

ETSI TS 137 483 V17.7.0 (2024-02)



5G;
E1 Application Protocol (E1AP)
(3GPP TS 37.483 version 17.7.0 Release 17)



Reference

RTS/TSGR-0337483vh70

Keywords

5G

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:

<https://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our
Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2024.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under <https://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	12
1 Scope	13
2 References	13
3 Definitions and abbreviations.....	14
3.1 Definitions	14
3.2 Abbreviations	16
4 General	16
4.1 Procedure specification principles.....	16
4.2 Forwards and backwards compatibility.....	17
4.3 Specification notations	17
5 E1AP services	17
6 Services expected from signalling transport.....	18
7 Functions of E1AP	18
8 E1AP procedures.....	18
8.1 List of E1AP Elementary Procedures.....	18
8.2 Interface Management procedures	21
8.2.1 Reset	21
8.2.1.1 General	21
8.2.1.2 Successful Operation.....	22
8.2.1.2.1 Reset Procedure Initiated from the gNB-CU-CP.....	22
8.2.1.2.2 Reset Procedure Initiated from the gNB-CU-UP	23
8.2.1.3 Abnormal Conditions	23
8.2.2 Error Indication.....	24
8.2.2.1 General	24
8.2.2.2 Successful Operation.....	24
8.2.2.3 Abnormal Conditions	24
8.2.3 gNB-CU-UP E1 Setup.....	25
8.2.3.1 General	25
8.2.3.2 Successful Operation.....	25
8.2.3.3 Unsuccessful Operation	26
8.2.3.4 Abnormal Conditions	26
8.2.4 gNB-CU-CP E1 Setup	27
8.2.4.1 General	27
8.2.4.2 Successful Operation.....	27
8.2.4.3 Unsuccessful Operation	28
8.2.4.4 Abnormal Conditions	28
8.2.5 gNB-CU-UP Configuration Update.....	28
8.2.5.1 General	28
8.2.5.2 Successful Operation.....	29
8.2.5.3 Unsuccessful Operation	30
8.2.5.4 Abnormal Conditions	30
8.2.6 gNB-CU-CP Configuration Update.....	30
8.2.6.1 General	30
8.2.6.2 Successful Operation.....	31
8.2.6.3 Unsuccessful Operation	32
8.2.6.4 Abnormal Conditions	32
8.2.7 E1 Release	32
8.2.7.1 General	32

8.2.7.2	Successful Operation.....	32
8.2.7.2.1	E1 Release Procedure Initiated from the gNB-CU-CP.....	32
8.2.7.2.2	E1 Release Procedure Initiated from the gNB-CU-UP.....	33
8.2.7.3	Abnormal Conditions.....	33
8.2.8	gNB-CU-UP Status Indication.....	34
8.2.8.1	General.....	34
8.2.8.2	Successful Operation.....	34
8.2.8.3	Abnormal Conditions.....	34
8.2.9	Resource Status Reporting Initiation.....	34
8.2.9.1	General.....	34
8.2.9.2	Successful Operation.....	34
8.2.9.3	Unsuccessful Operation.....	35
8.2.9.4	Abnormal Conditions.....	35
8.2.10	Resource Status Reporting.....	35
8.2.10.1	General.....	35
8.2.10.2	Successful Operation.....	36
8.2.10.3	Unsuccessful Operation.....	36
8.2.10.4	Abnormal Conditions.....	36
8.3	Bearer Context Management procedures.....	36
8.3.1	Bearer Context Setup.....	36
8.3.1.1	General.....	36
8.3.1.2	Successful Operation.....	36
8.3.1.3	Unsuccessful Operation.....	41
8.3.1.4	Abnormal Conditions.....	41
8.3.2	Bearer Context Modification (gNB-CU-CP initiated).....	42
8.3.2.1	General.....	42
8.3.2.2	Successful Operation.....	42
8.3.2.3	Unsuccessful Operation.....	48
8.3.2.4	Abnormal Conditions.....	48
8.3.3	Bearer Context Modification Required (gNB-CU-UP initiated).....	48
8.3.3.1	General.....	48
8.3.3.2	Successful Operation.....	49
8.3.3.3	Abnormal Conditions.....	49
8.3.4	Bearer Context Release (gNB-CU-CP initiated).....	49
8.3.4.1	General.....	49
8.3.4.2	Successful Operation.....	50
8.3.4.3	Abnormal Conditions.....	50
8.3.5	Bearer Context Release Request (gNB-CU-UP initiated).....	50
8.3.5.1	General.....	50
8.3.5.2	Successful Operation.....	50
8.3.5.3	Abnormal Conditions.....	51
8.3.6	Bearer Context Inactivity Notification.....	51
8.3.6.1	General.....	51
8.3.6.2	Successful Operation.....	51
8.3.6.3	Abnormal Conditions.....	51
8.3.7	DL Data Notification.....	52
8.3.7.1	General.....	52
8.3.7.2	Successful Operation.....	52
8.3.7.3	Abnormal Conditions.....	52
8.3.8	Data Usage Report.....	52
8.3.8.1	General.....	52
8.3.8.2	Successful Operation.....	53
8.3.8.3	Abnormal Conditions.....	53
8.3.9	gNB-CU-UP Counter Check.....	53
8.3.9.1	General.....	53
8.3.9.2	Successful Operation.....	53
8.3.9.3	Unsuccessful Operation.....	53
8.3.9.4	Abnormal Conditions.....	53
8.3.10	UL Data Notification.....	54
8.3.10.1	General.....	54
8.3.10.2	Successful Operation.....	54
8.3.10.3	Abnormal Conditions.....	54

8.3.11	MR-DC Data Usage Report	54
8.3.11.1	General	54
8.3.11.2	Successful Operation	54
8.3.11.3	Abnormal Conditions	55
8.3.12	Early Forwarding SN Transfer	55
8.3.12.1	General	55
8.3.12.2	Successful Operation	55
8.3.12.3	Unsuccessful Operation	55
8.3.12.4	Abnormal Conditions	55
8.3.13	GNB-CU-CP Measurement Results Information	55
8.3.13.1	General	55
8.3.13.2	Successful Operation	56
8.3.13.3	Abnormal Conditions	56
8.4	Trace Procedures	56
8.4.1	Trace Start	56
8.4.1.1	General	56
8.4.1.2	Successful Operation	56
8.4.1.3	Abnormal Conditions	56
8.4.2	Deactivate Trace	57
8.4.2.1	General	57
8.4.2.2	Successful Operation	57
8.4.2.3	Abnormal Conditions	57
8.4.3	Cell Traffic Trace	57
8.4.3.1	General	57
8.4.3.2	Successful Operation	57
8.4.3.3	Abnormal Conditions	58
8.5	IAB Procedures	58
8.5.1	IAB UP TNL Address Update	58
8.5.1.1	General	58
8.5.1.2	Successful Operation	58
8.5.1.3	Unsuccessful Operation	59
8.5.1.4	Abnormal Conditions	59
8.5.2	IAB PSK Notification	59
8.5.2.1	General	59
8.5.2.2	Successful Operation	59
8.5.2.3	Abnormal Conditions	60
8.6	MBS Procedures	60
8.6.1	MBS Procedures for Broadcast	60
8.6.1.1	BC Bearer Context Setup	60
8.6.1.1.1	General	60
8.6.1.1.2	Successful Operation	60
8.6.1.1.3	Unsuccessful Operation	61
8.6.1.1.4	Abnormal Conditions	61
8.6.1.2	BC Bearer Context Modification (gNB-CU-CP initiated)	61
8.6.1.2.1	General	61
8.6.1.2.2	Successful Operation	62
8.6.1.2.3	Unsuccessful Operation	63
8.6.1.2.4	Abnormal Conditions	63
8.6.1.3	BC Bearer Context Modification Required	63
8.6.1.3.1	General	63
8.6.1.3.2	Successful Operation	63
8.6.1.3.3	Abnormal Conditions	64
8.6.1.4	BC Bearer Context Release (gNB-CU-CP initiated)	64
8.6.1.4.1	General	64
8.6.1.4.2	Successful Operation	64
8.6.1.4.3	Abnormal Conditions	64
8.6.1.5	BC Bearer Context Release Request (gNB-CU-UP initiated)	64
8.6.1.5.1	General	64
8.6.1.5.2	Successful Operation	65
8.6.1.5.3	Abnormal Conditions	65
8.6.2	MBS Procedures for Multicast	65
8.6.2.1	MC Bearer Context Setup	65

8.6.2.1.1	General	65
8.6.2.1.2	Successful Operation	65
8.6.2.1.3	Unsuccessful Operation	67
8.6.2.1.4	Abnormal Conditions	67
8.6.2.2	MC Bearer Context Modification (gNB-CU-CP initiated)	67
8.6.2.2.1	General	67
8.6.2.2.2	Successful Operation	67
8.6.2.2.3	Unsuccessful Operation	69
8.6.2.2.4	Abnormal Conditions	69
8.6.2.3	MC Bearer Context Modification Required (gNB-CU-UP initiated).....	70
8.6.2.3.1	General	70
8.6.2.3.2	Successful Operation	70
8.6.2.3.3	Abnormal Conditions	70
8.6.2.4	MC Bearer Context Release (gNB-CU-CP initiated).....	70
8.6.2.4.1	General	70
8.6.2.4.2	Successful Operation	71
8.6.2.4.3	Abnormal Conditions	71
8.6.2.5	MC Bearer Context Release Request (gNB-CU-UP initiated).....	71
8.6.2.5.1	General	71
8.6.2.5.2	Successful Operation	71
8.6.2.5.3	Abnormal Conditions	72
8.6.2.6	MC Bearer Notification.....	72
8.6.2.6.1	General	72
8.6.2.6.2	Successful Operation	72
8.6.2.6.3	Abnormal Conditions	72
9	Elements for E1AP communication	72
9.1	General	72
9.2	Message Functional Definition and Content	73
9.2.1	Interface Management messages	73
9.2.1.1	RESET	73
9.2.1.2	RESET ACKNOWLEDGE	73
9.2.1.3	ERROR INDICATION	74
9.2.1.4	GNB-CU-UP E1 SETUP REQUEST	74
9.2.1.5	GNB-CU-UP E1 SETUP RESPONSE.....	75
9.2.1.6	GNB-CU-UP E1 SETUP FAILURE.....	75
9.2.1.7	GNB-CU-CP E1 SETUP REQUEST	76
9.2.1.8	GNB-CU-CP E1 SETUP RESPONSE.....	76
9.2.1.9	GNB-CU-CP E1 SETUP FAILURE.....	77
9.2.1.10	GNB-CU-UP CONFIGURATION UPDATE.....	77
9.2.1.11	GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE.....	78
9.2.1.12	GNB-CU-UP CONFIGURATION UPDATE FAILURE.....	78
9.2.1.13	GNB-CU-CP CONFIGURATION UPDATE.....	79
9.2.1.14	GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE	80
9.2.1.15	GNB-CU-CP CONFIGURATION UPDATE FAILURE	80
9.2.1.16	E1 RELEASE REQUEST.....	81
9.2.1.17	E1 RELEASE RESPONSE.....	81
9.2.1.18	GNB-CU-UP STATUS INDICATION.....	81
9.2.1.19	RESOURCE STATUS REQUEST.....	81
9.2.1.20	RESOURCE STATUS RESPONSE.....	82
9.2.1.21	RESOURCE STATUS FAILURE	83
9.2.1.22	RESOURCE STATUS UPDATE	83
9.2.2	Bearer Context Management messages	83
9.2.2.1	BEARER CONTEXT SETUP REQUEST	83
9.2.2.2	BEARER CONTEXT SETUP RESPONSE	85
9.2.2.3	BEARER CONTEXT SETUP FAILURE	85
9.2.2.4	BEARER CONTEXT MODIFICATION REQUEST	86
9.2.2.5	BEARER CONTEXT MODIFICATION RESPONSE	87
9.2.2.6	BEARER CONTEXT MODIFICATION FAILURE	88
9.2.2.7	BEARER CONTEXT MODIFICATION REQUIRED	89
9.2.2.8	BEARER CONTEXT MODIFICATION CONFIRM	89
9.2.2.9	BEARER CONTEXT RELEASE COMMAND.....	90

9.2.2.10	BEARER CONTEXT RELEASE COMPLETE	90
9.2.2.11	BEARER CONTEXT RELEASE REQUEST	90
9.2.2.12	BEARER CONTEXT INACTIVITY NOTIFICATION	91
9.2.2.13	DL DATA NOTIFICATION	92
9.2.2.14	DATA USAGE REPORT	92
9.2.2.15	GNB-CU-UP COUNTER CHECK REQUEST	92
9.2.2.16	UL DATA NOTIFICATION	94
9.2.2.17	MR-DC DATA USAGE REPORT	94
9.2.2.18	EARLY FORWARDING SN TRANSFER	95
9.2.2.19	GNB-CU-CP MEASUREMENT RESULTS INFORMATION	95
9.2.3	Trace Messages	96
9.2.3.1	TRACE START	96
9.2.3.2	DEACTIVATE TRACE	96
9.2.3.3	CELL TRAFFIC TRACE	96
9.2.4	IAB Messages	97
9.2.4.1	IAB UP TNL ADDRESS UPDATE	97
9.2.4.2	IAB UP TNL ADDRESS UPDATE ACKNOWLEDGE	97
9.2.4.3	IAB UP TNL ADDRESS UPDATE FAILURE	98
9.2.4.4	IAB PSK NOTIFICATION	98
9.2.5	MBS Messages	98
9.2.5.1	MBS Messages for Broadcast	98
9.2.5.1.1	BC BEARER CONTEXT SETUP REQUEST	99
9.2.5.1.2	BC BEARER CONTEXT SETUP RESPONSE	99
9.2.5.1.3	BC BEARER CONTEXT SETUP FAILURE	99
9.2.5.1.4	BC BEARER CONTEXT MODIFICATION REQUEST	99
9.2.5.1.5	BC BEARER CONTEXT MODIFICATION RESPONSE	100
9.2.5.1.6	BC BEARER CONTEXT MODIFICATION FAILURE	100
9.2.5.1.7	BC BEARER CONTEXT MODIFICATION REQUIRED	100
9.2.5.1.8	BC BEARER CONTEXT MODIFICATION CONFIRM	101
9.2.5.1.9	BC BEARER CONTEXT RELEASE COMMAND	101
9.2.5.1.10	BC BEARER CONTEXT RELEASE COMPLETE	101
9.2.5.1.11	BC BEARER CONTEXT RELEASE REQUEST	101
9.2.5.2	MBS Messages for Multicast	102
9.2.5.2.1	MC BEARER CONTEXT SETUP REQUEST	102
9.2.5.2.2	MC BEARER CONTEXT SETUP RESPONSE	102
9.2.5.2.3	MC BEARER CONTEXT SETUP FAILURE	102
9.2.5.2.4	MC BEARER CONTEXT MODIFICATION REQUEST	102
9.2.5.2.5	MC BEARER CONTEXT MODIFICATION RESPONSE	103
9.2.5.2.6	MC BEARER CONTEXT MODIFICATION FAILURE	103
9.2.5.2.7	MC BEARER CONTEXT MODIFICATION REQUIRED	103
9.2.5.2.8	MC BEARER CONTEXT MODIFICATION CONFIRM	104
9.2.5.2.9	MC BEARER CONTEXT RELEASE COMMAND	104
9.2.5.2.10	MC BEARER CONTEXT RELEASE COMPLETE	104
9.2.5.2.11	MC BEARER CONTEXT RELEASE REQUEST	104
9.2.5.2.12	MC BEARER NOTIFICATION	105
9.3	Information Element Definitions	105
9.3.1	Radio Network Layer Related IEs	105
9.3.1.1	Message Type	105
9.3.1.2	Cause	105
9.3.1.3	Criticality Diagnostics	109
9.3.1.4	gNB-CU-CP UE E1AP ID	110
9.3.1.5	gNB-CU-UP UE E1AP ID	110
9.3.1.6	Time To wait	110
9.3.1.7	PLMN Identity	111
9.3.1.8	Slice Support List	111
9.3.1.9	S-NSSAI	111
9.3.1.10	Security Information	111
9.3.1.11	Cell Group Information	111
9.3.1.12	QoS Flow List	112
9.3.1.13	UP Parameters	113
9.3.1.14	NR CGI	113
9.3.1.15	gNB-CU-UP ID	113

9.3.1.16	DRB ID	114
9.3.1.16a	MRB ID	114
9.3.1.17	E-UTRAN QoS	114
9.3.1.18	E-UTRAN Allocation and Retention Priority	114
9.3.1.19	GBR QoS Information	115
9.3.1.20	Bit Rate	116
9.3.1.21	PDU Session ID	116
9.3.1.22	PDU Session Type	116
9.3.1.23	Security Indication	116
9.3.1.24	QoS Flow Identifier	117
9.3.1.25	QoS Flow QoS Parameters List	117
9.3.1.26	QoS Flow Level QoS Parameters	117
9.3.1.27	Non Dynamic 5QI Descriptor	118
9.3.1.28	Dynamic 5QI Descriptor	119
9.3.1.29	NG-RAN Allocation and Retention Priority	120
9.3.1.30	GBR QoS Flow Information	121
9.3.1.31	Security Algorithm	122
9.3.1.32	User Plane Security Keys	122
9.3.1.33	UL Configuration	122
9.3.1.34	gNB-CU-UP Cell Group Related Configuration	122
9.3.1.35	PDCP Count	123
9.3.1.35a	MBS PDCP COUNT	123
9.3.1.36	NR CGI Support List	123
9.3.1.37	QoS Parameters Support List	124
9.3.1.38	PDCP Configuration	124
9.3.1.39	SDAP Configuration	127
9.3.1.40	ROHC Parameters	127
9.3.1.41	T-Reordering Timer	128
9.3.1.42	Discard Timer	129
9.3.1.43	UL Data Split Threshold	129
9.3.1.44	Data Usage Report List	129
9.3.1.45	Flow Failed List	130
9.3.1.46	Packet Loss Rate	130
9.3.1.47	Packet Delay Budget	130
9.3.1.48	Packet Error Rate	131
9.3.1.49	Averaging Window	131
9.3.1.50	Maximum Data Burst Volume	131
9.3.1.51	Priority Level	131
9.3.1.52	Security Result	131
9.3.1.53	Transaction ID	132
9.3.1.54	Inactivity timer	132
9.3.1.55	Paging Priority Indicator (PPI)	132
9.3.1.56	gNB-CU-UP Capacity	132
9.3.1.57	Maximum Integrity Protected Data Rate	132
9.3.1.58	PDCP SN Status Information	133
9.3.1.59	QoS Flow Mapping List	133
9.3.1.60	QoS Flow Mapping Indication	134
9.3.1.61	PDCP SN Size	134
9.3.1.62	Network Instance	134
9.3.1.63	MR-DC Usage Information	134
9.3.1.64	MR-DC Data Usage Report List	135
9.3.1.65	gNB-DU ID	135
9.3.1.66	Common Network Instance	136
9.3.1.67	Activity Notification Level	136
9.3.1.68	Trace Activation	136
9.3.1.69	Subscriber Profile ID for RAT/Frequency priority	137
9.3.1.70	Additional RRM Policy Index	137
9.3.1.71	Retainability Measurements Information	137
9.3.1.72	TNL Available Capacity Indicator	138
9.3.1.73	HW Capacity Indicator	138
9.3.1.74	Redundant QoS Flow Indicator	139
9.3.1.75	TSC Traffic Characteristics	139

9.3.1.76	TSC Assistance Information	139
9.3.1.77	Periodicity	139
9.3.1.78	Burst Arrival Time	139
9.3.1.79	Extended Packet Delay Budget	140
9.3.1.80	Redundant PDU Session Information	140
9.3.1.81	QoS Mapping Information	140
9.3.1.82	NID	140
9.3.1.83	NPN Support Information	140
9.3.1.84	NPN Context Information	141
9.3.1.85	MDT Configuration	141
9.3.1.86	M4 Configuration.....	142
9.3.1.87	M6 Configuration.....	142
9.3.1.88	M7 Configuration.....	142
9.3.1.89	MDT PLMN List	143
9.3.1.90	EHC Parameters.....	143
9.3.1.91	DAPS Request Information.....	144
9.3.1.92	Early Forwarding COUNT Information.....	144
9.3.1.93	Alternative QoS Parameters Set List.....	145
9.3.1.94	Extended Slice Support List.....	145
9.3.1.95	Extended gNB-CU-CP Name.....	145
9.3.1.96	Extended gNB-CU-UP Name	146
9.3.1.97	Extended NR CGI Support List	146
9.3.1.98	Direct Forwarding Path Availability	146
9.3.1.99	IAB-donor-CU-UP PSK Info	146
9.3.1.100	ECGI Support List	147
9.3.1.101	ECGI	147
9.3.1.102	UE Slice Maximum Bit Rate List	147
9.3.1.103	Survival Time.....	147
9.3.1.104	UDC Parameters	147
9.3.1.105	SCG Activation Status	148
9.3.1.106	gNB-CU-CP MBS E1AP ID.....	149
9.3.1.107	gNB-CU-UP MBS E1AP ID.....	149
9.3.1.108	Global MBS Session ID.....	149
9.3.1.109	DU Cell Reference	149
9.3.1.110	gNB-CU-UP MBS Support Information.....	149
9.3.1.111	MBS Area Session ID	150
9.3.1.112	BC Bearer Context NG-U TNL Info at 5GC	150
9.3.1.113	MBS NG-U Information at 5GC.....	150
9.3.1.114	BC MRB Setup Configuration	151
9.3.1.115	Requested Action for Available Shared NG-U Termination.....	151
9.3.1.116	BC Bearer Context NG-U TNL Info at NG-RAN.....	151
9.3.1.117	MBS NG-U Information at NG-RAN	152
9.3.1.118	BC Bearer Context F1-U TNL Info at CU	152
9.3.1.119	BC Bearer Context F1-U TNL Info at DU	152
9.3.1.120	MC MRB Setup Configuration	153
9.3.1.121	MC Bearer Context NG-U TNL Info at NG-RAN.....	153
9.3.1.122	MC Bearer Context NG-U TNL Info at 5GC.....	153
9.3.1.123	MC Bearer Context NG-U TNL Info at NG-RAN Request.....	154
9.3.1.124	MC Bearer Context F1-U TNL Info at DU	154
9.3.1.125	MBS Multicast F1-U Context Descriptor	154
9.3.1.126	Void.....	155
9.3.1.127	MC Bearer Context NG-U TNL Info at NG-RAN Modify Response.....	155
9.3.1.128	Discard Timer Extended	155
9.3.1.129	MDT PLMN Modification List.....	155
9.3.1.130	MRB Progress Information	155
9.3.1.131	MRB Progress Information Type	156
9.3.1.132	MC Forwarding Resource ID	156
9.3.1.133	MBS Session Associated Information.....	156
9.3.1.134	MC Forwarding Resource Request	156
9.3.1.135	MC Forwarding Resource Indication	157
9.3.1.136	MC Forwarding Resource Response.....	157
9.3.1.137	MC Forwarding Resource Release.....	157

9.3.1.138	MC Forwarding Resource Release Indication.....	158
9.3.1.139	Multicast F1-U Context ReferenceE1	158
9.3.1.140	MBS Session Associated Information Non-Support-to-Support.....	158
9.3.1.141	MBS Session Associated Information List	158
9.3.2	Transport Network Layer Related IEs	159
9.3.2.1	UP Transport Layer Information.....	159
9.3.2.2	CP Transport Layer Information	159
9.3.2.3	GTP-TEID.....	159
9.3.2.4	Transport Layer Address.....	159
9.3.2.5	Data Forwarding Information Request.....	160
9.3.2.6	Data Forwarding Information.....	160
9.3.2.7	Transport Network Layer Address Info	160
9.3.2.8	URI.....	161
9.3.3	Container and List IE definitions	161
9.3.3.1	DRB To Setup List E-UTRAN	161
9.3.3.2	PDU Session Resource To Setup List	162
9.3.3.3	DRB Setup List E-UTRAN.....	164
9.3.3.4	DRB Failed List E-UTRAN.....	164
9.3.3.5	PDU Session Resource Setup List	164
9.3.3.6	PDU Session Resource Failed List.....	165
9.3.3.7	DRB To Setup Modification List E-UTRAN.....	166
9.3.3.8	DRB To Modify List E-UTRAN	166
9.3.3.9	DRB To Remove List E-UTRAN	167
9.3.3.10	PDU Session Resource To Setup Modification List	167
9.3.3.11	PDU Session Resource To Modify List	168
9.3.3.12	PDU Session Resource To Remove List.....	172
9.3.3.13	DRB Setup Modification List E-UTRAN	172
9.3.3.14	DRB Failed Modification List E-UTRAN	173
9.3.3.15	DRB Modified List E-UTRAN.....	173
9.3.3.16	DRB Failed To Modify List E-UTRAN.....	173
9.3.3.17	PDU Session Resource Setup Modification List.....	174
9.3.3.18	PDU Session Resource Failed Modification List.....	174
9.3.3.19	PDU Session Resource Modified List.....	175
9.3.3.20	PDU Session Resource Failed To Modify List	176
9.3.3.21	DRB Required To Modify List E-UTRAN.....	176
9.3.3.22	DRB Required To Remove List E-UTRAN.....	177
9.3.3.23	PDU Session Resource Required To Modify List.....	177
9.3.3.24	DRB Confirm Modified List E-UTRAN.....	177
9.3.3.25	PDU Session Resource Confirm Modified List	178
9.3.3.26	BC Bearer Context To Setup.....	178
9.3.3.27	BC Bearer Context To Setup Response	178
9.3.3.28	BC Bearer Context To Modify.....	179
9.3.3.29	BC Bearer Context To Modify Response.....	179
9.3.3.30	BC Bearer Context To Modify Required	180
9.3.3.31	BC Bearer Context To Modify Confirm	180
9.3.3.32	MC Bearer Context To Setup.....	180
9.3.3.33	MC Bearer Context To Setup Response.....	181
9.3.3.34	MC Bearer Context To Modify	181
9.3.3.35	MC Bearer Context To Modify Response.....	182
9.3.3.36	MC Bearer Context To Modify Required	183
9.3.3.37	MC Bearer Context To Modify Confirm	184
9.4	Message and Information Element Abstract Syntax (with ASN.1).....	184
9.4.1	General.....	184
9.4.2	Usage of private message mechanism for non-standard use.....	184
9.4.3	Elementary Procedure Definitions	185
9.4.4	PDU Definitions	195
9.4.5	Information Element Definitions	234
9.4.6	Common Definitions.....	302
9.4.7	Constant Definitions	303
9.4.8	Container Definitions.....	309
10	Handling of unknown, unforeseen and erroneous protocol data	313

Annex A (informative): **Change History**314
History316

Foreword

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

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

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the 5G radio network layer signalling protocol for the E1 interface. The E1 interface provides means for interconnecting a gNB-CU-CP and a gNB-CU-UP of a gNB within an NG-RAN, or for interconnecting a gNB-CU-CP and a gNB-CU-UP of an en-gNB within an E-UTRAN, or for interconnecting an eNB-CP and an eNB-UP of an eNB within an E-UTRAN, or for interconnecting an ng-eNB-CU-CP and an ng-eNB-CU-UP of an ng-eNB within an NG-RAN. The E1 Application Protocol (E1AP) supports the functions of E1 interface by signalling procedures defined in the present document. E1AP is developed in accordance to the general principles stated in TS 38.401 [2] and TS 37.480 [3].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 38.401: "NG-RAN; Architecture Description".
- [3] 3GPP TS 37.480: "E1 general aspects and principles".
- [4] 3GPP TS 38.300: "NR; Overall description; Stage-2".
- [5] 3GPP TR 25.921 (version.7.0.0): "Guidelines and principles for protocol description and error".
- [6] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".
- [7] ITU-T Recommendation X.691 (2002-07): "Information technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".
- [8] ITU-T Recommendation X.680 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation".
- [9] ITU-T Recommendation X.681 (07/2002): "Information technology – Abstract Syntax Notation One (ASN.1): Information object specification".
- [10] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specificaiton".
- [11] 3GPP TS 23.401: "General Packet Radio Service (GPRS) Enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [12] 3GPP TS 23.203: "Policy and Charging Control Architecture".
- [13] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".
- [14] IETF RFC 5905: "Network Time Protocol Version 4: Protocol and Algorithms Specification".
- [15] 3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)".
- [16] 3GPP TS 38.414: "NG-RAN; NG Data Transport".
- [17] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

- [18] 3GPP TS 37.482: "E1 Signalling Transport".
- [19] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".
- [20] 3GPP TS 23.501: "System Architecture for the 5G System".
- [21] 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].

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

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

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

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

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

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

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

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

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

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

UE-associated logical E1-connection: The UE-associated logical E1-connection uses the identities *GNB-CU-CP UE E1AP ID* and *GNB-CU-UP UE E1AP ID* according to the definition in TS 38.401 [2]. For a received UE associated

E1AP message the gNB-CU-CP or eNB-CP or ng-eNB-CU-CP identifies the associated UE based on the *GNB-CU-CP UE E1AP ID IE* and the gNB-CU-UP or eNB-UP or ng-eNB-CU-UP identifies the associated UE based on the *GNB-CU-UP UE E1AP ID IE*.

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

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

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

5 E1AP services

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

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

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

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

6 Services expected from signalling transport

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

7 Functions of E1AP

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

8 E1AP procedures

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

8.1 List of E1AP Elementary Procedures

In the following tables, all EPs are divided into Class 1 and Class 2 EPs (see subclause 3.1 for explanation of the different classes):

Table 1: Class 1 procedures

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Reset	RESET	RESET ACKNOWLEDGE	
gNB-CU-UP E1 Setup	GNB-CU-UP E1 SETUP REQUEST	GNB-CU-UP E1 SETUP RESPONSE	GNB-CU-UP E1 SETUP FAILURE
gNB-CU-CP E1 Setup	GNB-CU-CP E1 SETUP REQUEST	GNB-CU-CP E1 SETUP RESPONSE	GNB-CU-CP E1 SETUP FAILURE
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	

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
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
MC Bearer Notification	MC BEARER NOTIFICATION

8.2 Interface Management procedures

8.2.1 Reset

8.2.1.1 General

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

The procedure uses non-UE associated signalling.

8.2.1.2 Successful Operation

8.2.1.2.1 Reset Procedure Initiated from the gNB-CU-CP

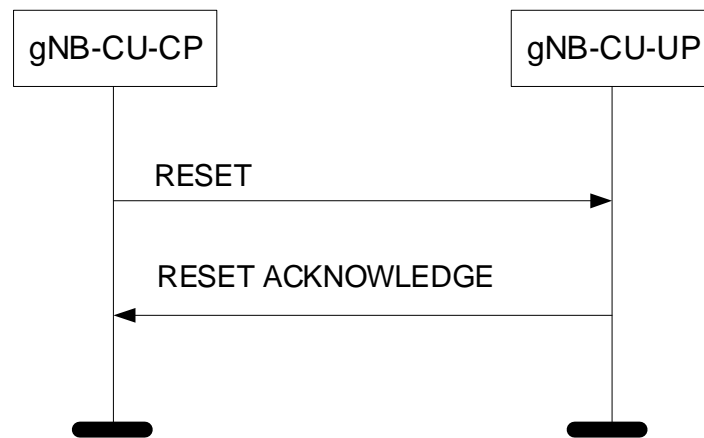


Figure 8.2.1.2.1-1: Reset procedure initiated from the gNB-CU-CP. Successful operation.

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

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

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

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

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

Interactions with other procedures:

If the RESET message is received, any other ongoing procedure (except for another Reset procedure) on the same E1 interface related to a UE association, indicated explicitly or implicitly in the RESET message, shall be aborted.

8.2.1.2.2 Reset Procedure Initiated from the gNB-CU-UP

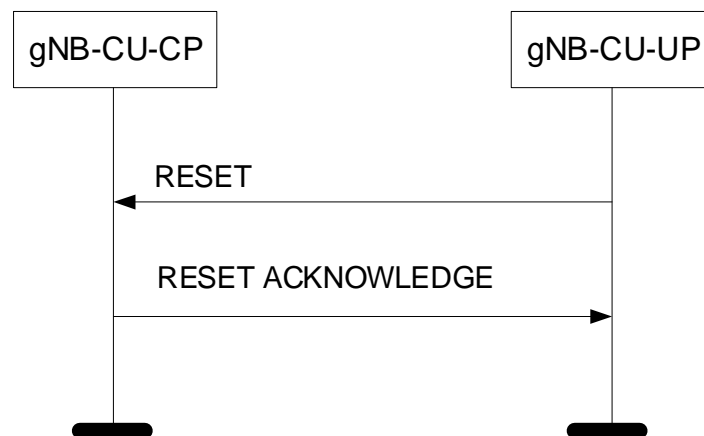


Figure 8.2.1.2.2-1: Reset procedure initiated from the gNB-CU-UP. Successful operation.

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

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

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

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

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

Interactions with other procedures:

If the RESET message is received, any other ongoing procedure (except for another Reset procedure) on the same E1 interface related to a UE association, indicated explicitly or implicitly in the RESET message, shall be aborted.

8.2.1.3 Abnormal Conditions

Not applicable.

8.2.2 Error Indication

8.2.2.1 General

The Error Indication procedure is initiated by a node in order to report detected errors in one incoming message, provided they cannot be reported by an appropriate failure message.

If the error situation arises due to reception of a message utilising UE associated signalling, then the Error Indication procedure uses UE associated signalling. Otherwise the procedure uses non-UE associated signalling.

8.2.2.2 Successful Operation

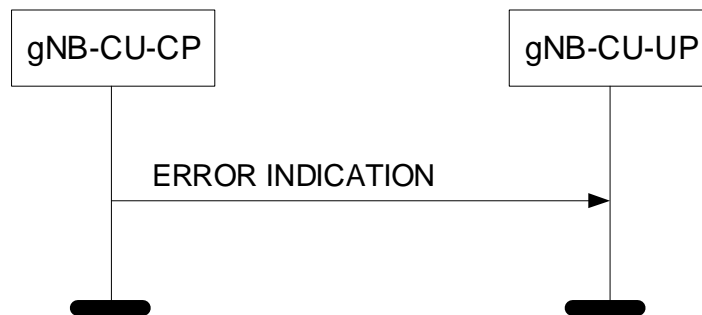


Figure 8.2.2.2-1: Error Indication procedure, gNB-CU-CP originated. Successful operation.

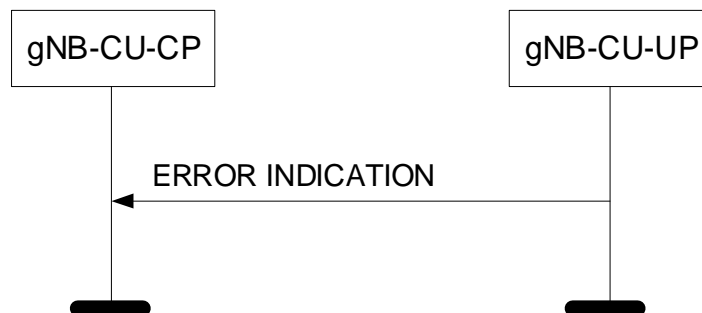


Figure 8.2.2.2-2: Error Indication procedure, gNB-CU-UP originated. Successful operation.

When the conditions defined in clause 10 are fulfilled, the Error Indication procedure is initiated by an ERROR INDICATION message sent from the receiving node.

The ERROR INDICATION message shall contain at least either the *Cause* IE or the *Criticality Diagnostics* IE. In case the Error Indication procedure is triggered by utilising UE associated signalling the *gNB-CU-CP UE E1AP ID* IE and *gNB-CU-UP UE E1AP ID* IE shall be included in the ERROR INDICATION message. If one or both of the *gNB-CU-CP UE E1AP ID* IE and the *gNB-CU-UP UE E1AP ID* IE are not correct, the cause shall be set to appropriate value, e.g., "Unknown or already allocated gNB-CU-CP UE E1AP ID", "Unknown or already allocated gNB-CU-UP UE E1AP ID" or "Unknown or inconsistent pair of UE E1AP ID".

8.2.2.3 Abnormal Conditions

Not applicable.

8.2.3 gNB-CU-UP E1 Setup

8.2.3.1 General

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

This procedure erases any existing application level configuration data in the two nodes and replaces it by the one received. This procedure also re-initialises the E1AP UE-related contexts (if any) and erases all related signalling connections in the two nodes like a Reset procedure would do.

8.2.3.2 Successful Operation

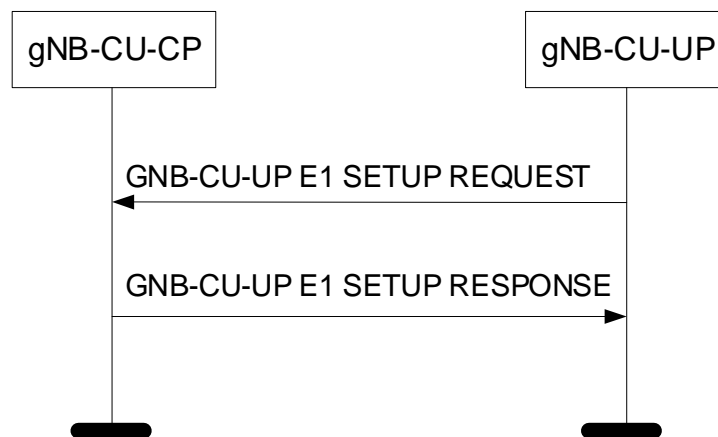


Figure 8.2.3.2-1: gNB-CU-UP E1 Setup procedure: Successful Operation.

