Mapping-Information  CRITICALITY reject  EXTENSION QoS-Mapping-Information   PRESENCE optional},
    ...
}

UPSecuritykey   ::= SEQUENCE {
    encryptionKey               EncryptionKey,
    integrityProtectionKey      IntegrityProtectionKey      OPTIONAL,
    iE-Extensions               ProtocolExtensionContainer { { UPSecuritykey-ExtIEs } } OPTIONAL,
    ...
}

UPSecuritykey-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

UP-TNL-Information      ::=     CHOICE {
    gTPTunnel       GTPTunnel,
    choice-extension        ProtocolIE-SingleContainer  {{UP-TNL-Information-ExtIEs}}
}

UP-TNL-Information-ExtIEs E1AP-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 E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

URIaddress ::= VisibleString

-- V

-- W
```

```
-- X

-- Y

-- Z

END
-- ASN1STOP
```

9.4.6 Common Definitions

```
-- ASN1START
-- **************************************************************
--
-- Common definitions
--
-- **************************************************************

E1AP-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-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
--
-- **************************************************************


E1AP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    ProcedureCode,
    ProtocolIE-ID

FROM E1AP-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


-- **************************************************************
--
-- Lists
--
-- **************************************************************

maxnoofErrors                               INTEGER ::= 256
maxnoofSPLMNs                               INTEGER ::= 12
maxnoofSliceItems                           INTEGER ::= 1024
maxnoofIndividualE1ConnectionsToReset       INTEGER ::= 65536
maxnoofEUTRANQOSParameters                  INTEGER ::= 256
maxnoofNGRANQOSParameters                   INTEGER ::= 256
maxnoofDRBs                                 INTEGER ::= 32
maxnoofNRCGI                                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
maxnoofExtNRCGI                             INTEGER ::= 16384
maxnoofPSKs                                 INTEGER ::= 256
maxnoofECGI                                 INTEGER ::= 512
maxnoofSMBRValues                           INTEGER ::= 8
maxnoofMBSAreaSessionIDs                    INTEGER ::= 256
maxnoofSharedNG-UTerminations               INTEGER ::= 8
maxnoofMRBs                                 INTEGER ::= 32
maxnoofMBSSessionIDs                        INTEGER ::= 512


-- **************************************************************
--
-- IEs
--
-- **************************************************************

id-Cause                                                        ProtocolIE-ID ::= 0
id-CriticalityDiagnostics                                       ProtocolIE-ID ::= 1
id-gNB-CU-CP-UE-E1AP-ID                                         ProtocolIE-ID ::= 2
id-gNB-CU-UP-UE-E1AP-ID                                         ProtocolIE-ID ::= 3
id-ResetType                                                    ProtocolIE-ID ::= 4
id-UE-associatedLogicalE1-ConnectionItem                        ProtocolIE-ID ::= 5
id-UE-associatedLogicalE1-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-EarlyForwardingCOUNTReq                                      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-E1AP-ID                                       ProtocolIE-ID ::= 155
id-GNB-CU-UP-MBS-E1AP-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-MBSMulticastF1UContextDescriptor                            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


END
-- ASN1STOP
```

9.4.8 Container Definitions

```
-- ASN1START
-- **************************************************************
--
-- Container definitions
--
-- **************************************************************
```

```
E1AP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) e1ap (5) version1 (1) e1ap-Containers (5) }


DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    maxPrivateIEs,
    maxProtocolExtensions,
    maxProtocolIEs,
    Criticality,
    Presence,
    PrivateIE-ID,
    ProtocolIE-ID

FROM E1AP-CommonDataTypes;

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

E1AP-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 RAN3#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

History

Document history		
V17.0.0	April 2022	Publication
V17.1.0	July 2022	Publication