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

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

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

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

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

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

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

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

The exchanged data shall be stored in respective node and used as long as there is an operational TNL association. When this procedure is finished, the E1 interface is operational and other E1 messages can be exchanged.

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

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

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

8.2.3.3 Unsuccessful Operation

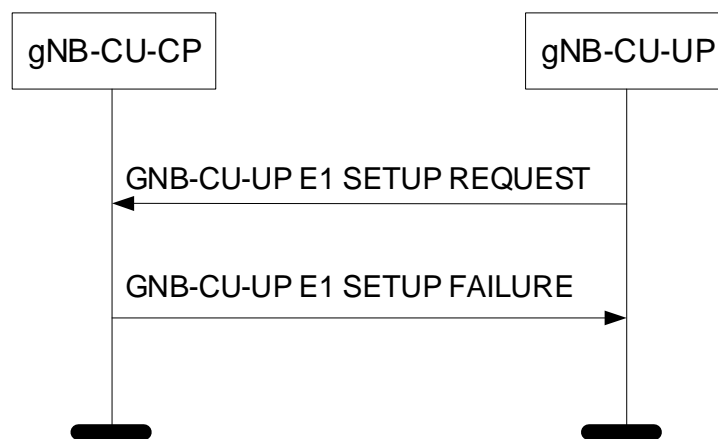


Figure 8.2.3.3-1: gNB-CU-UP E1 Setup procedure: Unsuccessful Operation.

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

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

8.2.3.4 Abnormal Conditions

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

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

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

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

8.2.4 gNB-CU-CP E1 Setup

8.2.4.1 General

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

This procedure erases any existing application level configuration data in the two nodes and replaces it by the one received. This procedure also re-initialises the E1AP UE-related contexts (if any) and erases all related signalling connections in the two nodes like a Reset procedure would do.

8.2.4.2 Successful Operation

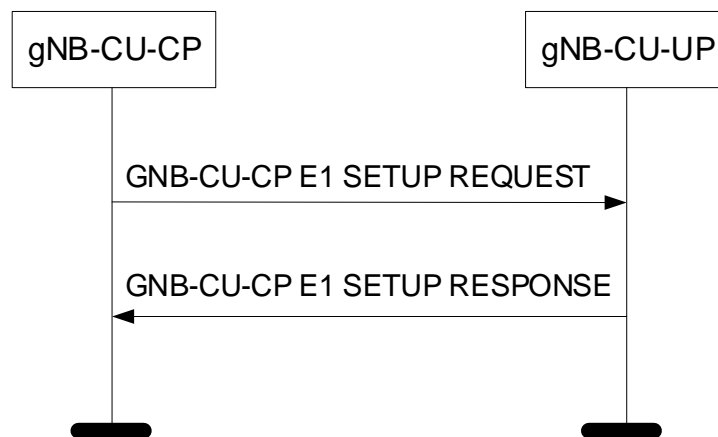


Figure 8.2.4.2-1: gNB-CU-CP E1 Setup procedure: Successful Operation.

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

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

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

The exchanged data shall be stored in respective node and used as long as there is an operational TNL association. When this procedure is finished, the E1 interface is operational and other E1 messages can be exchanged.

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

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

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

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

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

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

8.2.4.3 Unsuccessful Operation

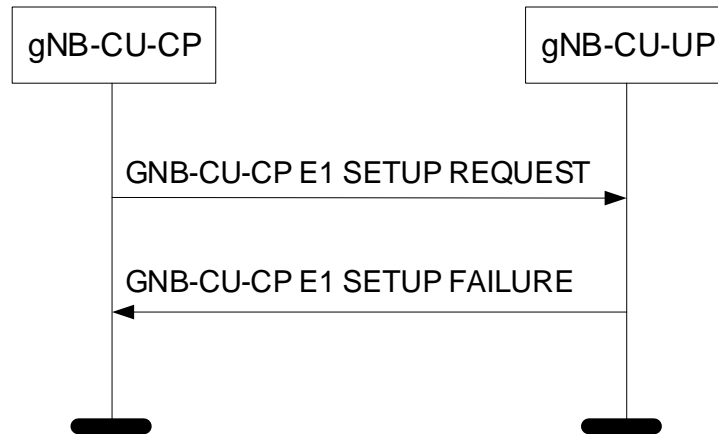


Figure 8.2.4.3-1: gNB-CU-CP E1 Setup procedure: Unsuccessful Operation.

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

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

8.2.4.4 Abnormal Conditions

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

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

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

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

8.2.5 gNB-CU-UP Configuration Update

8.2.5.1 General

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

8.2.5.2 Successful Operation

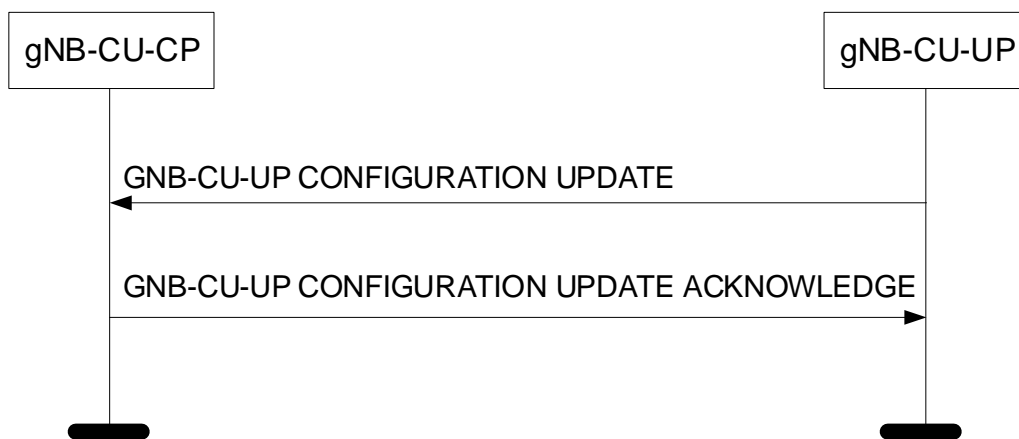


Figure 8.2.5.2-1: gNB-CU-UP Configuration Update procedure: Successful Operation.

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

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

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

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

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

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

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

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

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

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

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

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

8.2.5.3 Unsuccessful Operation

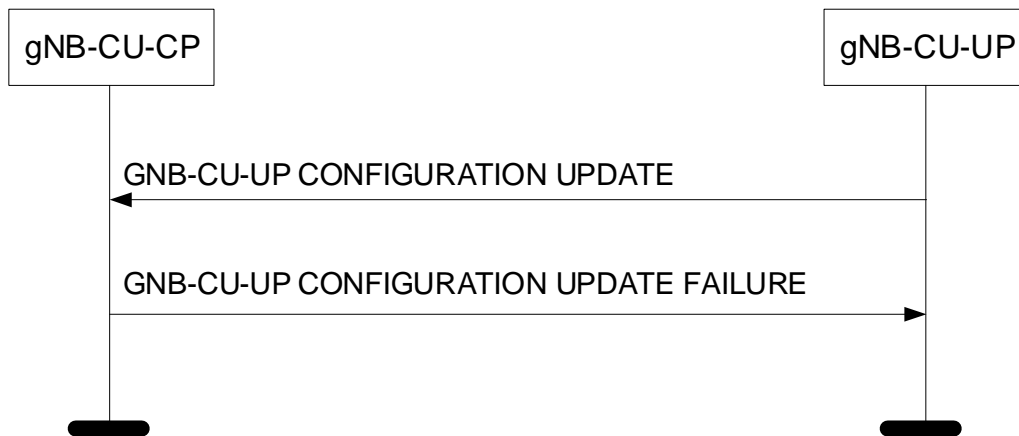


Figure 8.2.5.3-1: gNB-CU-UP Configuration Update procedure: Unsuccessful Operation.

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

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

8.2.5.4 Abnormal Conditions

Not applicable.

8.2.6 gNB-CU-CP Configuration Update

8.2.6.1 General

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

8.2.6.2 Successful Operation

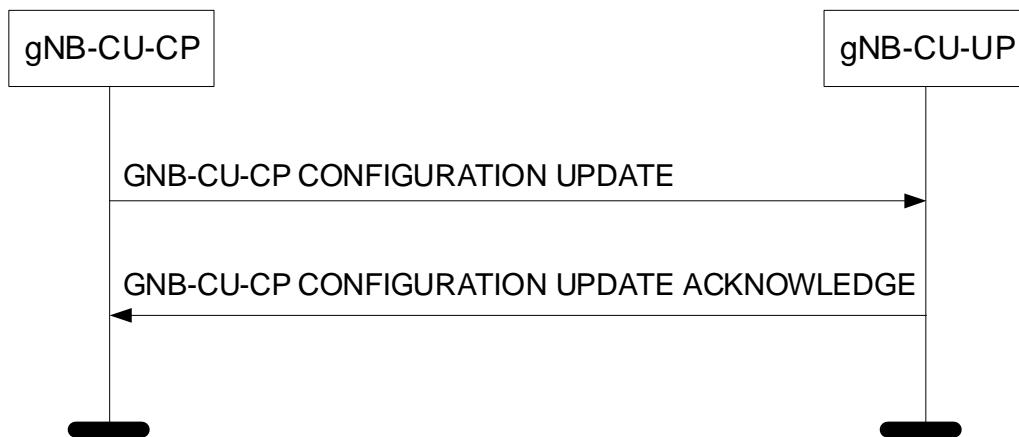


Figure 8.2.6.2-1: gNB-CU-CP Configuration Update procedure: Successful Operation.

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

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

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

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

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

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

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

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

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

If the *TNLA Usage* IE is included in the *gNB-CU-CP TNLA To Add List* IE or the *gNB-CU-CP TNLA To Update List* IE in the gNB-CU-CP CONFIGURATION UPDATE message, the gNB-CU-UP shall, if supported, use it as described in TS 38.462 [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

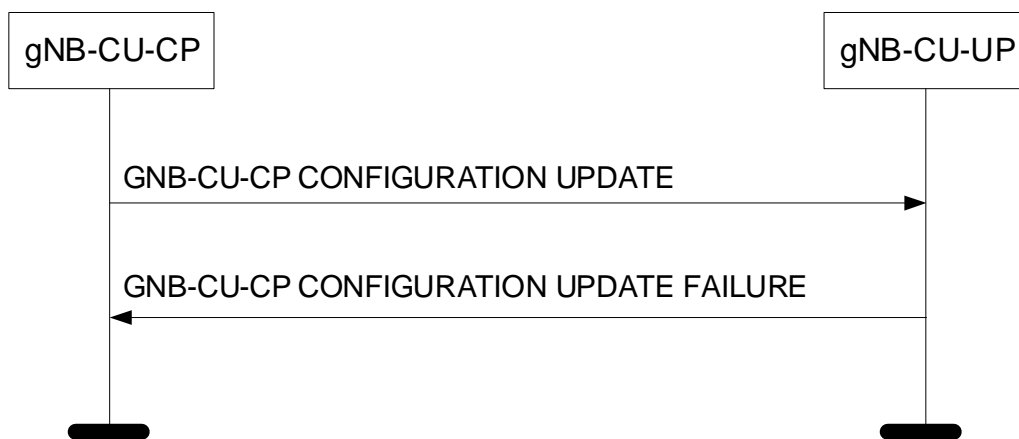


Figure 8.2.6.3-1: gNB-CU-CP Configuration Update procedure: Unsuccessful Operation.

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

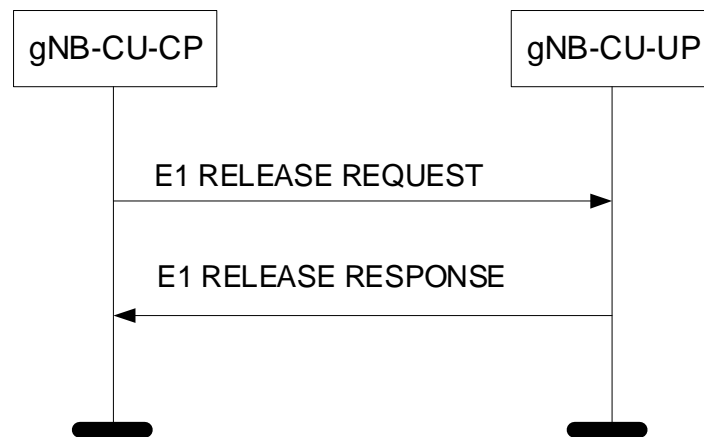


Figure 8.2.7.2.1-1: E1 Release procedure initiated from the gNB-CU-CP. Successful operation.

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

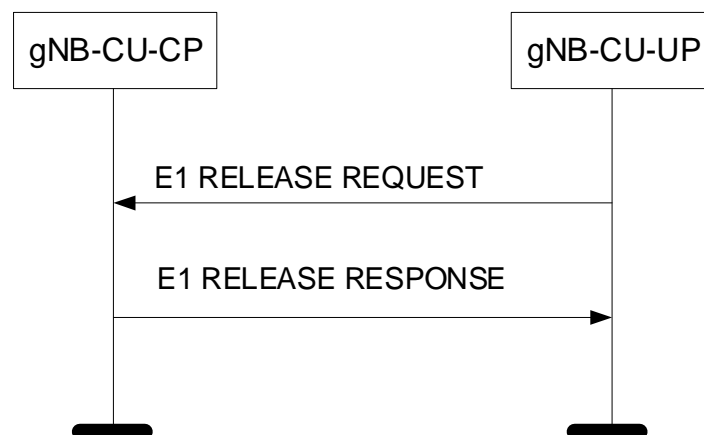


Figure 8.2.7.2.2-1: E1 Release procedure initiated from the gNB-CU-UP. Successful operation.

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

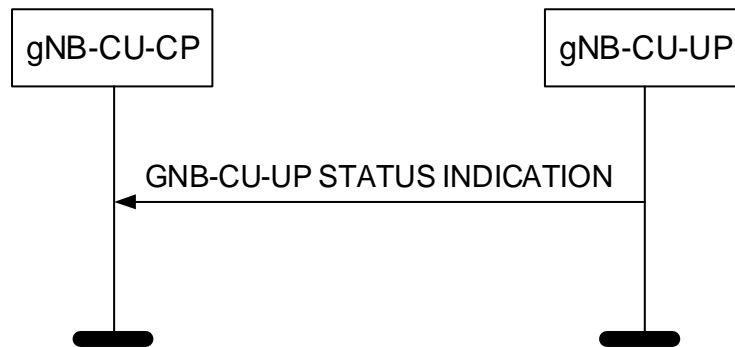


Figure 8.3.7.2-1: DL Data Notification procedure: Successful Operation.

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

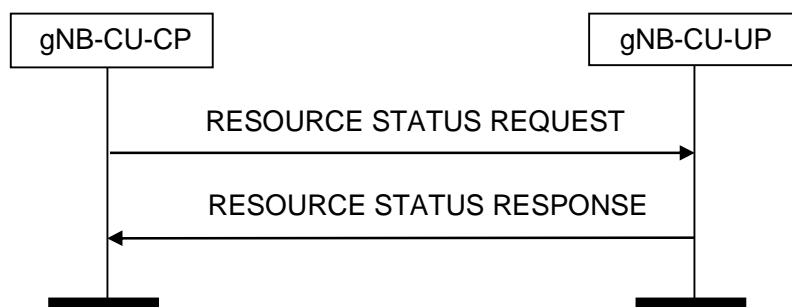


Figure 8.2.9.2-1: Resource Status Reporting Initiation, successful operation

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

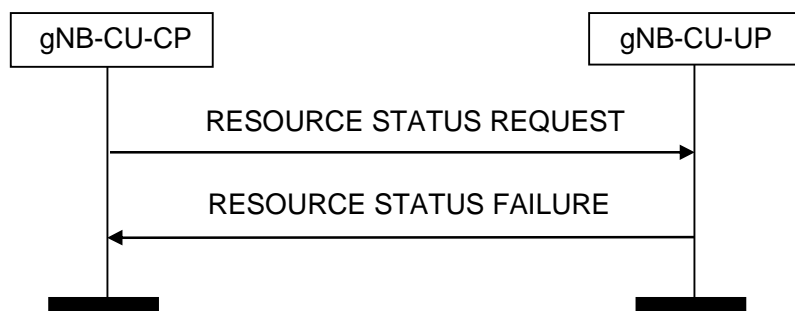


Figure 8.2.9.3-1: Resource Status Reporting Initiation, unsuccessful operation

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

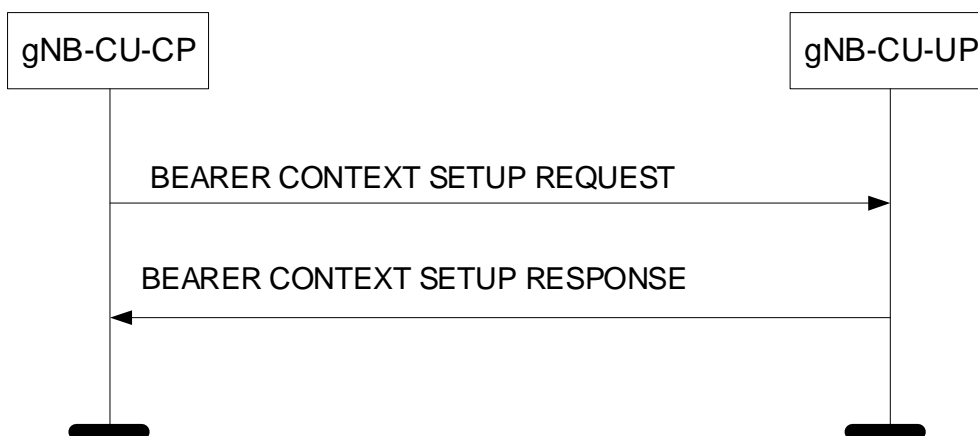


Figure 8.3.1.2-1: Bearer Context Setup procedure: Successful Operation.

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

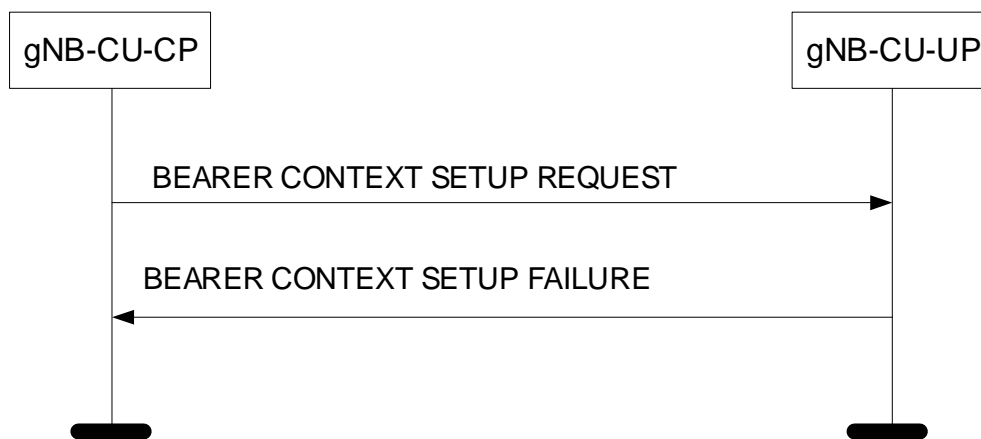


Figure 8.3.1.3-1: Bearer Context Setup procedure: Unsuccessful Operation.

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

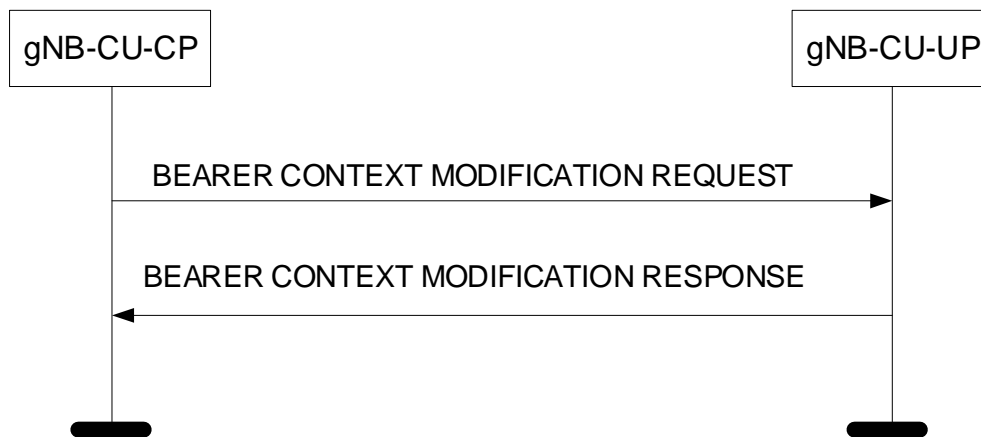


Figure 8.3.2.2-1: Bearer Context Modification procedure: Successful Operation.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

For E-UTRAN:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

If the *Old QoS Flow List - UL End Marker expected* IE is included in the *PDU Session Resource To Modify List* IE of the BEARER CONTEXT MODIFICATION REQUEST message for a DRB to be modified, the gNB-CU-UP shall consider that the source NG-RAN node has initiated QoS flow re-mapping and has not yet received SDAP end markers, as described in TS 38.300 [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].

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

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

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

8.3.2.3 Unsuccessful Operation

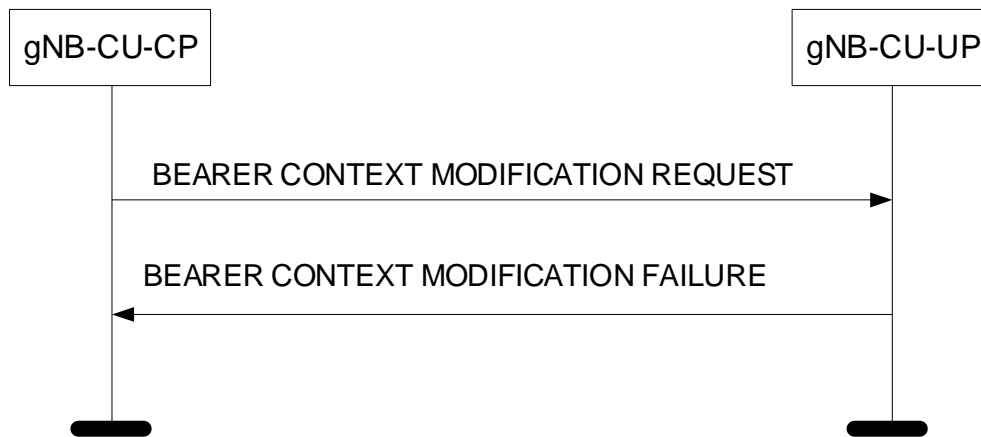


Figure 8.3.2.3-1: Bearer Context Modification procedure: Unsuccessful Operation.

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

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

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

8.3.2.4 Abnormal Conditions

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

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

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

8.3.3.1 General

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

8.3.3.2 Successful Operation

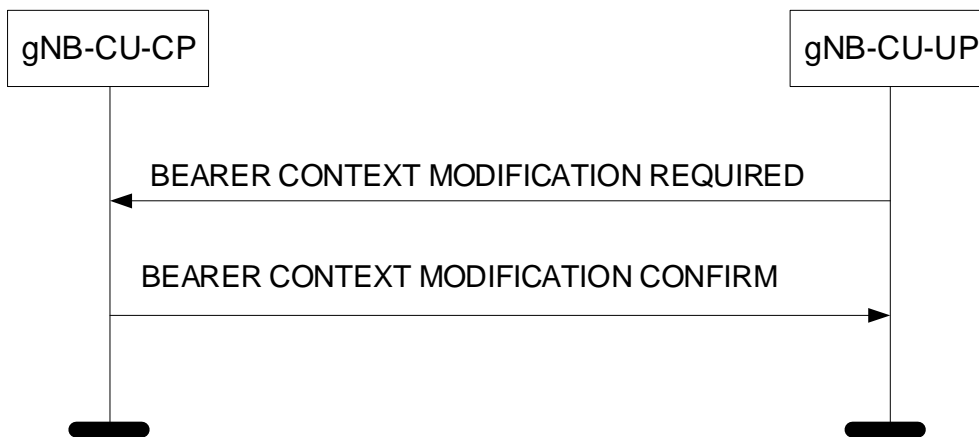


Figure 8.3.3.2-1: Bearer Context Modification Required procedure: Successful Operation.

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

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

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

8.3.3.3 Abnormal Conditions

Not applicable.

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

8.3.4.1 General

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

8.3.4.2 Successful Operation

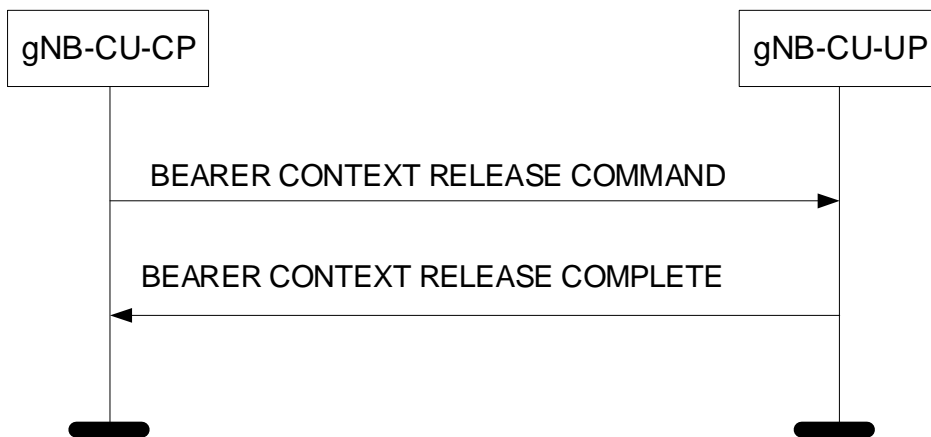


Figure 8.3.4.2-1: Bearer Context Release procedure: Successful Operation.

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

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

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

8.3.4.3 Abnormal Conditions

Not applicable.

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

8.3.5.1 General

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

8.3.5.2 Successful Operation



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

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

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

Interactions with Bearer Context Release procedure:

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

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

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

8.3.5.3 Abnormal Conditions

Not applicable.

8.3.6 Bearer Context Inactivity Notification

8.3.6.1 General

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

8.3.6.2 Successful Operation



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

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

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

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

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

8.3.6.3 Abnormal Conditions

Not applicable.

8.3.7 DL Data Notification

8.3.7.1 General

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

8.3.7.2 Successful Operation



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

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

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

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

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

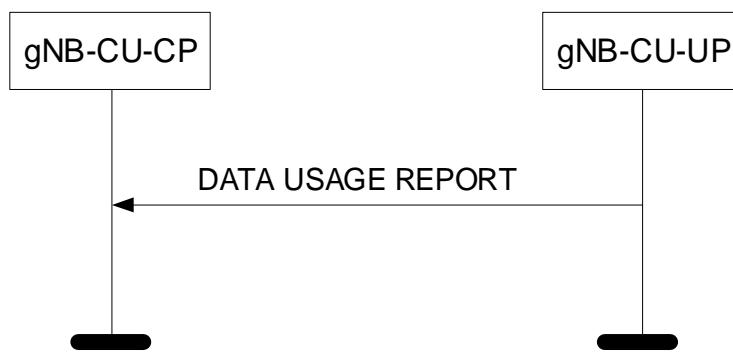


Figure 8.3.8.2-1: Data Usage Report procedure: Successful Operation.

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

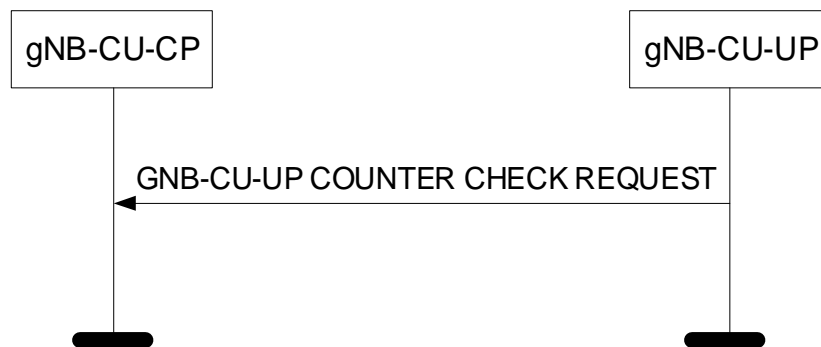


Figure 8.3.9.2-1: gNB-CU-UP Counter Check procedure, successful operation.

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

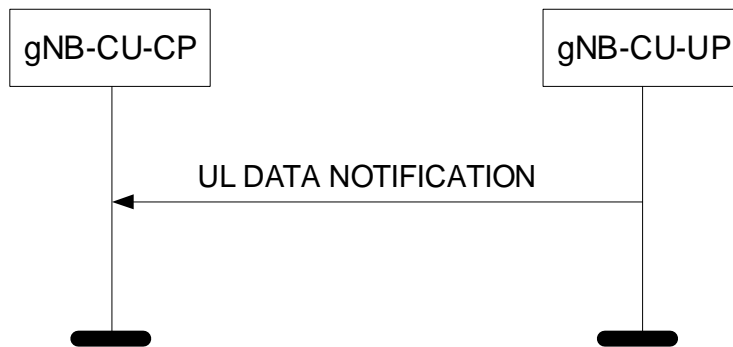


Figure 8.3.10.2-1: UL Data Notification procedure: Successful Operation.

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

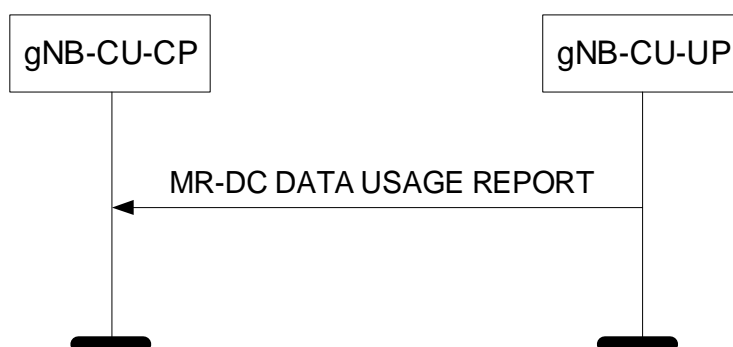


Figure 8.3.11.2-1: MR-DC Data Usage Report procedure: Successful Operation.

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

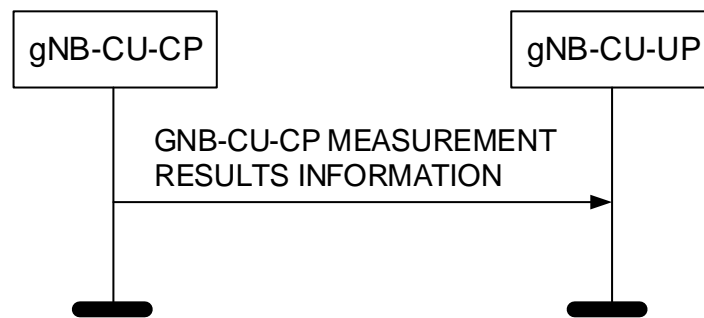


Figure 8.3.13.2-1: GNB-CU-CP Measurement Results Information procedure. Successful operation.

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

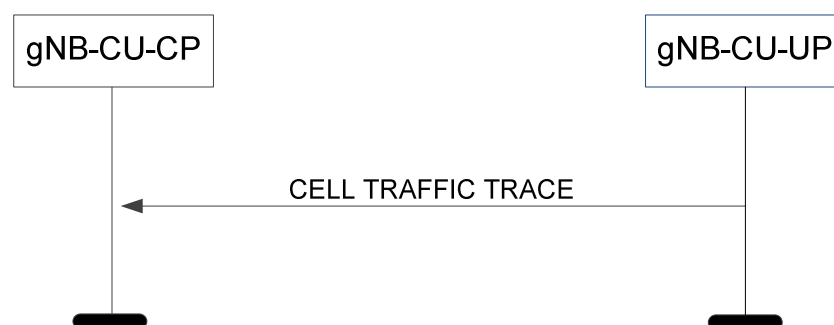


Figure 8.4.3.2-1: Cell Traffic Trace procedure. Successful operation.

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

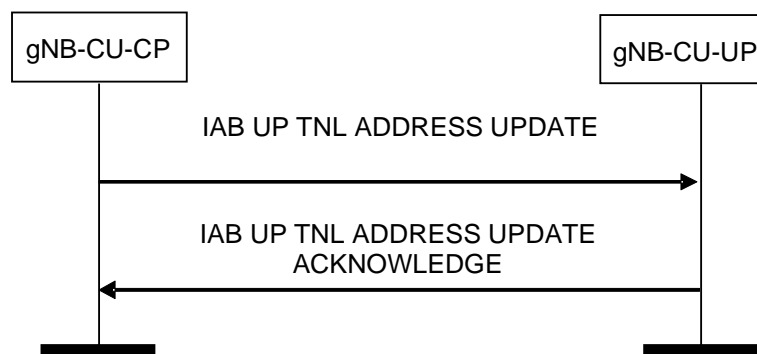


Figure 8.5.1.2-1: IAB UP TNL Address Update procedure: Successful Operation.

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

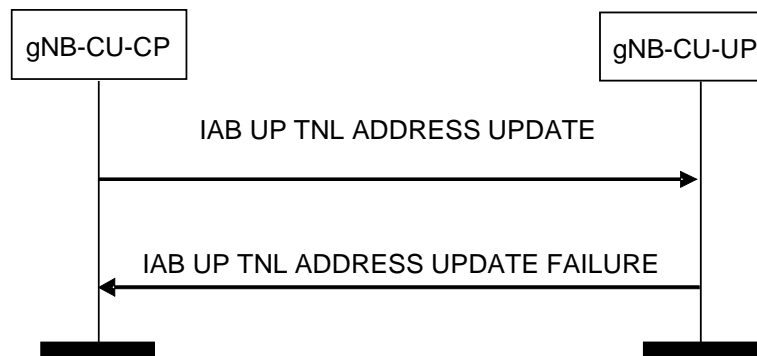


Figure 8.5.1.3-1: IAB UP TNL Address Update procedure: Unsuccessful Operation.

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

8.6.1.1.2 Successful Operation

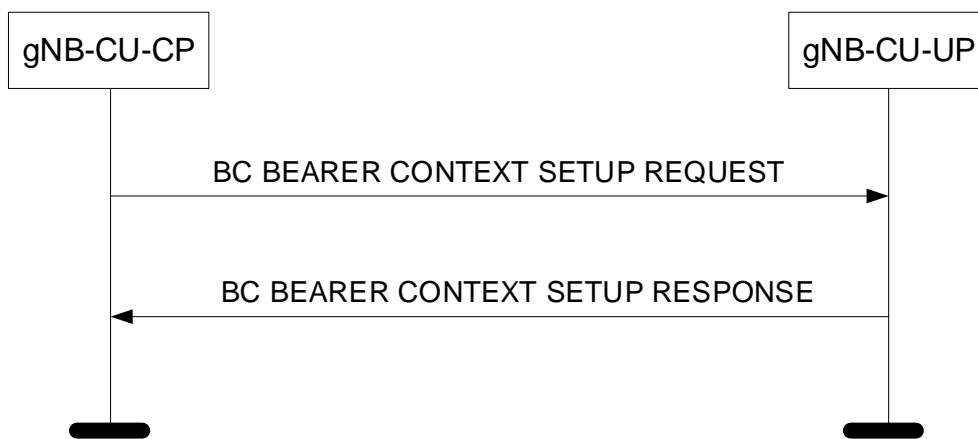


Figure 8.6.1.1.2-1: BC Bearer Context Setup procedure: Successful Operation.

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

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

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

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

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

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

8.6.1.1.3 Unsuccessful Operation

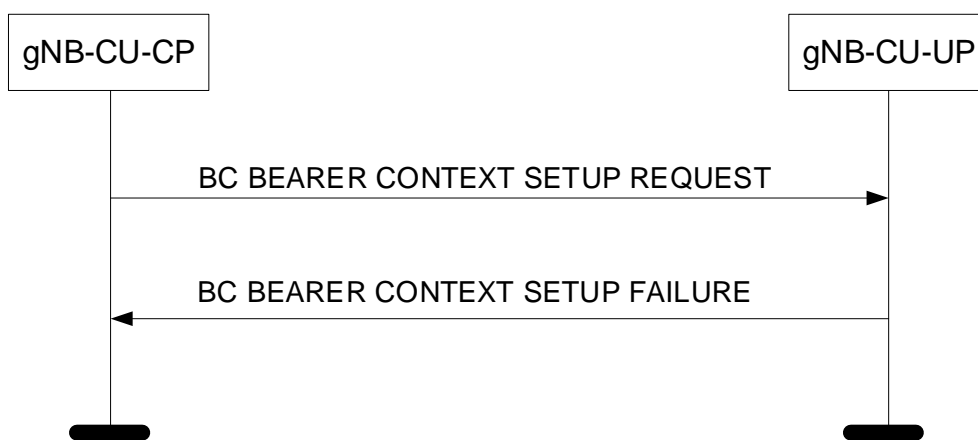


Figure 8.6.1.1.3-1: BC Bearer Context Setup procedure: Unsuccessful Operation.

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

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

8.6.1.1.4 Abnormal Conditions

void.

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

8.6.1.2.1 General

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

8.6.1.2.2 Successful Operation

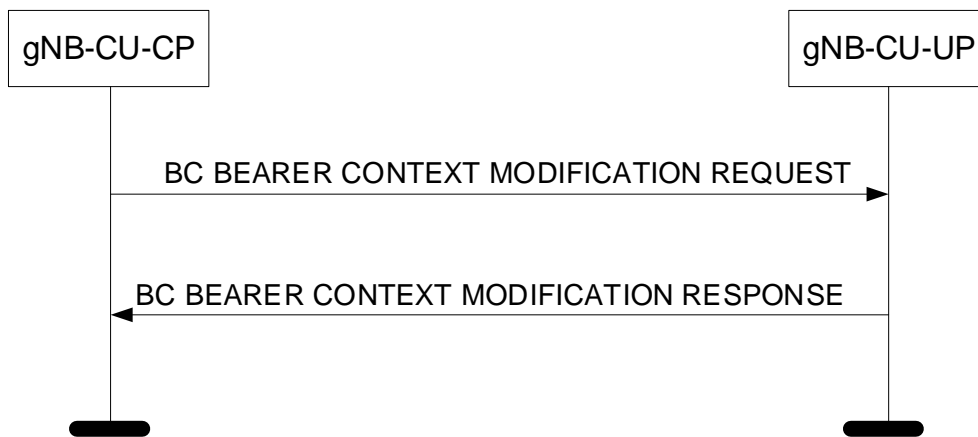


Figure 8.6.1.2.2-1: BC Bearer Context Modification procedure, gNB-CU-CP initiated: Successful Operation.

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

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

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

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

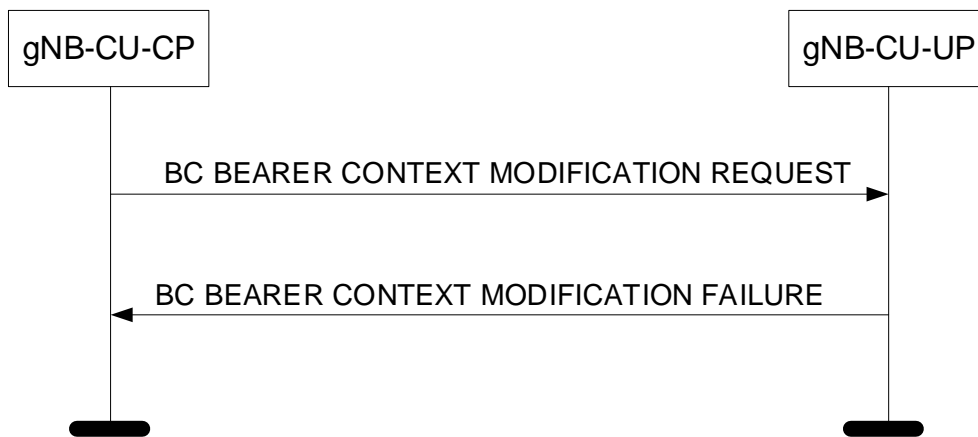


Figure 8.6.1.2.3-1: BC Bearer Context Modification procedure, gNB-CU-CP initiated: Unsuccessful Operation.

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

8.6.1.2.4 Abnormal Conditions

void.

8.6.1.3 BC Bearer Context Modification Required

8.6.1.3.1 General

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

8.6.1.3.2 Successful Operation

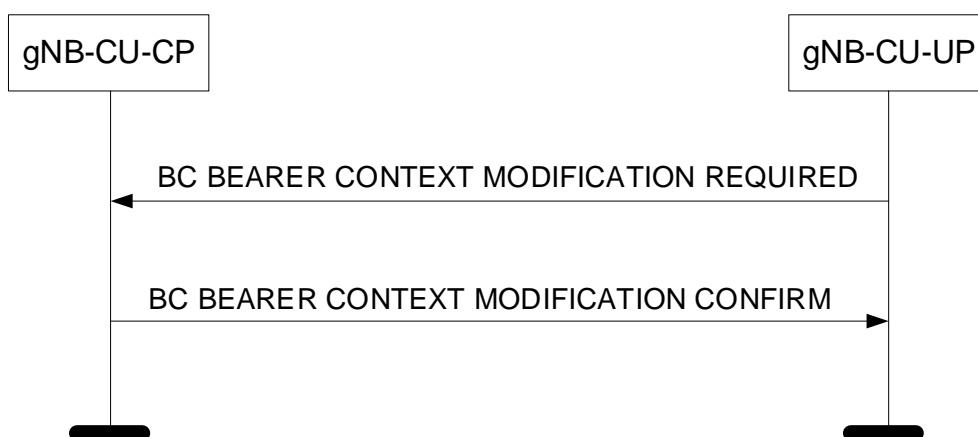


Figure 8.6.1.3.2-1: BC Bearer Context Modification Required procedure, gNB-CU-UP initiated: Successful Operation.

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

8.6.1.3.3 Abnormal Conditions

void.

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

8.6.1.4.1 General

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

8.6.1.4.2 Successful Operation

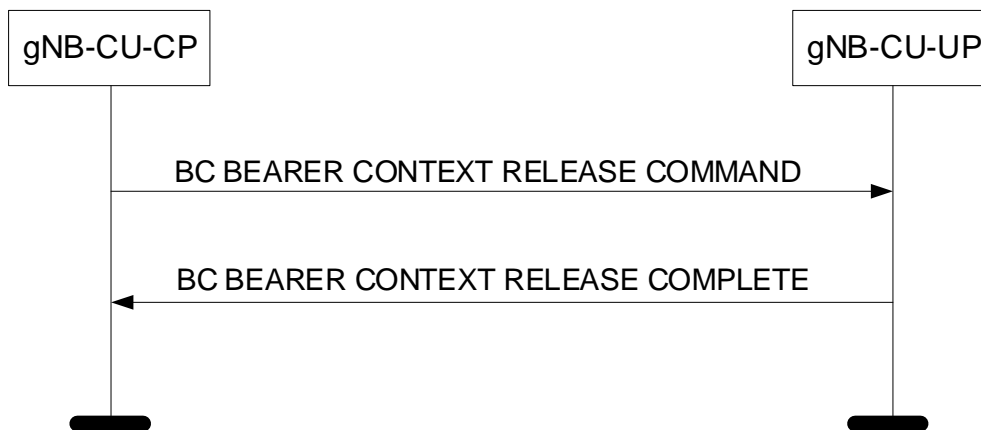


Figure 8.6.1.4.2-1: MC Bearer Context Release procedure: Successful Operation.

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

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

8.6.1.4.3 Abnormal Conditions

Not applicable.

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

8.6.1.5.1 General

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

8.6.1.5.2 Successful Operation



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

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

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

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

8.6.1.5.3 Abnormal Conditions

Not applicable.

8.6.2 MBS Procedures for Multicast

8.6.2.1 MC Bearer Context Setup

8.6.2.1.1 General

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

8.6.2.1.2 Successful Operation

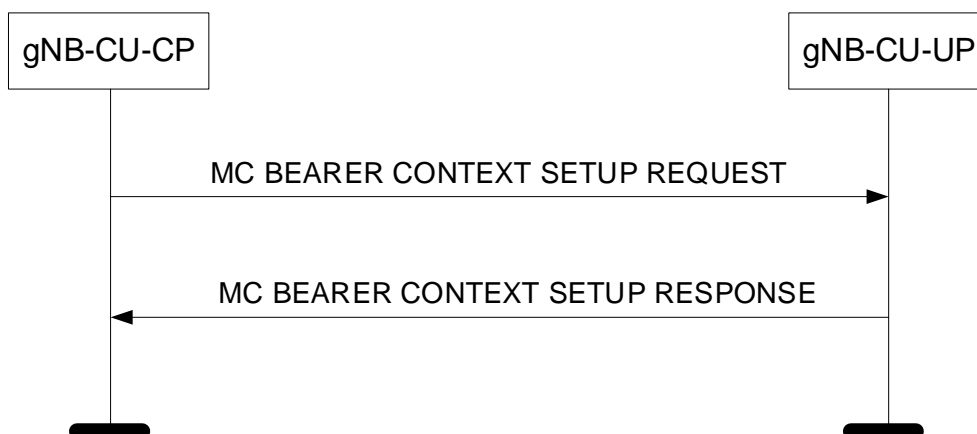


Figure 8.6.2.1.2-1: MC Bearer Context Setup procedure: Successful Operation.

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

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

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

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

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

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

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

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

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

Interaction with other procedures

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

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

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

8.6.2.1.3 Unsuccessful Operation

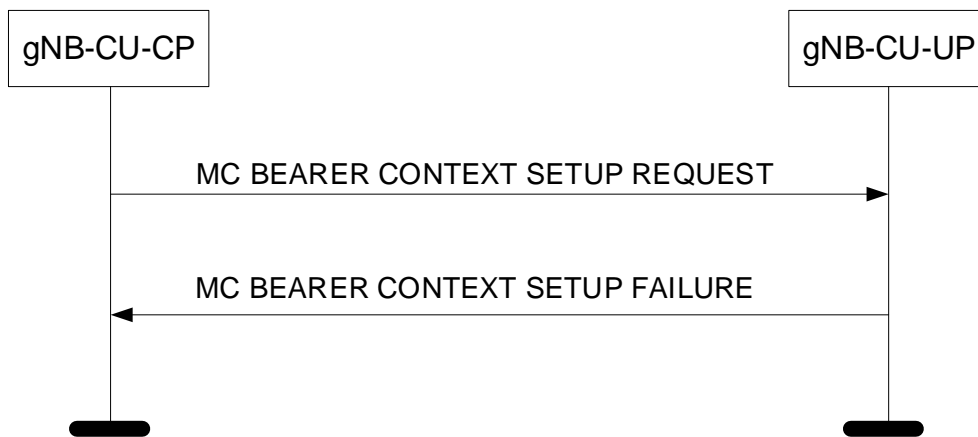


Figure 8.6.2.1.3-1: MC Bearer Context Setup procedure: Unsuccessful Operation.

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

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

8.6.2.1.4 Abnormal Conditions

void.

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

8.6.2.2.1 General

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

8.6.2.2.2 Successful Operation

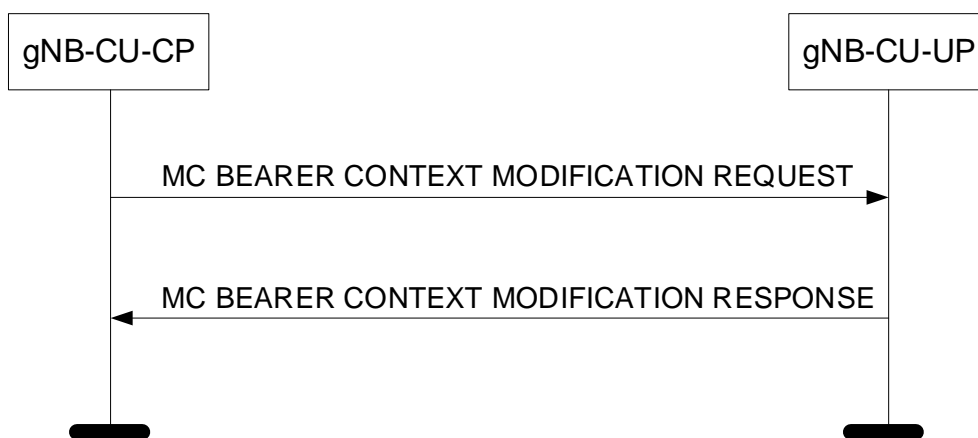


Figure 8.6.2.2.2-1: MC Bearer Context Modification procedure, gNB-CU-CP initiated: Successful Operation.

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

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

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

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

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

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

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

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

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

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

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

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

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

Interaction with other procedures

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

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

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

8.6.2.2.3 Unsuccessful Operation

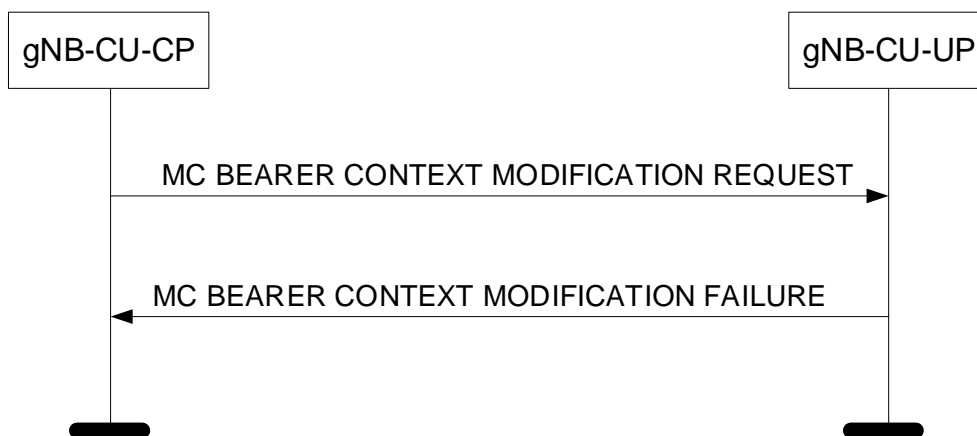


Figure 8.6.2.2.3-1: MC Bearer Context Modification procedure, gNB-CU-CP initiated: Unsuccessful Operation.

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

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

8.6.2.2.4 Abnormal Conditions

void.

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

8.6.2.3.1 General

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

8.6.2.3.2 Successful Operation

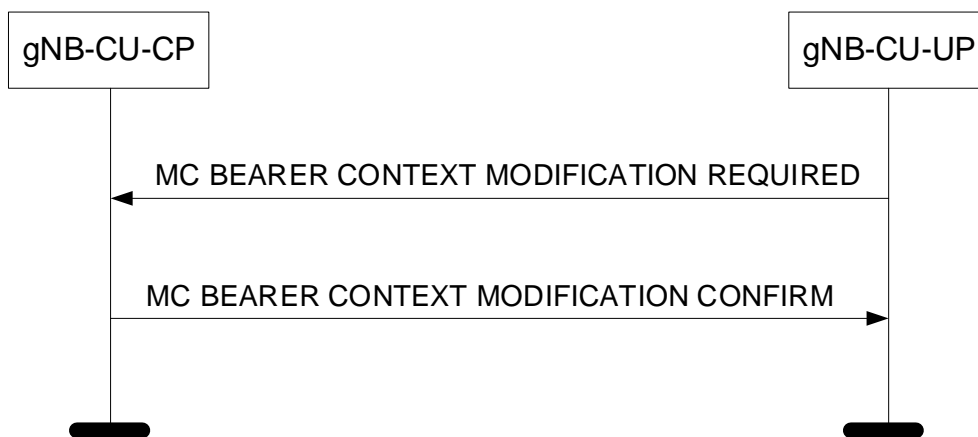


Figure 8.6.2.3.2-1: MC Bearer Context Modification Required procedure, gNB-CU-UP initiated: Successful Operation.

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

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

8.6.2.3.3 Abnormal Conditions

void

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

8.6.2.4.1 General

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

8.6.2.4.2 Successful Operation

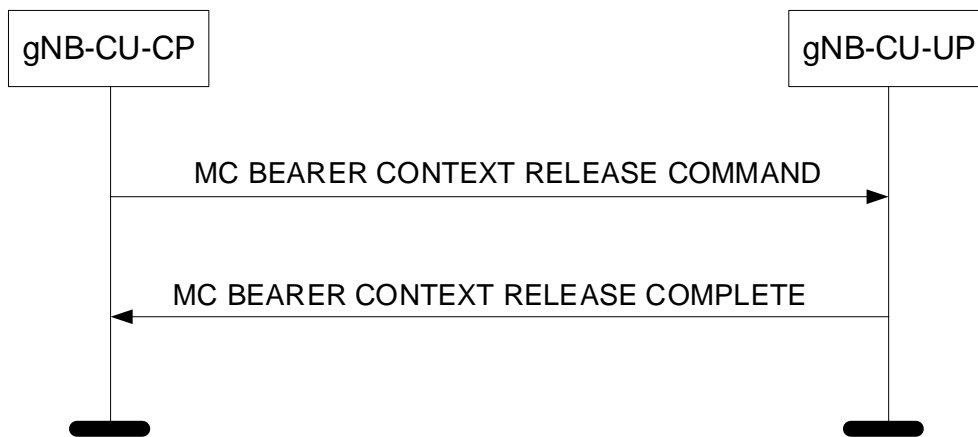


Figure 8.6.2.4.2-1: MC Bearer Context Release procedure: Successful Operation.

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

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

8.6.2.4.3 Abnormal Conditions

Not applicable.

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

8.6.2.5.1 General

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

8.6.2.5.2 Successful Operation



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

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

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

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

8.6.2.5.3 Abnormal Conditions

Not applicable.

8.6.2.6 MC Bearer Notification

8.6.2.6.1 General

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

The procedure uses MBS-associated signalling.

8.6.2.6.2 Successful Operation



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

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

8.6.2.6.3 Abnormal Conditions

Not applicable.

9 Elements for E1AP communication

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

9.1 General

Subclauses 9.2 and 9.3 present the E1AP message and IE definitions in tabular format. The corresponding ASN.1 definition is presented in subclause 9.4. In case there is contradiction between the tabular format and the ASN.1 definition, the ASN.1 shall take precedence, except for the definition of conditions for the presence of conditional IEs, where the tabular format shall take precedence.

The messages have been defined in accordance to the guidelines specified in TR 25.921 [5].

When specifying IEs which are to be represented by bitstrings, if not otherwise specifically stated in the semantics description of the concerned IE or elsewhere, the following principle applies with regards to the ordering of bits:

- The first bit (leftmost bit) contains the most significant bit (MSB);
- The last bit (rightmost bit) contains the least significant bit (LSB);
- When importing bitstrings from other specifications, the first bit of the bitstring contains the first bit of the concerned information;

The following attributes are used for the tabular description of the messages and information elements: Presence, Range Criticality and Assigned Criticality. Their definition and use can be found in TS 38.413 [6].

9.2 Message Functional Definition and Content

9.2.1 Interface Management messages

9.2.1.1 RESET

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
CHOICE <i>Reset Type</i>	M				YES	reject
> <i>E1 interface</i>						
>>Reset All	M		ENUMERATED (Reset all,...)		-	
> <i>Part of E1 interface</i>						
>>UE-associated logical E1-connection list		1			-	
>>>UE-associated logical E1-connection Item		1 .. <maxnoofIndividualE1ConnectionsToReset>			EACH	reject
>>>>gNB-CU-CP UE E1AP ID	O		9.3.1.4		-	
>>>>gNB-CU-UP UE E1AP ID	O		9.3.1.5		-	

Range bound	Explanation
maxnoofIndividualE1ConnectionsToReset	Maximum no. of UE-associated logical E1-connections allowed to reset in one message. Value is 65536.

9.2.1.2 RESET ACKNOWLEDGE

This message is sent by both the gNB-CU-CP and the gNB-CU-UP as a response to a RESET message.

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
UE-associated logical E1-connection list		0..1			YES	ignore
>UE-associated logical E1-connection Item		1 .. <maxnoofIndividualE1ConnectionsToReset>			EACH	ignore
>>gNB-CU-CP UE	O		9.3.1.4		-	

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

Range bound	Explanation
maxnoofIndividualE1ConnectionsToReset	Maximum no. of UE-associated logical E1-connections allowed to reset in one message. Value is 65536.

9.2.1.3 ERROR INDICATION

This message is sent by both the gNB-CU-CP and the gNB-CU-UP and is used to indicate that some error has been detected in the node.

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Transaction ID	M		9.3.1.53	This IE is ignored if received in UE associated signalling message.	YES	reject
gNB-CU-CP UE E1AP ID	O		9.3.1.4		YES	ignore
gNB-CU-UP UE E1AP ID	O		9.3.1.5		YES	ignore
Cause	O		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore
gNB-CU-CP MBS E1AP ID	O		9.3.1.106		YES	ignore
gNB-CU-UP MBS E1AP ID	O		9.3.1.107		YES	ignore

9.2.1.4 GNB-CU-UP E1 SETUP REQUEST

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-UP ID	M		9.3.1.15		YES	reject
gNB-CU-UP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-UP.	YES	ignore
CN Support	M		ENUMERATED (EPC, 5GC, both, ...)		YES	reject
Supported PLMNs		1..<maxno ofSPLMNs >		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>Extended Slice	O		9.3.1.94	Additional	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Support List				Supported S-NSSAIs per PLMN.		
>NR CGI Support List	O		9.3.1.36	Supported cells for gNB CP-UP separation.	-	-
>QoS Parameters Support List	O		9.3.1.37	Supported QoS parameters per PLMN.	-	-
>NPN Support Information	O		9.3.1.83	<i>NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP</i>	YES	reject
>Extended 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
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.6 GNB-CU-UP E1 SETUP FAILURE

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

Direction: gNB-CU-CP → gNB-CU-UP

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

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

9.2.1.7 GNB-CU-CP E1 SETUP REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-CP.	YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore
Extended gNB-CU-CP Name	O		9.3.1.95		YES	ignore

9.2.1.8 GNB-CU-CP E1 SETUP RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-UP ID	M		9.3.1.15		YES	reject
gNB-CU-UP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-UP.	YES	ignore
CN Support	M		ENUMERATED (EPC, 5GC, both, ...)		YES	reject
Supported PLMNs		1..<maxno of S-PLMNs>		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>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	<i>NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-</i>	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				<i>UP</i>		
>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
Criticality Diagnostics	O		9.3.1.3		YES	ignore

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

9.2.1.9 GNB-CU-CP E1 SETUP FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.10 GNB-CU-UP CONFIGURATION UPDATE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-UP ID	O		9.3.1.15		YES	reject
gNB-CU-UP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-UP.	YES	ignore
Supported PLMNs		<i>0..<maxno ofSPLMNs></i>		Supported PLMNs	YES	reject
>PLMN Identity	M		9.3.1.7		-	-
>Slice Support List	O		9.3.1.8	Supported S-NSSAIs per PLMN.	-	-
>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	O		9.3.1.37	Supported QoS	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Support List				parameters per PLMN.		
>NPN Support Information	O		9.3.1.83	<i>NOTE: This IE is not applicable to eNB-CP/eNB-UP and ng-eNB-CU-CP/ng-eNB-CU-UP</i>	YES	reject
>Extended 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..<maxno ofTNLAassociations>			-	-
>>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.
maxnoofTNLAassociations	Maximum numbers of TNL Associations between the gNB-CU-UP and the gNB-CU-CP. Value is 32.

9.2.1.11 GNB-CU-UP CONFIGURATION UPDATE ACKNOWLEDGE

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore

9.2.1.12 GNB-CU-UP CONFIGURATION UPDATE FAILURE

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore
Time To wait	O		9.3.1.6		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.13 GNB-CU-CP CONFIGURATION UPDATE

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP Name	O		PrintableString(SIZE(1..150,...))	Human readable name of the gNB-CU-CP	YES	ignore
gNB-CU-CP TNLA To Add List		0..1			YES	ignore
>gNB-CU-CP TNLA To Add Item IEs		1..<maxno ofTNLAassociations>			-	-
>>TNLA Transport Layer Information	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP.	-	-
>>TNLA Usage	M		ENUMERATED (ue, non-ue, both, ...)	Indicates whether the TNLA is only used for UE-associated signalling, or non-UE-associated signalling, or both. For usage of this IE, refer to TS 37.482 [18].	-	-
gNB-CU-CP TNLA To Remove List		0..1			YES	ignore
>gNB-CU-CP TNLA To Remove Item IEs		1..<maxno ofTNLAassociations>			-	-
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP.	-	-
>>TNLA Transport Layer Address gNB-CU-UP	O		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-UP.	YES	reject
gNB-CU-CP TNLA To Update List		0..1			YES	ignore
>gNB-CU-CP TNLA To Update Item IEs		1..<maxno ofTNLAassociations>			-	-
>>TNLA Transport Layer Address	M		CP Transport Layer 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-	-	-

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

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

9.2.1.14 GNB-CU-CP CONFIGURATION UPDATE ACKNOWLEDGE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP TNLA Setup List		0..1			YES	ignore
>gNB-CU-CP TNLA Setup Item IEs		1..<maxno ofTNLAAssociations>			-	-
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP	-	-
gNB-CU-CP TNLA Failed to Setup List		0..1			YES	ignore
>gNB-CU-CP TNLA Failed To Setup Item IEs		1..<maxno ofTNLAAssociations>			-	-
>>TNLA Transport Layer Address	M		CP Transport Layer Information 9.3.2.2	Transport Layer Address of the gNB-CU-CP	-	-
>>Cause	M		9.3.1.2			
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Transport Network Layer Address Info	O		9.3.2.7		YES	ignore

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

9.2.1.15 GNB-CU-CP CONFIGURATION UPDATE FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

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

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

9.2.1.16 E1 RELEASE REQUEST

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.1.17 E1 RELEASE RESPONSE

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.18 GNB-CU-UP STATUS INDICATION

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-UP Overload Information	M		ENUMERATED (overloaded, not-overloaded)		YES	reject

9.2.1.19 RESOURCE STATUS REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject

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

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

9.2.1.20 RESOURCE STATUS RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
gNB-CU-UP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.21 RESOURCE STATUS FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
gNB-CU-UP Measurement ID	O		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.1.22 RESOURCE STATUS UPDATE

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

Direction: gNB-CU-UP → gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Transaction ID	M		9.3.1.53		YES	reject
gNB-CU-CP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-CP	YES	reject
gNB-CU-UP Measurement ID	M		INTEGER (1..4095,...)	Allocated by gNB-CU-UP	YES	ignore
TNL Available Capacity Indicator	O		9.3.1.72		YES	ignore
HW Capacity Indicator	O		9.3.1.73		YES	ignore

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

9.2.2 Bearer Context Management messages

9.2.2.1 BEARER CONTEXT SETUP REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
Security Information	M		9.3.1.10		YES	reject
UE DL Aggregate	M		Bit Rate		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Maximum Bit Rate			9.3.1.20			
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. <i>NOTE: This IE is not applicable to eNB-CP/eNB-UP.</i>	YES	reject
CHOICE System	M				YES	reject
>E-UTRAN						
>>DRB To Setup List	M		DRB To Setup List E-UTRAN 9.3.3.1		YES	reject
>>Subscriber Profile ID for RAT/Frequency priority	O		9.3.1.69		YES	ignore
>>Additional RRM Policy Index	O		9.3.1.70		YES	ignore
>NG-RAN						
>>PDU Session Resource To Setup List	M		9.3.3.2		YES	reject
RAN UE ID	O		OCTET STRING (SIZE(8))		YES	ignore
gNB-DU ID	O		9.3.1.65	Included whenever it is known by the gNB-CU-CP or by the ng-eNB-CU-CP	YES	ignore
Trace Activation	O		9.3.1.68		YES	ignore
NPN Context Information	O		9.3.1.84		YES	reject
Management Based MDT PLMN List	O		MDT PLMN List 9.3.1.89		YES	ignore
CHO Initiation	O		ENUMERATED (True, ...)		YES	reject
Additional Handover Information	O		ENUMERATED (Discard PDCP SN, ...)	If set to "Discard PDCP SN", indicates that the forwarded PDCP SNs have to be removed	YES	ignore
Direct Forwarding Path Availability	O		9.3.1.98		YES	ignore
gNB-CU-UP UE E1AP ID	O		9.3.1.5		YES	ignore
MDT Polluted Measurement Indicator	O		ENUMERATED (IDC, no-IDC, ...)	Indication on whether MDT Measurement affect (e.g. IDC) is	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				undertake or not.		
UE Slice Maximum Bit Rate List	O		9.3.1.102		YES	ignore
SCG Activation Status	O		9.3.1.105		YES	ignore

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

9.2.2.2 BEARER CONTEXT SETUP RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE <i>System</i>	M				YES	reject
> <i>E-UTRAN</i>						
>>DRB Setup List	M		DRB Setup List E-UTRAN 9.3.3.3		YES	reject
>>DRB Failed List	O		DRB Failed List E-UTRAN 9.3.3.4		YES	reject
> <i>NG-RAN</i>						
>>PDU Session Resource Setup List	M		9.3.3.5		YES	reject
>>PDU Session Resource Failed List	O		9.3.3.6		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU Session Resource	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 <i>NOTE: This IE is not applicable to eNB-CP/eNB-UP.</i>	YES	reject
New UL TNL Information Required	O		ENUMERATED (required, ...)	Indicates that new UL TNL information has been requested to be provided.	YES	reject
UE Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to UE.	-	-
Data Discard Required	O		ENUMERATED (required, ...)	Indicate to discard the DL user data in case of RAN paging failure.	YES	ignore
CHOICE System >E-UTRAN	O				YES	reject
>>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	O		9.3.3.11		YES	reject

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

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

9.2.2.5 BEARER CONTEXT MODIFICATION RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
CHOICE <i>System</i>	O				YES	ignore
> <i>E-UTRAN</i>						
>>DRB Setup List	O		DRB Setup Modification List E-UTRAN		YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			9.3.3.13			
>>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
Criticality Diagnostics	O		9.3.1.3		YES	ignore
UE Inactivity Information	O		INTEGER (1.. 7200, ...)	Indicates the inactive time. The values are expressed in seconds.	YES	ignore

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

9.2.2.6 BEARER CONTEXT MODIFICATION FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP	M		9.3.1.4		YES	reject

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
			UTRAN 9.3.3.24			
>NG-RAN						
>>PDU Session Resource Modified List	O		PDU Session Resource Confirm Modified List 9.3.3.25		YES	Ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

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

9.2.2.9 BEARER CONTEXT RELEASE COMMAND

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.2.10 BEARER CONTEXT RELEASE COMPLETE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore
Retainability Measurements Information	O		9.3.1.71	Provides information on all the removed DRB(s) and QoS Flow(s), needed for retainability measurements in 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..<maxno ofDRBs>			-	-
>>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 <i>Activity Notification Level</i> IE is set as "DRB" in BEARER CONTEXT SETUP Request message	YES	reject
>>DRB Activity Item		1 .. <maxnoof DRBs>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>DRB Activity	M		ENUMERATED (Active, Not active, ...)		-	-
>PDU Session Resource Activity List		1		Used if the <i>Activity Notification Level</i> IE is set as "PDU Session" in the BEARER CONTEXT SETUP Request message	YES	reject
>>PDU Session Resource Activity Item		1 .. <maxnoof PDU SessionResource>			-	-
>>>PDU Session ID	M		9.3.1.21		-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>>PDU Session Resource Activity	M		ENUMERATED (Active, Not active, ...)		-	-
>UE Activity	M		ENUMERATED (Active, Not active, ...)	Used if the <i>Activity Notification Level</i> 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		<i>1..<maxnoofPDUSessionResource></i>			-	-
>>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 .. <maxnoof DRBs>			-	-
>>>>DRB ID	M		9.3.1.16		-	-
>>>>PDCP UL Count	M		PDCP Count 9.3.1.35	Indicates the value of uplink COUNT associated to this DRB, as specified in TS 38.331 [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 .. <maxnoof DRBs>			-	-
>>>>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	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				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..<maxno ofPDUSes sionResource>			-	-
>>PDU Session ID	M		9.3.1.21		-	-
>>QoS Flow List	M		9.3.1.12		-	-

9.2.2.17 MR-DC DATA USAGE REPORT

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

Direction: gNB-CU-UP → gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
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..<maxno of PDU sions>			-	
>>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 .. <maxnoof DRBs>			-	-
>>DRB ID	M		9.3.1.16		-	-
>>DL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper frame number of the last DL SDU successfully delivered in sequence to the UE, if RLC-AM, and successfully transmitted, if RLC-UM.	-	-

9.2.2.19 GNB-CU-CP MEASUREMENT RESULTS INFORMATION

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
DRB Measurement Results Information List		1			YES	reject
>DRB Measurement Results Information Item		1 .. <maxnoof DRBs>			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 <i>Trace Activation</i> IE	YES	ignore

9.2.3.3 CELL TRAFFIC TRACE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
gNB-CU-CP UE E1AP ID	M		9.3.1.4		YES	reject
gNB-CU-UP UE E1AP ID	M		9.3.1.5		YES	reject
Trace ID	M		OCTET STRING (SIZE(8))	The Trace ID IE is composed of the following: Trace Reference defined in TS 32.422 [24] (leftmost 6 octets, with PLMN information coded as in 9.2.3.8), and Trace Recording Session Reference defined in TS 32.422 [24]	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				(last 2 octets).		
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..<maxno ofTNLAddresses>			-	-
>>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..<maxno ofTNLAddresses>			-	-
>>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 MBS session resources for a broadcast MBS session.

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
Global MBS Session ID	M		9.3.1.108		YES	reject
BC Bearer Context To Setup	M		9.3.3.26		YES	reject

9.2.5.1.2 BC BEARER CONTEXT SETUP RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Setup Response	M		9.3.3.27		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.3 BC BEARER CONTEXT SETUP FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	O		9.3.1.107		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.4 BC BEARER CONTEXT MODIFICATION REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP	M		9.3.1.106		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
ID						
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify	M		9.3.3.28		YES	reject

9.2.5.1.5 BC BEARER CONTEXT MODIFICATION RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify Response	M		9.3.3.29		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.6 BC BEARER CONTEXT MODIFICATION FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.7 BC BEARER CONTEXT MODIFICATION REQUIRED

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify Required	M		9.3.3.30		YES	reject

9.2.5.1.8 BC BEARER CONTEXT MODIFICATION CONFIRM

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
BC Bearer Context To Modify Confirm	M		9.3.3.31		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.9 BC BEARER CONTEXT RELEASE COMMAND

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.1.10 BC BEARER CONTEXT RELEASE COMPLETE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.1.11 BC BEARER CONTEXT RELEASE REQUEST

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
ID						
Cause	M		9.3.1.2		YES	ignore

9.2.5.2 MBS Messages for Multicast

9.2.5.2.1 MC BEARER CONTEXT SETUP REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
Global MBS Session ID	M		9.3.1.108		YES	reject
MC Bearer Context To Setup	M		9.3.3.32		YES	reject

9.2.5.2.2 MC BEARER CONTEXT SETUP RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Setup Response	M		9.3.3.33		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.3 MC BEARER CONTEXT SETUP FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	O		9.3.1.107		YES	ignore
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.4 MC BEARER CONTEXT MODIFICATION REQUEST

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify	M		9.3.3.34		YES	reject

9.2.5.2.5 MC BEARER CONTEXT MODIFICATION RESPONSE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify Response	M		9.3.3.35		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.6 MC BEARER CONTEXT MODIFICATION FAILURE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MBS Multicast F1-U Context Descriptor	O		9.3.1.125		YES	reject
Cause	M		9.3.1.2		YES	ignore
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.7 MC BEARER CONTEXT MODIFICATION REQUIRED

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

Direction: gNB-CU-UP → gNB-CU-CP

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify Required	M		9.3.3.36		YES	reject

9.2.5.2.8 MC BEARER CONTEXT MODIFICATION CONFIRM

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
MC Bearer Context To Modify Confirm	M		9.3.3.37		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.9 MC BEARER CONTEXT RELEASE COMMAND

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

Direction: gNB-CU-CP → gNB-CU-UP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.2.10 MC BEARER CONTEXT RELEASE COMPLETE

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Criticality Diagnostics	O		9.3.1.3		YES	ignore

9.2.5.2.11 MC BEARER CONTEXT RELEASE REQUEST

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
Cause	M		9.3.1.2		YES	ignore

9.2.5.2.12 MC BEARER NOTIFICATION

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

Direction: gNB-CU-UP → gNB-CU-CP

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	reject
gNB-CU-CP MBS E1AP ID	M		9.3.1.106		YES	reject
gNB-CU-UP MBS E1AP ID	M		9.3.1.107		YES	reject
CHOICE MBS Session Resource Notification	M				YES	ignore
>DL Data Arrival						
>>DL Data Arrival Indication	M		ENUMERATED (true, ...)		YES	ignore
>>Paging Priority Indicator (PPI)	O		9.3.1.55		YES	ignore
>MC Bearer Context Inactivity						
>>MC Bearer Context Inactivity Indication	M		ENUMERATED (true, ...)		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-	

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
			Emption, RSN not available for the UP, NPN not supported, Report Characteristics Empty, Existing Measurement ID, Measurement Temporarily not Available Measurement not Supported For The Object, SCG activation deactivation failure, SCG deactivation failure due to data transmission, Unknown or already allocated gNB-CU-CP MBS E1AP ID, Unknown or already allocated gNB-CU-UP MBS E1AP ID, Unknown or inconsistent pair of MBS E1AP ID, Unknown or inconsistent MRB ID)	
>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 unknown.
Multiple DRB ID Instances	The action failed because multiple instances of the same DRB had been provided.
Unknown DRB ID	The action failed because the DRB ID is unknown.
Invalid QoS combination	The action was failed because of invalid QoS combination.
Procedure cancelled	The sending node cancelled the procedure due to other urgent actions to be performed.
Normal release	The action is due to a normal release of the UE (e.g. because of mobility) and does not indicate an error.
No radio resources available	The requested node doesn't have sufficient radio resources 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.

Radio Network Layer cause	Meaning
Measurement not Supported For The Object	At least one of the concerned object(s) does not support the requested measurement.
SCG activation deactivation failure	The action failed due to rejection of the SCG activation deactivation request.
SCG deactivation failure due to data transmission	The SCG deactivation failed due to ongoing or arriving data transmission.
Unknown or already allocated gNB-CU-CP MBS E1AP ID	The action failed because the gNB-CU-CP MBS E1AP ID is either unknown, or (for a first message received at the gNB-CU-CP) is known and already allocated to an existing context.
Unknown or already allocated gNB-CU-UP MBS E1AP ID	The action failed because the gNB-CU-UP MBS E1AP ID is either unknown, or (for a first message received at the gNB-CU-UP) is known and already allocated to an existing context.
Unknown or inconsistent pair of MBS E1AP ID	The action failed because both MBS E1AP IDs are unknown, or are known but do not define a single MBS context.
Unknown or inconsistent MRB ID	The action failed because the MRB ID is unknown or inconsistent.

Transport Layer cause	Meaning
Unspecified	Sent when none of the above cause values applies but still the cause is Transport Network Layer related.
Transport Resource Unavailable	The required transport resources are not available.
Unknown TNL address for IAB	The action failed because the TNL address is unknown. This cause value is applicable for IAB only.

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

Miscellaneous cause	Meaning
Control Processing Overload	Control processing overload.
Not Enough User Plane Processing Resources Available	No enough resources are available related to user plane processing.
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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				Error Indication procedure, and not within the response message of the same procedure that caused the error.
Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure).
Transaction ID	O		9.3.1.53	
Information Element Criticality Diagnostics		<i>0 .. <maxnoof Errors></i>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' is not applicable.
>IE ID	M		INTEGER (0..65535)	The IE ID of the not understood or missing IE.
>Type of Error	M		ENUMERATED(not understood, missing, ...)	

Range bound	Explanation
maxnoofErrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnoofErrors is 256.

9.3.1.4 gNB-CU-CP UE E1AP ID

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

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

9.3.1.5 gNB-CU-UP UE E1AP ID

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

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

9.3.1.6 Time To wait

This IE defines the minimum allowed waiting times.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Time To wait	M		ENUMERATED(1s, 2s, 5s, 10s, 20s, 60s)	

9.3.1.7 PLMN Identity

This information element indicates the PLMN Identity.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PLMN Identity	M		OCTET STRING (SIZE(3))	<ul style="list-style-type: none"> - digits 0 to 9, encoded 0000 to 1001, - 1111 used as filler digit, two digits per octet, - bits 4 to 1 of octet n encoding digit 2n-1 - bits 8 to 5 of octet n encoding digit 2n <p>-The PLMN identity consists of 3 digits from MCC followed by either</p> <ul style="list-style-type: none"> -a filler digit plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).

9.3.1.8 Slice Support List

This IE indicates the list of supported slices.

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

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

9.3.1.9 S-NSSAI

This IE indicates the S-NSSAI as defined in TS 23.003 [23].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SST	M		OCTET STRING (SIZE(1))	
SD	O		OCTET STRING (SIZE(3))	

9.3.1.10 Security Information

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

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

9.3.1.11 Cell Group Information

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Cell Group List		1			-	-
>Cell Group Item		1..<maxno ofCellGroups>			-	-
>>Cell Group ID	M		INTEGER (0..3, ...)	This IE corresponds to information provided in the <i>CellGroupId</i> IE as defined in TS 38.331 [10] (0=MCG, 1=SCG). In this version of the specification, values "2" and "3" are not used. For E-UTRA Cell Groups, the same encoding is used as for NR Cell Groups. NOTE: There is no corresponding IE defined in TS 36.331 [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..<maxno ofQoSFlows>			-	-
>>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	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				for data forwarding.		

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

9.3.1.13 UP Parameters

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

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

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

9.3.1.16a MRB ID

This IE identifies an MRB.

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

9.3.1.17 E-UTRAN QoS

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

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				for the bearer. Details in TS 23.401 [11].		

9.3.1.20 Bit Rate

This IE indicates the number of bits delivered by NG-RAN/E-UTRAN in UL or to NG-RAN/E-UTRAN in DL within a period of time, divided by the duration of the period. It is used, for example, to indicate the maximum or guaranteed bit rate for a GBR QoS flow or a GBR bearer, or an aggregated maximum bit rate.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Bit Rate	M		INTEGER (0..4,000,000,000,000, ...)	The unit is: bit/s

9.3.1.21 PDU Session ID

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

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

9.3.1.22 PDU Session Type

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

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

9.3.1.23 Security Indication

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
	required or preferred			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
if Integrity Protection required or preferred	This IE shall be present if the <i>Integrity Protection Indication</i> IE within the <i>Security Indication</i> IE is set to "required" or "preferred".

9.3.1.24 QoS Flow Identifier

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

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

9.3.1.25 QoS Flow QoS Parameters List

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
QoS Flow List		1			-	-
>QoS Flow Item		1..<maxno of QoS Flows>			-	-
>>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
maxno of QoS Flows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.1.26 QoS Flow Level QoS Parameters

This IE defines the QoS parameters to be applied to a QoS Flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE QoS Characteristics	M				-	
>Non-dynamic 5QI						
>>Non Dynamic 5QI Descriptor	M		9.3.1.27		-	
>Dynamic 5QI						
>>Dynamic 5QI Descriptor	M		9.3.1.28		-	
NG-RAN Allocation and Retention Priority	M		9.3.1.29		-	
GBR QoS Flow Information	O		9.3.1.30	This IE shall be present for GBR QoS Flows and is ignored otherwise.	-	
Reflective QoS Attribute	O		ENUMERATED (subject to, ...)	Details in TS 23.501 [20]. This IE applies to Non-GBR flows only and is ignored otherwise.	-	
Additional QoS Flow Information	O		ENUMERATED (more likely, ...)	This IE indicates that traffic for this QoS flow is likely to appear more often than traffic for other flows established for the PDU Session.	-	
Paging Priority Index	O		INTEGER (1.. 8, ...)	This IE is not used in this version of the specification.	-	
RDI	O		ENUMERATED (enabled, ...)	Indicates whether Reflective QoS flow to DRB mapping should 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 <i>Extended Packet Delay Budget</i> IE is present.	-	-
Packet Error Rate	M		9.3.1.48	For details see TS 23.501 [20].	-	-
5QI	O		INTEGER (0..255,...)	This IE contains the dynamically assigned 5QI as	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				specified in TS 23.501 [20].		
Delay Critical	C-ifGBRflow		ENUMERATED (delay critical, non-delay critical)	For details see TS 23.501 [20].	-	-
Averaging Window	C-ifGBRflow		9.3.1.49	For details see TS 23.501 [20].	-	-
Maximum Data Burst Volume	O		9.3.1.50	For details see TS 23.501 [20]. This IE shall be included if the <i>Delay Critical</i> IE is set to "delay critical" and is ignored otherwise.	-	-
Extended Packet Delay Budget	O		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 <i>GBR QoS Flow Information</i> IE is present in the <i>QoS Flow Level QoS Parameters</i> IE.

9.3.1.29 NG-RAN Allocation and Retention Priority

This IE specifies the relative importance of a QoS flow compared to other QoS flows for allocation and retention of NG-RAN resources.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Priority Level	M		INTEGER (0..15)	Desc.: This IE defines the relative importance of a resource request (see TS 23.501 [20]). Usage: Values are ordered in decreasing order of priority, i.e., with 1 as the highest priority and 15 as the lowest priority. Further usage is defined in TS 23.501 [20].
Pre-emption Capability	M		ENUMERATED (shall not trigger	Desc.: This IE indicates the pre-emption capability of the request

IE/Group Name	Presence	Range	IE type and reference	Semantics description
			pre-emption, may trigger pre-emption)	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 Loss Rate 9.3.1.46	Indicates the maximum rate for lost packets that can be tolerated in the downlink direction. Details in TS 23.501 [20].	-	
Maximum Packet Loss Rate Uplink	O		Packet Loss Rate 9.3.1.46	Indicates the maximum rate for lost packets that can be tolerated in	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				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 Cell Group is used for UL data.

9.3.1.34 gNB-CU-UP Cell Group Related Configuration

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

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

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

9.3.1.35 PDCP Count

This IE include the PDCP Count information.

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

9.3.1.35a MBS PDCP COUNT

This IE includes the MBS PDCP Count information.

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

9.3.1.36 NR CGI Support List

This IE indicates the list of supported NR CGIs.

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

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

9.3.1.37 QoS Parameters Support List

This IE indicates the list of supported QoS parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
E-UTRAN QoS Support List	O			
>E-UTRAN QoS Support Item		1..<maxnoofE UTRNQoSParameters>		
>>E-UTRAN QoS	M		9.3.1.17	
NG-RAN QoS Support List	O			
>NG-RAN QoS Support Item		1..<maxnoofN GRANQoSParameters>		
>>Non Dynamic 5QI Descriptor	M		9.3.1.27	

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

9.3.1.38 PDCP Configuration

This IE carries the PDCP configuration.

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				BEARER CONTEXT MODIFICATION REQUEST message.		
PDCP SN DL Size	M		PDCP SN Size 9.3.1.61	Indicates the PDCP SN DL size in bits. Corresponds to information provided in the <i>pdcp-SN-SizeDL</i> contained in the <i>PDCP-Config</i> IE in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. Is ignored if received through <i>DRB To Modify List</i> IE in the BEARER CONTEXT MODIFICATION REQUEST message.	-	-
RLC mode	M		ENUMERATED (RLC-TM, RLC-AM, RLC-UM-Bidirectional, RLC-UM-Unidirectional-UL, RLC-UM-Unidirectional-DL, ...)	Indicates the RLC mode for the DRB. For more information see <i>PDCP-Config</i> IE in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. Is ignored if received through <i>DRB To Modify List</i> IE in the BEARER CONTEXT MODIFICATION REQUEST message.	-	-
ROHC Parameters	O		9.3.1.40		-	-
T-Reordering Timer	O		9.3.1.41		-	-
Discard Timer	O		9.3.1.42	This IE is ignored if the <i>Discard Timer Extended</i> IE is present.	-	-
UL Data Split Threshold	O		9.3.1.43		-	-
PDCP Duplication	O		ENUMERATED (True, ...)	Indicates whether PDCP duplication is to be configured for the DRB. This IE is ignored when the " <i>Additional PDCP duplication Information</i> " IE is present.	-	-
PDCP Re-	O		ENUMERATED	Indicates PDCP	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
establishment			(true,...)	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	YES	ignore

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

9.3.1.40 ROHC Parameters

This IE carries the ROHC parameters for header compressions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice ROHC Parameters	M			Corresponds to information provided in the <i>rohc</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
>ROHC				
>>max CID	M		INTEGER (0..16383)	Corresponds to information provided in the <i>maxCID</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.
>>>ROHC Profiles	M		INTEGER (0..511)	Bitmap with supported UE

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

9.3.1.41 T-Reordering Timer

This IE indicates the t-Reordering timer.

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

9.3.1.42 Discard Timer

This IE indicates PDCP discard timer.

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

9.3.1.43 UL Data Split Threshold

This IE indicates UL data split threshold.

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

9.3.1.44 Data Usage Report List

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

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

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

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

9.3.1.46 Packet Loss Rate

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

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

9.3.1.47 Packet Delay Budget

This IE indicates the Packet Delay Budget for a QoS Flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Packet Delay Budget	M		INTEGER (0..1023, ...)	Upper bound value for the delay that a packet may experience expressed in unit of 0.5ms.

9.3.1.48 Packet Error Rate

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Scalar	M		INTEGER (0..9, ...)	The packet error rate is expressed as Scalar x 10-k where k is the Exponent.
Exponent	M		INTEGER (0..9, ...)	

9.3.1.49 Averaging Window

This IE indicates the Averaging Window for a QoS Flow.

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

9.3.1.50 Maximum Data Burst Volume

This IE indicates the Maximum Data Burst Volume for a QoS Flow and applies to delay critical GBR QoS flows only.

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

9.3.1.51 Priority Level

This IE indicates the Priority Level for a QoS Flow.

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

9.3.1.52 Security Result

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

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				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 <i>seconds</i> .

9.3.1.55 Paging Priority Indicator (PPI)

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

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

9.3.1.56 gNB-CU-UP Capacity

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

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

9.3.1.57 Maximum Integrity Protected Data Rate

This IE indicates the maximum aggregate data rate for integrity protected DRBs for a UE as defined in TS 38.300 [8].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Maximum IP rate	M		ENUMERATED (64kbps, max-	Defines the upper bound of the aggregated data rate of user

IE/Group Name	Presence	Range	IE type and reference	Semantics description
			UErate, ...)	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		1..<maxno			–	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Item		<i>ofQoSFlows</i>				
>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 <i>PDCP-Config IE</i> in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.

9.3.1.62 Network Instance

This IE provides the network instance to be used by the NG-RAN node when selecting a particular transport network resource as described in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Network Instance	M		INTEGER (1..256, ...)	

9.3.1.63 MR-DC Usage Information

This IE provides information on the data usage for the UE connected to 5GC, e.g., secondary RAT in MR-DC as specified in TS 37.340 [19].

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Data Usage per PDU Session Report	O				-	
>Secondary RAT Type	M		ENUMERATED (nR, e-UTRA...)			
>PDU session Timed	M		MR-DC Data			

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Report List			Usage Report List 9.3.1.64			
Data Usage per QoS Flow List	O					
>Data Usage per QoS Flow Item		1..<maxno ofQoSFlows>			–	
>>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..<maxnooftime periods>		
>Start timestamp	M		OCTET STRING (SIZE(4))	UTC time encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [14]. It indicates the start time of the collecting period of the included <i>Usage Count UL</i> IE and <i>Usage Count DL</i> IE.
>End timestamp	M		OCTET STRING (SIZE(4))	UTC time encoded in the same format as the first four octets of the 64-bit timestamp format as defined in section 6 of IETF RFC 5905 [14]. It indicates the end time of the collecting period of the included <i>Usage Count UL</i> IE and <i>Usage Count DL</i> IE.
>Usage count UL	M		INTEGER (0..2 ⁶⁴ -1)	The unit is: octets.
>Usage count DL	M		INTEGER (0..2 ⁶⁴ -1)	The unit is: octets.

Range bound	Explanation
maxnooftimeperiods	Maximum no. of time reporting periods. Value is 2.

9.3.1.65 gNB-DU ID

The gNB-DU ID uniquely identifies a gNB-DU at least within a gNB-CU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
gNB-DU ID	M		INTEGER (0 .. 2 ³⁶ -1)	The gNB-DU ID is independently configured from cell identifiers, i.e. no connection between gNB-

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				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 <i>Network Instance</i> IE specified in TS 29.244 [29]

9.3.1.67 Activity Notification Level

This IE contains information on which level activity notification shall be performed..

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Activity Notification Level	M		ENUMERATED (DRB, PDU Session, UE, ...)	

9.3.1.68 Trace Activation

This IE defines parameters related to a trace session activation.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Trace ID	M		OCTET STRING (SIZE(8))	This IE is composed of the following: Trace Reference defined in TS 32.422 [24] (leftmost 6 octets, with PLMN information encoded as in 9.3.1.7), and Trace Recording Session Reference defined in TS 32.422 [24] (last 2 octets).	-	-
Interfaces To Trace	M		BIT STRING (SIZE(8))	Each position in the bitmap represents an NG-RAN node interface: first bit = NG-C, second bit = Xn-C, third bit = Uu, fourth bit = F1-C, fifth bit = E1: other bits reserved for future use. Value '1' indicates 'should be traced'.	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				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..<maxno ofDRBs>			-	
>>DRB ID	M		9.3.1.16		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>>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 <i>ReferenceTime</i> IE as defined in TS 38.331 [10]. The value is provided with 1 us accuracy.

9.3.1.79 Extended Packet Delay Budget

This IE indicates the Packet Delay Budget for a QoS flow.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Extended Packet Delay Budget	M		INTEGER (0..65535, ..., 65536..109999)	Upper bound value for the delay that a packet may experience expressed in unit of 0.01ms.

9.3.1.80 Redundant PDU Session Information

This IE defines Redundancy information to be applied to a PDU Session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
RSN	M		ENUMERATED (v1, v2, ...)		-	-
PDU Session Pair ID	O		INTEGER (0..255, ...)	as defined in TS 23.501 [20]. This IE is not used in the response message. If received, the gNB-CU-CP shall ignore it.	YES	ignore

9.3.1.81 QoS Mapping Information

This IE indicates the DSCP and/or IPv6 Flow Label field(s) of IP packet which is sent through the GTP-U tunnel of a requested DRB. This IE is only used for IAB.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DSCP	O		BIT STRING (SIZE(6))	
Flow Label	O		BIT STRING (SIZE(20))	

9.3.1.82 NID

This IE contains the Network Identifier of an SNPN, as specified in TS 23.501 [20]. The NID is specified in TS 23.003 [23].

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

9.3.1.83 NPN Support Information

This IE provides NPN related information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>NPN Support Information</i>	M			
> <i>NPN Support Information</i> -SNPN				
>>NID	M		9.3.1.82	This IE is associated with the PLMN Identity and the Slice Support List contained in the <i>Supported PLMNs</i> IE. Together with the PLMN Identity it identifies the SNPN supported by the gNB-CU-UP.

9.3.1.84 NPN Context Information

This IE provides bearer context related NPN information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>NPN Context Information</i>	M			
> <i>SNPN Information</i>				
>>NID	M		9.3.1.82	This IE is associated with Serving PLMN information contained in bearer context related E1AP message. Together with the Serving PLMN identity it identifies the serving SNPN.

9.3.1.85 MDT Configuration

The IE defines the NR/E-UTRAN MDT configuration parameters.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT Activation	M		ENUMERATED (Immediate MDT only, Immediate MDT and Trace,...)	
CHOICE <i>MDT Mode</i>	M			
> <i>Immediate MDT</i>				
>>Measurements to Activate	M		BITSTRING (SIZE(8))	Each position in the bitmap indicates a MDT measurement, as defined in TS 37.320 [27]. Fourth Bit = M4, Seventh Bit = M6, Eighth Bit = M7. Value "1" indicates "activate" and value "0" indicates "do not activate". This version of the specification does not use bits 1, bit 2, bit 3, bit 5 and bit 6.
>>M4 Configuration	C-ifM4		9.3.1.86	
>>M6 Configuration	C-ifM6		9.3.1.87	
>>M7 Configuration	C-ifM7		9.3.1.88	

Condition	Explanation
ifM4	This IE shall be present if the <i>Measurements to Activate</i> IE has the

Condition	Explanation
	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, ... }	Corresponds to information provided in the <i>ehc-CID-Length</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.	-	-
EHC Downlink	O				-	-
>drb-ContinueEHC-DL	M		ENUMERATED { true, ..., false }	Corresponds to information provided in the <i>drb-ContinueEHC-DL</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. The value "false" indicates that the PDCP entity resets the downlink EHC header compression protocol during PDCP re-establishment.	-	-
>maxCID-EHC-DL	O		INTEGER(1..32 767, ...)	Indicate the maximum number of DL EHC contexts that can be established for	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				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.		
EHC Uplink	O				-	-
>drb-ContinueEHC-UL	M		ENUMERATED { true, ..., false }	Corresponds to information provided in the <i>drb-ContinueEHC-UL</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation. The value "false" indicates that the PDCP entity resets the 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 <i>Early Forwarding</i>	M			
> <i>First DL COUNT</i>				
>>FIRST DL COUNT Value	M		PDCP Count 9.3.1.35	PDCP-SN and Hyper frame number of the first DL SDU that the source NG-RAN node forwards to the target NG-RAN node

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>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..<maxnoofExtNR CGI>		
>NR CGI	M		9.3.1.14	

Range bound	Explanation
maxnoofExtNR CGI	Maximum no. of extended NR CGIs supported. Value is 16384.

9.3.1.98 Direct Forwarding Path Availability

This IE indicates whether a direct forwarding path is available.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Direct Forwarding Path Availability	M		ENUMERATED (inter-system direct path available, ..., intra-system direct path available)	

9.3.1.99 IAB-donor-CU-UP PSK Info

This IE contains the IAB-Donor-CU-UP Pre-Shared Key generated by the gNB-CU-CP and IP addresses for IAB-donor-CU-UP and IAB-DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
IAB-donor-CU-UP PSK Info Item IEs		1..<maxnoofPSKs>		
>IAB-Donor-CU-UP PSK	M		OCTET STRING	This IE contains the $K_{IAB-CU-UP}$ as defined in TS 33.501 [13].
>IAB-Donor-CU-UP IP Address	M		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
maxnoofSMBRValuesmaxnoofAllowedS-NSSAIs	Maximum no. of SLICE MAXIMUM BIT RATE values for a UE. Value is 8 Maximum no. of allowed S-NSSAI. Value is 8.

9.3.1.103 Survival Time

This IE indicates the Survival Time of the TSC QoS flow as defined in TS 23.501 [20].

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Survival Time	M		INTEGER (0..1920000, ...)	Survival Time expressed in units of 1 us.

9.3.1.104 UDC Parameters

This IE carries the UDC parameters for uplink data compression.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Buffer Size	M		ENUMERATED (kbyte2, kbyte4, kbyte8, ...)	Indicates the buffer size applied for UDC. Corresponds to information provided in the <i>bufferSize</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.	-	
Dictionary	O		ENUMERATED (sip-SDP, operator, ...)	Indicates which pre-defined dictionary is used for UDC. Corresponds to information provided in the <i>dictionary</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10] for gNB or ng-eNB CP-UP separation, or in TS 36.331 [33] for eNB CP-UP separation.	-	
Continue UDC	O		ENUMERATED (true, ...)	Corresponds to information provided in the <i>drb-ContinueUDC</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10].	-	
Version ID	O		INTEGER (0..15)	Indicates the version ID for Operator Defined Dictionary. Corresponds to information provided in <i>versionOfDictionary</i> contained in the <i>PDCP-Parameters</i> IE as defined in TS38.331[10].	YES	ignore

9.3.1.105 SCG Activation Status

The *SCG Activation Status* IE indicates the status of SCG resources.

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
SCG Activation Status	M		ENUMERATED (SCG activated, SCG deactivated, ...)	

9.3.1.106 gNB-CU-CP MBS E1AP ID

The gNB-CU-CP 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 an MBS session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
TMGI	M		OCTET STRING (SIZE(6))	Encoded as defined in TS 23.003.
NID	O		9.3.1.82	Defined in TS 23.003 [23].

9.3.1.109 DU Cell Reference

This IE indicates the index of an NR CGI within a DU.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DU Cell Index	M		INTEGER (1..512)	To support per cell F1-U tunnels and being able to refer to it.
NR CGI	M		9.3.1.14	

9.3.1.110 gNB-CU-UP MBS Support Information

This IE includes MBS related support information for the E1 Setup procedure.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Support Information To Add List		0..1		
>MBS Support Information To Add Item		1..<maxnoofM BSSessionIDs >		
>>Global MBS Session ID	M		9.3.1.108	
MBS Support Information To Remove List		0..1		
>MBS Support Information To Remove Item		1..<maxnoofM BSSessionIDs >		
>>Global MBS Session	M		9.3.1.108	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
ID				

Range bound	Explanation
maxnoofMBSsessionIDs	Maximum no. of MBS Session IDs. Value is 512.

9.3.1.111 MBS Area Session ID

This IE indicates an MBS Area Session.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Area Session ID	M		INTEGER (0 .. 65535, ...)	

9.3.1.112 BC Bearer Context NG-U TNL Info at 5GC

This IE contains TNL information for an MBS Session as provided by the 5GC for 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 <i>MBS Session Type</i>				
> <i>location independent</i>				
>>MBS NG-U Information at 5GC	M		9.3.1.113	
> <i>location dependent</i>				
>>Location dependent MBS NG-U Information at 5GC		1..<maxnoofMBSAreaSessionIDs>		
>>>MBS Area Session ID	M		9.3.1.111	
>>MBS NG-U Information at 5GC	M		9.3.1.113	

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

9.3.1.113 MBS NG-U Information at 5GC

This IE contains TNL information for a single shared NG-U tunnel as provided by the 5GC.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS NG-U Transport</i>				
> <i>multicast</i>				
>IP Multicast Address	M		Transport Layer Address 9.3.2.4	
>IP Source Address	M		Transport Layer Address 9.3.2.4	
>GTP DL TEID	M		GTP-TEID 9.3.2.3	

9.3.1.114 BC MRB Setup Configuration

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
BC MRB To Setup List		<i>1..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MBS PDCP Configuration	M		PDCP Configuration 9.3.1.38	
>MBS QoS Flows Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.1.115 Requested Action for Available Shared NG-U Termination

This IE provides information about the requested gNB-CU-UP's action with regards to a potentially available shared NG-U termination.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Requested Action for Available Shared NG-U Termination	M		ENUMERATED (apply available configuration, apply requested configuration, ..., apply available configuration if same as requested)	

9.3.1.116 BC Bearer Context NG-U TNL Info at NG-RAN

This IE contains NG-RAN NG-U TNL information for an MBS Session for both, shared NG-U unicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<i>CHOICE MBS Session Type</i>	M			
> <i>location independent</i>				
>>MBS NG-U Information at NG-RAN	M		9.3.1.117	
> <i>location dependent</i>				
>> Location dependent MBS NG-U Information at NG-RAN		<i>1..<maxnoofMBSAreaSessionIDs></i>		
>>>MBS Area Session ID	M		9.3.1.111	
>>MBS NG-U Information at NG-RAN	M		9.3.1.117	

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

9.3.1.117 MBS NG-U Information at NG-RAN

This IE contains NG-RAN TNL information for a single shared NG-U tunnel.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>MBS NG-U Transport</i>	M			
> <i>unicast</i>				
>>Shared NG-U DL Transport Layer Information	M		UP Transport Layer Information 9.3.2.1	

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 <i>MBS Session Type</i>	M			
> <i>location independent</i>				
>>MBS F1-U Information at CU	M		UP Transport Layer Information 9.3.2.1	
> <i>location dependent</i>				
>>Location dependent MBS F1-U Information at CU		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 <i>MBS Session Type</i>	M			
> <i>location independent</i>				
>>MBS F1-U Information at DU	M		UP Transport Layer Information 9.3.2.1	
> <i>location dependent</i>				
>>Location dependent		1..<maxnoofM		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS F1-U Information at DU		<i>BSAreaSessionIDs</i>		
>>>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		<i>1..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MBS PDCP Configuration	M		PDCP Configuration 9.3.1.38	
>MBS QoS Flows Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.1.121 MC Bearer Context NG-U TNL Info at NG-RAN

This IE contains NG-RAN NG-U TNL information for an MBS Session for both, shared NG-U unicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<i>CHOICE MBS Session Type</i>	M			
> <i>location independent</i>				
>>MBS NG-U Information at NG-RAN	M		9.3.1.117	
> <i>location dependent</i>				
>>Location dependent MBS NG-U Information at NG-RAN		<i>1..<maxnoofMBSAreaSessionIDs></i>		
>>>MBS Area Session ID	M		9.3.1.111	
>>>MBS NG-U Information at NG-RAN	M		9.3.1.117	

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

9.3.1.122 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 a reference to a Multicast F1-U Context and may contain an MBS Area Session ID and an indication to setup a Multicast F1-U Context for ptp retransmissions.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Multicast F1-U Context ReferenceE1	M		9.3.1.139	
MC F1-U Context usage	M		ENUMERATED (ptm, ptp, ptp retransmission, ptp forwarding, ...)	"ptm" indicates that the Multicast F1-U Context is setup for ptm transmissions; decided by the DU. "ptp" indicates that the Multicast F1-U Context is setup for ptp transmissions; decided by the DU. "ptp retransmission" indicates that the Multicast F1-U Context is setup for ptp retransmissions (based on PDCP Status Report); requested by the CU "ptp forwarding" indicates that the Multicast F1-U Context is setup for transmitting from a defined MBS Progress

IE/Group Name	Presence	Range	IE type and reference	Semantics description
				Information status onwards; requested by the CU.
MBS Area Session ID	O		9.3.1.111	To support per MBS Area Session F1-U tunnels and being able to refer to it.

9.3.1.126 Void

Void.

9.3.1.127 MC Bearer Context NG-U TNL Info at NG-RAN Modify Response

This IE contains NG-RAN NG-U TNL information for an MBS Session for both, shared NG-U multicast and unicast transport. It may also contain per Area Session ID NG-U TNL information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS NG-U Information at NG-RAN	M		9.3.1.117	
MBS Area Session ID	O		9.3.1.111	

9.3.1.128 Discard Timer Extended

This IE indicates the extended PDCP discard timer.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Discard Timer Extended	M		ENUMERATED (0.5, 1, 2, 4, 6, 8, ..., 2000)	Indicates the PDCP discard timer. The values are expressed in <i>ms</i> . Corresponds to information provided in the <i>DiscardTimerExt-r16</i> or the <i>DiscardTimerExt2-r17</i> contained in the <i>PDCP-Config</i> IE as defined in TS 38.331 [10].

9.3.1.129 MDT PLMN Modification List

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

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MDT PLMN Modification List		<i>0..<maxnoofMDTPLMNs></i>		An empty list indicates there is no PLMN allowed for MDT.
>PLMN Identity	M		9.3.1.7	

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

9.3.1.130 MRB Progress Information

This IE contains the MRB progress information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE MRB Progress Information SNs	M			
>12bits				
>>PDCP SN Length 12	M		INTEGER (0..4095)	
>18bits				
>>PDCP SN Length 18	M		INTEGER (0..262143)	
MRB Progress Information Type	M		9.3.1.131	

9.3.1.131 MRB Progress Information Type

This IE contains the MRB progress information.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MRB Progress Information Type	M		ENUMERATED (oldest available, last delivered, ...)	

9.3.1.132 MC Forwarding Resource ID

This IE provides the means to identify a MC forwarding resource. It is uniquely allocated for a MC Bearer Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		OCTET STRING (SIZE(2))	

9.3.1.133 MBS Session Associated Information

This IE provides the means to establish a MC MBS session level forwarding resource to support handover to a gNB not supporting NR MBS.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Associated QoS Flow Information List		1..<maxnoofQoSflows>		
>MBS QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	
>Associated Unicast QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	
MBS Session Forwarding Address	M		UP Transport Layer Information 9.3.2.1	

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

9.3.1.134 MC Forwarding Resource Request

This IE is used by the gNB-CU-CP for request from the gNB-CU-UP information from the peer node regarding a MC Forwarding Resource.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource	M		9.3.1.132	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
ID				
MBS Area Session ID	O		9.3.1.111	
MRB Forwarding Resource Request List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MRB Progress Information Type	O		9.3.1.131	Requests MRB Progress Information of the indicated type from the peer node
>MRB Forwarding Address Request	O		ENUMERATED (request, ...)	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.1.135 MC Forwarding Resource Indication

This IE is used by the gNB-CU-CP for indicate to the gNB-CU-UP information from the peer node regarding MC Forwarding Resources.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	
MRB Forwarding Indication List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MRB Progress Information	O		9.3.1.130	Provides MRB Progress Information from the peer node.
>MRB Forwarding Address	O		UP Transport Layer Information 9.3.2.1	
MBS Session Associated Information	O		9.3.1.133	

9.3.1.136 MC Forwarding Resource Response

This IE is used by the gNB-CU-UP to response to requests from the gNB-CU-CP regarding a MC Forwarding Resource at the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	
MRB Forwarding Indication List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MRB Progress Information	O		9.3.1.130	
>MRB Forwarding Address	O		UP Transport Layer Information 9.3.2.1	

9.3.1.137 MC Forwarding Resource Release

This IE is used by the gNB-CU-CP to release a MC Forwarding Resource at the gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource	M		9.3.1.132	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
ID				

9.3.1.138 MC Forwarding Resource Release Indication

This IE is used by the gNB-CU-UP to indicate the release of a MC Forwarding Resource to the gNB-CU-CP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Forwarding Resource ID	M		9.3.1.132	

9.3.1.139 Multicast F1-U Context ReferenceE1

This IE contains a reference to a Multicast F1-U Context used within an MBS-associated logical E1-connection.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Multicast F1-U Context ReferenceE1	M		OCTET STRING (SIZE(4))	This value is allocated to uniquely denote an Multicast F1-U Context within an MBS-associated logical E1-connection.

9.3.1.140 MBS Session Associated Information Non-Support-to-Support

This IE contains the UE ID, PDU session ID and QFIs associated to a given MBS session, used in handover from non-MBS-supporting RAN node to MBS-supporting RAN node to eliminate packet duplication.

NOTE: This IE is only applicable for deployments deriving the PDCP COUNT values by means of a DL MBS QFI Sequence Number provided on NG-U and requires the appropriate associated PDU Session and MBS session resources to be provided by the same logical gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
UE Reference ID	M		gNB-CU-CP UE E1AP ID 9.3.1.4	
PDU Session ID	M		9.3.1.21	
Associated QoS Flow Information List	M		MBS Session Associated Information List 9.3.1.141	

9.3.1.141 MBS Session Associated Information List

This IE provides the association between MBS QoS flows and unicast QoS flows.

NOTE: This IE is only applicable for deployments deriving the PDCP COUNT values by means of a DL MBS QFI Sequence Number provided on NG-U and requires the appropriate associated PDU Session and MBS session resources to be provided by the same logical gNB-CU-UP.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Session Association Information Item		<i>1..<maxnoofQoSflows></i>		
>MBS QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24	
>Associated Unicast QoS	M		QoS Flow Identifier	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Flow Identifier			9.3.1.24	

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

9.3.2 Transport Network Layer Related IEs

9.3.2.1 UP Transport Layer Information

The *UP Transport Layer Information* IE identifies a transport bearer associated to a DRB. It contains a Transport Layer Address and a GTP Tunnel Endpoint Identifier. The Transport Layer Address is an IP address to be used for the user plane transport.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
CHOICE <i>Transport Layer Information</i>	M			
> <i>GTP Tunnel</i>				
>>Transport Layer Address	M		9.3.2.4	
>>GTP-TEID	M		9.3.2.3	

9.3.2.2 CP Transport Layer Information

This IE is used to provide the E1 control plane transport layer information associated with an gNB-CU-CP and gNB-CU-UP pair.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
CHOICE <i>CP Transport Layer Information</i>						
> <i>Endpoint-IP-address</i>					-	-
>> Endpoint IP 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..<maxno of QoS flows>			-	-
>>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		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>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..<maxno ofDRBs>			-	-
>DRB ID	M		9.3.1.16		-	-
>PDCP Configuration	M		9.3.1.38		-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>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		<i>1..<maxno ofPDUSes sionResource></i>			-	-
>PDU Session ID	M		9.3.1.21		-	-
>PDU Session Type	M		9.3.1.22		-	-
>S-NSSAI	M		9.3.1.9		-	-
>Security Indication	M		9.3.1.23		-	-
>PDU Session Resource DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20	This IE shall be present when at least one Non-GBR QoS Flows is being setup.	-	-
>NG UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	-
>PDU Session Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5		-	-
>PDU Session Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				PDU Session.		
>Existing Allocated NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	-
>Network Instance	O		9.3.1.62	This IE is ignored if the <i>Common Network Instance</i> IE is included.	YES	ignore
>Common Network Instance	O		9.3.1.66		YES	ignore
>DRB To Setup List		1			-	-
>>DRB To Setup Item		1..<maxno ofDRBs>			-	-
>>>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	O		Common		YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Network Instance			Network Instance 9.3.1.66			
>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		<i>1..<maxno ofDRBs></i>			-	-
>DRB ID	M		9.3.1.16		-	-
>S1 DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	-
>Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6	Providing forwarding info from the target gNB-CU-UP.	-	-
>UL UP Parameters	M		UP Parameters 9.3.1.13		-	-
>S1 DL UP Unchanged	O		ENUMERATED (True, ...)	This IE is not used in this version of the specification.	-	-
>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore
>Security Result	O		9.3.1.52		YES	ignore

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

9.3.3.4 DRB Failed List E-UTRAN

This IE contains failed to setup DRB related information at Bearer Context Setup Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Failed Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

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

9.3.3.5 PDU Session Resource Setup List

This IE contains setup PDU session resource related information used at Bearer Context Setup Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Setup Item		1..<maxno ofPDU SessionResource>			-	-
>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..<maxno ofDRBs>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>DRB Data forwarding information Response	O		Data Forwarding Information 9.3.2.6	Providing forwarding info from the target gNB-CU-UP.	-	-
>>>UL UP Parameters	M		UP Parameters 9.3.1.13		-	-
>>>Flow Setup List	M		QoS Flow List 9.3.1.12		-	-
>>>Flow Failed List	O		Flow Failed List 9.3.1.45		-	-
>DRB Failed List		0.. 1			-	-
>>DRB Failed Item		1..<maxno ofDRBs>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>Cause	M		9.3.1.2		-	-
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore
>Used Redundant PDU Session Information	O		9.3.1.80		YES	ignore

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

9.3.3.6 PDU Session Resource Failed List

This IE contains failed PDU session resource related information used at Bearer Context Setup Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Failed Item		1..<maxnoofPDU SessionResource>		
>PDU Session ID	M		9.3.1.21	
>Cause	M		9.3.1.2	

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

9.3.3.7 DRB To Setup Modification List E-UTRAN

This IE contains DRB to setup related information used at Bearer Context Modification Request in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB To Setup Modification Item E-UTRAN		1..<maxno ofDRBs>			-	-
>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.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>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		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	

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

9.3.3.10 PDU Session Resource To Setup Modification List

This IE contains PDU session resource to setup related information used at Bearer Context Modification Request

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Setup Modification Item		<i>1..<maxnoofPDU Session Resource></i>			-	-
>PDU Session ID	M		9.3.1.21		-	-
>PDU Session Type	M		9.3.1.22		-	-
>S-NSSAI	M		9.3.1.9		-	-
>Security Indication	M		9.3.1.23		-	-
>PDU Session Resource DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20	This IE shall be present when Non-GBR QoS Flows are setting up.	-	-
>NG UL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	-
>PDU Session Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding info from the target gNB-CU-UP.	-	-
>PDU Session Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to PDU Session.	-	-
>Network Instance	O		9.3.1.62		-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>Common Network Instance	O		9.3.1.66		YES	ignore
>DRB To Setup List		1			-	-
>>DRB To Setup Item		1..<maxno ofDRBs>			-	-
>>>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.
maxnoofPDU SessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.11 PDU Session Resource To Modify List

This IE contains PDU session resource to modify related information used at Bearer Context Modification Request

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Modify Item		<i>1..<maxno ofPDUSessionResource></i>			-	-
>PDU Session ID	M		9.3.1.21		-	-
>Security Indication	O		9.3.1.23	This IE is not used in this release.	-	-
>PDU Session Resource DL Aggregate Maximum Bit Rate	O		Bit Rate 9.3.1.20		-	-
>NG UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	-
>PDU Session Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding information from the target gNB-CU-UP.	-	-
>PDU Session Data Forwarding Information	O		Data Forwarding Information 9.3.2.6	Providing forwarding information to the 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 <i>Common Network Instance</i> IE is included.	YES	ignore
>Common Network Instance	O		9.3.1.66		YES	ignore
>DRB To Setup List		<i>0..1</i>			-	-
>>DRB To Setup Item		<i>1..<maxno ofDRBs></i>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>SDAP Configuration	M		9.3.1.39		-	-
>>>PDCP Configuration	M		9.3.1.38		-	-
>>>Cell Group Information	M		9.3.1.11		-	-
>>>QoS Flow Information To Be Setup	M		QoS Flow QoS Parameters List 9.3.1.25		-	-
>>>DRB Data Forwarding Information Request	O		Data Forwarding Information Request 9.3.2.5	Requesting forwarding information from the target gNB-CU-UP.	-	-
>>>DRB Inactivity Timer	O		Inactivity Timer 9.3.1.54	Included if the Activity Notification Level is set to DRB.	-	-
>>>PDCP SN Status Information	O		9.3.1.58	Provides the PDCP SN Status at setup after Resume to the target gNB-CU-UP.	-	-
>>>DRB QoS	O		9.3.1.26	Indicates the DRB QoS when more	YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				than one QoS Flow is mapped to the DRB		
>>>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..<maxno ofDRBs>			-	-
>>>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	YES	reject

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
				not yet received SDAP end markers, as described in TS 38.300 [8].		
>>>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
>>>PDCP COUNT Reset	O		ENUMERATED (True, ...)	Used for intra-gNB-CU-UP HO with full configuration	YES	reject
>DRB To Remove List		0.. 1			-	-
>>DRB To Remove Item		1..<maxno ofDRBs>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>S-NSSAI	O		9.3.1.9		YES	reject
>Redundant NG UL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore
>Redundant Common Network Instance	O		Common Network Instance 9.3.1.66		YES	ignore
>Data Forwarding to E-UTRAN Information List		0.. 1		Contains a list of DL Data Forwarding tunnels and the associated QoS Flows to be forwarded on each tunnel	YES	ignore
>>Data Forwarding to E-UTRAN Information List Item		1..<maxno ofDataForwardingTunneltoE-UTRAN>			-	-
>>>Data forwarding tunnel information	M		UP Transport Layer Information 9.3.2.1		-	-
>>>QoS Flows to		1			-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
be forwarded List						
>>>>QoS Flows to be forwarded Item		1..<maxno ofQoSflows>			-	-
>>>>QoS Flow Identifier	M		QoS Flow Identifier 9.3.1.24		-	-
>Security Indication Modify	O		Security Indication 9.3.1.23		YES	ignore
>Secondary PDU Session Data Forwarding Information	O		Data Forwarding Information 9.3.2.6	Providing secondary forwarding information to the source gNB-CU-UP in case of split PDU session.	YES	ignore

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDUSessionResource	Maximum no. of PDU Sessions for a UE. Value is 256.
maxnoofDataForwardingTunneltoE-UTRAN	Maximum no. of Data Forwarding Tunnels to E-UTRAN for a UE. Value is 256.
maxnoofQoSflows	Maximum no. of QoS flows in a PDU Session. Value is 64.

9.3.3.12 PDU Session Resource To Remove List

This IE contains PDU session resource to remove related information

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource To Remove Item		1..<maxno ofPDUSessionResource>			-	-
>PDU Session ID	M		9.3.1.21		-	-
>Cause	O		9.3.1.2		YES	ignore

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

9.3.3.13 DRB Setup Modification List E-UTRAN

This IE contains setup DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
DRB Setup Modification Item E-UTRAN		1..<maxno ofDRBs>			-	-
>DRB ID	M		9.3.1.16		-	-
>S1 DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	-
>Data Forwarding Information Response	O		9.3.2.6	Provides forwarding information from the target gNB-CU-UP.	-	-

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>UL UP Parameters	M		UP Parameters 9.3.1.13		-	-
>Security Result	O		9.3.1.52		YES	ignore
>Data Forwarding Source IP Address	O		Transport Layer Address 9.3.2.4	Identifies the TNL address used by the source node for data forwarding.	YES	ignore

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

9.3.3.14 DRB Failed Modification List E-UTRAN

This IE contains failed to setup DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Failed Modification Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

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

9.3.3.15 DRB Modified List E-UTRAN

This IE contains modified DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Modified Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>S1 DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1	
>PDCP SN Status Information	O		9.3.1.58	Provides the PDCP SN Status from the source gNB-CU-UP.
>UL UP Parameters	O		UP Parameters 9.3.1.13	Carries the UL UP parameters.

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

9.3.3.16 DRB Failed To Modify List E-UTRAN

This IE contains failed to modify DRB related information at Bearer Context Modification Response in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Failed To Modify Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

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

9.3.3.17 PDU Session Resource Setup Modification List

This IE contains setup PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Setup Modification Item		<i>1..<maxno ofPDUSe sionResou rce></i>			-	-
>PDU Session ID	M		9.3.1.21		-	-
>Security Result	O		9.3.1.52		-	-
>NG DL UP Transport Layer Information	M		UP Transport Layer Information 9.3.2.1		-	-
>PDU Session Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6	Provides forwarding information from the target gNB-CU-UP.	-	-
>DRB Setup List		<i>1</i>			-	-
>>DRB Setup Item		<i>1..<maxno ofDRBs></i>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>DRB Data forwarding information Response	O		Data Forwarding Information 9.3.2.6	Provides forwarding information from the target gNB-CU-UP.	-	-
>>>UL UP Parameters	M		UP Parameters 9.3.1.13		-	-
>>>Flow Setup List	M		QoS Flow List 9.3.1.12		-	-
>>>Flow Failed List	O		Flow Failed List 9.3.1.45		-	-
>DRB Failed List		<i>0.. 1</i>			-	-
>>DRB Failed Item		<i>1..<maxno ofDRBs></i>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>Cause	M		9.3.1.2		-	-
>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.
maxnoofPDUSe ssionResource	Maximum no. of PDU Sessions for a UE. Value is 256.

9.3.3.18 PDU Session Resource Failed Modification List

This IE contains failed to setup PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Failed Modification Item		<i>1..<maxnoofP DUSe ssionRes ource></i>		

IE/Group Name	Presence	Range	IE type and reference	Semantics description
>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		<i>1..<maxno ofPDUSessionResource></i>			-	
>PDU Session ID	M		9.3.1.21		-	
>NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	
>Security Result	O		9.3.1.52		-	
>PDU Session Data Forwarding Information Response	O		Data Forwarding Information 9.3.2.6		-	
>DRB Setup List		<i>0.. 1</i>			-	
>>DRB Setup Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>DRB Data forwarding information Response	O		Data Forwarding Information 9.3.2.6		-	
>>>UL UP Parameters	M		UP Parameters 9.3.1.13		-	
>>>Flow Setup List	M		QoS Flow List 9.3.1.12		-	
>>>Flow Failed List	O		Flow Failed List 9.3.1.45		-	
>DRB Failed List		<i>0.. 1</i>			-	
>>DRB Failed Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>Cause	M		9.3.1.2		-	
>DRB Modified List		<i>0.. 1</i>			-	
>>DRB Modified Item		<i>1..<maxno ofDRBs></i>			-	
>>>DRB ID	M		9.3.1.16		-	
>>>UL UP Parameters	O		UP Parameters 9.3.1.13	Carries the UL UP parameters.	-	
>>>PDCP SN Status Information	O		9.3.1.58	Provides PDCP SN Status to the target gNB-CU-UP.	-	
>>>Flow Setup List	O		QoS Flow List 9.3.1.12		-	
>>>Flow Failed List	O		Flow Failed List 9.3.1.45		-	
>>>Early Forwarding COUNT	O		9.3.1.92	Provides early data forwarding information from	-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Information				the source gNB-CU-UP.		
>>> Old QoS Flow List - UL End Marker expected	O		QoS Flow List 9.3.1.12	Indicates the QoS flow(s) for which the gNB-CU-UP has not yet received SDAP end markers after the gNB-CU-CP reconfigured those QoS flow(s) to another DRB.	Yes	ignore
>DRB Failed To Modify List		0.. 1			-	-
>>DRB Failed To Modify Item		1..<maxno ofDRBs>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>Cause	M		9.3.1.2		-	-
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore

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

9.3.3.20 PDU Session Resource Failed To Modify List

This IE contains failed to modify PDU session resource related information used at Bearer Context Modification Response

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Failed To Modify Item		1..<maxnoofPDUSessionResource>		
>PDU Session ID	M		9.3.1.21	
>Cause	M		9.3.1.2	

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

9.3.3.21 DRB Required To Modify List E-UTRAN

This IE contains DRB to modify related information used at Bearer Context Modification Required in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Required To Modify Item E-UTRAN		1..<maxnoofDRBs>		
>DRB ID	M		9.3.1.16	
>S1 DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1	
>gNB-CU-UP Cell Group 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		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cause	M		9.3.1.2	

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

9.3.3.23 PDU Session Resource Required To Modify List

This IE contains PDU session resource to modify related information used at Bearer Context Modification Required

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
PDU Session Resource Required To Modify Item		<i>1..<maxnoofPDU SessionResource></i>			-	-
>PDU Session ID	M		9.3.1.21		-	-
>NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		-	-
>DRB To Modify List		<i>0.. 1</i>			-	-
>>DRB To Modify Item		<i>1..<maxnoofDRBs></i>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>gNB-CU-UP Cell Group Related Configuration	O		9.3.1.34		-	-
>>>Flow To Remove	O		QoS Flow List 9.3.1.12		-	-
>>>Cause	O		9.3.1.2		-	-
>DRB To Remove List		<i>0.. 1</i>			-	-
>>DRB To Remove Item		<i>1..<maxnoofDRBs></i>			-	-
>>>DRB ID	M		9.3.1.16		-	-
>>>Cause	M		9.3.1.2		-	-
>Redundant NG DL UP Transport Layer Information	O		UP Transport Layer Information 9.3.2.1		YES	ignore

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

9.3.3.24 DRB Confirm Modified List E-UTRAN

This IE contains modified DRB related information at Bearer Context Modification Confirm in E-UTRAN

IE/Group Name	Presence	Range	IE type and reference	Semantics description
DRB Confirm Modified Item E-UTRAN		<i>1..<maxnoofDRBs></i>		
>DRB ID	M		9.3.1.16	
>Cell Group Information	O		9.3.1.11	Included if the gNB-CU-CP was unable to change cell group related information as requested in the <i>gNB-CU-UP Cell Group Related Configuration</i> IE (e.g., UL Configuration).

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

9.3.3.25 PDU Session Resource Confirm Modified List

This IE contains modified PDU session resource related information used at Bearer Context Modification Confirm

IE/Group Name	Presence	Range	IE type and reference	Semantics description
PDU Session Resource Modified Item		<i>1..<maxnoofPDU Session Resource></i>		
>PDU Session ID	M		9.3.1.21	
>DRB Modified List		<i>0.. 1</i>		
>>DRB Modified Item		<i>1..<maxnoofDRBs></i>		
>>>DRB ID	M		9.3.1.16	
>>>Cell Group Information	O		9.3.1.11	Included if the gNB-CU-CP was unable to change cell group related information as requested in the <i>gNB-CU-UP Cell Group Related Configuration</i> IE (e.g., UL Configuration).

Range bound	Explanation
maxnoofDRBs	Maximum no. of DRBs for a UE. Value is 32.
maxnoofPDU Session Resource	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	O		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		<i>1..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MBS QoS Flow Setup List	M		QoS Flow List 9.3.1.12	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45	
>BC Bearer Context F1-U TNL Info at CU	M		9.3.1.118	
BC MRB Failed List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>Cause	M		9.3.1.2	
Available BC MRB Configuration	O		BC MRB Setup Configuration 9.3.1.114	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

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		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>BC Bearer Context F1-U TNL Info at DU	O		9.3.1.119	
>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		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.29 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		<i>1..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MBS QoS Flow Setup List	O		QoS Flow List 9.3.1.12	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45	
>BC Bearer Context F1-U TNL Info at CU	O		9.3.1.118	
BC MRB Failed List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>Cause	M		9.3.1.2	
Available BC MRB Configuration	O		BC MRB Setup Configuration 9.3.1.114	In case the shared MBS NG-U termination had a different MRB Configuration applied.

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

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		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.31 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	Criticality	Criticality
S-NSSAI	M		9.3.1.9		-	-
MC MRB To Setup List	O		MC MRB Setup Configuration 9.3.1.120		-	-
Requested Action for Available Shared NG-U Termination	O		9.3.1.115		-	-
MBS Session Associated Information Non-Support-to-Support	O		9.3.1.140		YES	ignore
MBS Area Session ID	O		9.3.1.111		YES	ignore
MC Bearer Context	O		Inactivity Timer		YES	ignore

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Criticality
Inactivity Timer			9.3.1.54			
MC Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, ...)		YES	ignore

9.3.3.33 MC Bearer Context To Setup Response

This IE contains MBS session resource related information used to confirm MC Bearer Context Context Setup.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MC Bearer Context NG-U TNL Info at NG-RAN	O		9.3.1.121	
MC MRB Setup Response List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>MBS QoS Flow Setup List	M		QoS Flow List 9.3.1.12	
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45	
>MBS PDCP COUNT	O		9.3.1.35a	
MC MRB Failed List		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	
>Cause	M		9.3.1.2	
Available MC MRB Configuration	O		MC MRB Setup Configuration 9.3.1.120	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.3.3.34 MC Bearer Context To Modify

This IE contains MBS session resource related information used to request a modification of a multicast MC Bearer Context.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MC Bearer Context NG-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		-	
Requested Action for Available Shared NG-U Termination	O		9.3.1.115		-	
MC MRB To Setup or Modify List		<i>0..<maxnoofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>MC Bearer Context F1-U TNL Info at DU	O		9.3.1.124		-	
>MBS PDCP Configuration	O		PDCP Configuration 9.3.1.38		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>MBS QoS Flows Information To Be Setup	O		QoS Flow QoS Parameters List 9.3.1.25		-	
>MRB QoS	O		QoS Flow Level QoS Parameters 9.3.1.26	Indicates the MRB QoS when more than one QoS Flow is mapped to the MRB.	-	
>MBS PDCP COUNT Request	O		ENUMERATED (true, ...)	Indicates that the MBS PDCP COUNT is requested.	-	
MC MRB To Remove List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
MC Forwarding Resource Request	O		9.3.1.134	Requests MC Forwarding Resource related information for the peer node	YES	ignore
MC Forwarding Resource Indication	O		9.3.1.135	Provides MC Forwarding Resource related information from the peer node	YES	ignore
MC Forwarding Resource Release	O		9.3.1.137	Requests the release of the MC Forwarding Resource	YES	ignore
MBS Session Associated Information Non-Support-to-Support	O		9.3.1.140		YES	ignore
MC Bearer Context Inactivity Timer	O		Inactivity Timer 9.3.1.54		YES	ignore
MC Bearer Context Status Change	O		ENUMERATED (Suspend, Resume, ...)		YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

Condition	Explanation
ifSetupOrRemove	This IE shall be present if either the <i>MC MRB To Setup or Modify List</i> IE or the <i>MC MRB To Remove List</i> IE or both IEs are included.

9.3.3.35 MC Bearer Context To Modify Response

This IE contains MBS session resource related information used to confirm a MC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MC Bearer Context NG-U TNL Info at NG-RAN Modify Response	O		9.3.1.127		-	
MBS Multicast F1-U Context Descriptor	C-ifSetupOrFailed		9.3.1.125		-	
MC MRB Setup or Modify Response List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>MBS QoS Flow Setup List	O		QoS Flow List 9.3.1.12		-	

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
>MBS QoS Flow Failed List	O		Flow Failed List 9.3.1.45		-	
>MC Bearer Context F1-U TNL Info at CU	O		UP Transport Layer Information 9.3.2.1		-	
>MBS PDCP COUNT	O		9.3.1.35a		-	
MC MRB Failed List		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
>Cause	M		9.3.1.2		-	
Available MC MRB Configuration	O		MC MRB Setup Configuration 9.3.1.120	In case the shared MBS NG-U termination had a different MRB Configuration applied.	-	
MC Forwarding Resource Response	O		9.3.1.136	Provides MC Forwarding Resource related information destined to the peer node	YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

Condition	Explanation
ifSetupOrFailed	This IE shall be present if either the <i>MC MRB Setup or Modify Response List</i> IE or the <i>MC MRB Failed List</i> IE or both IEs are included.

9.3.3.36 MC Bearer Context To Modify Required

This IE contains MBS session resource related information used to request MC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
MBS Multicast F1-U Context Descriptor	C- ifRemoved		9.3.1.125		-	
MC MRB To Remove List Required		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
MC MRB To Modify List Required		<i>0..<maxno ofMRBs></i>			-	
>MRB ID	M		9.3.1.16a		-	
> MBS PDCP COUNT	O		9.3.1.35a		-	
MC Forwarding Resource Release Indication	O		9.3.1.138	Indicates the release of an MC Forwarding Resource	YES	ignore

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

Condition	Explanation
ifRemove	This IE shall be present if either the <i>MC MRB To Remove List Required</i> IE is included.

9.3.3.37 MC Bearer Context To Modify Confirm

This IE contains MBS session resource related information used to confirm a MC Bearer Context Modification.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
MBS Multicast F1-U Context Descriptor	O		9.3.1.125	
MC MRB Modify List Required		<i>0..<maxnoofMRBs></i>		
>MRB ID	M		9.3.1.16a	

Range bound	Explanation
maxnoofMRBs	Maximum no. of MRBs for one MBS Session. Value is 32.

9.4 Message and Information Element Abstract Syntax (with ASN.1)

9.4.1 General

E1AP ASN.1 definition conforms to ITU-T Rec. X.691 [7], ITU-T Rec. X.680 [8] and ITU-T Rec. X.681 [9].

The ASN.1 definition specifies the structure and content of E1AP messages. E1AP messages can contain any IEs specified in the object set definitions for that message without the order or number of occurrence being restricted by ASN.1. However, for this version of the standard, a sending entity shall construct an E1AP message according to the PDU definitions module and with the following additional rules:

- IEs shall be ordered (in an IE container) in the order they appear in object set definitions.
- Object set definitions specify how many times IEs may appear. An IE shall appear exactly once if the presence field in an object has value "mandatory". An IE may appear at most once if the presence field in an object has value "optional" or "conditional". If in a tabular format there is multiplicity specified for an IE (i.e., an IE list) then in the corresponding ASN.1 definition the list definition is separated into two parts. The first part defines an IE container list where the list elements reside. The second part defines list elements. The IE container list appears as an IE of its own. For this version of the standard an IE container list may contain only one kind of list elements.

NOTE: In the above "IE" means an IE in the object set with an explicit ID. If one IE needs to appear more than once in one object set, then the different occurrences will have different IE IDs.

If an E1AP message that is not constructed as defined above is received, this shall be considered as Abstract Syntax Error, and the message shall be handled as defined for Abstract Syntax Error in clause 10.

9.4.2 Usage of private message mechanism for non-standard use

The private message mechanism for non-standard use may be used:

- for special operator- (and/or vendor) specific features considered not to be part of the basic functionality, i.e., the functionality required for a complete and high-quality specification in order to guarantee multivendor interoperability;
- by vendors for research purposes, e.g., to implement and evaluate new algorithms/features before such features are proposed for standardisation.

The private message mechanism shall not be used for basic functionality. Such functionality shall be standardised.

9.4.3 Elementary Procedure Definitions

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS
    Criticality,
    ProcedureCode

FROM ElAP-CommonDataTypes
    Reset,
    ResetAcknowledge,
    ErrorIndication,
    GNB-CU-UP-ElSetupRequest,
    GNB-CU-UP-ElSetupResponse,
    GNB-CU-UP-ElSetupFailure,
    GNB-CU-CP-ElSetupRequest,
    GNB-CU-CP-ElSetupResponse,
    GNB-CU-CP-ElSetupFailure,
    GNB-CU-UP-ConfigurationUpdate,
    GNB-CU-UP-ConfigurationUpdateAcknowledge,
    GNB-CU-UP-ConfigurationUpdateFailure,
    GNB-CU-CP-ConfigurationUpdate,
    GNB-CU-CP-ConfigurationUpdateAcknowledge,
    GNB-CU-CP-ConfigurationUpdateFailure,
    BCBearerContextSetupRequest,
    BCBearerContextSetupResponse,
    BCBearerContextSetupFailure,
    BCBearerContextModificationRequest,
    BCBearerContextModificationResponse,
    BCBearerContextModificationFailure,
    BCBearerContextModificationRequired,
    BCBearerContextModificationConfirm,
```

BCBearerContextReleaseCommand,
BCBearerContextReleaseComplete,
BCBearerContextReleaseRequest,
BearerContextSetupRequest,
BearerContextSetupResponse,
BearerContextSetupFailure,
BearerContextModificationRequest,
BearerContextModificationResponse,
BearerContextModificationFailure,
BearerContextModificationRequired,
BearerContextModificationConfirm,
BearerContextReleaseCommand,
BearerContextReleaseComplete,
BearerContextReleaseRequest,
BearerContextInactivityNotification,
DLDataNotification,
ULDataNotification,
DataUsageReport,
E1ReleaseRequest,
E1ReleaseResponse,
GNB-CU-UP-CounterCheckRequest,
GNB-CU-UP-StatusIndication,
MCBearerContextSetupRequest,
MCBearerContextSetupResponse,
MCBearerContextSetupFailure,
MCBearerContextModificationRequest,
MCBearerContextModificationResponse,
MCBearerContextModificationFailure,
MCBearerContextModificationRequired,
MCBearerContextModificationConfirm,
MCBearerNotification,
MCBearerContextReleaseCommand,
MCBearerContextReleaseComplete,
MCBearerContextReleaseRequest,
MRDC-DataUsageReport,
DeactivateTrace,
TraceStart,
PrivateMessage,
ResourceStatusRequest,
ResourceStatusResponse,
ResourceStatusFailure,
ResourceStatusUpdate,
IAB-UPTNLAddressUpdate,
IAB-UPTNLAddressUpdateAcknowledge,
IAB-UPTNLAddressUpdateFailure,
CellTrafficTrace,
EarlyForwardingSNTransfer,
GNB-CU-CPMeasurementResultsInformation,
IABPSKNotification

FROM E1AP-PDU-Contents
id-reset,
id-errorIndication,
id-gNB-CU-UP-E1Setup,

```

id-gNB-CU-CP-ElSetup,
id-gNB-CU-UP-ConfigurationUpdate,
id-gNB-CU-CP-ConfigurationUpdate,
id-elRelease,
id-bearerContextSetup,
id-bearerContextModification,
id-bearerContextModificationRequired,
id-bearerContextRelease,
id-bearerContextReleaseRequest,
id-bearerContextInactivityNotification,
id-dLDataNotification,
id-uLDataNotification,
id-dataUsageReport,
id-gNB-CU-UP-CounterCheck,
id-gNB-CU-UP-StatusIndication,
id-mRDC-DataUsageReport,
id-DeactivateTrace,
id-TraceStart,
id-privateMessage,
id-resourceStatusReportingInitiation,
id-resourceStatusReporting,
id-iAB-UPTNLAddressUpdate,
id-CellTrafficTrace,
id-earlyForwardingSNTransfer,
id-gNB-CU-CPMeasurementResultsInformation,
id-iABPSKNotification,
id-BCBearerContextSetup,
id-BCBearerContextModification,
id-BCBearerContextModificationRequired,
id-BCBearerContextRelease,
id-BCBearerContextReleaseRequest,
id-MCBearerContextSetup,
id-MCBearerContextModification,
id-MCBearerContextModificationRequired,
id-MCBearerNotification,
id-MCBearerContextRelease,
id-MCBearerContextReleaseRequest

```

FROM ElAP-Constants;

```

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

```

```

ElAP-ELEMENTARY-PROCEDURE ::= CLASS {
    &InitiatingMessage          ,
    &SuccessfulOutcome          OPTIONAL,

    &UnsuccessfulOutcome        OPTIONAL,
    &procedureCode              ProcedureCode UNIQUE,
    &criticality                 Criticality   DEFAULT ignore
}

```

```

WITH SYNTAX {
  INITIATING MESSAGE          &InitiatingMessage
  [SUCCESSFUL OUTCOME         &SuccessfulOutcome]
  [UNSUCCESSFUL OUTCOME       &UnsuccessfulOutcome]
  PROCEDURE CODE              &procedureCode
  [CRITICALITY                &criticality]
}

-- *****
--
-- Interface PDU Definition
--
-- *****

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

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

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

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

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

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

ElAP-ELEMENTARY-PROCEDURES-CLASS-1 ElAP-ELEMENTARY-PROCEDURE ::= {
  reset                                     |

```

```

gNB-CU-UP-E1Setup
gNB-CU-CP-E1Setup
gNB-CU-UP-ConfigurationUpdate
gNB-CU-CP-ConfigurationUpdate
e1Release
bearerContextSetup
bearerContextModification
bearerContextModificationRequired
bearerContextRelease
resourceStatusReportingInitiation
iAB-UPTNLAddressUpdate
bBearerContextSetup
bBearerContextModification
bBearerContextModificationRequired
bBearerContextRelease
mBearerContextSetup
mBearerContextModification
mBearerContextModificationRequired
mBearerContextRelease
...
}

E1AP-ELEMENTARY-PROCEDURES-CLASS-2 E1AP-ELEMENTARY-PROCEDURE ::= {
  errorIndication
  bearerContextReleaseRequest
  bearerContextInactivityNotification
  dLDataNotification
  uLDataNotification
  dataUsageReport
  gNB-CU-UP-CounterCheck
  gNB-CU-UP-StatusIndication
  mRDC-DataUsageReport
  deactivateTrace
  traceStart
  privateMessage
  cellTrafficTrace
  resourceStatusReporting
  earlyForwardingSNTransfer
  gNB-CU-CPMeasurementResultsInformation
  iABPSKNotification
  bBearerContextReleaseRequest
  mBearerContextReleaseRequest
  mBearerNotification
  ...
}

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

reset E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      Reset

```

```
    SUCCESSFUL OUTCOME      ResetAcknowledge
    PROCEDURE CODE          id-reset
    CRITICALITY              reject
}

errorIndication E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ErrorIndication
    PROCEDURE CODE          id-errorIndication
    CRITICALITY              ignore
}

gNB-CU-UP-E1Setup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-UP-E1SetupRequest
    SUCCESSFUL OUTCOME      GNB-CU-UP-E1SetupResponse
    UNSUCCESSFUL OUTCOME    GNB-CU-UP-E1SetupFailure
    PROCEDURE CODE          id-gNB-CU-UP-E1Setup
    CRITICALITY              reject
}

gNB-CU-CP-E1Setup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-CP-E1SetupRequest
    SUCCESSFUL OUTCOME      GNB-CU-CP-E1SetupResponse
    UNSUCCESSFUL OUTCOME    GNB-CU-CP-E1SetupFailure
    PROCEDURE CODE          id-gNB-CU-CP-E1Setup
    CRITICALITY              reject
}

gNB-CU-UP-ConfigurationUpdate E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-UP-ConfigurationUpdate
    SUCCESSFUL OUTCOME      GNB-CU-UP-ConfigurationUpdateAcknowledge
    UNSUCCESSFUL OUTCOME    GNB-CU-UP-ConfigurationUpdateFailure
    PROCEDURE CODE          id-gNB-CU-UP-ConfigurationUpdate
    CRITICALITY              reject
}

gNB-CU-CP-ConfigurationUpdate E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-CP-ConfigurationUpdate
    SUCCESSFUL OUTCOME      GNB-CU-CP-ConfigurationUpdateAcknowledge
    UNSUCCESSFUL OUTCOME    GNB-CU-CP-ConfigurationUpdateFailure
    PROCEDURE CODE          id-gNB-CU-CP-ConfigurationUpdate
    CRITICALITY              reject
}

e1Release E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      E1ReleaseRequest
    SUCCESSFUL OUTCOME      E1ReleaseResponse
    PROCEDURE CODE          id-e1Release
    CRITICALITY              reject
}

bearerContextSetup E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextSetupRequest
    SUCCESSFUL OUTCOME      BearerContextSetupResponse
    UNSUCCESSFUL OUTCOME    BearerContextSetupFailure
}
```

```
    PROCEDURE CODE          id-bearerContextSetup
    CRITICALITY             reject
}

bearerContextModification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextModificationRequest
    SUCCESSFUL OUTCOME      BearerContextModificationResponse
    UNSUCCESSFUL OUTCOME    BearerContextModificationFailure
    PROCEDURE CODE          id-bearerContextModification
    CRITICALITY             reject
}

bearerContextModificationRequired E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextModificationRequired
    SUCCESSFUL OUTCOME      BearerContextModificationConfirm
    PROCEDURE CODE          id-bearerContextModificationRequired
    CRITICALITY             reject
}

bearerContextRelease E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextReleaseCommand
    SUCCESSFUL OUTCOME      BearerContextReleaseComplete
    PROCEDURE CODE          id-bearerContextRelease
    CRITICALITY             reject
}

bearerContextReleaseRequest E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextReleaseRequest
    PROCEDURE CODE          id-bearerContextReleaseRequest
    CRITICALITY             ignore
}

bearerContextInactivityNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      BearerContextInactivityNotification
    PROCEDURE CODE          id-bearerContextInactivityNotification
    CRITICALITY             ignore
}

dLDataNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      DLDataNotification
    PROCEDURE CODE          id-dLDataNotification
    CRITICALITY             ignore
}

uLDataNotification E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ULDataNotification
    PROCEDURE CODE          id-uLDataNotification
    CRITICALITY             ignore
}

dataUsageReport E1AP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      DataUsageReport
    PROCEDURE CODE          id-dataUsageReport
    CRITICALITY             ignore
}
```



```

}

gNB-CU-UP-CounterCheck ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      GNB-CU-UP-CounterCheckRequest
    PROCEDURE CODE         id-gNB-CU-UP-CounterCheck
    CRITICALITY             ignore
}

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

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

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

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

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

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

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

resourceStatusReporting ElAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE      ResourceStatusUpdate

```

```

    PROCEDURE CODE          id-resourceStatusReporting
    CRITICALITY             ignore
}

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

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

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

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

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

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

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

bCBearerContextRelease ElAP-ELEMENTARY-PROCEDURE ::= {

```

```
INITIATING MESSAGE      BCBearerContextReleaseCommand
SUCCESSFUL OUTCOME      BCBearerContextReleaseComplete
PROCEDURE CODE          id-BCBearerContextRelease
CRITICALITY             reject
}

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

MCBearerContextSetup E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextSetupRequest
  SUCCESSFUL OUTCOME      MCBearerContextSetupResponse
  UNSUCCESSFUL OUTCOME    MCBearerContextSetupFailure
  PROCEDURE CODE          id-MCBearerContextSetup
  CRITICALITY             reject
}

MCBearerContextModification E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextModificationRequest
  SUCCESSFUL OUTCOME      MCBearerContextModificationResponse
  UNSUCCESSFUL OUTCOME    MCBearerContextModificationFailure
  PROCEDURE CODE          id-MCBearerContextModification
  CRITICALITY             reject
}

MCBearerContextModificationRequired E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextModificationRequired
  SUCCESSFUL OUTCOME      MCBearerContextModificationConfirm
  PROCEDURE CODE          id-MCBearerContextModificationRequired
  CRITICALITY             reject
}

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

MCBearerContextRelease E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextReleaseCommand
  SUCCESSFUL OUTCOME      MCBearerContextReleaseComplete
  PROCEDURE CODE          id-MCBearerContextRelease
  CRITICALITY             reject
}

MCBearerContextReleaseRequest E1AP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE      MCBearerContextReleaseRequest
  PROCEDURE CODE          id-MCBearerContextReleaseRequest
  CRITICALITY             reject
}
```

```
END
-- ASN1STOP
```

9.4.4 PDU Definitions

```
-- ASN1START
-- *****
--
-- PDU definitions for ELAP
--
-- *****

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

IMPORTS

    Cause,
    CriticalityDiagnostics,
    GNB-CU-CP-MBS-ElAP-ID,
    GNB-CU-UP-MBS-ElAP-ID,
    GNB-CU-CP-UE-ElAP-ID,
    GNB-CU-UP-UE-ElAP-ID,
    UE-associatedLogicalEl-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,
MBSMulticastFlUContextDescriptor,
GNB-CU-UP-MBS-Support-Info,
SDTContinueROHC,
MDTPLMNModificationList,
InactivityInformationRequest,
UEInactivityInformation,
MBSSESSIONResourceNotification

FROM E1AP-IEs

PrivateIE-Container {},
ProtocolExtensionContainer {},
ProtocolIE-Container {},
ProtocolIE-ContainerList {},
ProtocolIE-SingleContainer {},
E1AP-PRIVATE-IES,
E1AP-PROTOCOL-EXTENSION,

ElAP-PROTOCOL-IES

FROM ElAP-Containers

id-Cause,
id-CriticalityDiagnostics,
id-gNB-CU-CP-UE-ElAP-ID,
id-gNB-CU-UP-UE-ElAP-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-URAddress,
id-DRBs-Subject-To-Early-Forwarding-List,
id-CHOInitiation,
id-ExtendedSliceSupportList,
id-AdditionalHandoverInfo,
id-Extended-NR-CGI-Support-List,
id-DirectForwardingPathAvailability, id-IAB-Donor-CU-UPPSKInfo,


```

id-ECGI-Support-List,
id-MDTPollutedMeasurementIndicator,
id-UESliceMaximumBitRateList,
id-SCGActivationStatus,
id-GNB-CU-CP-MBS-ElAP-ID,
id-GNB-CU-UP-MBS-ElAP-ID,
id-GlobalMBSSESSIONID,
id-BCBearerContextToSetup,
id-BCBearerContextToSetupResponse,
id-BCBearerContextToModify,
id-BCBearerContextToModifyResponse,
id-BCBearerContextToModifyRequired,
id-BCBearerContextToModifyConfirm,
id-MCBearerContextToSetup,
id-MCBearerContextToSetupResponse,
id-MCBearerContextToModify,
id-MCBearerContextToModifyResponse,
id-MCBearerContextToModifyRequired,
id-MCBearerContextToModifyConfirm,
id-MBSMulticastFLUContextDescriptor,
id-gNB-CU-UP-MBS-Support-Info,
id-SDTContinueROHC,
id-ManagementBasedMDTPLMNModificationList,
id-InactivityInformationRequest,
id-UEInactivityInformation,
id-MBSSessionResourceNotification,
maxnoofErrors,
maxnoofSPLMNs,
maxnoofDRBs,
maxnoofTNLAssociations,
maxnoofIndividualE1ConnectionsToReset,
maxnoofTNLAddresses,
maxnoofPSKs

FROM ElAP-Constants;

-- *****
--
-- RESET
--
-- *****

-- *****
--
-- Reset
--
-- *****

Reset ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {ResetIEs} },
    ...
}

```

```

ResetIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
  { ID id-Cause                  CRITICALITY ignore TYPE Cause                  PRESENCE mandatory }|
  { ID id-ResetType              CRITICALITY reject TYPE ResetType              PRESENCE mandatory },
  ...
}

ResetType ::= CHOICE {
  e1-Interface                    ResetAll,
  partOfE1-Interface              UE-associatedLogicalE1-ConnectionListRes,
  choice-extension                 ProtocolIE-SingleContainer {{ResetType-ExtIEs}}
}

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

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

UE-associatedLogicalE1-ConnectionListRes ::= SEQUENCE (SIZE(1.. maxnoofIndividualE1ConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-
associatedLogicalE1-ConnectionItemRes } }

UE-associatedLogicalE1-ConnectionItemRes E1AP-PROTOCOL-IES ::= {
  { ID id-UE-associatedLogicalE1-ConnectionItem CRITICALITY reject TYPE UE-associatedLogicalE1-ConnectionItem PRESENCE mandatory},
  ...
}

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

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

ResetAcknowledgeIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
  { ID id-UE-associatedLogicalE1-ConnectionListResAck CRITICALITY ignore TYPE UE-associatedLogicalE1-ConnectionListResAck PRESENCE
optional }|
  { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

UE-associatedLogicalE1-ConnectionListResAck ::= SEQUENCE (SIZE(1.. maxnoofIndividualE1ConnectionsToReset)) OF ProtocolIE-SingleContainer { { UE-
associatedLogicalE1-ConnectionItemResAck } }

UE-associatedLogicalE1-ConnectionItemResAck E1AP-PROTOCOL-IES ::= {

```

```

    { ID id-UE-associatedLogicalE1-ConnectionItem    CRITICALITY ignore    TYPE UE-associatedLogicalE1-ConnectionItem    PRESENCE mandatory },
    ...
}

-- *****
--
-- ERROR INDICATION
--
-- *****

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

ErrorIndication-IEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                CRITICALITY reject    TYPE TransactionID                PRESENCE mandatory }|
    { ID id-gNB-CU-CP-UE-E1AP-ID        CRITICALITY ignore    TYPE GNB-CU-CP-UE-E1AP-ID        PRESENCE optional }|
    { ID id-gNB-CU-UP-UE-E1AP-ID        CRITICALITY ignore    TYPE GNB-CU-UP-UE-E1AP-ID        PRESENCE optional }|
    { ID id-Cause                        CRITICALITY ignore    TYPE Cause                        PRESENCE optional }|
    { ID id-CriticalityDiagnostics        CRITICALITY ignore    TYPE CriticalityDiagnostics        PRESENCE optional }|
    { ID id-gNB-CU-CP-MBS-E1AP-ID        CRITICALITY ignore    TYPE GNB-CU-CP-MBS-E1AP-ID        PRESENCE optional }|
    { ID id-gNB-CU-UP-MBS-E1AP-ID        CRITICALITY ignore    TYPE GNB-CU-UP-MBS-E1AP-ID        PRESENCE optional },
    ...
}

-- *****
--
-- GNB-CU-UP E1 SETUP
--
-- *****
--
-- *****
--
-- GNB-CU-UP E1 Setup Request
--
-- *****

GNB-CU-UP-E1SetupRequest ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container    { {GNB-CU-UP-E1SetupRequestIEs} },
    ...
}

GNB-CU-UP-E1SetupRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID                CRITICALITY reject    TYPE TransactionID                PRESENCE mandatory }|
    { ID id-gNB-CU-UP-ID                 CRITICALITY reject    TYPE GNB-CU-UP-ID                 PRESENCE mandatory }|
    { ID id-gNB-CU-UP-Name                CRITICALITY ignore    TYPE GNB-CU-UP-Name                PRESENCE optional }|
    { ID id-CNSupport                    CRITICALITY reject    TYPE CNSupport                    PRESENCE mandatory }|
    { ID id-SupportedPLMNs                CRITICALITY reject    TYPE SupportedPLMNs-List          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-Capacity            CRITICALITY ignore    TYPE GNB-CU-UP-Capacity            PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info  CRITICALITY ignore    TYPE Transport-Layer-Address-Info  PRESENCE optional }|
    { ID id-Extended-GNB-CU-UP-Name      CRITICALITY ignore    TYPE Extended-GNB-CU-UP-Name      PRESENCE optional }|
    { ID id-gNB-CU-UP-MBS-Support-Info    CRITICALITY reject    TYPE GNB-CU-UP-MBS-Support-Info    PRESENCE optional },
}

```

```

}
...
SupportedPLMNs-List ::= SEQUENCE (SIZE (1..maxnoofSPLMNs)) OF SupportedPLMNs-Item

SupportedPLMNs-Item ::= SEQUENCE {
  pLMN-Identity          PLMN-Identity,
  slice-Support-List     Slice-Support-List           OPTIONAL,
  nR-CGI-Support-List    NR-CGI-Support-List          OPTIONAL,
  qoS-Parameters-Support-List QoS-Parameters-Support-List OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { { SupportedPLMNs-ExtIEs } } OPTIONAL,
  ...
}

SupportedPLMNs-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-NPNSupportInfo          CRITICALITY reject EXTENSION NPNSupportInfo          PRESENCE optional }|
  { ID id-ExtendedSliceSupportList CRITICALITY reject EXTENSION ExtendedSliceSupportList PRESENCE optional }|
  { ID id-Extended-NR-CGI-Support-List CRITICALITY ignore EXTENSION Extended-NR-CGI-Support-List PRESENCE optional }|
  { ID id-ECGI-Support-List        CRITICALITY ignore EXTENSION ECGI-Support-List        PRESENCE optional },
  ...
}

-- *****
--
-- GNB-CU-UP E1 Setup Response
--
-- *****

GNB-CU-UP-E1SetupResponse ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {GNB-CU-UP-E1SetupResponseIEs} },
  ...
}

GNB-CU-UP-E1SetupResponseIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
  { ID id-gNB-CU-CP-Name          CRITICALITY ignore TYPE GNB-CU-CP-Name          PRESENCE optional }|
  { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
  { ID id-Extended-GNB-CU-CP-Name CRITICALITY ignore TYPE Extended-GNB-CU-CP-Name PRESENCE optional }|
  { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
  ...
}

-- *****
--
-- GNB-CU-UP E1 Setup Failure
--
-- *****

GNB-CU-UP-E1SetupFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {GNB-CU-UP-E1SetupFailureIEs} },
  ...
}

GNB-CU-UP-E1SetupFailureIEs E1AP-PROTOCOL-IES ::= {

```

```

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

-- *****
--
-- GNB-CU-CP E1 SETUP
--
-- *****

-- *****
--
-- GNB-CU-CP E1 Setup Request
--
-- *****

GNB-CU-CP-E1SetupRequest ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {GNB-CU-CP-E1SetupRequestIEs} },
    ...
}

GNB-CU-CP-E1SetupRequestIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-gNB-CU-CP-Name         CRITICALITY ignore TYPE GNB-CU-CP-Name         PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
    { ID id-Extended-GNB-CU-CP-Name CRITICALITY ignore TYPE Extended-GNB-CU-CP-Name     PRESENCE optional },
    ...
}

-- *****
--
-- GNB-CU-CP E1 Setup Response
--
-- *****

GNB-CU-CP-E1SetupResponse ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { {GNB-CU-CP-E1SetupResponseIEs} },
    ...
}

GNB-CU-CP-E1SetupResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-ID          CRITICALITY reject TYPE GNB-CU-UP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-Name        CRITICALITY ignore TYPE GNB-CU-UP-Name        PRESENCE optional }|
    { ID id-CNSupport             CRITICALITY reject TYPE CNSupport             PRESENCE mandatory }|
    { ID id-SupportedPLMNs        CRITICALITY reject TYPE SupportedPLMNs-List   PRESENCE mandatory }|
    { ID id-gNB-CU-UP-Capacity     CRITICALITY ignore TYPE GNB-CU-UP-Capacity     PRESENCE optional }|
    { ID id-Transport-Layer-Address-Info CRITICALITY ignore TYPE Transport-Layer-Address-Info PRESENCE optional }|
    { ID id-Extended-GNB-CU-UP-Name CRITICALITY ignore TYPE Extended-GNB-CU-UP-Name PRESENCE optional }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

```

```

}

-- *****
--
-- GNB-CU-CP E1 Setup Failure
--
-- *****

GNB-CU-CP-E1SetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { {GNB-CU-CP-E1SetupFailureIEs} },
    ...
}

GNB-CU-CP-E1SetupFailureIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject TYPE TransactionID          PRESENCE mandatory }|
    { ID id-Cause                  CRITICALITY ignore TYPE Cause                  PRESENCE mandatory }|
    { ID id-TimeToWait             CRITICALITY ignore TYPE TimeToWait             PRESENCE optional }|
    { ID id-CriticalityDiagnostics CRITICALITY ignore TYPE CriticalityDiagnostics PRESENCE optional },
    ...
}

-- *****
--
-- 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 ELAP-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.. maxnoofTNLAAssociations)) 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.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-To-Add-Item
GNB-CU-CP-TNLA-To-Remove-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-To-Remove-Item
GNB-CU-CP-TNLA-To-Update-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-To-Update-Item

-- *****
--
-- GNB-CU-CP Configuration Update Acknowledge
--
-- *****

GNB-CU-CP-ConfigurationUpdateAcknowledge ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {GNB-CU-CP-ConfigurationUpdateAcknowledgeIEs} },
  ...
}

GNB-CU-CP-ConfigurationUpdateAcknowledgeIEs 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.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-Setup-Item
GNB-CU-CP-TNLA-Failed-To-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofTNLAAssociations)) OF GNB-CU-CP-TNLA-Failed-To-Setup-Item

-- *****
--
-- GNB-CU-CP Configuration Update Failure
--
-- *****

GNB-CU-CP-ConfigurationUpdateFailure ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { {GNB-CU-CP-ConfigurationUpdateFailureIEs} },
  ...
}

GNB-CU-CP-ConfigurationUpdateFailureIEs E1AP-PROTOCOL-IES ::= {
  { ID id-TransactionID                CRITICALITY reject TYPE TransactionID                PRESENCE mandatory }|
  { ID id-Cause                        CRITICALITY ignore TYPE Cause                        PRESENCE mandatory }|
  { ID id-TimeToWait                   CRITICALITY ignore TYPE TimeToWait                   PRESENCE optional }|
  { ID id-CriticalityDiagnostics        CRITICALITY ignore TYPE CriticalityDiagnostics        PRESENCE optional },

```



```

}
...
}
-- *****
--
-- El RELEASE
--
-- *****

-- *****
--
-- El Release Request
--
-- *****

ElReleaseRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ElReleaseRequestIEs} },
    ...
}

ElReleaseRequestIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
    { ID id-Cause                  CRITICALITY ignore  TYPE Cause                    PRESENCE mandatory }|
    ...
}

-- *****
--
-- El Release Response
--
-- *****

ElReleaseResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { {ElReleaseResponseIEs} },
    ...
}

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

-- *****
--
-- BEARER CONTEXT SETUP
--
-- *****

-- *****
--
-- Bearer Context Setup Request
--
-- *****

```

```

BearerContextSetupRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container      { { BearerContextSetupRequestIEs } },
  ...
}

BearerContextSetupRequestIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-SecurityInformation            CRITICALITY reject  TYPE SecurityInformation          PRESENCE mandatory }|
  { ID id-UEDLAggregateMaximumBitRate    CRITICALITY reject  TYPE BitRate                      PRESENCE mandatory }|
  { ID id-UEDLMaximumIntegrityProtectedDataRate CRITICALITY reject  TYPE BitRate                      PRESENCE optional }|
  { ID id-Serving-PLMN                   CRITICALITY ignore  TYPE PLMN-Identity               PRESENCE mandatory }|
  { ID id-ActivityNotificationLevel      CRITICALITY reject  TYPE ActivityNotificationLevel    PRESENCE mandatory }|
  { ID id-UE-Inactivity-Timer            CRITICALITY reject  TYPE Inactivity-Timer            PRESENCE optional }|
  { ID id-BearerContextStatusChange      CRITICALITY reject  TYPE BearerContextStatusChange    PRESENCE optional }|
  { ID id-System-BearerContextSetupRequest CRITICALITY reject  TYPE System-BearerContextSetupRequest PRESENCE mandatory }|
  { ID id-RANUEID                        CRITICALITY ignore  TYPE RANUEID                     PRESENCE optional }|
  { ID id-gNB-DU-ID                      CRITICALITY ignore  TYPE GNB-DU-ID                   PRESENCE optional }|
  { ID id-TraceActivation                 CRITICALITY ignore  TYPE TraceActivation              PRESENCE optional }|
  { ID id-NPNContextInfo                  CRITICALITY reject  TYPE NPNContextInfo              PRESENCE optional }|
  { ID id-ManagementBasedMDTPLMNList     CRITICALITY ignore  TYPE MDTPLMNList                 PRESENCE optional }|
  { ID id-CHOInitiation                   CRITICALITY reject  TYPE CHOInitiation               PRESENCE optional }|
  { ID id-AdditionalHandoverInfo          CRITICALITY ignore  TYPE AdditionalHandoverInfo       PRESENCE optional }|
  { ID id-DirectForwardingPathAvailability CRITICALITY ignore  TYPE DirectForwardingPathAvailability PRESENCE optional }|
  { ID id-gNB-CU-UP-UE-E1AP-ID           CRITICALITY ignore  TYPE GNB-CU-UP-UE-E1AP-ID       PRESENCE optional }|
  { ID id-MDTPollutedMeasurementIndicator CRITICALITY ignore  TYPE MDTPollutedMeasurementIndicator PRESENCE optional }|
  { ID id-UESliceMaximumBitRateList      CRITICALITY ignore  TYPE UESliceMaximumBitRateList   PRESENCE optional }|
  { ID id-SCGActivationStatus             CRITICALITY ignore  TYPE SCGActivationStatus         PRESENCE optional },
  ...
}

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

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

EUTRAN-BearerContextSetupRequest E1AP-PROTOCOL-IES ::= {
  { ID id-DRB-To-Setup-List-EUTRAN        CRITICALITY reject  TYPE DRB-To-Setup-List-EUTRAN    PRESENCE mandatory }|
  { ID id-SubscriberProfileIDforRFP       CRITICALITY ignore  TYPE SubscriberProfileIDforRFP    PRESENCE optional }|
  { ID id-AdditionalRRMPriorityIndex      CRITICALITY ignore  TYPE AdditionalRRMPriorityIndex    PRESENCE optional },
  ...
}

NG-RAN-BearerContextSetupRequest E1AP-PROTOCOL-IES ::= {
  { ID id-PDU-Session-Resource-To-Setup-List CRITICALITY reject  TYPE PDU-Session-Resource-To-Setup-List PRESENCE mandatory },
  ...
}

```

```

-- *****
--
-- Bearer Context Setup Response
--
-- *****

BearerContextSetupResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BearerContextSetupResponseIEs } },
    ...
}

BearerContextSetupResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
    { ID id-System-BearerContextSetupResponse CRITICALITY ignore  TYPE System-BearerContextSetupResponse PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics        PRESENCE optional  },
    ...
}

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

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

EUTRAN-BearerContextSetupResponse E1AP-PROTOCOL-IES ::= {
    { ID id-DRB-Setup-List-EUTRAN          CRITICALITY ignore  TYPE DRB-Setup-List-EUTRAN          PRESENCE mandatory }|
    { ID id-DRB-Failed-List-EUTRAN         CRITICALITY ignore  TYPE DRB-Failed-List-EUTRAN         PRESENCE optional  },
    ...
}

NG-RAN-BearerContextSetupResponse E1AP-PROTOCOL-IES ::= {
    { ID id-PDU-Session-Resource-Setup-List CRITICALITY ignore  TYPE PDU-Session-Resource-Setup-List PRESENCE mandatory }|
    { ID id-PDU-Session-Resource-Failed-List CRITICALITY ignore  TYPE PDU-Session-Resource-Failed-List PRESENCE optional  },
    ...
}

-- *****
--
-- Bearer Context Setup Failure
--
-- *****

BearerContextSetupFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container      { { BearerContextSetupFailureIEs } },
    ...
}

```

```

BearerContextSetupFailureIEs 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 }|
  { ID id-InactivityInformationRequest   CRITICALITY ignore  TYPE InactivityInformationRequest   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 }|
  { ID id-CriticalityDiagnostics          CRITICALITY ignore   TYPE CriticalityDiagnostics          PRESENCE optional }|
  { ID id-UEInactivityInformation        CRITICALITY ignore   TYPE UEInactivityInformation        PRESENCE optional },
  ...
}

System-BearerContextModificationResponse ::= CHOICE {
  e-UTRAN-BearerContextModificationResponse  ProtocolIE-Container { {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 }|
  { ID id-CriticalityDiagnostics          CRITICALITY ignore  TYPE CriticalityDiagnostics          PRESENCE optional },
  ...
}

```

```

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

System-BearerContextModificationConfirm-ExtIEs ELAP-PROTOCOL-IES ::= {
  ...
}

EUTRAN-BearerContextModificationConfirm ELAP-PROTOCOL-IES ::= {
  { ID id-DRB-Confirm-Modified-List-EUTRAN      CRITICALITY ignore   TYPE DRB-Confirm-Modified-List-EUTRAN PRESENCE optional },
  ...
}

NG-RAN-BearerContextModificationConfirm ELAP-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 ELAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID      CRITICALITY reject   TYPE GNB-CU-CP-UE-E1AP-ID      PRESENCE mandatory } |
  { ID id-gNB-CU-UP-UE-E1AP-ID      CRITICALITY reject   TYPE GNB-CU-UP-UE-E1AP-ID      PRESENCE mandatory } |
  { ID id-Cause                      CRITICALITY ignore    TYPE Cause                     PRESENCE mandatory },
  ...
}

-- *****
--
-- Bearer Context Release Complete
--
-- *****

BearerContextReleaseComplete ::= SEQUENCE {
  protocolIEs      ProtocolIE-Container      { { BearerContextReleaseCompleteIEs } },
  ...
}

```



```

}

BearerContextReleaseCompleteIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-CriticalityDiagnostics        CRITICALITY ignore  TYPE CriticalityDiagnostics      PRESENCE optional   }|
  { ID id-RetainabilityMeasurementsInfo CRITICALITY ignore  TYPE RetainabilityMeasurementsInfo PRESENCE optional   },
  ...
}

-- *****
--
-- BEARER CONTEXT RELEASE REQUEST
--
-- *****

-- *****
--
-- Bearer Context Release Request
--
-- *****

BearerContextReleaseRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container   { { BearerContextReleaseRequestIEs } },
  ...
}

BearerContextReleaseRequestIEs E1AP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-E1AP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-E1AP-ID          PRESENCE mandatory }|
  { ID id-DRB-Status-List               CRITICALITY ignore  TYPE DRB-Status-List              PRESENCE optional   }|
  { ID id-Cause                          CRITICALITY ignore  TYPE Cause                         PRESENCE mandatory },
  ...
}

DRB-Status-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRB-Status-Item

-- *****
--
-- BEARER CONTEXT INACTIVITY NOTIFICATION
--
-- *****

-- *****
--
-- Bearer Context Inactivity Notification
--
-- *****

BearerContextInactivityNotification ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container   { { BearerContextInactivityNotificationIEs } },
  ...
}

```

```

}

BearerContextInactivityNotificationIEs ElAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
  { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
  { ID id-ActivityInformation            CRITICALITY reject TYPE ActivityInformation        PRESENCE mandatory },
  ...
}

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

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

DLDataNotification ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { DLDataNotificationIEs } },
  ...
}

DLDataNotificationIEs ElAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
  { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
  { ID id-PPI                            CRITICALITY ignore TYPE PPI                            PRESENCE optional } |
  { ID id-PDU-Session-To-Notify-List    CRITICALITY ignore TYPE PDU-Session-To-Notify-List    PRESENCE optional },
  ...
}

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

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

ULDataNotificationIEs ElAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
  { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
  { ID id-PDU-Session-To-Notify-List    CRITICALITY reject TYPE PDU-Session-To-Notify-List    PRESENCE mandatory },
  ...
}

```

```

-- *****
--
-- DATA USAGE REPORT
--
-- *****

-- *****
--
-- Data Usage Report
--
-- *****

DataUsageReport ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { DataUsageReportIEs } },
    ...
}

DataUsageReportIEs 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-ElAP-ID          CRITICALITY reject      TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject      TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-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 ElAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject      TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject      TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-PDU-Session-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 ElAP-PROTOCOL-IES ::= {
    { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject      TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject      TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory } |
    { ID id-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 ignore         TYPE ReportingPeriodicity PRESENCE optional},
    ...
}

-- *****
--
-- RESOURCE STATUS RESPONSE
--
-- *****

ResourceStatusResponse ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { ResourceStatusResponseIEs } },
    ...
}

ResourceStatusResponseIEs E1AP-PROTOCOL-IES ::= {
    { ID id-TransactionID          CRITICALITY reject          TYPE TransactionID PRESENCE mandatory}|
    { ID id-gNB-CU-CP-Measurement-ID CRITICALITY reject          TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-gNB-CU-UP-Measurement-ID CRITICALITY ignore        TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-CriticalityDiagnostics    CRITICALITY ignore         TYPE CriticalityDiagnostics PRESENCE optional},
    ...
}

-- *****
--
-- RESOURCE STATUS FAILURE
--
-- *****

ResourceStatusFailure ::= SEQUENCE {
    protocolIEs      ProtocolIE-Container      { { ResourceStatusFailureIEs } },
    ...
}

ResourceStatusFailureIEs 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 ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID                CRITICALITY reject    TYPE TransactionID  PRESENCE mandatory}|
    { ID id-gNB-CU-CP-Measurement-ID      CRITICALITY reject    TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-gNB-CU-UP-Measurement-ID      CRITICALITY ignore    TYPE INTEGER (1..4095, ...) PRESENCE mandatory}|
    { ID id-TNL-AvailableCapacityIndicator CRITICALITY ignore    TYPE                TNL-AvailableCapacityIndicator PRESENCE
optional}|
    { ID id-HW-CapacityIndicator          CRITICALITY ignore    TYPE                HW-CapacityIndicator PRESENCE
optional},
    ...
}

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

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

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

IAB-UPTNLAddressUpdateIEs ELAP-PROTOCOL-IES ::= {
    { ID id-TransactionID                CRITICALITY reject    TYPE TransactionID  PRESENCE mandatory }|
    { ID id-DLUPTNLAddressToUpdateList    CRITICALITY ignore    TYPE DLUPTNLAddressToUpdateList PRESENCE optional },
    ...
}

DLUPTNLAddressToUpdateList ::= SEQUENCE (SIZE(1.. maxnoofTNLAddresses)) OF DLUPTNLAddressToUpdateItem

-- *****

```



```

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

IAB-UPTNLAddressUpdateAcknowledge ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { IAB-UPTNLAddressUpdateAcknowledgeIEs } },
    ...
}

IAB-UPTNLAddressUpdateAcknowledgeIEs 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 ELAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-CP-UE-ElAP-ID          PRESENCE mandatory }|
  { ID id-gNB-CU-UP-UE-ElAP-ID          CRITICALITY reject  TYPE GNB-CU-UP-UE-ElAP-ID          PRESENCE mandatory }|
  { ID id-DRBs-Subject-To-Early-Forwarding-List  CRITICALITY reject  TYPE DRBs-Subject-To-Early-Forwarding-List  PRESENCE mandatory },
  ...
}

-- *****
--
-- IAB PSK NOTIFICATION
--
-- *****

-- *****
--
-- IAB PSK Notification
--
-- *****

IABPSKNotification ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { IABPSKNotificationIEs } },
  ...
}

IABPSKNotificationIEs ELAP-PROTOCOL-IES ::= {
  { ID id-TransactionID          CRITICALITY reject  TYPE TransactionID          PRESENCE mandatory }|
  { ID id-IAB-Donor-CU-UPPSKInfo  CRITICALITY reject  TYPE IAB-Donor-CU-UPPSKInfo  PRESENCE mandatory },
  ...
}

IAB-Donor-CU-UPPSKInfo ::= SEQUENCE (SIZE(1.. maxnoofPSKs)) OF IAB-Donor-CU-UPPSKInfo-Item

-- *****
--
-- BC BEARER CONTEXT SETUP
--
-- *****

-- *****
--
-- BC BEARER CONTEXT SETUP REQUEST
--
-- *****

BCBearerContextSetupRequest ::= SEQUENCE {
  protocolIEs          ProtocolIE-Container          { { BCBearerContextSetupRequestIEs } },
  ...
}

BCBearerContextSetupRequestIEs ELAP-PROTOCOL-IES ::= {
  { ID id-gNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject  TYPE          GNB-CU-CP-MBS-ElAP-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 ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-BCBearerContextToModify        CRITICALITY reject TYPE BCBearerContextToModify        PRESENCE mandatory },
    ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION RESPONSE
--
-- *****

BCBearerContextModificationResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextModificationResponseIEs } },
    ...
}

BCBearerContextModificationResponseIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-BCBearerContextToModifyResponse CRITICALITY reject TYPE BCBearerContextToModifyResponse PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION FAILURE
--
-- *****

BCBearerContextModificationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextModificationFailureIEs } },
    ...
}

BCBearerContextModificationFailureIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-Cause                          CRITICALITY ignore TYPE Cause                          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT MODIFICATION REQUIRED
--

```

```

-- *****
-- *****
--
-- BC BEARER CONTEXT MODIFICATION REQUIRED
--
-- *****

BCBearerContextModificationRequired ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextModificationRequiredIEs } },
    ...
}

BCBearerContextModificationRequiredIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-BCBearerContextToModifyRequired CRITICALITY reject TYPE BCBearerContextToModifyRequired PRESENCE mandatory },
    ...
}

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

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

BCBearerContextModificationConfirmIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-BCBearerContextToModifyConfirm CRITICALITY reject TYPE BCBearerContextToModifyConfirm PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore  TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

-- *****
--
-- BC BEARER CONTEXT RELEASE
--
-- *****
-- *****
--
-- BC BEARER CONTEXT RELEASE COMMAND
--
-- *****

BCBearerContextReleaseCommand ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { BCBearerContextReleaseCommandIEs } },
    ...
}

```

```

}

BCBearerContextReleaseCommandIEs 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-ElAP-ID          CRITICALITY ignore TYPE GNB-CU-UP-MBS-ElAP-ID          PRESENCE optional }|
    { ID id-Cause                          CRITICALITY ignore TYPE Cause                          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

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

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

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

MCBearerContextModificationRequestIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModify        CRITICALITY reject TYPE MCBearerContextToModify        PRESENCE mandatory },
    ...
}

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

MCBearerContextModificationResponse ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container          { { MCBearerContextModificationResponseIEs } },
    ...
}

MCBearerContextModificationResponseIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-ElAP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModifyResponse CRITICALITY reject TYPE MCBearerContextToModifyResponse PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics         CRITICALITY ignore TYPE CriticalityDiagnostics         PRESENCE optional },
    ...
}

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

```



```

MCBearerContextModificationFailure ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationFailureIEs } },
    ...
}

MCBearerContextModificationFailureIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-MBSMulticastFlUContextDescriptor CRITICALITY reject TYPE MBSMulticastFlUContextDescriptor PRESENCE optional }|
    { ID id-Cause                          CRITICALITY ignore TYPE Cause                          PRESENCE mandatory }|
    { ID id-CriticalityDiagnostics          CRITICALITY ignore TYPE CriticalityDiagnostics          PRESENCE optional },
    ...
}

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

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

MCBearerContextModificationRequired ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCBearerContextModificationRequiredIEs } },
    ...
}

MCBearerContextModificationRequiredIEs E1AP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-E1AP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-E1AP-ID          PRESENCE mandatory }|
    { ID id-MCBearerContextToModifyRequired CRITICALITY reject 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
--
-- *****
MCCBearerContextReleaseRequest ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCCBearerContextReleaseRequestIEs } },
    ...
}

MCCBearerContextReleaseRequestIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-Cause                           CRITICALITY ignore TYPE Cause PRESENCE mandatory },
    ...
}

-- *****
--
-- MC BEARER NOTIFICATION
--
-- *****

MCCBearerNotification ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    { { MCCBearerNotificationIEs } },
    ...
}

MCCBearerNotificationIEs ELAP-PROTOCOL-IES ::= {
    { ID id-GNB-CU-CP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-CP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-GNB-CU-UP-MBS-ElAP-ID          CRITICALITY reject TYPE GNB-CU-UP-MBS-ElAP-ID PRESENCE mandatory }|
    { ID id-MBSSessionResourceNotification CRITICALITY ignore TYPE MBSSessionResourceNotification PRESENCE mandatory },
    ...
}

END
-- ASN1STOP

```

9.4.5 Information Element Definitions

```

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

ElAP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

```

BEGIN

IMPORTS

id-CommonNetworkInstance,
id-SNSSAI,
id-OldQoSFlowMap-ULendmarkerexpected,
id-DRB-QoS,
id-endpoint-IP-Address-and-Port,
id-NetworkInstance,
id-QoSFlowMappingIndication,
id-TNLAssociationTransportLayerAddressgNBCUUP,
id-Cause,
id-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-EarlyForwardingCOUNTReg,
id-EarlyForwardingCOUNTInfo,
id-AlternativeQoSParaSetList,
id-MCG-OfferedGBRQoSFlowInfo,
id-Number-of-tunnels,
id-DataForwardingtoE-UTRANInformationList,
id-DataForwardingtoNG-RANQoSFlowInformationList,
id-MaxCIDEHCDL,
id-ignoreMappingRuleIndication,
id-EarlyDataForwardingIndicator,
id-QoSFlowsDRBRemapping,
id-SecurityIndicationModify,
id-DataForwardingSourceIPAddress,
id-M4ReportAmount,
id-M6ReportAmount,
id-M7ReportAmount,
id-PDUSession-PairID,
id-SurvivalTime,
id-UDC-Parameters,
id-SecurityIndication,
id-SecurityResult,

id-SDTindicatorSetup,
id-SDTindicatorMod,
id-DiscardTimerExtended,
id-MCForwardingResourceRequest,
id-MCForwardingResourceIndication,
id-MCForwardingResourceResponse,
id-MCForwardingResourceRelease,
id-MCForwardingResourceReleaseIndication,
id-PDCP-COUNT-Reset,
id-MBSSessionAssociatedInfoNonSupportToSupport,
id-VersionID,
id-MBSAreaSessionID,
id-Secondary-PDU-Session-Data-Forwarding-Information,
id-MBSSessionResourceNotification,
id-MCBearerContextInactivityTimer,
id-MCBearerContextStatusChange,
maxnoofMBSAreaSessionIDs,
maxnoofSharedNG-UTerminations,
maxnoofMRBs,
maxnoofMBSSessionIDs,
maxnoofQoSParaSets,
maxnoofErrors,
maxnoofSliceItems,
maxnoofEUTRANQoSParameters,
maxnoofNGRANQoSParameters,
maxnoofDRBs,
maxnoofPDUSessionResource,
maxnoofQoSFlows,
maxnoofUPParameters,
maxnoofCellGroups,
maxnooftimeperiods,
maxnoofNR CGI,
maxnoofTLAs,
maxnoofGTPTLAs,
maxnoofSPLMNs,
maxnoofMDT PLMNs,
maxnoofExtSliceItems,
maxnoofDataForwardingTunneltoE-UTRAN,
maxnoofExtNR CGI,
maxnoofECGI,
maxnoofSMBRValues

FROM ElAP-Constants

Criticality,
ProcedureCode,
ProtocolIE-ID,
TriggeringMessage

FROM ElAP-CommonDataTypes

ProtocolExtensionContainer{},
ProtocolIE-SingleContainer{},
ElAP-PROTOCOL-EXTENSION,

```

ElAP-PROTOCOL-IES

FROM ElAP-Containers;

-- A

ActivityInformation ::= CHOICE {
    drb-Activity-List          DRB-Activity-List,
    pdu-Session-Resource-Activity-List  PDU-Session-Resource-Activity-List,
    ue-Activity                UE-Activity,
    choice-extension          ProtocolIE-SingleContainer  {{ActivityInformation-ExtIEs}}
}

ActivityInformation-ExtIEs ElAP-PROTOCOL-IES ::= {
    ...
}

ActivityNotificationLevel ::= ENUMERATED {
    drb,
    pdu-session,
    ue,
    ...
}

AdditionalHandoverInfo ::= ENUMERATED {
    discard-pdpc-SN,
    ...
}

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

AdditionalRRMPriorityIndex ::= BIT STRING (SIZE(32))

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

AlternativeQoSParaSetList ::= SEQUENCE (SIZE(1..maxnoofQoSParaSets)) OF AlternativeQoSParaSetItem

AlternativeQoSParaSetItem ::= SEQUENCE {
    alternativeQoSParameterIndex  INTEGER(1..8,...),
    guaranteedFlowBitRateDL       BitRate                OPTIONAL,
    guaranteedFlowBitRateUL       BitRate                OPTIONAL,
    packetDelayBudget              PacketDelayBudget      OPTIONAL,
    packetErrorRate                PacketErrorRate        OPTIONAL,
    iE-Extensions                  ProtocolExtensionContainer { {AlternativeQoSParaSetItem-ExtIEs} }  OPTIONAL,
    ...
}

AlternativeQoSParaSetItem-ExtIEs ElAP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

}
-- B
-- BCBearerContextToSetup
BCBearerContextToSetup ::= SEQUENCE {
    snssai                               SNSSAI,
    bcBearerContextNGU-TNLInfoat5GC     BCBearerContextNGU-TNLInfoat5GC     OPTIONAL,
    bcMRBToSetupList                    BCMRBSetupConfiguration,
    requestedAction                      RequestedAction4AvailNGUTermination    OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { {BCBearerContextToSetup-ExtIEs} } OPTIONAL,
    ...
}
BCBearerContextToSetup-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

BCBearerContextNGU-TNLInfoat5GC ::= CHOICE {
    locationindependent      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,
    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,
  bcBearerContextFlU-TNLInfoatCU BCBearerContextFlU-TNLInfoatCU,
  iE-Extensions ProtocolExtensionContainer {{BCMRBSetupResponseList-Item-ExtIEs}} OPTIONAL,
  ...
}

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

BCBearerContextFlU-TNLInfoatCU ::= CHOICE {
  locationindependent MBSFlUInformationAtCU,
  locationdependent LocationDependentMBSFlUInformationAtCU,
  choice-extension ProtocolIE-SingleContainer {{BCBearerContextFlU-TNLInfoatCU-ExtIEs}}
}

BCBearerContextFlU-TNLInfoatCU-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

BCMRBFailedList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBFailedList-Item
BCMRBFailedList-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  cause Cause,
  iE-Extensions ProtocolExtensionContainer {{BCMRBFailedList-Item-ExtIEs}} OPTIONAL,
  ...
}

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

```



```

-- BCBearerContextToModify

BCBearerContextToModify ::= SEQUENCE {
    bcBearerContextNGU-TNLInfoat5GC      BCBearerContextNGU-TNLInfoat5GC OPTIONAL,
    bcMRBToSetupList                      BCMRBSetupConfiguration      OPTIONAL,
    bcMRBToModifyList                     BCMRBModifyConfiguration     OPTIONAL,
    bcMRBToRemoveList                     BCMRBRemoveConfiguration    OPTIONAL,
    iE-Extensions                          ProtocolExtensionContainer { {BCBearerContextToModify-ExtIEs} } OPTIONAL,
    ...
}

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

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

BCMRBModifyConfiguration-Item ::= SEQUENCE {
    mrb-ID                                MRB-ID,
    bcBearerContextFlU-TNLInfoatDU       BCBearerContextFlU-TNLInfoatDU OPTIONAL,
    mbs-pdcp-config                       PDCP-Configuration          OPTIONAL,
    qos-Flow-QoS-Parameter-List          QoS-Flow-QoS-Parameter-List OPTIONAL,
    qosFlowLevelQoSParameters            QoSFlowLevelQoSParameters   OPTIONAL,
    iE-Extensions                          ProtocolExtensionContainer { {BCMRBModifyConfiguration-Item-ExtIEs} } OPTIONAL,
    ...
}

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

BCBearerContextFlU-TNLInfoatDU ::= CHOICE {
    locationindependent                   MBSFlUInformationAtDU,
    locationdependent                      LocationDependentMBSFlUInformationAtDU,
    choice-extension                       ProtocolIE-SingleContainer { {BCBearerContextFlU-TNLInfoatDU-ExtIEs} }
}

BCBearerContextFlU-TNLInfoatDU-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

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

-- BCBearerContextToModifyResponse

BCBearerContextToModifyResponse ::= SEQUENCE {
    bcBearerContextNGU-TNLInfoatNGRAN    BCBearerContextNGU-TNLInfoatNGRAN      OPTIONAL,
    bcMRBSetupModifyResponseList         BCMRBSetupModifyResponseList,
    bcMRBFailedList                       BCMRBFailedList                          OPTIONAL,
    availableBCMRBConfig                  BCMRBSetupConfiguration                  OPTIONAL,
    iE-Extensions                          ProtocolExtensionContainer { {BCBearerContextToModifyResponse-ExtIEs} } OPTIONAL,
    ...
}

```

```

}
BCBearerContextToModifyResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}
BCMRBSetupModifyResponseList ::= SEQUENCE (SIZE(1..maxnoofMRBs)) OF BCMRBSetupModifyResponseList-Item
BCMRBSetupModifyResponseList-Item ::= SEQUENCE {
  mrb-ID MRB-ID,
  qosflow-setup QoS-Flow-List OPTIONAL,
  qosflow-failed QoS-Flow-Failed-List OPTIONAL,
  bcBearerContextFLU-TNLInfoatCU BCBearerContextFLU-TNLInfoatCU OPTIONAL,
  iE-Extensions ProtocolExtensionContainer { {BCMRBSetupModifyResponseList-Item-ExtIEs} } OPTIONAL,
  ...
}
BCMRBSetupModifyResponseList-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}
-- 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-elap-id,
    unknown-or-already-allocated-gnb-cu-up-ue-elap-id,
    unknown-or-inconsistent-pair-of-ue-elap-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,
unknown-or-already-allocated-gNB-CU-CP-MBS-ElAP-ID,
unknown-or-already-allocated-gNB-CU-UP-MBS-ElAP-ID,
unknown-or-inconsistent-pair-of-MBS-ElAP-ID,
unknown-or-inconsistent-MRB-ID
}

CauseTransport ::= ENUMERATED {
    unspecified,
    transport-resource-unavailable,
    ...,
    unknown-TNL-address-for-IAB
}

Cell-Group-Information ::= SEQUENCE (SIZE(1.. maxnoofCellGroups)) OF Cell-Group-Information-Item

Cell-Group-Information-Item ::= SEQUENCE {
    cell-Group-ID                Cell-Group-ID,
    uL-Configuration             UL-Configuration           OPTIONAL,
    dL-TX-Stop                   DL-TX-Stop             OPTIONAL,
    rAT-Type                     RAT-Type              OPTIONAL,
    iE-Extensions                ProtocolExtensionContainer { { Cell-Group-Information-Item-ExtIEs } } OPTIONAL,
    ...
}

Cell-Group-Information-Item-ExtIEs      ElAP-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 ELAP-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 ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

-- D

DAPSRequestInfo ::= SEQUENCE {
    dapsIndicator                  ENUMERATED {daps-HO-required, ...},
    iE-Extensions                  ProtocolExtensionContainer { {DAPSRequestInfo-ExtIEs} } OPTIONAL,
    ...
}

DAPSRequestInfo-ExtIEs ELAP-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 ELAP-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 ELAP-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 {
    oldTNLAddress          TransportLayerAddress,
    newTNLAddress          TransportLayerAddress,
    iE-Extensions         ProtocolExtensionContainer { { DLUPTNLAddressToUpdateItemExtIEs } } OPTIONAL,
    ...
}

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

DL-TX-Stop ::= ENUMERATED {
    stop,

```



```

    resume,
    ...
}

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

DRB-Activity-List ::= SEQUENCE (SIZE(1..maxnoofDRBs)) OF DRB-Activity-Item

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

DRB-Activity-ItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Confirm-Modified-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Confirm-Modified-Item-EUTRAN

DRB-Confirm-Modified-Item-EUTRAN ::= SEQUENCE {
    dRB-ID DRB-ID,
    cell-Group-Information Cell-Group-Information OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRB-Confirm-Modified-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Confirm-Modified-Item-EUTRAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Confirm-Modified-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Confirm-Modified-Item-NG-RAN

DRB-Confirm-Modified-Item-NG-RAN ::= SEQUENCE {
    dRB-ID DRB-ID,
    cell-Group-Information Cell-Group-Information OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { DRB-Confirm-Modified-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Confirm-Modified-Item-NG-RAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Item-EUTRAN

DRB-Failed-Item-EUTRAN ::= SEQUENCE {
    dRB-ID DRB-ID,
    cause Cause,

```

```

    iE-Extensions          ProtocolExtensionContainer { { DRB-Failed-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-Mod-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Mod-Item-EUTRAN

DRB-Failed-Mod-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-Mod-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Mod-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Item-NG-RAN

DRB-Failed-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-Mod-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-Mod-Item-NG-RAN

DRB-Failed-Mod-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-Mod-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Failed-Mod-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Failed-To-Modify-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Failed-To-Modify-Item-EUTRAN

DRB-Failed-To-Modify-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    cause                 Cause,
    iE-Extensions        ProtocolExtensionContainer { { DRB-Failed-To-Modify-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

```

```

}
DRB-Failed-To-Modify-Item-EUTRAN-ExtIEs      ELAP-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      ELAP-PROTOCOL-EXTENSION ::= {
...
}
DRB-ID ::= INTEGER (1..32, ...)
DRB-Measurement-Results-Information-List ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Measurement-Results-Information-Item
DRB-Measurement-Results-Information-Item ::= SEQUENCE {
  dRB-ID                                DRB-ID,
  uL-DL-Result                          INTEGER (0..10000, ...)                                OPTIONAL,
  iE-Extensions                         ProtocolExtensionContainer { { DRB-Measurement-Results-Information-Item-ExtIEs } } OPTIONAL,
  ...
}
DRB-Measurement-Results-Information-Item-ExtIEs      ELAP-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      ELAP-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
    iE-Extensions
    ...
}

DRB-Modified-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-EarlyForwardingCOUNTInfo      CRITICALITY reject  EXTENSION EarlyForwardingCOUNTInfo      PRESENCE optional}|
    {ID id-OldQoSFlowMap-ULendmarkerexpected  CRITICALITY ignore  EXTENSION QoS-Flow-List      PRESENCE optional},
    ...
}

DRB-Removed-Item      ::= SEQUENCE {
    dRB-ID              DRB-ID,
    dRB-Released-In-Session      ENUMERATED {released-in-session, not-released-in-session, ...}  OPTIONAL,
    dRB-Accumulated-Session-Time  OCTET STRING (SIZE(5))  OPTIONAL,
    qoS-Flow-Removed-List        SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF QoS-Flow-Removed-Item  OPTIONAL,
    iE-Extensions              ProtocolExtensionContainer { { DRB-Removed-Item-ExtIEs } }  OPTIONAL,
    ...
}

DRB-Removed-Item-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Required-To-Modify-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Modify-Item-EUTRAN

DRB-Required-To-Modify-Item-EUTRAN ::= SEQUENCE {
    dRB-ID              DRB-ID,
    s1-DL-UP-TNL-Information      UP-TNL-Information      OPTIONAL,
    gNB-CU-UP-CellGroupRelatedConfiguration  GNB-CU-UP-CellGroupRelatedConfiguration  OPTIONAL,
    cause              Cause      OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { DRB-Required-To-Modify-Item-EUTRAN-ExtIEs } }  OPTIONAL,
    ...
}

DRB-Required-To-Modify-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Required-To-Modify-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Modify-Item-NG-RAN

DRB-Required-To-Modify-Item-NG-RAN ::= SEQUENCE {
    dRB-ID              DRB-ID,
    gNB-CU-UP-CellGroupRelatedConfiguration  GNB-CU-UP-CellGroupRelatedConfiguration  OPTIONAL,
    flow-To-Remove      QoS-Flow-List      OPTIONAL,
    cause              Cause      OPTIONAL,
    iE-Extensions      ProtocolExtensionContainer { { DRB-Required-To-Modify-Item-NG-RAN-ExtIEs } }  OPTIONAL,
    ...
}

DRB-Required-To-Modify-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

DRB-Setup-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Item-EUTRAN

DRB-Setup-Item-EUTRAN ::= SEQUENCE {
  dRB-ID                               DRB-ID,
  s1-DL-UP-TNL-Information              UP-TNL-Information,
  data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
  uL-UP-Transport-Parameters            UP-Parameters,
  s1-DL-UP-Unchanged                    ENUMERATED {true, ...} OPTIONAL,
  iE-Extensions                          ProtocolExtensionContainer { { DRB-Setup-Item-EUTRAN-ExtIEs } } OPTIONAL,
  ...
}

DRB-Setup-Item-EUTRAN-ExtIEs           E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-DataForwardingSourceIPAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional}|
  {ID id-SecurityResult                 CRITICALITY ignore EXTENSION SecurityResult       PRESENCE optional},
  ...
}

DRB-Setup-Mod-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Mod-Item-EUTRAN

DRB-Setup-Mod-Item-EUTRAN ::= SEQUENCE {
  dRB-ID                               DRB-ID,
  s1-DL-UP-TNL-Information              UP-TNL-Information,
  data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
  uL-UP-Transport-Parameters            UP-Parameters,
  iE-Extensions                          ProtocolExtensionContainer { { DRB-Setup-Mod-Item-EUTRAN-ExtIEs } } OPTIONAL,
  ...
}

DRB-Setup-Mod-Item-EUTRAN-ExtIEs       E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-SecurityResult                 CRITICALITY ignore EXTENSION SecurityResult       PRESENCE optional}|
  {ID id-DataForwardingSourceIPAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional},
  ...
}

DRB-Setup-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Item-NG-RAN

DRB-Setup-Item-NG-RAN ::= SEQUENCE {
  dRB-ID                               DRB-ID,
  dRB-data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
  uL-UP-Transport-Parameters            UP-Parameters,
  flow-Setup-List                       QoS-Flow-List,
  flow-Failed-List                      QoS-Flow-Failed-List OPTIONAL,
  iE-Extensions                          ProtocolExtensionContainer { { DRB-Setup-Item-NG-RAN-ExtIEs } } OPTIONAL,
  ...
}

DRB-Setup-Item-NG-RAN-ExtIEs           E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

DRB-Setup-Mod-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Setup-Mod-Item-NG-RAN

```

```

DRB-Setup-Mod-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                                DRB-ID,
    dRB-data-Forwarding-Information-Response Data-Forwarding-Information OPTIONAL,
    uL-UP-Transport-Parameters            UP-Parameters,
    flow-Setup-List                       QoS-Flow-List,
    flow-Failed-List                      QoS-Flow-Failed-List OPTIONAL,
    iE-Extensions                         ProtocolExtensionContainer { { DRB-Setup-Mod-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Setup-Mod-Item-NG-RAN-ExtIEs        E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-Status-Item ::= SEQUENCE {
    dRB-ID                                DRB-ID,
    pDCP-DL-Count                         PDCP-Count OPTIONAL,
    pDCP-UL-Count                         PDCP-Count OPTIONAL,
    iE-Extensions                         ProtocolExtensionContainer { { DRB-Status-ItemExtIEs } } OPTIONAL,
    ...
}

DRB-Status-ItemExtIEs                  E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-Subject-To-Counter-Check-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRBs-Subject-To-Counter-Check-Item-EUTRAN

DRBs-Subject-To-Counter-Check-Item-EUTRAN ::= SEQUENCE {
    dRB-ID                                DRB-ID,
    pDCP-UL-Count                         PDCP-Count,
    pDCP-DL-Count                         PDCP-Count,
    iE-Extensions                         ProtocolExtensionContainer { { DRBs-Subject-To-Counter-Check-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRBs-Subject-To-Counter-Check-Item-EUTRAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRBs-Subject-To-Counter-Check-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRBs-Subject-To-Counter-Check-Item-NG-RAN

DRBs-Subject-To-Counter-Check-Item-NG-RAN ::= SEQUENCE {
    pDU-Session-ID                       PDU-Session-ID,
    dRB-ID                                DRB-ID,
    pDCP-UL-Count                         PDCP-Count,
    pDCP-DL-Count                         PDCP-Count,
    iE-Extensions                         ProtocolExtensionContainer { { DRBs-Subject-To-Counter-Check-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRBs-Subject-To-Counter-Check-Item-NG-RAN-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

```

```

DRBs-Subject-To-Early-Forwarding-List ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRBs-Subject-To-Early-Forwarding-Item

DRBs-Subject-To-Early-Forwarding-Item ::= SEQUENCE {
    drb-ID                DRB-ID,
    dlCountValue          PDCP-Count,
    ie-Extensions         ProtocolExtensionContainer { { DRBs-Subject-To-Early-Forwarding-Item-ExtIEs } } OPTIONAL,
    ...
}

DRBs-Subject-To-Early-Forwarding-Item-ExtIEs          E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-To-Modify-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Modify-Item-EUTRAN

DRB-To-Modify-Item-EUTRAN ::= SEQUENCE {
    drb-ID                DRB-ID,
    pDCP-Configuration    PDCP-Configuration                OPTIONAL,
    eUTRAN-QoS            EUTRAN-QoS                        OPTIONAL,
    s1-UL-UP-TNL-Information UP-TNL-Information            OPTIONAL,
    data-Forwarding-Information Data-Forwarding-Information OPTIONAL,
    pDCP-SN-Status-Request PDCP-SN-Status-Request          OPTIONAL,
    pDCP-SN-Status-Information PDCP-SN-Status-Information  OPTIONAL,
    dl-UP-Parameters      UP-Parameters                    OPTIONAL,
    cell-Group-To-Add      Cell-Group-Information          OPTIONAL,
    cell-Group-To-Modify   Cell-Group-Information          OPTIONAL,
    cell-Group-To-Remove   Cell-Group-Information          OPTIONAL,
    drb-Inactivity-Timer   Inactivity-Timer                OPTIONAL,
    ie-Extensions         ProtocolExtensionContainer { { DRB-To-Modify-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Modify-Item-EUTRAN-ExtIEs          E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-To-Modify-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Modify-Item-NG-RAN

DRB-To-Modify-Item-NG-RAN ::= SEQUENCE {
    drb-ID                DRB-ID,
    sDAP-Configuration    SDAP-Configuration                OPTIONAL,
    pDCP-Configuration    PDCP-Configuration                OPTIONAL,
    drb-Data-Forwarding-Information Data-Forwarding-Information OPTIONAL,
    pDCP-SN-Status-Request PDCP-SN-Status-Request          OPTIONAL,
    pdcp-SN-Status-Information PDCP-SN-Status-Information  OPTIONAL,
    dl-UP-Parameters      UP-Parameters                    OPTIONAL,
    cell-Group-To-Add      Cell-Group-Information          OPTIONAL,
    cell-Group-To-Modify   Cell-Group-Information          OPTIONAL,
    cell-Group-To-Remove   Cell-Group-Information          OPTIONAL,
    flow-Mapping-Information QoS-Flow-QoS-Parameter-List    OPTIONAL,
    drb-Inactivity-Timer   Inactivity-Timer                OPTIONAL,
    ie-Extensions         ProtocolExtensionContainer { { DRB-To-Modify-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

```

```

}
DRB-To-Modify-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-OldQoSFlowMap-ULendmarkerexpected  CRITICALITY reject  EXTENSION QoS-Flow-List PRESENCE optional}|
  {ID id-DRB-QoS                            CRITICALITY ignore  EXTENSION QoSFlowLevelQoSParameters  PRESENCE optional}|
  {ID id-EarlyForwardingCOUNTReq          CRITICALITY reject  EXTENSION EarlyForwardingCOUNTReq  PRESENCE optional}|
  {ID id-EarlyForwardingCOUNTInfo        CRITICALITY reject  EXTENSION EarlyForwardingCOUNTInfo  PRESENCE optional}|
  {ID id-DAPSRequestInfo                   CRITICALITY ignore  EXTENSION DAPSRequestInfo            PRESENCE optional}|
  {ID id-EarlyDataForwardingIndicator      CRITICALITY ignore  EXTENSION EarlyDataForwardingIndicator PRESENCE optional}|
  {ID id-SDTindicatorMod                   CRITICALITY reject  EXTENSION SDTindicatorMod            PRESENCE optional}|
  {ID id-PDCP-COUNT-Reset                   CRITICALITY reject  EXTENSION PDCP-COUNT-Reset           PRESENCE optional } ,
  ...
}

DRB-To-Remove-List-EUTRAN      ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Remove-Item-EUTRAN

DRB-To-Remove-Item-EUTRAN      ::= SEQUENCE {
  dRB-ID                        DRB-ID,
  iE-Extensions                  ProtocolExtensionContainer { { DRB-To-Remove-Item-EUTRAN-ExtIEs } } OPTIONAL,
  ...
}

DRB-To-Remove-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

DRB-Required-To-Remove-List-EUTRAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Remove-Item-EUTRAN

DRB-Required-To-Remove-Item-EUTRAN ::= SEQUENCE {
  dRB-ID                        DRB-ID,
  cause                          Cause,
  iE-Extensions                  ProtocolExtensionContainer { { DRB-Required-To-Remove-Item-EUTRAN-ExtIEs } } OPTIONAL,
  ...
}

DRB-Required-To-Remove-Item-EUTRAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

DRB-To-Remove-List-NG-RAN      ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Remove-Item-NG-RAN

DRB-To-Remove-Item-NG-RAN      ::= SEQUENCE {
  dRB-ID                        DRB-ID,
  iE-Extensions                  ProtocolExtensionContainer { { DRB-To-Remove-Item-NG-RAN-ExtIEs } } OPTIONAL,
  ...
}

DRB-To-Remove-Item-NG-RAN-ExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

DRB-Required-To-Remove-List-NG-RAN ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Required-To-Remove-Item-NG-RAN

DRB-Required-To-Remove-Item-NG-RAN ::= SEQUENCE {

```



```

    dRB-ID                DRB-ID,
    cause                  Cause,
    iE-Extensions          ProtocolExtensionContainer { { DRB-Required-To-Remove-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-Required-To-Remove-Item-NG-RAN-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

DRB-To-Setup-List-EUTRAN    ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Item-EUTRAN

DRB-To-Setup-Item-EUTRAN    ::= SEQUENCE {
    dRB-ID                DRB-ID,
    pDCP-Configuration     PDCP-Configuration,
    eUTRAN-QoS             EUTRAN-QoS,
    s1-UL-UP-TNL-Information UP-TNL-Information,
    data-Forwarding-Information-Request Data-Forwarding-Information-Request    OPTIONAL,
    cell-Group-Information Cell-Group-Information,
    dL-UP-Parameters        UP-Parameters                                OPTIONAL,
    dRB-Inactivity-Timer     Inactivity-Timer                                OPTIONAL,
    existing-Allocated-S1-DL-UP-TNL-Info UP-TNL-Information                                OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { DRB-To-Setup-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Setup-Item-EUTRAN-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-DataForwardingSourceIPAddress          CRITICALITY ignore  EXTENSION TransportLayerAddress  PRESENCE optional}|
    {ID id-SecurityIndication                    CRITICALITY reject  EXTENSION SecurityIndication    PRESENCE optional},
    ...
}

DRB-To-Setup-Mod-List-EUTRAN    ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Mod-Item-EUTRAN

DRB-To-Setup-Mod-Item-EUTRAN    ::= SEQUENCE {
    dRB-ID                DRB-ID,
    pDCP-Configuration     PDCP-Configuration,
    eUTRAN-QoS             EUTRAN-QoS,
    s1-UL-UP-TNL-Information UP-TNL-Information,
    data-Forwarding-Information-Request Data-Forwarding-Information-Request    OPTIONAL,
    cell-Group-Information Cell-Group-Information,
    dL-UP-Parameters        UP-Parameters                                OPTIONAL,
    dRB-Inactivity-Timer     Inactivity-Timer                                OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { { DRB-To-Setup-Mod-Item-EUTRAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Setup-Mod-Item-EUTRAN-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-SecurityIndication                    CRITICALITY reject  EXTENSION SecurityIndication    PRESENCE optional}|
    {ID id-DataForwardingSourceIPAddress          CRITICALITY ignore  EXTENSION TransportLayerAddress  PRESENCE optional},
    ...
}

DRB-To-Setup-List-NG-RAN    ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-To-Setup-Item-NG-RAN

```

```

DRB-To-Setup-Item-NG-RAN ::= SEQUENCE {
    dRB-ID                DRB-ID,
    sDAP-Configuration   SDAP-Configuration,
    pDCP-Configuration   PDCP-Configuration,
    cell-Group-Information Cell-Group-Information,
    qos-flow-Information-To-Be-Setup QoS-Flow-QoS-Parameter-List,
    dRB-Data-Forwarding-Information-Request Data-Forwarding-Information-Request OPTIONAL,
    dRB-Inactivity-Timer Inactivity-Timer OPTIONAL,
    pDCP-SN-Status-Information PDCP-SN-Status-Information OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { { DRB-To-Setup-Item-NG-RAN-ExtIEs } } OPTIONAL,
    ...
}

DRB-To-Setup-Item-NG-RAN-ExtIEs ELAP-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 ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-DRB-QoS                CRITICALITY ignore EXTENSION QoSFlowLevelQoSParameters PRESENCE optional}|
    {ID id-ignoreMappingRuleIndication CRITICALITY reject EXTENSION IgnoreMappingRuleIndication PRESENCE optional}|
    {ID id-DAPSRequestInfo        CRITICALITY ignore EXTENSION DAPSRequestInfo PRESENCE optional}|
    {ID id-SDTindicatorSetup       CRITICALITY reject EXTENSION SDTindicatorSetup PRESENCE optional},
    ...
}

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, ..., 65536..109999)

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

E-UTRAN-Cell-Identity ::= BIT STRING (SIZE(28))

ECGI ::= SEQUENCE {
    pLMN-Identity          PLMN-Identity,
    eUTRAN-Cell-Identity  E-UTRAN-Cell-Identity,
    iE-Extensions          ProtocolExtensionContainer { { ECGI-ExtIEs } } OPTIONAL
}

ECGI-ExtIEs 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,
    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 ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

GNB-CU-CP-TNLA-To-Add-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress    CP-TNL-Information,
    tNLAssociationUsage                    TNLAssociationUsage,
    iE-Extensions                          ProtocolExtensionContainer { { GNB-CU-CP-TNLA-To-Add-Item-ExtIEs} } OPTIONAL
}

GNB-CU-CP-TNLA-To-Add-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

GNB-CU-CP-TNLA-To-Remove-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-TNLAssociationTransportLayerAddresssgNBCUUP    CRITICALITY reject    EXTENSION CP-TNL-Information    PRESENCE optional},
    ...
}

GNB-CU-CP-TNLA-To-Update-Item ::= SEQUENCE {
    tNLAssociationTransportLayerAddress    CP-TNL-Information,
    tNLAssociationUsage                    TNLAssociationUsage    OPTIONAL,
    iE-Extensions                          ProtocolExtensionContainer { { GNB-CU-CP-TNLA-To-Update-Item-ExtIEs} } OPTIONAL
}

GNB-CU-CP-TNLA-To-Update-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

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

GBR-QosInformation ::= SEQUENCE {
    e-RAB-MaximumBitrateDL                BitRate,
    e-RAB-MaximumBitrateUL                BitRate,

```



```

    e-RAB-GuaranteedBitrateDL      BitRate,
    e-RAB-GuaranteedBitrateUL      BitRate,
    iE-Extensions                  ProtocolExtensionContainer { { GBR-QosInformation-ExtIEs } } OPTIONAL,
    ...
}

GBR-QosInformation-ExtIEs 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))

GTPTTLAs ::= SEQUENCE (SIZE(1.. maxnoofGTPTTLAs)) OF  GTPTTLA-Item

GTPTTLA-Item ::= SEQUENCE {
    gTPTransportLayerAddresses      TransportLayerAddress,
    iE-Extensions  ProtocolExtensionContainer { { GTPTTLA-Item-ExtIEs } }      OPTIONAL,
    ...
}

GTPTTLA-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 } } OPTIONAL,
    ...
}

HW-CapacityIndicator-ExtIEs ELAP-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-UIPAddress   TransportLayerAddress,
    iAB-DUIPAddress           TransportLayerAddress,
    iE-Extensions            ProtocolExtensionContainer { { IAB-donor-CU-UPPSKInfoItemExtIEs } } OPTIONAL,
    ...
}
IAB-donor-CU-UPPSKInfoItemExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}
IAB-donor-CU-UPPSK ::= OCTET STRING

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

-- J
-- K
-- L

Links-to-log ::= ENUMERATED {
    uplink,
    downlink,
    both-uplink-and-downlink,
    ...
}

LocationDependentMBSNGUInformationAt5GC ::= SEQUENCE (SIZE(1..maxnoofMBSAreaSessionIDs)) OF LocationDependentMBSNGUInformationAt5GC-Item

LocationDependentMBSNGUInformationAt5GC-Item ::= SEQUENCE {
    mbsAreaSession-ID        MBSAreaSessionID,
    mbsNGUInformationAt5GC    MBSNGUInformationAt5GC,
    iE-Extensions            ProtocolExtensionContainer { { LocationDependentMBSNGUInformationAt5GC-Item-ExtIEs } } OPTIONAL,
    ...
}

LocationDependentMBSNGUInformationAt5GC-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

LocationDependentMBSF1UInformationAtCU-Item ::= SEQUENCE {

```

```

    mbsAreaSession-ID          MBSAreaSessionID,
    mbs-flu-info-at-CU         UP-TNL-Information,
    iE-Extensions              ProtocolExtensionContainer { { LocationDependentMBSFlUInformationAtCU-Item-ExtIEs } } OPTIONAL,
    ...
}

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

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

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

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

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

LocationDependentMBSNGUInformationAtNGRAN-Item ::= SEQUENCE {
    mbsAreaSession-ID          MBSAreaSessionID,
    mbsNGUInformationAtNGRAN    MBSNGUInformationAtNGRAN,
    iE-Extensions              ProtocolExtensionContainer { { LocationDependentMBSNGUInformationAtNGRAN-Item-ExtIEs } } OPTIONAL,
    ...
}

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

-- M

MaxDataBurstVolume ::= INTEGER (0..4095, ..., 4096.. 2000000)

MaximumIPdatarate ::= SEQUENCE {
    maxIPrate          MaxIPrate,
    iE-Extensions      ProtocolExtensionContainer { {MaximumIPdatarate-ExtIEs} } OPTIONAL,
    ...
}

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

MaxIPrate ::= ENUMERATED {
    bitrate64kbs,
    max-UErate,
    ...
}

```

```

}

MaxPacketLossRate ::= INTEGER (0..1000, ...)

MaxCIDEHCDL ::= INTEGER (1..32767, ...)

MBSAreaSessionID ::= INTEGER (0..65535, ...)

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

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

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

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

MBSNGUInformationAt5GC ::= CHOICE {
    multicast                    MBSNGUInformationAt5GC-Multicast,
    choice-extension            ProtocolIE-SingleContainer { {MBSNGUInformationAt5GC-ExtIEs} }
}

MBSNGUInformationAt5GC-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

MBSNGUInformationAt5GC-Multicast ::= SEQUENCE {
    ipmcAddress                TransportLayerAddress,
    ipsourceAddress            TransportLayerAddress,
    gtpDLTEID                  GTP-TEID,
    iE-Extensions              ProtocolExtensionContainer { {MBSNGUInformationAt5GC-Multicast-ExtIEs} } OPTIONAL,
    ...
}

MBSNGUInformationAt5GC-Multicast-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

MBSNGUInformationAtNGRAN ::= CHOICE {
    unicast                      UP-TNL-Information,
    choice-extension            ProtocolIE-SingleContainer { {MBSNGUInformationAtNGRAN-ExtIEs} }
}

```

```

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

MBSSessionAssociatedInfoNonSupportToSupport ::= SEQUENCE {
    ue-Reference-ID          GNB-CU-CP-UE-E1AP-ID,
    pdu-Session-ID          PDU-Session-ID,
    associatedQoSFlowInformationList MBSSessionAssociatedInformationList,
    iE-Extensions          ProtocolExtensionContainer { {MBSSessionAssociatedInfoNonSupportToSupport-ExtIEs} } OPTIONAL,
    ...
}

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

MBSSessionAssociatedInformation ::= SEQUENCE {
    mbsSessionAssociatedInformationList MBSSessionAssociatedInformationList,
    mbsSessionForwardingAddress        UP-TNL-Information,
    iE-Extensions          ProtocolExtensionContainer { {MBSSessionAssociatedInformation-ExtIEs} } OPTIONAL,
    ...
}

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

MBSSessionAssociatedInformationList ::= SEQUENCE (SIZE(1..maxnoofQoSFlows)) OF MBSSessionAssociatedInformation-Item

MBSSessionAssociatedInformation-Item ::= SEQUENCE {
    mbs-QoS-Flow-Identifier          QoS-Flow-Identifier,
    associated-unicast-QoS-Flow-Identifier QoS-Flow-Identifier,
    iE-Extensions          ProtocolExtensionContainer { { MBSSessionAssociatedInformation-Item-ExtIEs } } OPTIONAL,
    ...
}

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

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

MBS-Support-Info-ToAdd-Item ::= SEQUENCE {
    globalMBSSessionID          GlobalMBSSessionID,
    iE-Extensions          ProtocolExtensionContainer { { MBS-Support-Info-ToAdd-Item-ExtIEs } } OPTIONAL,
    ...
}

MBS-Support-Info-ToAdd-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

```

```

MBSsessionResourceNotification ::= CHOICE {
  mbs-DL-Data-Arrival          MBS-DL-Data-Arrival,
  inactivity                    MCBearerContext-Inactivity,
  choice-extension             ProtocolIE-SingleContainer {{ MBSsessionResourceNotification-ExtIEs}}
}

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

MBS-DL-Data-Arrival ::= SEQUENCE {
  dlDataArrival                ENUMERATED {true, ...},
  ppi                          PPI                                OPTIONAL,
  iE-Extensions                ProtocolExtensionContainer { { MBS-DL-Data-Arrival-ExtIEs} } OPTIONAL,
  ...
}

MBS-DL-Data-Arrival-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MCBearerContext-Inactivity ::= SEQUENCE {
  mcBearerContext-Inactivity-Indication          ENUMERATED {true, ...},
  iE-Extensions          ProtocolExtensionContainer { {MCBearerContext-Inactivity-ExtIEs} } OPTIONAL,
  ...
}

MCBearerContext-Inactivity-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MBS-Support-Info-ToRemove-Item ::= SEQUENCE {
  globalMBSsessionID          GlobalMBSsessionID,
  iE-Extensions          ProtocolExtensionContainer { { MBS-Support-Info-ToRemove-Item-ExtIEs} } OPTIONAL,
  ...
}

MBS-Support-Info-ToRemove-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCBearerContextToSetup

MCBearerContextToSetup ::= SEQUENCE {
  snssai          SNSSAI,
  mcMRBToSetupList          MCMRBSetupConfiguration          OPTIONAL,
  requestedAction          RequestedAction4AvailNGUTermination          OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { {MCBearerContextToSetup-ExtIEs} } OPTIONAL,
  ...
}

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

```

```

    {ID id-MBSSessionAssociatedInfoNonSupportToSupport CRITICALITY ignore EXTENSION MBSSessionAssociatedInfoNonSupportToSupport PRESENCE
optional}}|
    {ID id-MBSAreaSessionID CRITICALITY ignore EXTENSION MBSAreaSessionID PRESENCE optional}}|
    {ID id-MCBearerContextInactivityTimer CRITICALITY ignore EXTENSION Inactivity-Timer PRESENCE optional}}|
    {ID id-MCBearerContextStatusChange CRITICALITY ignore EXTENSION MCBearerContextStatusChange PRESENCE optional},
    ...
}

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

MCMRBSetupConfiguration-Item ::= SEQUENCE {
    mrb-ID MRB-ID,
    mbs-pdcp-config PDCP-Configuration,
    qos-Flow-QoS-Parameter-List QoS-Flow-QoS-Parameter-List,
    qosFlowLevelQoSParameters QoSFlowLevelQoSParameters OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { {MCMRBSetupConfiguration-Item-ExtIEs} } OPTIONAL,
    ...
}

MCMRBSetupConfiguration-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MCBearerContextStatusChange ::= ENUMERATED {suspend, resume, ...}

-- MCBearerContextToSetupResponse

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

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

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

MCBearerContextNGU-TNLInfoatNGRAN-ExtIEs ELAP-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,
    mBS-PDCP-COUNT       MBS-PDCP-COUNT             OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {MCMRBSetupResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

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

MBS-PDCP-COUNT ::= BIT STRING (SIZE (32))

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

MCMRBFailedList-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    cause                 Cause,
    iE-Extensions        ProtocolExtensionContainer { {MCMRBFailedList-Item-ExtIEs} }     OPTIONAL,
    ...
}

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

-- MCBearerContextToModify

MCBearerContextToModify ::= SEQUENCE {
    mcBearerContextNGUTNLInfoat5GC                MCBearerContextNGUTNLInfoat5GC                OPTIONAL,
    mcBearerContextNGUTnlInfoatNGRANRequest       MCBearerContextNGUTnlInfoatNGRANRequest       OPTIONAL,
    mbsMulticastFLUContextDescriptor             MBSMulticastFLUContextDescriptor             OPTIONAL,
    -- This IE shall be present if either the MC MRB To Setup or Modify List IE or the MC MRB To Remove List IE or both IEs are included.
    requestedAction                               RequestedAction4AvailNGUTermination           OPTIONAL,
    mcMRBToSetupModifyList                       MCMRBSetupModifyConfiguration               OPTIONAL,
    mcMRBToRemoveList                            MCMRBRemoveConfiguration                   OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {MCBearerContextToModify-ExtIEs} } OPTIONAL,
    ...
}

MCBearerContextToModify-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-MCForwardingResourceRequest           CRITICALITY ignore  EXTENSION MCForwardingResourceRequest           PRESENCE
optional}|
    {ID id-MCForwardingResourceIndication       CRITICALITY ignore  EXTENSION MCForwardingResourceIndication       PRESENCE
optional}|
    {ID id-MCForwardingResourceRelease         CRITICALITY ignore  EXTENSION MCForwardingResourceRelease         PRESENCE
optional}|
    {ID id-MBSSessionAssociatedInfoNonSupportToSupport CRITICALITY ignore  EXTENSION MBSSessionAssociatedInfoNonSupportToSupport PRESENCE
optional}|
    {ID id-MCBearerContextInactivityTimer      CRITICALITY ignore  EXTENSION Inactivity-Timer                        PRESENCE
optional}|

```

```

    {ID id-MCBearerContextStatusChange
optional},
    ...
}

MCBearerContextNGUTNLInfoat5GC ::= SEQUENCE {
    mbsNGUIInformationAt5GC          MBSNGUIInformationAt5GC,
    mbsAreaSession-ID                MBSAreaSessionID          OPTIONAL,
    iE-Extensions                    ProtocolExtensionContainer { {MCBearerContextNGUTNLInfoat5GC-ExtIEs} } OPTIONAL,
    ...
}

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

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

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

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

MCMRBSetupModifyConfiguration-Item ::= SEQUENCE {
    mrb-ID                            MRB-ID,
    fluTNLatDU                        MCBearerContextFlUTNLInfoatDU          OPTIONAL,
    mbs-pdcp-config                    PDCP-Configuration          OPTIONAL,
    qos-Flow-QoS-Parameter-List       QoS-Flow-QoS-Parameter-List    OPTIONAL,
    mrbQoS                             QoSFlowLevelQoSParameters    OPTIONAL,
    mbs-PDCP-COUNT-Req                 MBS-PDCP-COUNT-Req          OPTIONAL,
    iE-Extensions                    ProtocolExtensionContainer { {MCMRBSetupModifyConfiguration-Item-ExtIEs} } OPTIONAL,
    ...
}

MCMRBSetupModifyConfiguration-Item-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

MCBearerContextFlUTNLInfoatDU ::= SEQUENCE {
    mbsFlUInfoatDU                    UP-TNL-Information,
    mbsMulticastFlUContextDescriptor  MBSMulticastFlUContextDescriptor,
    iE-Extensions                    ProtocolExtensionContainer { {MCBearerContextFlUTNLInfoatDU-ExtIEs} } OPTIONAL,
    ...
}

MCBearerContextFlUTNLInfoatDU-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {

```

```

}
...
MulticastFlUContextReferenceE1 ::= OCTET STRING (SIZE(4))

MBSMulticastFlUContextDescriptor ::= SEQUENCE {
    multicastFlUContextReferenceE1 MulticastFlUContextReferenceE1,
    mc-FlUCtxtusage      ENUMERATED {ptm, ptp, ptp-retransmission, ptp-forwarding, ...},
    mbsAreaSession      MBSAreaSessionID OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { { MBSMulticastFlUContextDescriptor-ExtIEs } } OPTIONAL,
    ...
}

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

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

MBS-PDCP-COUNT-Req ::= ENUMERATED {true, ... }

-- MCBearerContextToModifyResponse

MCBearerContextToModifyResponse ::= SEQUENCE {
    mcBearerContextNGU-TNLInfoatNGRANModifyResponse MCBearerContextNGU-TNLInfoatNGRANModifyResponse OPTIONAL,
    mbsMulticastFlUContextDescriptor MBSMulticastFlUContextDescriptor OPTIONAL,
    -- This IE shall be present if either the MC MRB Setup or Modify Response List IE or the MC MRB Failed List IE or both IEs are included.
    mcMRBModifySetupResponseList MCMRBSetupModifyResponseList OPTIONAL,
    mcMRBFailedList MCMRBFailedList OPTIONAL,
    availableMCMRBConfig MCMRBSetupConfiguration OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { MCBearerContextToModifyResponse-ExtIEs } } OPTIONAL,
    ...
}

MCBearerContextToModifyResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-MCForwardingResourceResponse CRITICALITY ignore EXTENSION MCForwardingResourceResponse PRESENCE optional},
    ...
}

MCBearerContextNGU-TNLInfoatNGRANModifyResponse ::= SEQUENCE {
    mbs-NGU-InfoatNGRAN MBSNGUInformationAtNGRAN,
    mbsAreaSession MBSAreaSessionID OPTIONAL,
    iE-Extensions ProtocolExtensionContainer { { MCBearerContextNGU-TNLInfoatNGRANModifyResponse-ExtIEs } } OPTIONAL,
    ...
}

MCBearerContextNGU-TNLInfoatNGRANModifyResponse-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    ...
}

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

```

```

MCMRBSetupModifyResponseList-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    qosflow-setup        QoS-Flow-List            OPTIONAL,
    qosflow-failed       QoS-Flow-Failed-List     OPTIONAL,
    mcBearerContextFlUTNLInfoatCU  UP-TNL-Information  OPTIONAL,
    mBS-PDCP-COUNT       MBS-PDCP-COUNT          OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {MCMRBSetupModifyResponseList-Item-ExtIEs} } OPTIONAL,
    ...
}

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

-- MCBearerContextToModifyRequired

MCBearerContextToModifyRequired ::= SEQUENCE {
    mbsMulticastFlUContextDescriptor          MBSMulticastFlUContextDescriptor          OPTIONAL,
    -- This IE shall be present if either the MC MRB To Remove List Required IE is included.
    mcMRBToRemoveRequiredList                MCMRBRemoveConfiguration                OPTIONAL,
    mcMRBToModifyRequiredList                MCMRBModifyRequiredConfiguration          OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {MCBearerContextToModifyRequired-ExtIEs} } OPTIONAL,
    ...
}

MCBearerContextToModifyRequired-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
    {ID id-MCForwardingResourceReleaseIndication    CRITICALITY ignore    EXTENSION MCForwardingResourceReleaseIndication    PRESENCE optional},
    ...
}

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

MCMRBModifyRequiredConfiguration-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    mBS-PDCP-COUNT       MBS-PDCP-COUNT          OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { { MCMRBModifyRequiredConfiguration-Item-ExtIEs} } OPTIONAL,
    ...
}

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

-- MCBearerContextToModifyConfirm

MCBearerContextToModifyConfirm ::= SEQUENCE {
    mbsMulticastFlUContextDescriptor          MBSMulticastFlUContextDescriptor          OPTIONAL,
    mcMRBModifyConfirmList                MCMRBModifyConfirmList                OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { {MCBearerContextToModifyConfirm-ExtIEs} } OPTIONAL,
    ...
}

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

```

```

MCMRBModifyConfirmList-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    iE-Extensions        ProtocolExtensionContainer { { MCMRBModifyConfirmList-Item-ExtIEs } } OPTIONAL,
    ...
}

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

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

-- MCFForwardingResourceRequest

MCFForwardingResourceRequest ::= SEQUENCE {
    mcForwardingResourceID    MCFForwardingResourceID,
    mbsAreaSession-ID        MBSAreaSessionID                OPTIONAL,
    mrbForwardingResourceRequestList MRBForwardingResourceRequestList OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { { MCFForwardingResourceRequest-ExtIEs } } OPTIONAL,
    ...
}

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

MRBForwardingResourceRequestList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MRBForwardingResourceRequest-Item

MRBForwardingResourceRequest-Item ::= SEQUENCE {
    mrb-ID                MRB-ID,
    mrbProgressRequestType MRB-ProgressInformationType OPTIONAL,
    mrbForwardingAddressRequest ENUMERATED {request, ...} OPTIONAL,
    iE-Extensions        ProtocolExtensionContainer { { MRBForwardingResourceRequest-Item-ExtIEs } } OPTIONAL,
    ...
}

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

-- MCFForwardingResourceIndication

MCFForwardingResourceIndication ::= SEQUENCE {
    mcForwardingResourceID    MCFForwardingResourceID,
    mrbForwardingResourceIndicationList MRBForwardingResourceIndicationList OPTIONAL,
    mbsSessionAssociatedInformation MBSSessionAssociatedInformation OPTIONAL,
    iE-Extensions            ProtocolExtensionContainer { { MCFForwardingResourceIndication-ExtIEs } } OPTIONAL,
    ...
}

```

```

MCForwardingResourceIndication-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MRBForwardingResourceIndicationList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MRBForwardingResourceIndication-Item

MRBForwardingResourceIndication-Item ::= SEQUENCE {
  mrb-ID                MRB-ID,
  mrb-ProgressInformation  MRB-ProgressInformation  OPTIONAL,
  mrbForwardingAddress     UP-TNL-Information      OPTIONAL,
  iE-Extensions           ProtocolExtensionContainer { {MRBForwardingResourceIndication-Item-ExtIEs} } OPTIONAL,
  ...
}

MRBForwardingResourceIndication-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCForwardingResourceResponse

MCForwardingResourceResponse ::= SEQUENCE {
  mcForwardingResourceID      MCForwardingResourceID,
  mrbForwardingResourceResponseList  MRBForwardingResourceResponseList  OPTIONAL,
  iE-Extensions              ProtocolExtensionContainer { {MCForwardingResourceResponse-ExtIEs} }  OPTIONAL,
  ...
}

MCForwardingResourceResponse-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

MRBForwardingResourceResponseList ::= SEQUENCE (SIZE(1.. maxnoofQoSFlows)) OF MRBForwardingResourceResponse-Item

MRBForwardingResourceResponse-Item ::= SEQUENCE {
  mrb-ID                MRB-ID,
  mrb-ProgressInformation  MRB-ProgressInformation  OPTIONAL,
  mrbForwardingAddress     UP-TNL-Information      OPTIONAL,
  iE-Extensions           ProtocolExtensionContainer { {MRBForwardingResourceResponse-Item-ExtIEs} } OPTIONAL,
  ...
}

MRBForwardingResourceResponse-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}

-- MCForwardingResourceRelease

MCForwardingResourceRelease ::= SEQUENCE {
  mcForwardingResourceID      MCForwardingResourceID,
  iE-Extensions              ProtocolExtensionContainer { {MCForwardingResourceRelease-ExtIEs} }  OPTIONAL,
  ...
}

```

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

-- MCForwardingResourceReleaseIndication

MCForwardingResourceReleaseIndication ::= SEQUENCE {
  mcForwardingResourceID          MCForwardingResourceID,
  iE-Extensions          ProtocolExtensionContainer { {MCForwardingResourceReleaseIndication-ExtIEs} } OPTIONAL,
  ...
}

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

MCForwardingResourceID ::= OCTET STRING (SIZE(2))

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

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

MRB-ProgressInformation ::= SEQUENCE {
  mrb-ProgressInformationSNs MRB-ProgressInformationSNs,
  mrb-ProgressInformationType MRB-ProgressInformationType,
  iE-Extensions          ProtocolExtensionContainer { {MRB-ProgressInformation-ExtIEs} } OPTIONAL,
  ...
}

MRB-ProgressInformation-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MRB-ProgressInformationSNs ::= CHOICE {
  pdcp-SN12          INTEGER (0..4095),
  pdcp-SN18          INTEGER (0..262143),
  choice-extension   ProtocolIE-SingleContainer { { MRB-ProgressInformationSNs-ExtIEs} }
}

MRB-ProgressInformationSNs-ExtIEs E1AP-PROTOCOL-IES ::= {
  ...
}

MRB-ProgressInformationType ::= ENUMERATED {oldest-available, last-delivered, ...}

MRDC-Data-Usage-Report-Item ::= SEQUENCE {
  startTimeStamp      OCTET STRING (SIZE(4)),
  endTimeStamp        OCTET STRING (SIZE(4)),
  usageCountUL        INTEGER (0..18446744073709551615),
```

```

usageCountDL                INTEGER (0..18446744073709551615),
iE-Extensions                ProtocolExtensionContainer { { MRDC-Data-Usage-Report-Item-ExtIEs } } OPTIONAL,
...
}

MRDC-Data-Usage-Report-Item-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

MRDC-Usage-Information ::= SEQUENCE {
  data-Usage-per-PDU-Session-Report      Data-Usage-per-PDU-Session-Report      OPTIONAL,
  data-Usage-per-QoS-Flow-List           Data-Usage-per-QoS-Flow-List           OPTIONAL,
  iE-Extensions                          ProtocolExtensionContainer { { MRDC-Usage-Information-ExtIEs } } OPTIONAL,
  ...
}

MRDC-Usage-Information-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

M4Configuration ::= SEQUENCE {
  m4period                M4period,
  m4-links-to-log         Links-to-log,
  iE-Extensions           ProtocolExtensionContainer { { M4Configuration-ExtIEs } } OPTIONAL,
  ...
}

M4Configuration-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  { ID id-M4ReportAmount      CRITICALITY ignore EXTENSION M4ReportAmount      PRESENCE optional      },
  ...
}

M4period ::= ENUMERATED {ms1024, ms2048, ms5120, ms10240, min1, ... }

M4ReportAmount ::= ENUMERATED { r1, r2, r4, r8, r16, r32, r64, infinity, ... }

M6Configuration ::= SEQUENCE {
  m6report-Interval       M6report-Interval,
  m6-links-to-log         Links-to-log,
  iE-Extensions           ProtocolExtensionContainer { { M6Configuration-ExtIEs } } OPTIONAL,
  ...
}

M6Configuration-ExtIEs 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 ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-M7ReportAmount      CRITICALITY ignore EXTENSION M7ReportAmount      PRESENCE optional      },
    ...
}

M7period ::= INTEGER(1..60, ...)

M7ReportAmount ::= ENUMERATED { r1, r2, r4, r8, r16, r32, r64, infinity, ... }

MDT-Activation ::= ENUMERATED {
    immediate-MDT-only,
    immediate-MDT-and-Trace,
    ...
}

MDT-Configuration ::= SEQUENCE {
    mdt-Activation      MDT-Activation,
    mDTMode             MDTMode,
    iE-Extensions        ProtocolExtensionContainer { { MDT-Configuration-ExtIEs } } OPTIONAL,
    ...
}

MDT-Configuration-ExtIEs ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

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

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

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

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

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

NG-RAN-QoS-Support-List ::= SEQUENCE (SIZE(1.. maxnoofNGRANQoSParameters)) OF NG-RAN-QoS-Support-Item

NG-RAN-QoS-Support-Item ::= SEQUENCE {
    non-Dynamic5QIDDescriptor  Non-Dynamic5QIDDescriptor,
    iE-Extensions             ProtocolExtensionContainer { { NG-RAN-QoS-Support-Item-ExtIEs } } OPTIONAL
}

NG-RAN-QoS-Support-Item-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

NID ::= BIT STRING (SIZE (44))

Non-Dynamic5QIDDescriptor ::= SEQUENCE {
    fiveQI                INTEGER (0..255, ...),
    qoSPriorityLevel       QoSPriorityLevel          OPTIONAL,
    averagingWindow        AveragingWindow          OPTIONAL,
    maxDataBurstVolume     MaxDataBurstVolume       OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { { Non-Dynamic5QIDDescriptor-ExtIEs } } OPTIONAL
}

Non-Dynamic5QIDDescriptor-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-CNPacketDelayBudgetDownlink          CRITICALITY ignore  EXTENSION  ExtendedPacketDelayBudget  PRESENCE optional },
    { ID id-CNPacketDelayBudgetUplink           CRITICALITY ignore  EXTENSION  ExtendedPacketDelayBudget  PRESENCE optional },
    ...
}

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

NPNSupportInfo-ExtIEs  ELAP-PROTOCOL-IES ::= {
    ...
}

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

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

```

```

}
NPNContextInfo ::= CHOICE {
    sNPN                NPNContextInfo-SNPN,
    choice-extension    ProtocolIE-SingleContainer  {{NPNContextInfo-ExtIEs}}
}
NPNContextInfo-ExtIEs 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-Reset ::= ENUMERATED {
    true,
    ...
}

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)

PDU-Session-PairID ::= INTEGER (0..255, ...)

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

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

PDU-Session-Resource-Activity-Item ::= SEQUENCE {
    pDU-Session-ID          PDU-Session-ID,
    pDU-Session-Resource-Activity PDU-Session-Resource-Activity,
    iE-Extensions          ProtocolExtensionContainer { { PDU-Session-Resource-Activity-ItemExtIEs } } OPTIONAL,
    ...
}

```

```

PDU-Session-Resource-Activity-ItemExtIEs      E1AP-PROTOCOL-EXTENSION ::= {
  ...
}

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

PDU-Session-Resource-Modified-Item ::= SEQUENCE {
    pDU-Session-ID                PDU-Session-ID,
    nG-DL-UP-TNL-Information      UP-TNL-Information                OPTIONAL,
    securityResult                SecurityResult                OPTIONAL,
    pDU-Session-Data-Forwarding-Information-Response    Data-Forwarding-Information    OPTIONAL,
    dRB-Setup-List-NG-RAN         DRB-Setup-List-NG-RAN            OPTIONAL,
    dRB-Failed-List-NG-RAN        DRB-Failed-List-NG-RAN        OPTIONAL,
    dRB-Modified-List-NG-RAN      DRB-Modified-List-NG-RAN    OPTIONAL,
    dRB-Failed-To-Modify-List-NG-RAN DRB-Failed-To-Modify-List-NG-RAN OPTIONAL,
    iE-Extensions                 ProtocolExtensionContainer { { PDU-Session-Resource-Modified-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Modified-Item-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-redundant-nG-DL-UP-TNL-Information    CRITICALITY ignore EXTENSION    UP-TNL-Information PRESENCE optional },
    ...
}

PDU-Session-Resource-Required-To-Modify-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Required-To-Modify-Item

PDU-Session-Resource-Required-To-Modify-Item ::= SEQUENCE {
    pDU-Session-ID                PDU-Session-ID,
    nG-DL-UP-TNL-Information      UP-TNL-Information                OPTIONAL,
    dRB-Required-To-Modify-List-NG-RAN    DRB-Required-To-Modify-List-NG-RAN    OPTIONAL,
    dRB-Required-To-Remove-List-NG-RAN    DRB-Required-To-Remove-List-NG-RAN    OPTIONAL,
    iE-Extensions                 ProtocolExtensionContainer { { PDU-Session-Resource-Required-To-Modify-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Required-To-Modify-Item-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {
    { ID id-redundant-nG-DL-UP-TNL-Information    CRITICALITY ignore EXTENSION    UP-TNL-Information PRESENCE optional },
    ...
}

PDU-Session-Resource-Setup-List ::= SEQUENCE (SIZE(1.. maxnoofPDU-Session-Resource)) OF PDU-Session-Resource-Setup-Item

PDU-Session-Resource-Setup-Item ::= SEQUENCE {
    pDU-Session-ID                PDU-Session-ID,
    securityResult                SecurityResult                OPTIONAL,
    nG-DL-UP-TNL-Information      UP-TNL-Information,
    pDU-Session-Data-Forwarding-Information-Response    Data-Forwarding-Information    OPTIONAL,
    nG-DL-UP-Unchanged            ENUMERATED {true, ...}    OPTIONAL,
    dRB-Setup-List-NG-RAN         DRB-Setup-List-NG-RAN,
    dRB-Failed-List-NG-RAN        DRB-Failed-List-NG-RAN        OPTIONAL,
    iE-Extensions                 ProtocolExtensionContainer { { PDU-Session-Resource-Setup-Item-ExtIEs } } OPTIONAL,
    ...
}

PDU-Session-Resource-Setup-Item-ExtIEs    E1AP-PROTOCOL-EXTENSION ::= {

```



```

    { ID id-redundant-nG-DL-UP-TNL-Information      CRITICALITY ignore EXTENSION  UP-TNL-Information PRESENCE optional }|
    { ID id-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    ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-redundant-nG-DL-UP-TNL-Information      CRITICALITY ignore EXTENSION  UP-TNL-Information PRESENCE optional },
    ...
}

PDU-Session-Resource-To-Modify-List ::= SEQUENCE (SIZE(1.. 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    ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-SNSSAI                  CRITICALITY reject EXTENSION SNSSAI                PRESENCE optional}|
    {ID id-CommonNetworkInstance   CRITICALITY ignore EXTENSION CommonNetworkInstance PRESENCE optional}
    }|
    {ID id-redundant-nG-UL-UP-TNL-Information      CRITICALITY ignore EXTENSION  UP-TNL-Information PRESENCE optional }|
    {ID id-RedundantCommonNetworkInstance         CRITICALITY ignore EXTENSION  CommonNetworkInstance PRESENCE optional }|
    {ID id-DataForwardingtoE-UTRANInformationList CRITICALITY ignore EXTENSION  DataForwardingtoE-UTRANInformationList PRESENCE optional }|
    {ID id-SecurityIndicationModify               CRITICALITY ignore EXTENSION  SecurityIndication PRESENCE optional }|
    {ID id-Secondary-PDU-Session-Data-Forwarding-Information CRITICALITY ignore EXTENSION  Data-Forwarding-Information PRESENCE optional },
    ...
}

```

```

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      ELAP-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      ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-CommonNetworkInstance          CRITICALITY ignore EXTENSION CommonNetworkInstance          PRESENCE optional }|
    { ID id-redundant-nG-UL-UP-TNL-Information CRITICALITY ignore EXTENSION UP-TNL-Information          PRESENCE optional }|
    { ID id-RedundantCommonNetworkInstance CRITICALITY ignore EXTENSION CommonNetworkInstance          PRESENCE optional }|
    { ID id-RedundantPDUSessionInformation CRITICALITY ignore EXTENSION RedundantPDUSessionInformation PRESENCE optional },
    ...
}

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 ELAP-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          ELAP-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    ELAP-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-Index              INTEGER (1..8, ...) OPTIONAL,
  -- The paging-Policy-Index IE is not used in this version of the specification.
  reflective-QoS-Indicator         ENUMERATED {enabled, ...} OPTIONAL,
  iE-Extensions                    ProtocolExtensionContainer { { QoSFlowLevelQoSParameters-ExtIEs } } OPTIONAL
}

QoSFlowLevelQoSParameters-ExtIEs E1AP-PROTOCOL-EXTENSION ::= {
  {ID id-QoSMonitoringRequest      CRITICALITY ignore EXTENSION QoSMonitoringRequest PRESENCE optional}|
  {ID id-MCG-OfferedGBRQoSFlowInfo CRITICALITY ignore EXTENSION GBR-QoSFlowInformation PRESENCE optional}|

```

```

    {ID id-QoSMonitoringReportingFrequency CRITICALITY ignore EXTENSION QoSMonitoringReportingFrequency PRESENCE optional}|
    {ID id-QoSMonitoringDisabled CRITICALITY ignore EXTENSION QoSMonitoringDisabled PRESENCE optional}|
    {ID id-DataForwardingSourceIPAddress CRITICALITY ignore EXTENSION TransportLayerAddress PRESENCE optional},
    ...
}

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 ELAP-PROTOCOL-EXTENSION ::= {
    {ID id-PDUSession-PairID    CRITICALITY ignore EXTENSION PDUSession-PairID PRESENCE optional },
    ...
}

RSN ::= ENUMERATED {v1, v2, ...}

RetainabilityMeasurementsInfo ::= SEQUENCE (SIZE(1.. maxnoofDRBs)) OF DRB-Removed-Item

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

ReportCharacteristics ::= BIT STRING (SIZE(36))

ReportingPeriodicity ::= ENUMERATED {
    ms500, ms1000, ms2000, ms5000, ms10000, ms20000, ms30000, ms40000, ms50000, ms60000, ms70000, ms80000, ms90000, ms100000, ms110000, ms120000,
    ...
}

RequestedAction4AvailNGUTermination ::= ENUMERATED {
    apply-available-configuration,
    apply-requested-configuration,
    ...,
    apply-available-configuration-if-same-as-requested
}

RLC-Mode ::= ENUMERATED {
    rlc-tm,
    rlc-am,
    rlc-um-bidirectional,
    rlc-um-unidirectional-ul,
}
```

```

    rlc-um-unidirectional-dl,
    ...
}

ROHC-Parameters ::= CHOICE {
    rOHC                ROHC,
    uPlinkOnlyROHC     UplinkOnlyROHC,
    choice-Extension    ProtocolIE-SingleContainer { { ROHC-Parameters-ExtIEs } }
}

ROHC-Parameters-ExtIEs E1AP-PROTOCOL-IES ::= {
    ...
}

ROHC ::= SEQUENCE {
    maxCID                INTEGER (0..16383, ...),
    rOHC-Profiles         INTEGER (0..511, ...),
    continueROHC          ENUMERATED {true, ...} OPTIONAL,
    iE-Extensions         ProtocolExtensionContainer { { ROHC-ExtIEs } } OPTIONAL
}

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

-- S

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 } } OPTIONAL,
    ...
}

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

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

```

```

TSTrafficCharacteristics-ExtIEs    ELAP-PROTOCOL-EXTENSION ::= {
    ...
}

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

TSTrafficInformation-ExtIEs        ELAP-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              ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-MDTConfiguration          CRITICALITY ignore         EXTENSION MDT-Configuration      PRESENCE optional }|
    { ID id-TraceCollectionEntityURI  CRITICALITY ignore         EXTENSION URIaddress            PRESENCE optional},
    ...
}

TraceDepth ::= ENUMERATED {
    minimum,
    medium,
    maximum,
    minimumWithoutVendorSpecificExtension,
    mediumWithoutVendorSpecificExtension,
    maximumWithoutVendorSpecificExtension,
    ...
}

TraceID ::= OCTET STRING (SIZE(8))

TransportLayerAddress               ::= BIT STRING (SIZE(1..160, ...))

TransactionID                       ::= INTEGER (0..255, ...)

T-Reordering                       ::= ENUMERATED {ms0, ms1, ms2, ms4, ms5, ms8, ms10, ms15, ms20, ms30, ms40, ms50, ms60, ms80, ms100, ms120, ms140, ms160, ms180,
ms200, ms220, ms240, ms260, ms280, ms300, ms500, ms750, ms1000, ms1250, ms1500, ms1750, ms2000, ms2250, ms2500, ms2750, ms3000, ...}

T-ReorderingTimer ::= SEQUENCE {

```

```

    t-Reordering          T-Reordering,
      iE-Extensions      ProtocolExtensionContainer { { T-ReorderingTimer-ExtIEs } } OPTIONAL,
    ...
  }
T-ReorderingTimer-ExtIEs  ELAP-PROTOCOL-EXTENSION ::= {
  ...
}
TypeOfError ::= ENUMERATED {
  not-understood,
  missing,
  ...
}
Transport-Layer-Address-Info ::= SEQUENCE {
  transport-UP-Layer-Addresses-Info-To-Add-List  Transport-UP-Layer-Addresses-Info-To-Add-List OPTIONAL,
  transport-UP-Layer-Addresses-Info-To-Remove-List  Transport-UP-Layer-Addresses-Info-To-Remove-List OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { { Transport-Layer-Address-Info-ExtIEs } } OPTIONAL,
  ...
}
Transport-Layer-Address-Info-ExtIEs ELAP-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  GTPTTLAs OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { { Transport-UP-Layer-Addresses-Info-To-Add-ItemExtIEs } } OPTIONAL,
  ...
}
Transport-UP-Layer-Addresses-Info-To-Add-ItemExtIEs ELAP-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  GTPTTLAs OPTIONAL,
  iE-Extensions          ProtocolExtensionContainer { { Transport-UP-Layer-Addresses-Info-To-Remove-ItemExtIEs } } OPTIONAL,
  ...
}
Transport-UP-Layer-Addresses-Info-To-Remove-ItemExtIEs ELAP-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 ELAP-PROTOCOL-EXTENSION ::= {
    { ID id-VersionID CRITICALITY ignore EXTENSION INTEGER (0..15) PRESENCE optional},
    ...
}

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

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

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

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

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

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

ULUPTNLAddressToUpdateItem ::= SEQUENCE {
    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 { { UPLinkOnlyROHC-ExtIEs } }    OPTIONAL,
    ...
}

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

UP-TNL-Information    ::=    CHOICE {
    gTPTunnel        GTP Tunnel,
    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

```

```
UEInactivityInformation ::= INTEGER (1..7200, ...)
```

```
-- V
```

```
-- W
```

```
-- X
```

```
-- Y
```

```
-- Z
```

```
END
```

```
-- ASN1STOP
```

9.4.6 Common Definitions

```
-- ASN1START
```

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

```
--
```

```
-- Common definitions
```

```
--
```

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

```
ElAP-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
ngran-access (22) modules (3) elap (5) version1 (1) elap-CommonDataTypes (3)}
```

```
DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN
```

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

```
--
```

```
-- Extension constants
```

```
--
```

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

```
maxPrivateIEs                INTEGER ::= 65535
maxProtocolExtensions         INTEGER ::= 65535
maxProtocolIEs                INTEGER ::= 65535
```

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

```
--
```

```
-- Common Data Types
```

```
--
```

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

```
Criticality ::= ENUMERATED { reject, ignore, notify }
```

```
Presence ::= ENUMERATED { optional, conditional, mandatory }
```

```

PrivateIE-ID ::= CHOICE {
    local      INTEGER (0..maxPrivateIEs),
    global     OBJECT IDENTIFIER
}

ProcedureCode ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..maxProtocolExtensions)

ProtocolIE-ID ::= INTEGER (0..maxProtocolIEs)

TriggeringMessage ::= ENUMERATED { initiating-message, successful-outcome, unsuccessful-outcome}

END
-- ASN1STOP

```

9.4.7 Constant Definitions

```

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

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

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    ProcedureCode,
    ProtocolIE-ID

FROM ElAP-CommonDataTypes;

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

id-reset                               ProcedureCode ::= 0
id-errorIndication                      ProcedureCode ::= 1
id-privateMessage                       ProcedureCode ::= 2
id-gNB-CU-UP-ElSetup                   ProcedureCode ::= 3
id-gNB-CU-CP-ElSetup                   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-UP-TNLAddressUpdate	ProcedureCode ::= 24
id-CellTrafficTrace	ProcedureCode ::= 25
id-earlyForwardingSNTransfer	ProcedureCode ::= 26
id-gNB-CU-CPMeasurementResultsInformation	ProcedureCode ::= 27
id-iABPSKNotification	ProcedureCode ::= 28
id-BCBearerContextSetup	ProcedureCode ::= 29
id-BCBearerContextModification	ProcedureCode ::= 30
id-BCBearerContextModificationRequired	ProcedureCode ::= 31
id-BCBearerContextRelease	ProcedureCode ::= 32
id-BCBearerContextReleaseRequest	ProcedureCode ::= 33
id-MCBearerContextSetup	ProcedureCode ::= 34
id-MCBearerContextModification	ProcedureCode ::= 35
id-MCBearerContextModificationRequired	ProcedureCode ::= 36
id-MCBearerContextRelease	ProcedureCode ::= 37
id-MCBearerContextReleaseRequest	ProcedureCode ::= 38
id-MCBearerNotification	ProcedureCode ::= 39

```
-- *****
--
-- Lists
--
-- *****
```

maxnoofErrors	INTEGER ::= 256
maxnoofSPLMNs	INTEGER ::= 12
maxnoofSliceItems	INTEGER ::= 1024
maxnoofIndividualE1ConnectionsToReset	INTEGER ::= 65536
maxnoofEUTRANQoSParameters	INTEGER ::= 256
maxnoofNGRANQoSParameters	INTEGER ::= 256
maxnoofDRBs	INTEGER ::= 32
maxnoofNR CGI	INTEGER ::= 512
maxnoofPDUSessionResource	INTEGER ::= 256
maxnoofQoSFlows	INTEGER ::= 64
maxnoofUPParameters	INTEGER ::= 8
maxnoofCellGroups	INTEGER ::= 4

```

maxnooftimeperiods          INTEGER ::= 2
maxnoofTNLAssociations      INTEGER ::= 32
maxnoofTTLAs                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-ELAP-ID	ProtocolIE-ID ::= 155
id-GNB-CU-UP-MBS-ELAP-ID	ProtocolIE-ID ::= 156
id-GlobalMBSSESSIONID	ProtocolIE-ID ::= 157
id-BCBearerContextToSetup	ProtocolIE-ID ::= 158
id-BCBearerContextToSetupResponse	ProtocolIE-ID ::= 159
id-BCBearerContextToModify	ProtocolIE-ID ::= 160
id-BCBearerContextToModifyResponse	ProtocolIE-ID ::= 161
id-BCBearerContextToModifyRequired	ProtocolIE-ID ::= 162
id-BCBearerContextToModifyConfirm	ProtocolIE-ID ::= 163
id-MCBearerContextToSetup	ProtocolIE-ID ::= 164
id-MCBearerContextToSetupResponse	ProtocolIE-ID ::= 165
id-MCBearerContextToModify	ProtocolIE-ID ::= 166
id-MCBearerContextToModifyResponse	ProtocolIE-ID ::= 167
id-MCBearerContextToModifyRequired	ProtocolIE-ID ::= 168
id-MCBearerContextToModifyConfirm	ProtocolIE-ID ::= 169
id-MBSMulticastFLUContextDescriptor	ProtocolIE-ID ::= 170
id-gNB-CU-UP-MBS-Support-Info	ProtocolIE-ID ::= 171
id-SecurityIndication	ProtocolIE-ID ::= 172
id-SecurityResult	ProtocolIE-ID ::= 173
id-SDTContinueROHC	ProtocolIE-ID ::= 174
id-SDTindicatorSetup	ProtocolIE-ID ::= 175
id-SDTindicatorMod	ProtocolIE-ID ::= 176
id-DiscardTimerExtended	ProtocolIE-ID ::= 177
id-ManagementBasedMDTPLMNModificationList	ProtocolIE-ID ::= 178
id-MCForwardingResourceRequest	ProtocolIE-ID ::= 179
id-MCForwardingResourceIndication	ProtocolIE-ID ::= 180
id-MCForwardingResourceResponse	ProtocolIE-ID ::= 181
id-MCForwardingResourceRelease	ProtocolIE-ID ::= 182
id-MCForwardingResourceReleaseIndication	ProtocolIE-ID ::= 183
id-PDCP-COUNT-Reset	ProtocolIE-ID ::= 184
id-MBSSessionAssociatedInfoNonSupportToSupport	ProtocolIE-ID ::= 185
id-VersionID	ProtocolIE-ID ::= 186
id-InactivityInformationRequest	ProtocolIE-ID ::= 187
id-UEInactivityInformation	ProtocolIE-ID ::= 188
id-MBSAreaSessionID	ProtocolIE-ID ::= 189
id-Secondary-PDU-Session-Data-Forwarding-Information	ProtocolIE-ID ::= 190

```

id-MBSSessionResourceNotification      ProtocolIE-ID ::= 191
id-MCBearerContextInactivityTimer     ProtocolIE-ID ::= 192
id-MCBearerContextStatusChange        ProtocolIE-ID ::= 193

```

```

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) elap (5) version1 (1) elap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

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

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

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

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

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

-- *****
--
-- Container Lists for Protocol IE Containers
--
-- *****

ProtocolIE-ContainerList {INTEGER : lowerBound, INTEGER : upperBound, ElAP-PROTOCOL-IES : IEsSetParam} ::=
  SEQUENCE (SIZE (lowerBound..upperBound)) OF
  ProtocolIE-Container {{IEsSetParam}}

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

ProtocolExtensionContainer { ElAP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
  SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
  ProtocolExtensionField {{ExtensionSetParam}}

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

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

PrivateIE-Container { ElAP-PRIVATE-IES : IEsSetParam} ::=
  SEQUENCE (SIZE (1..maxPrivateIEs)) OF
  PrivateIE-Field {{IEsSetParam}}

PrivateIE-Field { ElAP-PRIVATE-IES : IEsSetParam} ::= SEQUENCE {
  id          ElAP-PRIVATE-IES.&id          ({IEsSetParam}),

```



```
    criticality    E1AP-PRIVATE-IES.&criticality    ({IEsSetParam}{@id}),
    value         E1AP-PRIVATE-IES.&Value        ({IEsSetParam}{@id})
}

END
-- ASN1STOP
```

9.5 Message Transfer Syntax

E1AP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax, as specified in ITU-T Recommendation X.691 [7].

9.6 Timers

10 Handling of unknown, unforeseen and erroneous protocol data

Section 10 of TS 38.413 [6] is applicable for the purposes of the present document, with the following additions for non-UE-associated procedures:

- In case of Abstract Syntax Error, when reporting the *Criticality Diagnostics* IE for not comprehended IE/IEgroups or missing IE/IE groups, the *Transaction ID* IE shall also be included;
- In case of Logical Error, when reporting the *Criticality Diagnostics* IE, the *Transaction ID* IE shall also be included;
- In case of Logical Error in a response message of a Class 1 procedure, or failure to comprehend *Transaction ID* IE from a received message, the procedure shall be considered as unsuccessfully terminated or not terminated (e.g., transaction ID unknown in response message), and local error handling shall be initiated.

Annex A (informative): Change History

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2022-01	R3#114b-e	R3-221121	-	-	-	Text transferred from TS 38.463 v16.8.0 with no changes. Capture LTE_NR_arch_evo_enh-Core endorsed BL CRs and agreed TPs	0.0.1
2022-02	R3#115-e	R3-221645	-	-	-	Submitted to RAN#115-e	0.1.0
2022-02	R3#115-e	R3-222578	-	-	-	Change the date of specification release	0.1.1
2022-03	RAN#95-e	RP-220798	-	-	-	Version submitted for approval in RAN#95-e	1.0.0
2022-03	RAN#95-e	RP-220851	-	-	-	Agreed Rel-16/17 CRs from other WIs are merged. Including REL-16 38.463 changes of: R3-221223 of RP-220276, R3-221253 of RP-220278, R3-220836 of RP-220277, R3-221707 of RP-220282, R3-222108 of RP-220279, R3-222844 of RP-220279. and REL-17 38.463 changes of: R3-221516 of RP-220218, R3-221550 of RP-220221, R3-221598 of RP-220232, R3-221617 of RP-220294, R3-222541 of RP-220223, R3-222613 of RP-220234, R3-222906 of RP-220218, R3-222930 of RP-220224, RP-220927, R3-222986 of RP-220233.	1.1.0
2022-03	RAN#95-e					Promotion to Release 17 without technical change	17.0.0
2022-06	RAN#96	RP-221138	0001	1	F	Correction of UDC in CP-UP Split architecture	17.1.0
2022-06	RAN#96	RP-221132	0002	2	F	Extended PDCP Discard Timer over E1 interface	17.1.0
2022-06	RAN#96	RP-221154	0004	1	A	Correction on EHC parameters	17.1.0
2022-06	RAN#96	RP-221140	0005	1	F	Correction on enhanced eNB architecture evolution	17.1.0
2022-06	RAN#96	RP-221134	0007	1	F	Correction on configuration of initial value of HFN and reference SN	17.1.0
2022-06	RAN#96	RP-221150	0008	1	A	Dynamic ACL over E1 CR 37.483	17.1.0
2022-06	RAN#96	RP-221134	0009	1	F	MBS E1AP corrections	17.1.0
2022-06	RAN#96	RP-221149	0010	2	A	Correction on IAB PSK generation	17.1.0
2022-06	RAN#96	RP-221134	0013	3	F	Correction of MBS shared NG-U termination	17.1.0
2022-06	RAN#96	RP-221145	0014	1	D	E1AP Rapporteur Corrections	17.1.0
2022-06	RAN#96	RP-221134	0015	1	F	Correction on NR MBS in E1AP	17.1.0
2022-06	RAN#96	RP-221141	0016	1	F	Correction on update management based MDT user consent	17.1.0
2022-06	RAN#96	RP-221134	0019	-	F	NR MBS E1AP asn.1 correction	17.1.0
2022-06	RAN#96	RP-221135	0020	1	F	Correction for E1AP on SCG (de)activation	17.1.0
2022-09	RAN#97-e	RP-222201	0027	1	A	Correction on Missing Criticality Diagnostics over E1AP	17.2.0
2022-09	RAN#97-e	RP-222188	0030	1	F	Correction of shared CU UP codepoints	17.2.0
2022-09	RAN#97-e	RP-222188	0031	1	F	Further Corrections for NR MBS	17.2.0
2022-09	RAN#97-e	RP-222188	0032	-	F	E1AP ASN.1 correction on MCBearerContextToModify	17.2.0
2022-09	RAN#97-e	RP-222188	0034	1	F	Introduction of MBS specific cause values	17.2.0
2022-09	RAN#97-e	RP-222188	0035	1	F	Correction on Maximum number of MRBs	17.2.0
2022-09	RAN#97-e	RP-222188	0037	2	F	Correction for the MBS multicast data forwarding	17.2.0
2022-09	RAN#97-e	RP-222188	0038	1	F	Corrections for the establishment of F1-U ptp retransmission tunnels	17.2.0
2022-12	RAN#98	RP-222891	0026	4	A	PDCP COUNT reset in CU-UP for inter-gNB-DU Handover	17.3.0
2022-12	RAN#98	RP-222882	0042	3	F	Clarification on initialRX-DELIV over E1AP	17.3.0
2022-12	RAN#98	RP-222882	0043	2	F	Correction on non-MBS-supporting to MBS-supporting handover on TS 37.483	17.3.0
2022-12	RAN#98	RP-222882	0046	1	F	MC Bearer Context Setup without MBS QoS flow information available	17.3.0
2023-03	RAN#99	RP-230583	0049	-	F	Correction on providing MBS Session Associated Information	17.4.0
2023-03	RAN#99	RP-230595	0050	-	A	Mandatory extension container in E1AP Resource Status Update	17.4.0
2023-03	RAN#99	RP-230594	0051	1	F	E1AP corrections of references to RRC	17.4.0
2023-06	RAN#100	RP-231081	0055	1	A	Alignment of the tabular and ASN.1 definitions for the Resource Status Update	17.5.0
2023-06	RAN#100	RP-231075	0056	1	A	Corrections on TNL association addition, update and removal (E1)	17.5.0
2023-06	RAN#100	RP-231073	0057	1	F	Correction of Burst Arrival Time semantics description	17.5.0
2023-06	RAN#100	RP-231074	0058	1	F	Correction on NG-U tunnel aspect for MBS session	17.5.0
2023-06	RAN#100	RP-231075	0059	2	F	Correction of Priority Level	17.5.0
2023-06	RAN#100	RP-231068	0060	2	F	Correction of RAT type in Data Usage Report List for Rel-17	17.5.0
2023-06	RAN#100	RP-231081	0061	2	A	Correction on RESOURCE STATUS FAILURE message over E1 in Rel-17	17.5.0
2023-06	RAN#100	RP-231084	0062	2	F	Correction of Extended Packet Delay Budget	17.5.0
2023-06	RAN#100	RP-231070	0063	2	A	Correction of Paging Priority Indicator in QoS Flow Level QoS Parameters	17.5.0
2023-06	RAN#100	RP-231082	0064	4	F	Correction to UDC Parameters in E1AP	17.5.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2023-06	RAN#100	RP-231074	0065	0	F	Correction of MRB Setup Configuration over E1	17.5.0
2023-09	RAN#101	RP-231902	0067	0	F	UDC Parameters over E1	17.6.0
2023-09	RAN#101	RP-231895	0068	2	A	Inactive Time Signaling over E1 for Mobility	17.6.0
2023-09	RAN#101	RP-231897	0069	1	F	Correction of Location Dependent Service	17.6.0
2023-09	RAN#101	RP-231895	0072	2	A	Correction of data forwarding for split PDU session	17.6.0
2023-09	RAN#101	RP-231897	0073	0	F	Correction on MBS Session Forwarding Address	17.6.0
2023-12	RAN#102	RP-233849	0079	3	F	Correction on Temp no data and DL data arrival for Activate Multicast Session	17.7.0
2023-12	RAN#102	RP-233847	0089	1	A	Correction on Resource Status Request	17.7.0
2023-12	RAN#102	RP-233849	0094	1	F	ASN.1 and tabular alignment for Multicast related message	17.7.0
2023-12	RAN#102	RP-233852	0096	1	F	Correction on Bearer Context Status Change	17.7.0

History

Document history		
V17.0.0	April 2022	Publication
V17.1.0	July 2022	Publication
V17.2.0	October 2022	Publication
V17.3.0	January 2023	Publication
V17.4.0	April 2023	Publication
V17.5.0	July 2023	Publication
V17.6.0	October 2023	Publication
V17.7.0	February 2024	Publication